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Third Review



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Foreword

This third Environmental Performance Review (EPR) of Uzbekistan builds on the substantial experience accumulated by the United Nations Economic Commission for Europe (ECE) and its member States in using this tool to regularly assess progress achieved in reconciling national economic and environmental objectives. Over two decades, EPRs have resulted in stronger institutions for environmental management, improved financial frameworks for environmental protection, advanced environmental monitoring and information systems, better integration of environmental concerns into sectoral policies, strengthened public participation and increased international cooperation. They bring together good practices and a wealth of experience from all ECE member States in a mutually enriching learning exchange.

ECE is privileged to have conducted this EPR at the time when Uzbekistan is in the midst of political, economic and social reforms. Its environmental policy develops in leaps and bounds, with the Concept on Environmental Protection until 2030, the Strategy for Transition to Green Economy for the period 2019–2030 and several other documents setting the scene for major environmental issues adopted in the course of 2019. Rich in natural gas, gold, uranium and other mineral resources, Uzbekistan actively attracts international investments, implements large infrastructure projects and is confronted with difficult choices in finding its way to long-term growth based on climate-friendly technologies and the sustainable management of natural resources. The EPR highlights challenges but also opportunities and solutions in this respect.

This review is also special since it comes right after the adoption by Uzbekistan of the national Sustainable Development Goals, targets and indicators based on the global Sustainable Development Goals, targets and indicators. It reflects on the outcomes of adapting the global Goals to national circumstances and equips the Government and interested stakeholders in Uzbekistan with recommendations to inspire future work to implement the 2030 Agenda for Sustainable Development and the national climate change commitments under the Paris Agreement under the United Nations Framework Convention on Climate Change.

I trust that this third review will serve as a powerful tool to support policymakers and other stakeholders in their efforts to improve environmental management and achieve the Sustainable Development Goals in Uzbekistan. ECE wishes the Government of Uzbekistan further success in carrying out the tasks involved in meeting its environmental objectives, including through the implementation of the recommendations in the third review. I also hope that the lessons learned from the peer review process in Uzbekistan will benefit other countries throughout the ECE region.

Olga Algayerova



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Preface

This third EPR of Uzbekistan takes stock of progress made by Uzbekistan in the management of its environment since it was reviewed for the second time in 2009–2010 and assesses the implementation of the recommendations made in the second review.

The EPR covers legal and policy frameworks and environmental compliance assurance mechanisms and addresses the topics of greening the economy, environmental monitoring, public participation and education. Furthermore, it addresses issues of specific importance to the country related to air protection, biodiversity and protected areas, as well as water, waste and chemicals management. The EPR also examines the efforts of Uzbekistan to integrate environmental considerations into its policies in the energy, agriculture, transport, industry and health sectors and to make human settlements more environmentally friendly. The Aral Sea disaster and its consequences for the environment and human health come as a cross-cutting issue throughout the review. The review further provides a substantive and policy analysis of the country's climate change adaptation and mitigation measures and its participation in international mechanisms. It includes an assessment of progress towards relevant targets of the 2030 Agenda for Sustainable Development and provides recommendations related to the achievement of Sustainable Development Goals.

This EPR of Uzbekistan began in September 2018 with a preparatory mission to agree on the structure of the report and the schedule for its completion. A team of international experts took part in the review mission from 25 February to 5 March 2019. In September 2019, the draft report was sent to Uzbekistan for comments. In October 2019, it was submitted to the ECE Expert Group on Environmental Performance Reviews for consideration. During its meeting on 31 October–1 November 2019, the Expert Group discussed the draft report with a delegation from Uzbekistan, focusing on the conclusions and recommendations made by the international experts. The recommendations, with suggested amendments from the Expert Group, were then submitted for peer review to the ECE Committee on Environmental Policy at its twenty-fifth session on 13–15 November 2019. A high-level delegation from Uzbekistan participated in the peer review and the Committee adopted the recommendations in this report.

The Committee and the ECE Secretariat are grateful to the Government of Uzbekistan and its experts who worked with the international experts and contributed their knowledge and expertise. ECE would also like to express its deep appreciation to the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety and the German Federal Environment Agency for their support by providing funds through the Advisory Assistance Programme, and to Switzerland for its financial support to this review.

Sincere thanks also go to Hungary, Italy, Portugal, the United Nations Environment Programme, the World Health Organization Regional Office for Europe and the Organisation for Economic Co-operation and Development for having provided their experts to this review. Furthermore, ECE is grateful to the United Nations Country Team in Uzbekistan for its support of this review.

ECE also takes this opportunity to thank Austria, Germany, Norway, Portugal, Switzerland and the European Union for their financial support to the EPR Programme in 2018–2019 and expresses its deep appreciation to Estonia, Georgia, Germany, Hungary, Italy, Montenegro, Romania and Switzerland for having provided their experts for the ECE Expert Group on Environmental Performance Reviews, which undertook the expert review of this report.

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PHOTO CREDITS

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Cover page photos:

Four-spotted blister beetle (*Mylabris quadripunctata*) – State Committee on Development of Tourism;

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Greater flamingo (*Phoenicopterus roseus*) – Mr. Vadim Ni;

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KEY ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
API	Air Pollution Index
ASBP	Aral Sea Basin Programme
BAT	best available techniques
BISA	basin irrigation system administration
BRI	Belt and Road Initiative
CAREC	Regional Environmental Centre of Central Asia
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CHPP	combined heat and power plant
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLR	complex (landscape) reserve
CLRTAP	Convention on Long-Range Transboundary Air Pollution
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CNG	compressed natural gas
CSAC	Centre for Specialized Analytical Control on Environmental Protection
CSR	corporate social responsibility
EBRD	European Bank for Reconstruction and Development
ECE	United Nations Economic Commission for Europe
EIA	environmental impact assessment
EITI	Extractive Industries Transparency Initiative
ELV	emission limit value
EMEP	European Monitoring and Evaluation Programme
EMS	environmental management system
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ESD	education for sustainable development
EU	European Union
EU BREF	EU Best Available Techniques Reference Document
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
GCF	Green Climate Fund
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
GIS	geographical information system
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMO	genetically modified organism
HCFC	hydrochlorofluorocarbon
HFC	hydrofluorocarbon
HPP	hydropower plant
IAEA	International Atomic Energy Agency
IBA	important bird area
ICSD	Interstate Commission for Sustainable Development
ICT	information and communication technologies
ICWC	Interstate Commission for Water Coordination of Central Asia
IFAS	International Fund for Saving the Aral Sea
IFC	International Finance Corporation
IFI	international financial institution
ILO	International Labour Organization
IMF	International Monetary Fund
(I)NDC	(Intended) Nationally Determined Contribution
ISA	irrigation system administration
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
IWRM	integrated water resources management

JSC	joint stock company
KBA	key biodiversity area
LPG	liquefied petroleum gas
LUCF	land use change and forestry
MAB	Man and the Biosphere
MAC	maximum allowable concentration
MDG	Millennium Development Goal
MEA	multilateral environmental agreement
MoU	memorandum of understanding
MSW	municipal solid waste
NBSAP	National Biodiversity Strategy and Action Plan
NCD	non-communicable disease
NGO	non-governmental organization
NHSZ	natural health spa zone
NM	nature monument
NMVOC	non-methane volatile organic compound
NNP	national nature park
NP	national park
NPP	nuclear power plant
NTFP	non-timber forest product
NUU	National University of Uzbekistan named after Mirzo Ulugbek
ODA	official development assistance
ODS	ozone-depleting substance
OECD	Organisation for Economic Co-operation and Development
OSCE	Organization for Security and Co-operation in Europe
PA	protected area
PCB	polychlorinated biphenyl
POP	persistent organic pollutant
PM	particulate matter
PPP	public–private partnership
PPP	purchasing power parity
PRTR	pollutant release and transfer register
PV	photovoltaic
R&D	research and development
RES	renewable energy source(s)
SAICM	Strategic Approach to International Chemicals Management
SanPiN	sanitary rules and norms
SBC	species breeding centre
SBR	state biosphere reserve
SBSNR	state biosphere strict nature reserve
SCEEP	State Committee on Ecology and Environmental Protection
SEA	strategic environmental assessment
SEE	state ecological expertise
SEEA	System of Environmental-Economic Accounting
SEIS	Shared Environmental Information System
SMEs	small and medium-sized enterprises
SR	state reserve
SSESS	State Sanitary and Epidemiological Surveillance Service
SSNR	state strict nature reserve
SUE	state unitary enterprise
TB	tuberculosis
TNC	Third National Communication (under the UNFCCC)
TPP	thermal power plant
TSP	total suspended particles
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
UzSPB	Uzbekistan Society for the Protection of Birds
VNR	voluntary national review
WASH	water, sanitation and hygiene
WHO	World Health Organization
WPI	Water Pollution Index
WUA	water user association
WWTP	wastewater treatment plant

SIGNS AND MEASURES

..	not available
-	nil or negligible
.	decimal point
€	euro
US\$	United States dollar
cap	capita
eq.	equivalent
g	gram
Gg	gigagram
GWh	gigawatt-hour
ha	hectare
kg	kilogram
km	kilometre
km ²	square kilometre
kt	kiloton
ktoe	kiloton of oil equivalent
kW	kilowatt
kWh	kilowatt-hour
l	litre
m	metre
m ²	square metre
m ³	cubic metre
Mg	megagram
MW	megawatt
pkm	passenger kilometre
t	ton (1,000 kg)
tkm	ton kilometre
toe	ton of oil equivalent

CURRENCY CONVERSION

Exchange rate (period average)

	Sum per Euro	Sum per US\$
2010	2 104.71	1 586.76
2011	2 386.66	1 715.60
2012	2 430.48	1 890.84
2013	2 785.24	2 096.32
2014	3 070.05	2 312.56
2015	2 851.57	2 570.94
2016	3 279.85	2 965.28
2017	5 917.84	5 167.28
2018	9 535.52	8 070.82

Source: ECE Statistical database, 2019.

Executive summary

Sustainable Development Goals

In the period 2016–2018, Uzbekistan worked intensively to define the national Sustainable Development Goals on the basis of the global Goals. This process has greatly contributed to awareness of the Goals and culminated in the adoption of 16 national goals, 125 national targets and 206 national indicators.

The institutional set-up for coordination of implementation and monitoring of the national Goals is centred around the Coordination Council headed by the Deputy Prime Minister. The Coordination Council is supported by six expert groups. However, its membership is exclusively governmental and the composition of the expert groups is largely governmental.

The effort to define national goals and targets has brought the global Goals closer to the realities and concepts used in Uzbekistan. However, the lack of national equivalents for some global environment-related targets (12.2, 12.3, 15.6, 15.b and several targets under Goal 13) is difficult to explain. Significant changes in the wording of some other targets (12.7 and 15.9) are notable.

Some national environment-related indicators have a more limited scope than the corresponding ones in the global indicator framework. Examples include indicators 6.4.1, 7.2.1, 7.b.1, 11.4.1, 12.5.1, 15.4.1 and 15.8.1. A significant drawback is that Uzbekistan did not nationalize the global indicator 3.9.1, on mortality from air pollution, in its internationally accepted wording.

Challenges in monitoring of the Goals include the non-availability of data and methodologies for the vast majority of national environment-related indicators. For example, there are no data on indicators 6.6.1, 7.1.2, 8.4.1, 8.4.2, 12.6.1, 15.2.1, 15.7.1 and 15.c.1. Compatibility of national and international methodologies for data collection is another challenge particularly relevant for indicators 7.3.1 and 12.4.2.

Since 2019, Uzbekistan runs the national Sustainable Development Goals portal. The portal provides centralized access to information resources on the implementation of national goals and targets. As at May 2019, the portal provides data for about one third of the national indicators.

The State Committee on Statistics collects a significant amount of gender-related data but no gender and environment statistics are collected. This is an important area to develop considering the requirements for gender-disaggregated information for monitoring the implementation of the 2030 Agenda for Sustainable Development (2030 Agenda).

Addressing persistent regional differences is crucial for the achievement by Uzbekistan of the 2030 Agenda. Within the country, the Aral Sea region, which includes the Republic of Karakalpakstan and Khorezm Oblast, stands out in terms of the multiple impacts on it of the Aral Sea disaster. For example, in 2017, the incidence of antenatal, perinatal and post-neonatal health conditions and complications in the Aral Sea region exceeded the national average by 50 per cent.

Another crucial aspect for the achievement of the 2030 Agenda is to leave no one behind. Examples in this respect are the unequal distribution of health-care services throughout the country and the lack of qualified health professionals in remote rural areas, which present important challenges for achieving progress with targets 3.1 and 3.2, on mothers' and children's health. Under current health-care financing, differences in income among population groups result in further health inequalities, calling for urgent actions under target 3.8.

Legal, policy and institutional framework

In 2019, Uzbekistan is in the midst of intensive reforms of its policy and legal framework, including in the environmental area. Achievements include the adoption in 2019 of several long-term policy documents, such as the Concept on Environmental Protection until 2030, Strategy for Transition to Green Economy for the period 2019–2030, Strategy on Municipal Waste Management for the period 2019–2028 and Strategy for the

Conservation of Biological Diversity for the period 2019–2028. Several new draft laws are in the process of preparation and the country is about to embark on drafting an environmental code.

The ongoing development of the entire national policy and legal framework represents opportunities for mainstreaming environmental protection throughout sectoral policies and legislation. The integration of environmental requirements into sectoral legislation and policies is more advanced in the energy and agricultural sectors and has started in the transport, housing and infrastructure, industry, health and tourism sectors.

Uzbekistan does not yet apply the strategic environmental assessment (SEA) tool to evaluate environmental impacts of future sectoral strategic documents. Awareness of the SEA tool is limited in the country. Introduction of the SEA tool could help Uzbekistan to enhance policy coherence for sustainable development in line with target 17.14 of the 2030 Agenda.

The 2019 Concept on Environmental Protection until 2030 sets long-term goals and priorities in environmental protection. Opportunities for further development of the national policy framework on environmental protection include such areas as climate change, low carbon development, environmental compliance and enforcement, forest protection, soil protection and environmental noise. At subnational level, almost no strategic documents on environmental protection have been adopted by local authorities, which represents another area for development.

The national environmental authority – the State Committee on Ecology and Environmental Protection (SCEEP) – is well respected among governmental authorities. At the same time, the establishment of new, separate ministries for several major economic sectors during the period 2017–2019 demonstrates the intention of Uzbekistan to rapidly develop its economy. In these circumstances, effective horizontal coordination mechanisms and meaningful public participation become of outmost importance to ensure that environmental protection is not set aside.

Regulatory and compliance assurance mechanisms

Uzbekistan is working to improve the state ecological expertise (SEE) and environmental impact assessment (EIA) procedures, with some changes to the legal and regulatory framework already adopted and others under consideration. As at 2019, the short time limits for conducting SEE do not provide sufficient time to take due account of the outcomes of the EIA. Other areas in need of improvements are screening, scoping, effective public participation and transboundary impact assessment.

In 2017–2018, new inspection procedures were introduced with a focus on the use of risk analysis in inspection planning and the reduction of administrative burden on businesses. This has led to a change in the focus of monitoring of environmental compliance, from areas that became restricted for inspections to areas that were not subject to restrictions, at the expense of potentially overlooking significant violations.

The national enforcement policy aims at reduction of inspection checks by governmental bodies and more active engagement of citizens in compliance monitoring. However, there are no procedures for citizens' involvement in environmental enforcement. Citizens' environmental concerns focus on smaller projects in the close vicinity of their homes. Information on inspection activities by SCEEP is not publicly available.

Any citizen can apply for the status of a public environmental inspector. From 2017, thousands of citizens received training and obtained identity cards as public environmental inspectors. There are no official statistics on inspection and enforcement activities by these inspectors.

The level of administrative fines is too low to act as a deterrent to violations since the economic benefits from the illegal activity clearly outweigh the size of fines. One example is illegal trade in species under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which can often be an organized international crime but would only entail a fine of 0.3–1.0 minimum salary for a citizen and 1–3 minimum salaries for an official.

The 1992 Law on Nature Protection includes provisions on compulsory and voluntary environmental insurance. In the absence of subsidiary legislation, the mechanism of environmental insurance does not function.

Numerous companies have declared their commitment to corporate social responsibility (CSR). However, the low level of public environmental awareness does not incentivize companies to integrate environmental aspects into their CSR policies.

No national environmental labelling scheme exists as at 2019. This area is expected to develop following the adoption in 2019 of the Regulation on voluntary eco-labelling of products.

The Government started promoting environmental management system (EMS) certification, due to the opening market for foreign investments. A number of companies provide services in Uzbekistan to deliver ISO 14001 certification.

Greening the economy

Uzbekistan demonstrates marked improvement in the business climate since the launch of economic reforms. In the World Bank's Ease of Doing Business rating, the country ranked 76 (out of 190 countries) in 2018, up from ranking 166 in 2011. Well-designed government policies can help catalyse foreign direct investment (FDI) in directions that contribute to promoting environmentally sustainable growth.

The system of pollution charges has remained largely unchanged since 2010. The number of air and water pollutants covered by the system remains very large. Since 2019, pollution charge rates are better protected against erosion through inflation. At the same time, pollution charges are mainly designed to generate revenue for the environmental fund and the state budget.

The abstraction of water from natural sources is subject to payment of a water use tax. Water used for irrigation in agriculture is not subject to taxation. There are a number of other tax exemptions that weaken incentives for more rationale use of water.

The Government has liberalized prices of imported higher quality fuels. Prices of domestically produced motor fuels continue to be regulated and subsidized. Very low tax rates do not provide incentives for fuel savings.

The Government has made progress on reform of tariffs for utility services (energy, water, waste) by bringing them closer to cost-recovery levels. Nevertheless, tariffs remain below cost-recovery levels and provide across-the-board benefits to all households, which mainly favour those with higher incomes.

Progress is observed in reducing fossil fuel subsidies relative to total GDP (from 30 per cent of GDP in 2010 to 10.9 per cent of GDP in 2017). However, this proportion is still very high. This makes target 12.c of the 2030 Agenda, on the rationalization of fossil fuel subsidies, of crucial importance for the country.

Uzbekistan applies investment tax credits and reduced import taxes for renewable energy technologies. Traditional support schemes such as feed-in tariffs and competitive bidding/auctions have not been used so far to support the use of renewable energy sources (RES).

The 2018 Law on Public Procurement paves the way for greening the public procurement that accounts for about one third of the consolidated state budget expenditures in Uzbekistan. Capacity-building of officials involved in procurement is key to ensure the effectiveness of the Law and achieve progress with target 12.7 of the 2030 Agenda.

Environmental protection expenditures (excluding off-budget funds) accounted for 0.06 per cent, on average, of total general government expenditures in the period 2012–2019. The proportion of environmental protection expenditures relative to GDP was even smaller, at some 0.02 per cent, in the same period. These numbers are extremely low, especially taking into account the environmental challenges faced by the country.

In 2017, Uzbekistan reformed the system of environmental funds by merging the Republican Fund and 14 regional funds into the Fund for Ecology, Environmental Protection and Waste Management. However, the operational rules and procedures of the Fund are not fully transparent.

Uzbekistan started developing the institutional and legal framework for the establishment of public–private partnerships (PPPs), in line with target 17.17 of the 2030 Agenda. The intention is to use PPPs in areas such as the provision of public utility services and financing of public infrastructure. The major deterrent is the lack of experience in the use of PPPs.

Environmental monitoring, information and science

Environmental monitoring activities are conducted according to the five-year programmes of environmental monitoring. Key areas for development are automation and digitalization of monitoring and the introduction of PM₁₀ and PM_{2.5} monitoring. An integrated environmental information system is not available.

Most analytical laboratories under ministries and agencies involved in environmental monitoring lack accreditation. Regional laboratories under the Centre of Hydrometeorological Service (Uzhydromet) analyse air pollution samples but lack capacity to analyse water and soil pollution samples.

Most biodiversity monitoring is conducted in protected areas (PAs), in particular those with legal status and dedicated personnel. As of 2018, the populations of some rare and threatened Red Book species are also monitored outside PAs. Long-term research on wild species of flora and fauna suffers from the lack of continuity. No modern forest inventory has been carried out since 1987.

Most environmental reports and bulletins produced by government agencies in charge of environmental monitoring activities are only shared among government agencies and not made publicly available. Except for two tables, the State Committee on Statistics does not upload to its website the environmental statistics it collects.

As at 2019, the national report on the state of the environment and use of natural resources has not been produced since 2013. The last report, covering the period from 2008 to 2011, was largely descriptive and is not available online.

Uzbekistan has placed innovation at the heart of its economic development strategy. Nevertheless, domestic research and development (R&D) expenditure corresponded to 0.2 per cent of GDP in 2017 compared with a global average of 1.7 per cent in 2014 and Organisation for Economic Co-operation and Development (OECD) average of 2.37 per cent in 2017, deferring Uzbekistan's progress on target 9.5 of the 2030 Agenda. Financing for scientific research and innovation in support of environmental protection is not defined as a priority.

The Scientific and Research Institute on Environment and Nature Protection Technologies under SCEEP has extensive experience in developing technologies for wastewater treatment and reduction of industrial emissions. The Institute was assigned additional responsibilities in 2018 but struggles with the lack of funding for applied research.

Access to information, public participation and education on the environment

The majority of information and data on the environment is not made available online. Printed publications with information on the environment are disseminated primarily among governmental institutions. The public at large is not sufficiently aware of what information on environmental matters is, its right to request it and the procedures to do so.

Since 2018, the procedures for operation of environmental non-governmental organizations (NGOs) and the oversight of the activities of NGOs have been simplified. However, hindrances to the activities of environmental NGOs remain, including for receipt of international funding.

The public at large and NGO representatives are poorly engaged in decision-making on environmental matters. Mostly, a small circle of NGOs working closely with governmental authorities is invited to participate in consultation processes. Detailed procedures to enable effective public participation in decision-making on environmental matters are lacking.

Individuals and environmental NGOs have the opportunity to file cases on environmental matters and appeal actions (or inaction) of governmental authorities in the courts. However, there are no precedents of environmental NGOs or representatives of the public doing so.

Public servants working in the environmental and other sectors with an impact on the environment lack sufficient expertise and capacity to enable effective provision of information and public participation in decision-making on environmental matters. The capacity of the judicial system to provide access to justice on environmental matters has not had the opportunity to develop.

Environmental education is well developed. Education for Sustainable Development (ESD) is not integrated into the education system. The country adopted the Concept of Education for Sustainable Development in 2011 but it has not prompted actual changes in the education system. Without ESD, achieving many goals and targets of the 2030 Agenda will be challenging for Uzbekistan.

Neither SCEEPP nor the three ministries in charge of education issues have a clear mandate to work on ESD. The Coordination Council on Education for Sustainable Development, established in 2011, discontinued its activities in 2014. The driving forces for ESD are the universities and environmental NGOs.

Implementation of international agreements and commitments

Uzbekistan is undergoing a major transformation in its relationship with the international community. It is committed to enhanced regional cooperation in Central Asia. The country has changed its position on water–energy issues. Bilateral cooperation on transboundary waters and the environment has greatly intensified in the past few years.

Since 2017, Uzbekistan has intensified cooperation with donors on environmental and sustainable development issues. This is manifested in the growing partnerships in terms of both the amount of financing and areas of engagement.

Uzbekistan has a proven high capacity for implementation and financial management of Global Environmental Facility (GEF) projects. About US\$37.524 million of GEF funding was utilized in the period 2010–2018.

A framework agreement with the European Bank for Reconstruction and Development (EBRD) was concluded to enable the operation of the Environmental Remediation Account for Central Asia (ERA). This will allow the remediation of Charkesar and Yangiabad uranium tailings – the most dangerous sites left by the past uranium production.

In 2018–2019, Uzbekistan became party to the Paris Agreement, the Stockholm Convention on Persistent Organic Pollutants and the Cartagena Protocol on Biosafety. Nevertheless, the country is not a party to a number of relevant global and regional multilateral environmental agreements (MEAs).

MEA implementation remains a problem, related to insufficient administrative capacity, significant gaps in critical information and deficiencies in coordination. There are no effective systemic coordination mechanisms on environment-related issues that are the subject of international, regional or bilateral cooperation. The country has had difficulties fulfilling its reporting obligations under several MEAs.

The Multi-Partner Human Security Trust Fund for the Aral Sea Region is an emblematic initiative of Uzbekistan. It aims to streamline the efforts of the Government and the international community to address the consequences of the Aral Sea disaster. Efficient functioning and transparency in the operation of the trust fund are prerequisites for attracting interest from the international community.

In 2016, the Western Tien-Shan transboundary site (Kazakhstan–Kyrgyzstan–Uzbekistan) was inscribed onto the World Heritage List. It is the first natural heritage property for Uzbekistan. A trilateral memorandum of cooperation signed by the three countries in 2019 foresees the establishment of a coordinating working group and a monitoring programme for the property.

Climate change

The country fulfils its reporting obligations and has submitted three national communications under the United Nations Framework Convention on Climate Change (UNFCCC). However, the newest data on greenhouse gas (GHG) emissions available in 2019 are from 2012. The process of preparing a GHG inventory is not a regular activity.

In the period 1990–2012, there has been a 13.7 per cent increase in overall GHG emissions and a 21.6 per cent decrease in emissions per capita. In 2012, the energy sector accounted for 82 per cent of GHG emissions. Within the energy sector, most GHG emissions come from fuel combustion.

The land use change and forestry (LUCF) sector is the greatest contributor to CO₂ removals. In 2012, the sector's contribution to emissions was -2.9 Mt CO₂-eq. This translates in net sinks corresponding to 2.7 per cent of the total CO₂ emissions, and 1.4 per cent of total GHG emissions. A marked increase in removals from 2008 onwards is due to intensive afforestation in desert areas.

The 2017 (Intended) Nationally Determined Contribution ((I)NDC) of Uzbekistan stipulates a carbon intensity target, namely, to decrease specific emissions of GHGs per unit of GDP by 10 per cent by 2030, with 2010 values as reference values. Considering the strong growth of the economy and the projected growth of the population, it is very probable that overall GHG emissions will increase significantly, even if the mitigation target of the (I)NDC is reached.

Climate change issues have, to a certain extent, been incorporated into sectoral legislation and strategic documents. Uzbekistan does not have legislation to specifically address climate change and is also lacking an overall strategic document on the issue.

The energy sector is the focus of most mitigation measures in the country. Mitigation measures mostly concern improving energy efficiency, including energy efficiency in buildings, and increasing the share of renewable energy in the energy mix.

The most important measures relevant to climate change in the forestry sector are the massive afforestation campaigns in the dried bed of the Aral Sea. These forest plantations are essential in mitigating dust storms and can provide economic opportunities to the impoverished communities that once relied on fishing.

Uzbekistan has been very successful in mobilizing international climate finance sources in the past years. The country has also had success in hosting Clean Development Mechanism (CDM) projects.

The 2019 Strategy for Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 in the Republic of Uzbekistan defined priority areas for disaster risk reduction. Local disaster risk reduction strategies are lacking.

Climate change issues have started being integrated into the curricula of secondary school education. They are not yet integrated into the curricula of primary education, vocational training and higher education. Most awareness-raising activities are implemented in the framework of donor-financed projects.

Air protection

Uzbekistan has a comprehensive air monitoring network with 63 fixed posts and measurement of 13 different substances. Development of monitoring of fine dust (PM₁₀ and PM_{2.5}) by automatic equipment, along with acquiring technical support for compiling emission inventories, are urgent priorities.

Compared with World Health Organization (WHO) and European Union (EU) air quality standards, the air quality standards in Uzbekistan are the same for NO₂ and ozone, more stringent for CO and less stringent for SO₂. For PM₁₀ and PM_{2.5}, no air quality standards are defined in Uzbekistan.

Although PM_{10} and $PM_{2.5}$ data are scarce in Uzbekistan, the probability that WHO Air Quality Guidelines for the mean concentrations of PM_{10} are exceeded in cities is high. In a few cities, the annual dust concentration exceeded the national standard for dust.

An important part of the air pollution by dust particles is due to natural causes. Natural emissions of aerosols to the atmosphere by sandstorms from the Karakum and Kyzylkum Deserts and from dry parts of the Aral Sea, which transport dust from the western to the eastern part of the country, and also transboundary air pollution by dust, cause high background levels of dust.

The industrial emissions of SO_2 , NO_x and total suspended particles (TSP) account for 40 per cent, 5 per cent and 38 per cent of the total national emissions respectively. In industrial cities such as Angren, Almalyk, Fergana and Navoiy, emissions from industry and mining lead to relatively high values on the Air Pollution Index used in Uzbekistan.

Best available techniques (BATs) to abate air pollutant emissions as described in guidance documents developed under the Convention on Long-Range Transboundary Air Pollution or the EU Industrial Emissions Directive are not applied in Uzbekistan. Emission reduction plans for air-polluting industrial sectors are not developed.

In 2016, 19 per cent of the emissions of SO_2 and 70 per cent of the emissions of NO_x from stationary sources were caused by thermal power plants (TPPs). The emission limits defined for specific plants in Uzbekistan are generally less stringent in comparison with EU emission standards based on BATs. On a positive note, the modernization of old TPPs has started.

The agricultural sector is the largest source (99 per cent) of emissions of NH_3 . Measures to control ammonia emissions are not yet widely applied.

Air pollution from the residential sector contributes to bad air quality. Poor maintenance of district heating installations and the lack of insulation of buildings lead to low energy efficiency. The use of firewood and coal in individual stoves and furnaces with low emission heights is another contributor to poor air quality.

Uzbekistan progressed with reducing the consumption of ozone-depleting substances (ODS). In 2017, consumption decreased to 0.87 ozone-depletion-potential (ODP) tons (100 per cent hydrochlorofluorocarbons (HCFCs)), which represents a reduction of 98.8 per cent from baseline (74.7 ODP tons in 1989). A slight increase of consumption to 2.53 ODP tons was observed in 2018.

Water management

The majority of surface water bodies are considered to be moderately polluted under the Water Pollution Index used in Uzbekistan. The most polluted watercourses in 2018 were the Siab collector channel in Samarkand and the Salar channel downstream of the cities of Tashkent and Yangiyul. Groundwater quality is considered generally satisfactory. Average non-compliance of drinking water samples in the period 2012–2017 is in the range of 5–10 per cent per year for microbiological analysis and 10–15 per cent for chemical analysis.

The current annual demand for water in all sectors of the economy of Uzbekistan is estimated at 64 km³. Forecasts show that the demand for drinking water supply and in industry and rural areas will increase, while demand in irrigated agriculture, the current share of which is around 89–92 per cent of total water use, will decrease.

Since 2010, Uzbekistan has made progress in the area of investment in new capital infrastructure to increase access to drinking water and sanitation. Investments were also made for refurbishment of irrigation infrastructure.

According to the State Committee on Statistics, access to centralized drinking water supply was 76 per cent nationwide and 63 per cent in rural areas at the end of 2017. According to the Ministry of Housing and Communal Utilities, only about 63.5 per cent of the population nationwide were covered by centralized drinking water supply services in early 2019. While work is being done to improve access, quality of service remains an issue.

According to the State Committee on Statistics, at the end of 2017, 35.8 per cent of the housing stock in the country had sanitation services provided, and only 10.8 per cent in rural areas. According to the Ministry of Housing and Communal Utilities, in early 2019, only about 15.6 per cent of the population were connected to centralized sewerage services.

In terms of water-use efficiency, Uzbekistan reports US\$1.2 per m³ of water for 2015. This figure is the lowest of all countries that reported against the global Sustainable Development Goals indicator 6.4.1 for 2015.

The formation of the Ministry of Water Management and the Ministry of Housing and Communal Utilities in 2017–2018 adds focus to the key issues of water resources management and water supply and sanitation. The need to move towards the principles of integrated water resources management (IWRM) and greater stakeholder involvement remains, along with the opportunities to better coordinate the activities of various actors and harmonize the use of data collected.

The policy framework does not sufficiently focus on the use of economic instruments and cost recovery with regard to the use of groundwater and surface water. In addition, linkages between land use planning and water management are not sufficiently present in the current policy framework. The policy framework does not require the development of river basin management plans (RBMPs), even though some progress was achieved in this area.

Waste and chemicals management

Uzbekistan is reforming its waste management policies. In 2017–2018, the responsibilities of SCEEP in waste management were strengthened and respective institutional arrangements were put in place. New institutional arrangements and dedicated efforts allowed the country to increase the coverage of the population by waste services from 22 per cent in 2016 to 53 per cent in 2018.

The Strategy on Municipal Waste Management for the period 2019–2028 sets well-defined goals until 2029 and should support the achievement of target 12.5 of the Sustainable Development Goals. However, all data on waste are estimated and incomplete. The 2002 Law on Waste does not respond to the needs of the new system of waste management.

The number of dumpsites in Uzbekistan is known but details of their operation are not yet collected and summarized. Cities other than Tashkent dispose of their waste on allocated sites, usually on the city outskirts. Such sites do not include barriers controlling pollution and are regularly set on fire to make space for additional waste. Replacing existing dumpsites by controlled landfills is a priority recognized by the Government.

Sorting of municipal solid waste (MSW) is not yet formally introduced as a national policy, but the informal sector and private companies are active in recovering recyclables from waste. The recycling rate was estimated to be 5–10 per cent in 2017 but the actual recycling rate could be higher. The first waste sorting plant was put into operation in 2018.

Uzbekistan classifies hazardous waste based on four hazard classes that cover 134 types of waste. This waste classification is not compatible with international practice.

Requirements on safe handling and treatment of medical waste are in place. Public hospitals face challenges in complying with the requirements, due to limited funds being allocated in hospital budgets for medical waste management. A specialized service for collection and treatment of medical waste is not available.

Uzbekistan does not possess the expertise and financial resources to deal with the impacts of waste generated in the past, such as radioactive waste, obsolete pesticides and other persistent organic pollutants (POPs). The national POPs inventory dates back to 2009. Cooperation with the international community is key to addressing environmental and health risks from these types of waste.

The National Profile on Management of Chemical Substances was prepared in 2012 and contains data from 2008, 2009 and 2010. It does not provide enough information on chemicals management to enable policy development.

Uzbekistan does not have specific legislation on chemical emergency preparedness and response. Chemical emergencies are included in the general framework of technogenic emergencies. Chemicals management is not included as part of environmental policy.

Biodiversity and protected areas

The adoption of the 2019 National Biodiversity Strategy and Action Plan (NBSAP) is a step forward for protection of biodiversity and implementation of the country's international commitments on biodiversity. However, only a few rare and threatened fauna species, and no flora species, are currently covered by single species conservation plans. No national wetland policy is in place. The development and implementation of policies on biodiversity conservation is seriously hampered by the unavailability of reliable data.

The populations of widespread wild animal species are either stable or growing in numbers. However, there are decreasing trends in populations of several globally threatened or locally endemic fauna species. This is the case for the saiga antelope, marbled polecat, Pallas's cat, Saker falcon, sociable lapwing, Egyptian vulture and many others.

To prevent further biodiversity loss, Uzbekistan runs several rare and threatened species breeding centres. The Species Breeding Centre "Jeyran", established over 40 years ago, specializes in breeding goitered gazelle. Two smaller nurseries were established in 2007 and 2008 for breeding the Asian houbara bustard. Zarafshan State Strict Nature Reserve (SSNR) operates a facility for breeding Bukhara deer.

Uzbekistan makes considerable efforts to increase forested areas through reforestation and afforestation works. In the period 2010–2018, forested areas increased from 6.63 per cent to 7.26 per cent of the country's territory. More and more areas are being placed in the state forest fund land category as land potentially suitable for afforestation.

Formally, the protected area (PA) system encompassed 13.2 million ha or 29.4 per cent of the country's territory on 1 January 2019. However, it predominantly comprises state forest fund lands. PAs in the common understanding of this term cover less than 2.1 million ha or only 4.63 per cent of the country's territory.

There is a striking disparity in the geographical distribution of PAs among the regions of Uzbekistan. The PA network is not yet ecologically representative, meaning that it does not cover all main representative landscapes and ecosystems. In addition, it does not encompass the habitats of several rare, endemic and threatened species.

The most effective protection of biological and landscape diversity is ensured only in PAs granted legal entity status, which have their own managing body and field personnel. The state budget funding for PAs is insufficient to implement effective nature conservation.

There are some positive examples of the ecological connectivity of PAs on a local scale. However, the national PA system of Uzbekistan is still not a "network" in the common meaning of the term. The concepts of ecological networks and ecological corridors are absent from the 2004 Law on Protected Natural Territories.

The environmental disaster in the Aral Sea region, formerly abundant in flora and fauna species, resulted in a sharp decrease in biological diversity. The Government's efforts focus on protection of biodiversity that survived the disaster and rehabilitation of aquatic and wetland ecosystems in the Amu Darya River delta through engineering works aimed at landscaping the delta for the restoration of aquatic and wetland ecosystems and stabilizing the water regime. The Government's efforts also aim at stabilization of the soils of the dried bed of the Aral Sea.

Uzbekistan progressed with identification and description of important bird areas (IBAs) and key biodiversity areas (KBAs). However, only 17 of the 52 IBAs and 12 of the 36 KBAs either partially or entirely overlap existing PAs.

Neither of the two Ramsar sites, nor the PAs overlapping the territories of the Ramsar sites, have management plans. The submission of nomination for a new Ramsar site, Tudakul and Kuymazar Water Reservoirs, has not been completed.

Energy and the environment

Primary energy supply is concentrated in fossil fuels, mainly natural gas, with some hydropower. The development of local fuels such as natural gas and coal remains a goal of national energy policies.

Information on accidents occurring in the natural gas industry focuses on economic aspects rather than environmental impact. Nevertheless, gas leakages cause the release of carbon monoxide, carbon dioxide, nitrogen oxides, sulfur compounds, methane, methanol and other pollutants. In the past few years, several natural gas processing facilities introduced new technologies to improve environmental protection.

The volume of gas flaring has declined from 1.494 bcm in 2013 to 0.788 bcm in 2018. The decrease was caused not only by reduction of oil production but also by measures implemented by oil production companies. The limited market and low prices for commercial gas, especially in remote areas, result in some gas still being flared.

Coal mining is carried out at the open-pit Angren mine and underground mines Baisun and Shargun. Angren deposit is developed by surface mining, with associated environmental problems such as large-scale land use, overburden removal and disposal, disturbance of hydrology, acid mine drainage and fugitive dust. For underground mines in the Baisun and Shargun deposits, the main environmental issues are mine water drainage, methane emissions and fugitive dust.

Mining of uranium ore is carried out by the in-situ leaching (ISL) mining process. Although some environmental impacts are minimized under the ISL method, such as there being no need for large uranium tailings, the productive solution has to be disposed of after the initial treatment. One of the challenges in the application of ISL is to prevent contamination of groundwater.

In 2019, there is no renewable energy (other than hydro) generation in Uzbekistan, except for some off-grid and/or small-scale units. The country's enormous technical potential for the use of solar energy is not used. Uzbekistan has set a target of 19.7 per cent of total energy production being produced by RES by 2025. Most of this (i.e. 15.8 per cent) is to come from hydropower.

The Government is taking measures to increase energy efficiency. Standards for energy management of industrial production and energy labelling of household equipment have been introduced. The introduction of energy-efficient technologies in the system of street lighting and energy-saving lamps for residential and public buildings is being carried out.

Despite these measures, the energy intensity of the economy remains high. No measures to increase energy efficiency in buildings and transport have been introduced. In industry, a World Bank project has greatly contributed to energy efficiency in many industrial enterprises but energy losses in the industrial sector at large remain high.

Electricity transmission assets have not been properly maintained and upgraded, affecting the delivery of reliable power supply to domestic customers. There is a high level of electricity losses: transmission system losses are 18 per cent and distribution losses are 14 per cent. Modernization of existing facilities is ongoing, along with the construction of additional generation capacities.

Uzbekistan intends to build a nuclear power plant (NPP) in order to meet the growing needs of the economy for energy resources. The Government plans to organize a national EIA and conduct a dialogue with neighbouring countries. The organization of a transboundary EIA is not planned. The country is not party to several key conventions on nuclear safety.

Lake Tuzkan, identified as a priority location for the NPP, is part of the Aydar-Arnasay Lake System, which was declared a Ramsar site in 2008. Construction of an NPP in the Ramsar site would require sound justification and may result in the need to delete or restrict the boundaries of wetlands already included in the Ramsar List, with these decisions potentially damaging the image of the country in the international arena.

Agriculture and the environment

Agriculture accounts for about 32 per cent of GDP and 27 per cent of employment. In 2018, crop production made up 53.2 per cent of total agricultural production, while animal husbandry accounted for 46.8 per cent.

In the period 2009–2017, water use in agriculture remained at around 89–92 per cent of total water use. Around one third of the total water use in this sector is lost. By reducing or eliminating water losses, the country would be able to solve the problem of a forecast water deficit and save enough water to mitigate the fluctuations in annual available water quantity caused by the variability of precipitation.

Crop diversification has been central to governmental policies in the sector in the past decade. Switching to higher value crops should decrease water consumption because water demand for cotton growing is higher than water demand for irrigation of most other crops. However, these positive gains may be nullified by the poor state of irrigation infrastructure.

The Government started subsidizing the installation by farmers of water-saving techniques, in particular, drip irrigation. However, water-saving techniques are clearly not expanding at an adequate pace. In 2019, the total area under water-saving techniques amounted to only 9.6 per cent of irrigated lands.

Agriculture also puts pressure on water quality. Farmers regularly “wash” their fields with water to decrease soil salinization. The water used for “washing” is directed back to the irrigation channels and rivers, even though it might contain pesticides and other pollutants.

The use of fertilizers in Uzbekistan is 60–70 per cent higher than the world average. The high consumption is a basic precondition for agricultural production on the country’s irrigated lands, since the soil fertility would be very low without the use of fertilizers.

Organic fertilizers are widely used, their consumption being 20 times higher than that of mineral fertilizers. Manure makes up a significant proportion of the organic fertilizers.

In the past decade, the Government has actively promoted biological plant protection. More than 1,500 biological laboratories for processing crops by biological methods have been created in the country. In 2017, the amount of pesticides applied to arable land was only 0.4 kg/ha, whereas, in the final years of the Soviet Union, it was 15–19 kg/ha.

The agricultural sector is the second biggest emitter of GHGs, accounting for 11 per cent of emissions in 2012. Agricultural GHG emissions increased by 27.1 per cent in the period 1990–2012. Methane emissions from agriculture increased by 98.2 per cent in the same period, due to an increase in the number of cattle and sheep.

Organic production is already ongoing in the country. Over 5,600 ha are certified for organic products by foreign certification organizations. The legal framework for organic agriculture is still lacking, so the country does not issue certifications for organic agricultural products. The use of genetically modified organisms (GMOs) is not regulated at the level of laws.

Agricultural extension services are not systematically provided. The development of extension services remains important for improving the sector’s performance towards productive and sustainable agriculture and resilience to climate change, in line with target 2.4 of the 2030 Agenda.

Transport and the environment

With a 9.4 per cent contribution to GDP in 2017, the transport sector attracts significant investment, which has already resulted in the improvement of the country’s scores under the Logistics Performance Index, most prominently with regard to infrastructure. The investments are also helping to improve the environmental performance of the sector.

Road transport is by far the dominant mode of transport, with a market share of 98.3 per cent of passenger transport and 88.3 per cent of freight transport in 2018. However, road vehicles are using low quality fuels

leading to negative effects on the environment, among other impacts. This is facilitated by fossil fuel subsidies through regulated prices that incentivize the use of the lower quality fuels.

Many vehicles run on natural gas or liquefied petroleum gas (LPG) as a result of local resource availability and the fiscal advantage associated with certain fuels. Many compressed natural gas (CNG)/LPG fuel systems are retrofitted to vehicles that originally operated on gasoline or diesel. The quality, reliability and emissions from such retrofitted systems can be problematic unless the right measures are put in place to ensure they operate appropriately.

The use of public transport in cities remains limited. The largest cities are investing in renewing their fleets and improving accessibility of public transport in line with target 11.2 of the 2030 Agenda, as well as in making the alternative modes of transport more attractive. However, these initiatives are not supplemented by dedicated policies and action plans.

Investments in the railway sector are under way to improve its efficiency and reduce the environmental impact of transport as a whole. In 2019, the locomotive fleet is about 28 per cent electric and 72 per cent diesel powered.

The aviation sector is also in the midst of reforms. Efforts in this area have focused on the management aspects, modernization of the fleet to reduce CO₂ and noise emissions and provision of flight services in accordance with international standards. Domestic aviation remains very limited.

In terms of air pollution, the transport sector was the highest NO_x emitter, accounting for 63 per cent of NO_x emissions in 2016. The sector was responsible for 9.6 per cent of TSP emissions in 2016.

Transport accounted for 12.4 per cent of GHG emissions from fuel combustion or 6.6 per cent of total GHG emissions without LUCF in 2012. In 2012, the largest contributors to CO₂ emissions from transport were road vehicles (63 per cent).

The transport sector is expected to grow dramatically in the coming decades, with resulting growth in CO₂ emissions. The For Future Inland Transport Systems (ForFITS) tool demonstrates opportunities for decoupling economic growth and CO₂ emissions in Uzbekistan.

The number of road fatalities has remained steady since 2015 with only minor fluctuations, at around 80 fatalities per million inhabitants. The number is not decreasing in Uzbekistan and is well below the requirements in target 3.6 of the 2030 Agenda. The enforcement of driving and road safety laws and regulations presents challenges.

Industry and the environment

In 2018, the industrial sector accounted for 23.3 per cent of GDP, of which manufacturing industries represented 15.5 per cent and mining and quarrying 6 per cent. The share of manufacturing industry in the structure of industrial output reached 76.6 per cent in 2018.

Uzbekistan aims at diversification of its economy through the development of non-resource-based sectors and increasing the manufacturing of higher-value-added products. The modernization and diversification of leading industries and introduction of innovation are already taking place.

Policy documents on the development of specific industrial sectors do not include environmental safeguards. The lack of clear environmental, health and safety and social management objectives lessens the contribution of the sector to the well-being of local communities.

There is no consistent trend in the total volume of industrial air emissions since 2009. However, monitoring data show continuous exceedance of emissions of nitrogen oxides, sulfur dioxide, carbon oxides, ammonia and dust, mainly by chemical industry, energy and construction industry enterprises.

Many of the largest enterprises are carrying out modernization to reduce air emissions, making the country better prepared to achieve target 9.4 of the Sustainable Development Goals. However, technological upgrading is still lagging behind in small and medium-sized enterprises (SMEs).

Mining, chemicals, oil and gas, electricity and the production of construction materials are among the country's most energy-intensive industries. National policy documents set enterprise-specific targets for the reduction of energy consumption. Impressive improvements have been achieved through the implementation of the World Bank's Energy Efficiency Facility for Industrial Enterprises Project, which finances energy-saving investments in both large enterprises and SMEs.

The industrial sector's share of total water use was negligible (on average, 1.4 per cent in the period 2009–2017), but water pollution from the chemical, oil, manufacturing and metallurgical industries is a major issue. Many industrial enterprises do not have wastewater treatment facilities on their premises or do not carry out preliminary treatment. Industrial wastewater is often discharged directly into rivers or into urban sewerage systems.

Approximately 100 million m³ of industrial waste is generated in the country annually. Due to the insufficient number of landfills for storage and disposal of industrial waste, there is a widespread practice of dumping in unauthorized places. In recent years, several mining and chemical enterprises have shifted to technologies that allow more efficient extraction and production and generate less hazardous waste.

Soils are severely degraded by mining activities, which remove large amounts of soil and vegetation for open pit mining. Furthermore, soil contamination with heavy metals is observed in the areas located in close proximity to industrial enterprises.

Artisanal and small-scale mining can be the source of large releases of mercury, which can have serious health impacts. The number of illegal gold miners is estimated at 30,000 but detailed information is not available to evaluate health impacts from these activities in Uzbekistan.

Human settlements and the environment

The country's land fund has seen profound changes in terms of the distribution of land between categories. "Agricultural land" decreased from 72.76 per cent in 1990 to 45.13 per cent in 2018, along with an almost fivefold increase in "forest fund lands" – from 5.50 per cent to 24.84 per cent in the same period. The high share of "reserve lands" (24.16 per cent in 2018) indicates a large potential for designation of new PAs.

The population grew from 28.56 million in 2010 to 32.66 million in 2018. This has been accompanied by high rates of urbanization. In 2019, about 50.5 per cent of the population lives in urban areas, whereas, in 2012, 36 per cent of the population lived in urban areas.

The rapid growth of cities increased the number of people exposed to the effects of "urban" climate change. Climate adaptation planning in urban areas and rural settlements has not yet been introduced.

The majority of the housing stock dates to the Soviet period, but housing stock in Tashkent and other big cities is undergoing an injection of new construction. The new buildings commonly lack representation of the typical elements of Uzbek design.

Uzbekistan has not yet introduced a proper system of participatory urban planning and management. New architectural undertakings require the approval of the territorially-competent makhalla chairperson, but local inhabitants often complain because of the lack of information and public involvement in the decision-making process. This makes target 11.3 of the 2030 Agenda of particular importance to the country.

The implementation of urban development and construction policies in recent years has resulted in numerous cases in which the rights of inhabitants of buildings ordered for demolition were violated. Several cases are reported of people receiving an order to leave their residences to allow for new buildings to be built, without the provision of new housing or adequate compensation.

Main roads and green areas in major city centres are, in general, in good condition. However, infrastructure such as electricity, heating, and sewerage and drainage networks, in most cases, needs upgrading, maintenance or replacement.

The existing housing stock is highly energy inefficient. Construction standards changed in 2018 and introduced new energy efficiency requirements. However, they apply to new projects and are not applicable to existing buildings.

The housing sector is partially accountable for the deterioration of urban air quality. Construction sites lack specific regulations to prevent pollution due to particulate matter and dust.

Asbestos is extensively used as a construction material. The population is largely not aware of its danger for human health.

Green areas inside urban and rural settlements occupy, on average, 0.1–2 per cent of the territory of a settlement. Uzbekistan makes efforts to increase the number of trees planted in urban areas, with the ambition to also create green belts around major cities. The concept of an urban ecological network is not implemented in Uzbekistan.

Several national programmes and projects have been developed to protect and promote Uzbekistan's cultural heritage. However, the preservation of some sites suffers from the absence of management plans, inadequate restoration interventions and the construction of modern buildings.

Health and the environment

Life expectancy in Uzbekistan has increased by approximately five years since 1995. Nevertheless, it is still one of the lowest in the WHO European Region. The same holds true for maternal, neonatal and under-5 mortality rates, which have decreased in Uzbekistan but remain among the highest in the WHO European Region.

Non-communicable diseases (NCDs) continue to represent by far the major share of deaths and of years of life lost in the country. Environmental pressures, such as exposure to air pollution and noise, contribute to high levels of blood pressure and low birth weight, which are among the most important risk factors for NCDs in the country, along with poor diet, child and maternal malnutrition and tobacco use.

The incidence and prevalence of some communicable diseases, such as tuberculosis (TB) and, in particular, multidrug-resistant TB, remain a concern. TB incidence rates, which began declining steadily around 2005, remain twice as high as those in the WHO European Region. Within the country, the Republic of Karakalpakstan and Tashkent Oblast have the highest incidence of TB.

Environment-related health risks and hazards remain high. The annual mortality rate attributed to household and ambient air pollution was estimated by WHO at 81.1 cases per 100,000 population in 2016, ranking the country fifth in the WHO European Region. The burden of disease due to diarrhoea due to a lack of adequate water, sanitation and hygiene was estimated at about 14,860 disability-adjusted life years (DALYs) in 2016, ranking the country sixth in the WHO European Region.

There is no integrated information system on population health, its determinants and trends in the country. There is a huge data and information gap on health determinants and risk factors, including environmental factors. Information relevant to the health of children and other vulnerable population groups is very limited.

Climate change in Uzbekistan is bringing excessive rates of cardiovascular and respiratory morbidity and mortality and acute intestinal infections. Furthermore, a significant number of people live in areas prone to flash floods, mudflows, heatwaves, droughts and dust storms, which are becoming more frequent and intense, resulting in excessive rates of morbidity and mortality.

There are no systematic policy actions targeted to protecting people's health from climate change and to reducing life-threatening risks from natural disasters. The capacity of the health sector to assess climate change-related health status and trends as a basis for planning preventive measures and monitoring their effectiveness is insufficient.

The current surveillance system is prone to underreporting. Surveillance of infectious diseases, in particular, water- and food-borne diseases and human zoonoses, has severe limitations. Detection of pathogens in water supply and food products is rather limited.

The Aral Sea crisis has brought a large burden of disease and disability to the population, in particular in the Republic of Karakalpakstan and Khorezm Oblast. In 2017, in Khorezm Oblast, morbidity from diseases of the nervous, circulatory, digestive and urological (kidney stones) systems was higher than the national averages by about 50 per cent. According to the data for the period 2009–2017, in the Republic of Karakalpakstan, morbidity from acute intestinal infections was well over the national averages during the entire period (by an average of 60 per cent).

Successes in the past decade and priorities for the future

The top 10 environmental achievements in the period 2010–2019 include:¹

- Increasing afforestation activities to address the impacts of the Aral Sea disaster;
- Conduct of engineering works aimed at the restoration of aquatic and wetland ecosystems in the Amu Darya River delta;
- Tremendous efforts to raise the attention of the international community to the Aral Sea disaster;
- Reforms of municipal waste management;
- Investments to expand water supply and sanitation and introduce water metering;
- Launch of incentive schemes for farmers to apply water-saving techniques;
- Implementation of enterprise-specific targets to reduce energy consumption and introduction of energy-efficient measures in the residential and public sectors;
- Investments in the electrification of railways and the acquisition of new rolling stock;
- Well-developed environmental education;
- Adherence to the Sustainable Development Goals through the adoption of national goals and targets.

The top 10 environmental priorities for the next 5–10 years include:²

- Make all data and information on the environment available to the public and enable meaningful public participation in environmental matters and urban planning;
- Join global and regional MEAs to which the country is not party;
- Improve environmental assessment by reforming EIA/SEE and introducing SEA;
- Automate environmental monitoring and start monitoring PM₁₀ and PM_{2.5};
- Expand PAs and ensure the ecological connectivity and representativeness of the PA network;
- Increase efforts to address water losses in agriculture;
- Take measures to decrease the carbon and energy intensity of the economy and introduce support measures for RES, in particular, solar energy;
- Improve management of wastewater from industrial enterprises and develop sanitary landfills;
- Rehabilitate uranium legacy sites and eliminate risks from obsolete pesticides and other POPs;
- Reduce the environment- and climate change-related health risks and hazards and improve road safety.

¹ No ranking applies.

² No ranking applies.

***PART I: ENVIRONMENTAL GOVERNANCE AND
FINANCING***

Chapter 1

LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

1.1 Legal framework and its implementation

The legislation of Uzbekistan is generally coherent and of good quality in terms of the legal drafting techniques. It is fully accessible to the population through a governmental online database (lex.uz). Since 2015, the public also has online access to draft legislative acts (regulation.gov.uz) and is able to submit comments, though not many comments are submitted (chapter 5). In 2019, Uzbekistan introduced regulatory impact assessment³ but no practical experience in using this instrument has yet been gained.

Laws in Uzbekistan, including environmental ones, are rather general and short, with many reference rules that envisage that respective issues are to be addressed through subsidiary legislation. Decrees and resolutions of the President and resolutions of the Cabinet of Ministers are acts of subsidiary legislation that are extremely important in the context of Uzbekistan. They are adopted and amended much more dynamically than laws and often include not only the legal rules but also key policy directions and major institutional changes.

With few exceptions, no profound changes were made to laws on environmental issues since 2010. On the contrary, there have been profound developments to environmental and sectoral legislation through the adoption of decrees and resolutions of the President and resolutions of the Cabinet of Ministers. This has particularly been the case since 2017 when the intensity of legislative activities has increased at times.

As at early 2019, several policy documents in Uzbekistan envisage the development of an environmental code. The primary reasoning behind the codification is to harmonize the environmental legislation and make it more convenient for users. It is expected that codification would raise the profile of environmental norms, even though codes in Uzbekistan formally have the same legal value as other laws.

Environmental legislation

Horizontal issues

Since 2010, there were no significant changes in the 1992 Law on Nature Protection. The 2013 amendments replaced the need to obtain the permission of environmental authorities with the need to obtain state ecological expertise (SEE) conclusions for such activities as disposal of radioactive waste, disposal of chemical substances, and processing, disposal and storage of waste at landfills. The 2014 amendments brought the Law on Nature Protection in line with the 2013 Law on Environmental Control. The amendments introduced to the Law on Nature Protection in 2017 reflected the institutional changes in the system of environmental authorities, expanded the list of requirements for the use of subsoil and mineral deposits and clarified the terminology.

The 2013 Law on Environmental Control is a new law that for the first time provides an overarching legal framework regulating various types and forms of control in the area of environment. It covers state environmental control, internal control (when the legality of inspections, permits or SEE conclusions is being checked by a higher governmental body), self-monitoring and public environmental control. Subsidiary legislation has been adopted to regulate each type of control (2014 Resolution of the Cabinet of Ministers No. 216 and 2015 Resolutions of the Cabinet of Ministers No. 286 and No. 287). The Law delineates the responsibilities of various bodies entrusted to perform environmental control, including the State Committee on Ecology and Environmental Protection (SCEEP), the Ministry of Health (drinking water supply, radioactive/chemical substances, adverse impacts of physical factors on ambient air), the Ministry of Internal Affairs (air pollution from vehicles), the Ministry of Water Management (water use from artificial water bodies), etc. It describes such forms of control as inspections, environmental monitoring, SEE and environmental audit. Environmental audit in Uzbekistan is a “self-control” instrument for enterprises, as it can only be ordered by an enterprise wishing to evaluate its environmental

³ Regulatory impact assessment is a set of measures aimed to identify possible positive and negative effects of the adoption of a draft law or regulation.

performance. As at early 2019, a draft law on environmental audit has been prepared.

Since 2010, the 2000 Law on Ecological Expertise has not been subject to other than minor amendments. However, a new Regulation on Ecological Expertise (2018 Resolution of the Cabinet of Ministers No. 949) was adopted in 2018 to replace the 2001 Regulation. The changes brought about by the new Regulation are mostly clarificatory and correspond to what was already existing practice. The lists of activities of high, medium, low and local risk were slightly modified, and nuclear plants were added to the list of high-risk activities.

Air protection and ozone-depleting substances

The 2013 amendments to the 1996 Law on Ambient Air Protection clarified the role of the SEE and, in particular, SEE conclusions as the key document (instead of a permit) that determines the conditions for decontamination of banned and obsolete chemicals and for regulation of air emissions by stationary sources.

More significant amendments were introduced to this Law in 2019. They clarify the competences on air protection of the Cabinet of Ministers, SCEEP and local authorities, as well as the roles of local self-government bodies and non-governmental organizations (NGOs). They clearly outline the division of responsibilities with regard to the state control of air pollution between SCEEP (pollution sources), the Ministry of Health (sanitary protection zones and residential areas) and the Ministry of Internal Affairs (vehicles). Temporary suspension and termination of polluting activities can now be requested not only for stationary but also for mobile pollution sources. The governmental authorities that can request temporary suspension and termination now also include the Ministry of Internal Affairs, in addition to SCEEP, the Ministry of Health and local executive authorities (khokimiyats). The 2019 amendments abolish the standards for air consumption for industrial needs that used to be developed by enterprises and approved by SCEEP – such standards are no longer required. A set of other amendments to the Law has been discussed since 2016 but is not yet adopted. These amendments envisage gradual transition to stricter emission standards, provide for economic incentives as tools to reduce air pollution and include provisions on transboundary air pollution.

The 2019 amendments include detailed requirements on ozone-depleting substances (ODSs). They impose more responsibilities on enterprises with regard to

ODS accounting, recycling (primary treatment to allow reuse) and replacement. The 2018 Resolution of the Cabinet of Ministers No. 17 (replacing a 2005 act on the same issue) lists ODSs the importation or export of which requires a permit, provides detailed regulation of permitting procedures, and sets quotas for importation of ODSs in the period 2018–2030 and quota allocation procedures.

Nature protection

In 2016, new editions of the 1997 Law on Protection and Use of Flora and 1997 Law on Protection and Use of Fauna were approved. The 2016 Laws include a detailed description of the relevant competences of SCEEP, the State Committee on Forestry and local authorities with a view to clearly delineating them. Furthermore, both laws specify the role of the Academy of Sciences in terms of provision of various opinions as part of permitting procedures and the rights of local self-government bodies, NGOs and citizens to exercise public control and participate in the protection and use of flora and fauna. Both laws include new provisions on incentives that can be granted to individuals and legal entities that ensure the protection and rational use of flora and fauna.

In addition, the 2016 Law on Protection and Use of Flora includes new articles dedicated to botanic gardens and dendrological parks, regulates botanic collections (previously regulated by a resolution of the State Committee for Nature Protection) and regulates in greater detail the use of flora and the related permitting. The 2016 Law on Protection and Use of Fauna includes more detailed provisions on hunting and fishing and the management of hunting and fishing grounds than the previous law on the same subject.

Uzbekistan allows the extraction (including hunting) of Red Book species and collection of Red Book plants, subject to regulated procedures. Quotas for extraction of such species and collection of such plants are approved by the Cabinet of Ministers upon the proposal of SCEEP based on the opinion of the Academy of Sciences; this procedure is regulated in detail by the 2014 Resolution of the Cabinet of Ministers No. 290. In fact, this Resolution regulates all permitting procedures and fees for the extraction of flora and fauna species and damage payments for illegal extraction. It also regulates the CITES-related permitting procedures and fees.

Detailed rules on hunting and fishing are set in the 2006 Rules on hunting and fishing (2006 Order of the Chairperson of the State Committee for Nature Protection No. 27). This act did not undergo any

amendments – neither with regard to the list of species nor with regard to methods, areas and tools of hunting and fishing.

The new Regulation on the procedure for adoption, publication and updating of the Red Book (2018 Resolution of the Cabinet of Ministers No. 1034) was approved in place of a 1992 act. The Red Book is to be published every five years (previously, every 10 years). A novelty is that private individuals and legal entities can initiate the inclusion of new species in the Red Book.

With regard to protected areas (PAs), most significant amendments to the 2004 Law on Protected Natural Territories were made in 2014 when a dedicated section on the state biosphere reserves, national parks and interstate PAs was included in the Law. While, previously, the expropriation of PA lands for state and public needs was allowed in exceptional cases for all categories of PAs, the 2014 amendments specify that no expropriation of land of national parks is allowed under any circumstances. Other new developments in the legislation on PAs include the Regulation on procedure of developing protected area management plans (2012 Resolution of the State Committee for Nature Protection No. 3) and new rules for access to and payments for visiting PAs (2018 Resolution of the Cabinet of Ministers No. 13). In addition, model regulations for several types of PAs were approved to facilitate their management and protection (2018 Resolution of the Cabinet of Ministers No. 339).

Forests

In 2018, the new edition of the 1999 Law on Forests was adopted. Unlike the previous version, the new edition includes definitions of concepts used (e.g. “forest” can only mean trees, bushes and other natural objects on the lands of the forest fund) and defines the main directions of the state policy on forest management. Similarly to the 2016 editions of the laws on flora and fauna, it delineates the responsibilities of the Cabinet of Ministers, State Committee on Forestry, SCEEP and local authorities and specifies the roles of local self-government bodies, NGOs and citizens to exercise public control and participate in various activities on the protection, afforestation and use of forests. The 2018 Law lists measures on forest protection, some of which are new. It regulates afforestation and forest restoration activities in much more detail.

The 2019 Decree of the President No. 5742 and 2019 Resolution of the President No. 4424 allow the leasing of forest fund lands to the citizens of Uzbekistan and agricultural enterprises for a period up to 50 years

based on investment contracts or public–private partnerships (PPPs).

Subsoil and soil

By way of 2017 amendments to the 2002 Law on Subsoil, its section on rational use and protection of subsoil was enhanced with requirements for activities on extraction of widespread mineral deposits. The 2018 amendments to the Law removed the obligation of subsoil users to suspend the excavation or extraction works in the event that they find archeological objects.

More detailed environmental requirements to mining are stated in the 1997 Uniform rules for subsoil protection during the mining of minerals (1997 Resolution of the Cabinet of Ministers No. 20). The rules include provisions on the design of mining projects, exploitation, treatment of minerals, and post-mining rehabilitation of land and water bodies. Mining of mineral deposits in PAs (even in state strict nature reserves (zapovedniks)) is allowed subject to respective approval procedures. There are no provisions on financial or other guarantees for post-mining rehabilitation. No opportunities for alternative land rehabilitation exist in the legislation. There are some requirements on the conservation of fish species but, other than these, the document does not pay enough attention to biodiversity conservation and mining waste.

A new regulation on soil assessment works and approval of their results (2013 Resolution of the State Committee on Land Resources, Geodesy, Cartography and State Cadastre No. 2521) was approved in place of a 1999 act. In 2018, amendments to the Code on Administrative Liability introduced the responsibility on land owners, users and tenants (even those holding a land plot of less than 1 hectare) in the event of non-performance of mandatory measures to improve and protect irrigated land and increase soil fertility.

The Regulation on the development and rehabilitation of protective forest plantations to combat wind erosion of irrigated lands and prevent the sanding of water infrastructure (2018 Resolution of the Cabinet of Ministers No. 422) is a new act that regulates forest planting activities on irrigated lands. The Regulation is exemplary in terms of outlining the approaches to afforestation adapted to the natural and climatic conditions of Uzbekistan.

Waste

The most significant amendments to the 2002 Law on Waste, introduced in 2018, clarified several terms on

waste management with the overall aim of moving the country towards more modern regulation and practices in this area. The 2018 Decree of the President No. 5580 changed the institutional structure for solid waste management and the payment system for waste management services. The Rules for provision of services on collection and removal of solid and liquid municipal waste (2019 Resolution of the Cabinet of Ministers No. 95) and Rules for the placement and operation of infrastructure facilities for sanitary cleaning and municipal waste management (2018 Resolution of the Cabinet of Ministers No. 787) further regulate these issues.

Water

The amendments introduced in 2011 to the 1993 Law on Water and Water Use concern the protected water bodies. They expand the list of grounds for protection with environmental, aesthetic, recreational and sanitary criteria.

Since 2018, consumers are to prepay the costs of water supply and sanitation services (2017 Decree of the President No. 5241; 2018 Resolution of the Cabinet of Ministers No. 950). This measure should enhance the financial sustainability of services and result in better quality of service provided.

The 2018 Resolution of the President No. 3823 sets the new rates for the water resources use tax. Compared with the previous acts, there is a significant increase in rates for industrial enterprises (by more than three times) and for car washing stations (by 10 times) (table 3.5).

The 2017 Resolution of the President No. 3286 was adopted to prevent illegal extraction of sand and gravel from riverbeds under the cover of sediment control and bank stabilization works, since some 228 illegal works of this kind were discovered in 2017. The Resolution clearly specifies the organizations empowered to perform sediment control and bank stabilization works and introduces new control mechanisms in this area.

There have been no amendments to the 1999 Law on the Safety of Hydrotechnical Installations since 2010. The subsidiary legislation was enhanced with adoption of the Rules on the safety of hydrotechnical installations (2018 Order of the Minister of Emergency Situations No. 3039).

Other

The Law on Nature Protection has a provision on mandatory and voluntary environmental insurance,

but no subsidiary legislation on environmental insurance exists. The Classification of Insurance Activities (2002 Resolution of the Cabinet of Ministers No. 413), which lists all types of insurance, does not include environmental insurance.

Green public procurement is not part of the legislation (2018 Law on Public Procurement).

Genetically modified organisms (GMOs) are mentioned in some subsidiary legislative acts on pharmaceuticals and in several general technical regulations devoted to the safety of food products but are not regulated at the level of laws.

Noise, vibration and electromagnetic fields are regulated through sanitary norms and standards (e.g. 2009 SanPiN No. 0267-09 on acceptable noise levels inside residential and public buildings and in residential areas).

Legislation dedicated to climate change is at an early stage of development. Some aspects are included in the legislation on energy, emergencies and monitoring.

There is no framework legislation dedicated to chemicals management. Rather, certain aspects are covered by the legislation on air protection, sanitary well-being of the population, industrial safety, plant protection, transport and mining.

Environment-related provisions in sectoral legislation

Since 2010, some efforts have been applied to introduce environment-related provisions in the legislation covering the economic sectors. However, these efforts have been largely fragmented, apart from in the energy sector, where a more focused effort on energy efficiency is noticeable. In addition, Uzbekistan has been quite active in introducing national standards in fields of environment and energy based on ISO standards – a useful measure for greening the economic sectors.

Energy

The 2019 Law on the Use of Nuclear Energy for Peaceful Purposes regulates the procedures of establishment and operation of nuclear installations and storage facilities for nuclear materials and radioactive waste. The key regulatory tool is the “safety expertise for nuclear facilities”. However, the Law does not clarify the relationship of this tool with SEE. According to the Law, citizens and NGOs have the right to visit nuclear facilities and storage facilities

for educational purposes. The Law requires the adoption of a large number of regulatory acts, where various procedures, including those related to permitting, will be defined.

The 2015 amendments to the 1997 Law on Rational Use of Energy significantly expanded the range of enterprises subject to energy audits: the threshold for mandatory energy audits was reduced from 6,000 tons of reference fuel as total annual energy consumption to 2,000 tons.

The 2019 Law on the Use of Renewable Energy Sources provides for state support to stimulate the use of RES and covers regulation of tariffs for energy produced from RES (chapter 12).

Following the launch of production of energy-saving lamps by several enterprises in Uzbekistan, in 2015, the Government banned the sale of incandescent lamps over 40W as of 2017 (2015 Resolution of the Cabinet of Ministers No. 299).

The 2017 Resolution of the President No. 3379 introduced, as of 2018, differentiated (by the time of day) tariffs for energy consumers with a connected capacity of 750 kVA and above, except budget-funded organizations and pumping stations. Furthermore, the Resolution stipulates that, as of 2022, all state bodies and organizations will be disconnected from centralized supply of hot water and are obliged to use solar water heating installations for hot water supply and energy-saving lamps for lighting.

The legal framework for energy service contracts has been set with the adoption of 2018 Resolution of the Cabinet of Ministers No. 551.

Transport

Uzbekistan announced the introduction of a ban on the import of motor fuels of classes below Euro-3 from 2020 and below Euro-4 from 2023 (2019 Decree of the President No. 5863).

The 2019 Resolution of the President No. 4230 exempts from customs fees, until the end of 2021, railway cars and certain freight transport vehicles that are less than four years old, with a view to renewing the transport fleet.

The Rules for carriage of freight by road transport (2014 Resolution of the Cabinet of Ministers No. 213), as amended in 2018, requires that open vehicles carrying construction materials, industrial goods and other bulk goods cover the cargo with a tarp or dense material. In addition, the entry of vehicles from

construction sites onto public roads is not allowed without prior washing of the vehicle's body and wheels.

Several new general technical regulations have been adopted to increase transport safety and better protect people and the environment: "On safety of road vehicles operating on CNG, liquefied petroleum gas or on a mixture of diesel and gaseous fuels" (2015 Resolution of the Cabinet of Ministers No. 326); "On the safety of railway transport in technical use" (2012 Resolution of the Cabinet of Ministers No. 192); and "On the requirements for motor and aviation gasoline, diesel and marine fuel, jet fuel and fuel oil" (2017 Resolution of the Cabinet of Ministers No. 931).

A new edition of the 1999 Law on Road Safety was approved in 2013. The new edition states among the main principles of road safety the priority of human life and health, protection of the rights and interests of the population and environmental protection. The new version is exemplary in terms of providing opportunities for citizens, local self-government bodies and NGOs to initiate measures to improve road safety.

Industry

There have been no significant amendments to the 2006 Law on Industrial Safety of Hazardous Production Facilities since 2010. However, the legislation on industrial safety has been enhanced with adoption of the new Regulation on organization of the industrial safety expertise and issuance of its conclusions (2018 Resolution of the Cabinet of Ministers No. 784) in place of 2009 rules on the same issue. No particular legislative steps have been taken to stimulate the greening of the industrial sector.

Agriculture

The 2019 Resolution of the President No. 4239 aims to promote agricultural cooperatives in fruit and vegetable production. Significantly, this Resolution gives such cooperatives the freedom to choose/change which agricultural crops to cultivate.

Cotton production is fully regulated (e.g. 2018 Resolution of the Cabinet of Ministers No. 1037 on forecasted volume of raw cotton production and distribution of lands by cotton type). The 2018 Resolution of the President No. 4087 facilitates widespread use of drip irrigation for raw cotton production. Raw cotton producers can receive subsidies to introduce drip irrigation technology (8 million sum/ha), as well as support to partially cover credits to purchase and repair drip irrigation systems.

Certain equipment for drip irrigation systems is exempted from customs duties in 2019–2020.

Housing

The 1998 Housing Code and the 1998 Land Code, and their enforcement are at stake in the long-standing issue with expropriation of land plots and demolition of houses for state and public needs in Uzbekistan. A number of disputes are related to violation of compensation rules, which envisage the provision of alternative housing of equivalent value in compliance with social norms (16 m² per person) or payment of the market value of the expropriated property together with an entitlement to a land plot. A 2018 amendment to the Housing Code reduces the list of persons entitled to compensation to property owners only, thus excluding members of the owner's family or other people residing with the owner. In early 2019, the Government announced that, starting from mid-2019, owners of private houses and buildings will be able to privatize land plots on which their buildings are located (2019 Decree of the President No. 5623). The Law on Privatization of Non-Agricultural Land Plots was adopted in May 2019 and is to enter into force in March 2020. If implemented, this measure may provide better safeguards vis-à-vis currently flexible provisions of the 1998 Land Code on expropriation of land plots for public needs.

A positive development in the housing legislation is the adoption of a methodology for organization of recreational parks and green areas (2018 Resolution of the Cabinet of Ministers No. 671). Apart from regulating the requirements for development of recreational parks and green areas (urban forests, gardens, pedestrian boulevards), it aims to attract PPPs in this area.

Another positive development is the mandatory requirement coming into force in 2020 (2018 Decree of the President No. 5577) that all new housing shall have energy-efficient and energy-saving equipment and undergo an energy audit or receive BREEAM (Building Research Establishment Environmental Assessment Method) or LEED (Leadership in Energy and Environmental Design) certification.

A new code on urban construction is under development to replace the 2002 code, and an intense process of revising the building standards, norms and rules is ongoing.

Tourism

The development of legislation on tourism has been very intensive since 2018, with key measures taken to

ease the entry requirements and improve the logistical attraction of the country for foreign tourists. However, the 1999 Law on Tourism does not include any environmental requirements. As at March 2019, a new law on tourism is under preparation.

The 2018 Resolution of the Cabinet of Ministers No. 13 “On some issues of regulating the visits to protected areas” includes licensing and certification requirements for legal entities intending to develop environmental and other tourism in PAs. It also approves model rules for visitors in PAs.

The 2018 Resolution of the Cabinet of Ministers No. 978 “On measures to develop ecotourism and improve allocation of land plots in river protection zones of water reservoirs” lists 18 water reservoirs where land in river protection zones can be allocated to develop ecotourism and infrastructure for ecotourism. However, only 16 water reservoirs are suitable for recreation.

The 2019 Resolution of the Cabinet of Ministers No. 347 aims to facilitate tourism development in Aydar-Arnasay Lakes System. It provides for the development of roads and other infrastructure and organization of fish markets, along with measures to strengthen environmental inspections in the area through better equipment and increased staffing.

1.2 Policy framework

Strategic planning system

The overarching policy framework in Uzbekistan is provided by the 2017 Action Strategy on Five Priority Directions for Development for the period 2017–2021 (2017 Decree of the President No. 4947), also known as the national Action Strategy. This is a midterm planning document. As at March 2019, no valid long-term strategic document exists; work is under way to develop a concept of socioeconomic development until 2030.

As at March 2019, Uzbekistan does not have a law on strategic planning, but a draft law on this issue is under preparation. Rules on development and financing of “state development programmes” are in place to regulate the elaboration of this type of document (2017 Resolution of the President No. 3437).

With the national Action Strategy on top, the national policy framework also includes state programmes, comprehensive programmes, programmes, concepts,

roadmaps, action plans, “measures”⁴ and several categories of strategic documents in the area of spatial planning. Except for state programmes, which are approved by the President only, no particular rules can be identified with regard to who adopts which category of documents.

Most strategic documents include provisions specifying the amounts and sources of financing for their implementation. Grants from foreign donors and other non-budgetary funds are considered as cofinancing sources for implementation and are included as such in the texts of strategic documents, but the state budget is clearly the major funding source for implementation of all strategic documents.

In the case of most strategic documents, responsibilities for implementation are clearly defined and not only the names of institutions but even the names of governmental officials responsible for each measure are specified. Strategic documents usually include provisions on monitoring and reporting, but these are not sufficiently elaborated. Implementation reports are produced but never appear on the public authorities’ websites. Limited information on implementation of strategic documents is channelled to the media. Few strategic documents include information on implementation of earlier strategic documents on the same subject matter.

Until recently, strategic documents in Uzbekistan rarely included quantitative indicators of implementation. This is now changing and indicators, including rankings under international indexes, are increasingly used. Nevertheless, there is much room for improvement in terms of meaningfully using the indicators. For example, currently, a target value is often indicated with no indication of the baseline value, or a target value is indicated that is in fact already achieved, or a percentage change is indicated without the actual values that lie behind it.

Another issue, which is peculiar to Uzbekistan, is that important strategic documents are requested to be produced within very short time frames (e.g. in only three months), which jeopardizes their quality.

Action Strategy on Five Priority Directions for Development for the period 2017–2021

The 2017 Action Strategy identifies priority steps in five areas: (1) strengthening the State and society; (2)

rule of law and reform of the judicial system; (3) development and liberalization of the economy; (4) social sector development; (5) safety, religious tolerance and interethnic consensus, and foreign policy.

Environmental issues are not really prominent in the Action Strategy, though they are present under various sections. Environmental security and waste management are mentioned under area (4). Prevention of environmental problems is referred to under area (5). Mitigating the impacts of climate change and drying out of the Aral Sea and resource-efficient technologies are mentioned under area (3).

The Roadmap for Structural Reforms for the period 2019–2021 (2019 Decree of the President No. 5614) names major focus areas of reforms in support of the implementation of the Action Strategy. In the environmental area, it prioritizes:

- Development of an integrated environmental database;
- Implementation of the green economy approach;
- Drafting an environmental code;
- Public access to relevant data such as reports and summary information on inspection activities;
- Developing a solid waste management strategy for the period 2019–2028;
- Strengthening economic mechanisms of environmental protection by introducing extended producer and importer responsibility responsibility.

Annual state programmes are approved for implementation of the Action Strategy.

Strategic documents on green economy

The Strategy for Transition to Green Economy for the period 2019–2030 (2019 Resolution of the President No. 4477), adopted in October 2019, is a framework document that largely restates the provisions of existing sectoral documents related to the greening of economic sectors and resource efficiency. The adoption of this framework document is important because it recognizes green economy as a key strategic area for development of the country. Annual action plans will be developed to facilitate implementation of the Strategy (chapters 3 and 7).

combination of institutional changes (procedural norms) and legal (material) norms and may contain a roadmap or a programme of measures for a given issue.

⁴ “Measures” are documents approved by either the Cabinet of Ministers or the President that include priority steps for a sector or a specific issue (e.g. road safety). A decree or a resolution entitled “On measures ...” usually includes a

Strategic documents on the environment

Concept on Environmental Protection until 2030

Approved in October 2019, the Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863) is a totally new document for Uzbekistan that sets *long-term goals* in environmental protection and measures to achieve them.

The Concept provides for measures in the following areas: global environmental issues and the development of international cooperation; desertification and land degradation; water conservation; air protection; conservation of biological resources and increase in forest cover; industrial waste; greening the economy; economic mechanisms of environmental management; state environmental control; SEE and eco-certification; environmental monitoring; science; participation of civil society in environmental protection and the creation of a continuous system of environmental education. Part of the tasks and activities provided for by the Concept reflect tasks and activities already provided for in previously approved documents, but some of the tasks and activities are new. This is especially true for measures envisaged under air protection, industrial waste, greening the economy, state environmental control, SEE and public participation.

Among others, target indicators for 2030 include:

- Bringing the area of forest plantations in the Uzbek part of the Aral Sea to 60 per cent of its territory;
- Improving the efficiency of wastewater treatment up to 80 per cent;
- An increase in the forest fund lands covered by forests to 4.5 million hectares;
- Increase in the area of protected natural territories of categories I–V to 12 per cent;
- Bringing the coverage of the population with services for the collection and disposal of municipal solid waste (MSW) to 100 per cent.

The implementation of the Concept is expected through the adoption of “roadmaps” for a three-year period. The roadmap for the period 2019–2021 (2019 Decree of the President No. 5863) contains a list of 41 activities.

Programmes of actions on environmental protection

Strategic planning on environmental issues has been based on five-year programmes of action. By the end of 2012, 71 of 78 activities envisaged by the 2008 Programme of Actions on Environmental Protection for the period 2008–2012 (2008 Resolution of the Cabinet of Ministers No. 212) were implemented. According to the then State Committee for Nature Protection, overall expenditures amounted to 376.14 billion sum, US\$427.79 million and €504,400. Good results were achieved in: modernizing the oil refineries and raising the quality of motor fuels; transfer of motor vehicles to cleaner fuels; widening the use of natural gas in motor vehicles; introduction of facilities to use flaring gas; electrifying certain parts of railways; and construction of small hydropower plants (HPPs). Furthermore, a number of measures were implemented on the strengthening of the legal framework (e.g. development of the Law on Environmental Control, adopted in 2013), public participation (e.g. establishment of a public council under the State Committee for Nature Protection in October 2011) and education (development of the Concept on Education for Sustainable Development (ESD), adopted in 2011). The drawbacks in implementation included: failure to transfer some environmentally hazardous facilities from water protection zones to other areas; poor effectiveness of measures to decrease air emissions in Almalyk, Nukus, Tashkent and Chirchik; problems with water quality monitoring in small rivers; and poor control over municipal wastewater treatment facilities in several towns.

The 2013 Programme of Actions on Environmental Protection for the period 2013–2017 (2013 Resolution of the Cabinet of Ministers No. 142) included measures on: reduction of air, water and land pollution; improved environmental monitoring; greening the economic sectors; rehabilitation of the environmental situation in the Aral Sea region and other environmentally affected areas; provision of safe drinking water, sanitation and wastewater treatment; development and extension of the PA network; and improvement of legislation, environmental education and ESD. It explicitly mentioned green economy.

The 2013 Programme envisaged 78 activities. Successes in implementation include the afforestation and land reclamation works undertaken on 90,000 ha of the dried bed in the Aral Sea region. Problems in implementation were encountered with completing the reconstruction of some wastewater treatment plants (WWTPs) and delays with reconstruction of treatment facilities of the Ferghana Oil Refinery. As at mid-

2018, other non-completed activities included: expansion of Navoiy TPP by constructing the second 450 MWt combined-cycle facility; construction of the associated gas degassing and utilization unit at Shurtaneftegaz facilities; modernization and reconstruction of main aggregates of the Fergana and Bukhara oil refineries; and publication of two remaining volumes of the Red Book. Also, the development of Pskom Nature Reserve as a core zone of Ugam-Chatkal State Nature Park did not proceed as planned, despite a relevant study having been prepared by the Academy of Sciences.

The positive aspect of five-year programmes of action on environmental protection is that they clearly outlined measures and responsibilities and facilitated allocation of significant funding for environmental protection measures. No such programme exists for the post-2017 period.

Aral Sea-related policy documents

The 2015 Comprehensive Programme of Measures related to Mitigation of the Consequences of the Aral Disaster, Rehabilitation and Socioeconomic Development of the Aral Sea Region for the period 2015–2018 (2015 Resolution of the Cabinet of Ministers No. 255) outlines the approach of the Government of Uzbekistan to tackling the consequences of the disaster in two regions – the Republic of Karakalpakstan and Khorezm Oblast. This approach provides for actions in five directions:

- Improve the management and rational use of water resources in the Aral Sea region (create local water bodies, modernize existing water management infrastructure, etc.);
- Improve health conditions (ensure stable drinking water supply, prevent respiratory diseases, enrich food products with iron, folic acid, iodine, etc.);
- Expand opportunities for employment and income generation;
- Restore ecosystems and biodiversity (create 10 new PAs covering 3.7 million ha, preserve natural water bodies and lake systems in the Amu Darya River delta, plant forests on the dry bottom of the Aral Sea, etc.);
- Modernize production and improve infrastructure to ensure socioeconomic development (refurbish existing enterprises, introduce new production facilities, etc.).

Annexes to the Comprehensive Programme include lists of projects to be implemented in the Republic of Karakalpakstan and Khorezm Oblast in these five areas.

Despite the title of the Comprehensive Programme mentioning the period 2015–2018, it contains measures with timelines until 2021 or 2022.

The 2017 State Programme on Development of the Aral Sea Region for the period 2017–2021 (2017 Resolution of the President No. 2731) is more development oriented than the 2015 Comprehensive Programme. Nevertheless, taking into account the overlapping time spans of the two programmes, their relationship is not clear. The 2017 State Programme provides for activities to create new jobs and increase employment, develop centralized water supply and increase access to safe drinking water, improve sanitation and enhance afforestation – the areas that were also prioritized under the 2015 Comprehensive Programme. The 2017 State Programme includes stronger measures on the improvement of transport, engineering and other municipal infrastructure in human settlements and on supporting the population in the area of public health. The new areas addressed by the 2017 State Programme are solid waste management, new housing construction and enhanced social support.

Other documents

The National Action Plan on Implementation of International Commitments on Chemical, Biological, Radiation and Nuclear Safety for the period 2018–2021 (2018 Resolution of the Cabinet of Ministers No. 968) is a new document for Uzbekistan tackling chemical and biological safety, among other matters. Its measures are aimed at prevention of illegal transport of nuclear, chemical and biological weapons, improving equipment and training of staff on chemical, biological, radiation and nuclear safety, and strengthening related export and import control procedures. The Action Plan provides for rehabilitation of uranium tailings in Tashkent and Namangan Oblasts in 2019–2020, measures to improve the registration of pesticides and mineral fertilizers, and measures to analyse the situation with regard to stockpiles of obsolete pesticides in Farkhad village of Syrdarya Oblast and the storage sites in Surkhandarya and Jizzakh Oblasts. Implementation of the Action Plan is expected to be funded primarily by international organizations and donors.

The 2010 Programme on Accelerated Development of Infrastructure, Transport and Communications Networks for the period 2011–2015 (2010 Resolution of the President No. 1446) and the 2015 Programme on Development and Modernization of Communications, Road and Transport Infrastructure for the period 2015–2019 (2015 Resolution of the President No. 2313) included measures and projects

primarily to develop the transport sector but also to expand water supply, sewerage and electricity networks, in particular in rural areas. Equipment for investment projects included in these programmes was given preferential customs treatment.

The 2017 Programme for Comprehensive Development and Modernization of the Drinking Water Supply and Sewerage Systems for the period 2017–2021 (2017 Resolution of the President No. 2910) is the first policy document specifically targeting water supply and sanitation. It includes district- and town-level details on the infrastructure (length of networks, number of pumping stations, etc.) to be built under the Programme and the funding allocated for this by the Government and international donors. A Clean Water Fund (later transformed into the Fund for Development of Water Supply and Sanitation Systems with additional mandate to finance sewerage networks) under the Ministry of Finance was created to finance activities under the Programme. Equipment for investment projects included in this Programme is given preferential customs treatment. The 2018 Resolution of the President No. 4040 “On additional measures to develop water supply and sewerage systems” provides further strategic directions for development of the sector, such as expansion of water metering, implementation of PPPs, simultaneous construction of water supply and sewerage networks and transition to cost-recovery tariffs. The Resolution exempts companies that sign PPP agreements in the water supply and sanitation sector from all taxes and mandatory payments, except the social tax, for three years. It also includes programmes for gradual modernization and construction of wastewater treatment facilities in 20 towns.

The 2017 Set of Measures to Strengthen Control and Accounting for the Rational Use of Groundwater Resources for the period 2017–2021 (2017 Resolution of the President No. 2954) includes measures to regularize the use of groundwater and fight illegal use, as well as to ensure protection of groundwater. It follows the official inventory conducted in February–March 2017 that revealed uncontrolled abstraction from over 60 per cent of wells (of a total of 10,073 wells), whereas 59 per cent of abstracted groundwater was from non-approved groundwater reserves.

The 2019 Strategy on Municipal Solid Waste Management for the period 2019–2028 (2019 Resolution of the President No. 4291) is an attempt to introduce modern waste management by developing technically advanced infrastructure, enhancing recycling capacities, decreasing the amounts of waste going to landfills, optimizing tariff policies to achieve cost recovery tariffs and promoting the use of waste

for energy production. Its targets include 100 per cent coverage of the population by waste collection and disposal services by 2025, up from 48 per cent in 2018, and increasing MSW recycling (to 25 per cent by 2021 and 60 per cent by 2028) (chapter 10). The Strategy’s action plan includes details on specific activities, timelines, responsible bodies and financing.

The 2019 Roadmap for Development of the Protected Areas Network for the period 2019–2022 (2019 Resolution of the President No. 4247) envisages the creation of five new PAs in the Republic of Karakalpakstan (chapter 11).

The 2019 Strategy for the Conservation of Biological Diversity for the period 2019–2028 (2019 Resolution of the Cabinet of Ministers No. 484) aims at expansion of the area of protected natural territories to 12 per cent of the country’s territory by 2028 (chapter 11).

Other strategic documents on the environment include the: 2008 Plan of Actions to Ensure Stability of the Environmental Situation and Effective Use of the Aydar-Arnasay Lakes System for the period 2008–2015; 2011 Programme of State Environmental Monitoring for the period 2011–2015 (2011 Resolution of the Cabinet of Ministers No. 292); and 2016 Programme of Environmental Monitoring for the period 2016–2020 (2016 Resolution of the Cabinet of Ministers No. 273).

As at 2019, the policy framework on environmental protection does not sufficiently cover the issues of climate change, low carbon development, environmental compliance and enforcement, forest protection, soil protection and environmental noise.

Strategic documents on environment at subnational level

The 1992 Law on Nature Protection entrusts the local authorities to approve regional (territorial) environmental programmes. Similarly, the 2016 Law on the Protection and Use of Flora and 2016 Law on the Protection and Use of Fauna entrust the local authorities to approve territorial programmes on flora and fauna. The 2019 amendments to the Law on Ambient Air Protection entrust the local authorities to approve territorial programmes on air protection.

Only one subnational programme was approved, in the Republic of Karakalpakstan (Territorial State Programme of Actions on Environmental Protection for the period 2013–2017 (2013 Resolution of the Council of Ministers of the Republic of Karakalpakstan No. 135)). No other programme of this kind adopted by local authorities exists.

Programmes that target various local (primarily socioeconomic, but also environmental) issues are commonly adopted at the central government level.

Sectoral development with a possible impact on the environment

Integration of environment-related provisions in sectoral policies is in its early stages in the housing, infrastructure, transport, industry, tourism and health sectors and slightly more advanced in the energy sector (with regard to energy efficiency and RES) and the agricultural sector (with regard to water-use efficiency).

Energy

The 2015 Programme of Measures to Reduce Energy Intensity and Introduce Energy Efficient Technologies in Economic Sectors and the Social Sector for the period 2015–2019 (2015 Resolution of the President No. 2343) included measures to modernize district and local boiler houses, replace electric engines of water pumping stations and increase the energy efficiency of buildings. Its successes include the replacement of boilers (with more energy-efficient ones) in many public education institutions, introduction of energy-efficient street lighting and introduction of the national standards – O‘z DSt ISO 50001:2015 on energy management systems and O‘z DSt ISO 50002:2015 on energy audits.

The 2017 Programme of Measures for Further Development of Renewable Energy, Increase of Energy Efficiency in Economic Sectors and the Social Sector for the period 2017–2021 (2017 Resolution of the President No. 3012) prioritizes innovation development in RES and energy efficiency, diversification of the energy balance through production of energy from renewable and alternative energy sources, and a decrease in energy intensity. Altogether, the Programme names 810 investment projects on RES development. Intensive development of legislation on RES is envisaged. The document includes targets aimed at raising the share of renewables from 12.7 per cent (all from hydropower) of total energy production capacity in 2016 to 19.7 per cent (of which 15.8 per cent is hydropower, 2.3 per cent is solar and 1.6 per cent is wind energy) in 2025. Another target is to decrease the energy intensity of the national economy by 37.4 per cent in the period 2017–2021. The good aspect of this target is that it is broken down by large enterprises. However, the actual figures on energy intensity are not indicated – only the required percentage is.

The 2019 Comprehensive Programme for Further Development of Energy Efficiency of Economic Sectors and the Social Sector, Introduction of Energy Saving Technologies and Development of Renewable Energy Sources (2019 Resolution of the President No. 4422) sets targets for further development of RES from 10 per cent (all from hydropower) of total power production in 2018 to 25 per cent (of which 11.2 per cent is hydropower, 8.8 per cent is solar and 5 per cent is wind) in 2030. The document includes a roadmap of implementation, a list of administrative buildings of public authorities and organizations that are recommended to install solar photovoltaic (PV) installations and solar water heating devices, as well as a list of enterprises that are required to introduce, by 1 January 2023, the energy management systems in line with ISO 50001.

A short policy document, “Set of Measures to Promote Production and Use of Biogas Installations in the period 2017–2019” (2017 Resolution of the Cabinet of Ministers No. 338) aims to facilitate grants, technical assistance and access to credit in this area and achieve implementation of more than 700 biogas projects in livestock and poultry farms across the country.

The 2017 Programme for Development of the Heat Supply System for the period 2018–2022 (2017 Resolution of the President No. 2912) envisages the expansion of local boiler houses, including through domestic production of energy-efficient local boiler houses and individual in-apartment heat systems. The idea is to refrain from building new multi-apartment residences and public buildings connected to central heat supply networks and reduce the reliance on central heat supply.

The 2017 Programme of Measures for Further Development of Hydropower for the period 2017–2021 (2017 Resolution of the President No. 2947) lists 18 projects of new HPP construction and 14 projects to modernize the existing HPPs. The objective is to increase the total hydropower capacity from 1,793.9 MWt in 2016 to 3,037.8 MWt by 2025. It explicitly mentions the need for preservation of flora and fauna during the construction of hydropower facilities.

Along with the development of RES, Uzbekistan continues to extract fossil fuels. The 2017 Programme to Increase the Extraction of Hydrocarbons for the period 2017–2021 (2017 Resolution of the President No. 2822) envisages the construction of 502 new wells for extraction of natural gas and gas condensate and 216 new wells for extraction of oil in this period.

Two programmes aim at modernization of the coal industry: one for the period 2013–2018 (2013

Resolution of the Cabinet of Ministers No. 161, no longer in force) and another for the period 2017–2021 (2017 Resolution of the President No. 3054). Their primary objectives are to explore new coal reserves and increase coal extraction.

The 2018 Decree of the President No. 5484 and the Concept for the Development of Nuclear Energy in the period 2019–2029 (2019 Resolution of the President No. 4165) envisage the construction of the first NPP in Uzbekistan, with two power units, each having installed capacity of 1.2 GW (chapter 12). The Concept requires active cooperation with the International Atomic Energy Agency (IAEA) and provides for the country's accession in 2019–2020 to several conventions on nuclear safety. The Concept does not include any details on environmental monitoring or the fate of spent nuclear fuel.

Transport

In the area of transport, previous policy documents (e.g. 2010 Programme on Accelerated Development of Infrastructure, Transport and Communications Networks for the period 2011–2015 (2010 Resolution of the President No. 1446) and 2015 Programme on Development and Modernization of Communications, Road and Transport Infrastructure for the period 2015–2019 (2015 Resolution of the President No. 2313)) included few environmental considerations. These mostly referred to electrifying parts of the railway network and modernizing the railway and road networks. The 2017 Comprehensive Programme to Improve Transport Infrastructure and Diversify External Trade Routes for Freight Transport for the period 2018–2022 (2017 Resolution of the President No. 3422) is similarly limited in terms of integration of environmental requirements. The direct environmental impacts are mostly linked to further electrification of railways. The projects included in the Comprehensive Programme to improve transport connectivity, logistics and infrastructure may bring indirect environmental benefits. However, the document does not mention and does not address air emissions from the transport sector and the sector's contribution to climate change.

The 2017 Programme for Greening the Roads, including Roads of Common Use and Streets, in the period 2018–2020 (2017 Resolution of the President No. 3262) provides funds for tree planting along the roads and streets.

The 2018 Global Status Report on Road Safety by the World Health Organization (WHO) estimates the road traffic fatality rate in Uzbekistan in 2016 to be 11.5 per 100,000 population, which is better than in

Kazakhstan (17.6) but worse than in Belarus (8.9), Germany (4.1) or Switzerland (2.7). The official estimate by the Government of Uzbekistan is 8.3 fatalities per 100,000 population. The country made a step in the right direction by adopting its first policy document on road safety – the 2018 Concept on Road Safety for the period 2018–2022 (2018 Resolution of the Cabinet of Ministers No. 377), but the document lacks any quantitative targets.

Industry

Uzbekistan regularly approves “localization programmes” that include projects aimed at developing the production of competitive import-replacing and export-oriented products (e.g. Programme of Localization of Goods, Components and Materials for the period 2015–2019 (2015 Resolution of the President No. 2298)). The enterprises included in the “localization programmes” receive tax and customs preferences to enable them to launch the production of certain goods. Beyond economic effects, such programmes may have important environmental effects.

The 2016 Programme of Measures for Further Development of the Textile and Knitwear Industry in the period 2017–2019 (2016 Resolution of the President No. 2687) aims at increasing local production of export-oriented knitwear products based on deep processing of cotton fibre.

Boosting the local chemical industry is the purpose of the 2018 Resolution of the President No. 3983 “On measures for accelerated development of the chemical industry”. It includes targets on increasing and diversification of the production of chemicals, including a twofold increase in the production of mineral fertilizers in the period 2018–2030.

A set of measures to accelerate the development of the construction materials industry in the period 2019–2020 (2019 Resolution of the President No. 4335) aims to optimize imports and expand local production of construction materials, as well as introduce innovation and international standards in the production of construction materials.

Agriculture

The 2012 Programme for Further Modernization, Technical and Technological Upgrade of Agricultural Production for the period 2012–2016 (2012 Resolution of the President No. 1758) focused on renewal and expansion of the use of more economically and resource-efficient equipment in

agriculture. There is no information on its impact on water or energy efficiency.

The 2018 Roadmap on Profound Reform of the Agricultural and Food System (2018 Resolution of the President No. 3671) aims to increase the effectiveness of the sector and improve food security. It has important environmental connotations, as it envisages studying the possibilities for more effective use of agricultural lands for other crops by reducing cotton and spiked cereals cultivation. It also provides for gradual expansion of mechanized harvesting of raw cotton. The Roadmap envisages the promotion of global standards for organic production and calls for increased transparency in the distribution of mineral fertilizers and fuel among agricultural producers.

The 2013 State Programme for Improvement of Land Reclamation in Irrigated Lands and Rational Use of Water Resources in the period 2013–2017 (2013 Resolution of the President No. 1958) provided for measures to improve the quality of irrigated lands, build new and repair existing irrigation infrastructure and expand drip irrigation. Information on implementation of the State Programme includes impressive numbers with regard to irrigation networks and pumping stations repaired. Implementation is reported to have resulted in a decrease of lands with strong and middle levels of saltiness by 149,400 ha and a decrease of areas with near-surface groundwater occurrence by 302,900 ha.

The 2017 Programme of Comprehensive Measures on the Development of Irrigation, Improvement of Land Reclamation of Irrigated Lands and Rational Use of Water Resources in the period 2018–2019 (2017 Resolution of the President No. 3405) provides for further measures in this area, including significant expansion of drip irrigation and introduction of alternative ways of watering cotton (mobile flexible irrigation pipes and irrigation in the furrows, shielded with perforated plastic film).

The 2019 Concept for Rational Use of Land and Water Resources in Agriculture (2019 Decree of the President No. 5742) provides for measures to stimulate the use of unused degraded agricultural lands through improving their reclamation state, fertility and water availability. It also envisages measures to identify groundwater reserves suitable for irrigation of crops. With regard to water efficiency, the Concept provides for increased energy efficiency of pumping stations and step-by-step introduction of market mechanisms in the field of water consumption.

Forestry

The Programme of Measures for Effective Organization of Forest Management Organizations, Introduction of Advanced Scientific and Technological Measures in Forestry, Renewal of Equipment and Raising International Funds for Forestry for the period 2017–2021 (2017 Resolution of the President No. 2966) is the key policy document aimed at expediting development in the forestry sector. It has not been preceded by a similar document. The Programme provides for measures to ensure financial viability of forest management organizations, increase research and technology development on forestry and ensure training of forestry professionals.

A number of forecast indicators for the development of forestry in the period 2020–2024 are defined to cover the procurement of seeds, cultivation of medicinal herbs, creation of protective forest stands and other activities on the lands of the forest fund (2019 Resolution of the President No. 4424).

Housing and infrastructure

The 2018 Programme “Obod Qishloq” (“Prosperous village”) (2018 Decree of the President No. 5386) is the key policy document for the building and maintenance of infrastructure and amenities in qishloqs (villages). The Programme funds construction and landscaping works, regional roads and street maintenance, street lighting, improvements in public transport (building bus stations, purchase of buses, etc.), water supply, electricity and gas supply infrastructure, repair of individual private houses and multi-apartment residences and construction and repair of schools and hospitals. The Programme also provides funds to build and repair irrigation infrastructure. Environmental considerations (water and resource use efficiency or the use of environmentally friendly construction materials) are not included in the Programme, though activities within its framework may have clear environmental benefits. A similar programme for towns is the 2018 Programme “Obod Makhalla” (“Prosperous neighbourhood”) (2018 Decree of the President No. 5467). Some measures in the “Obod Qishloq” and “Obod Makhalla” Programmes are similar to those under the 2017 Programme for Comprehensive Development and Modernization of the Drinking Water Supply and Sewerage Systems for the period 2017–2021 and the 2015 Programme for Development and Modernization of Communications, Road and Transport Infrastructure for the period 2015–2019, but they are implemented in different settlements.

The 2019 Concept to Implement the Smart City Approach (2019 Resolution of the Cabinet of Ministers No. 48) adapts the smart city approach to the context of Uzbekistan. The Concept addresses 10 areas for implementation of the smart city approach: transport, education, medicine, energy system, water supply and sanitation, utilities, construction sector, houses, khokimiyats and makhallas. The period until 2027 is mostly for conceptual and detailed planning, whereas actual implementation of automatic systems and information technologies is envisaged for the period 2028–2030. If implemented, the Concept will result in a significant increase in resource efficiency and reduction of the overall environmental footprint of urban settlements.

Tourism

The Concept for Development of the Tourism Sector for the period 2019–2025 (2019 Decree of the President No. 5611) is the first policy document on tourism. It sets an ambitious target for tourism to account for 5 per cent of GDP by 2025 (in 2017, it accounted for 2.3 per cent). It names ecological tourism and rural tourism among 10 potentially promising tourism types. Its action plan for 2019 names among measures for 2019 the organization of protection zones in state strict nature reserves (except Surkhan and Kitab) with identification of areas for ecological tourism, and also envisages organization of the zoning of Zaamin National Nature Park. Overall, the Concept provides for major investments to develop tourism infrastructure. It does not make any particular references to environmental protection.

Health

Increased interagency cooperation for the protection of public health, development of a healthy and safe environment, improvement of water supply and sanitation, healthy nutrition and healthy lifestyles are among the objectives of the Concept on Development of the Health System for the period 2019–2025 (2018 Decree of the President No. 5590). Unlike many other policy documents in the country, this one includes a number of quantitative targets and indicators. Moving towards sustainable health systems (reduced consumption of water and energy by health institutions, proper treatment of medical waste, etc.) is not addressed in the Concept.

The 2018 Resolution of the President No. 4063 provides for various direct measures to promote healthy lifestyles and approves the Concept to Prevent Non-Communicable Diseases, Support Healthy Lifestyle and Increase Physical Activities of the Population in the period 2019–2022. Among other

things, the Concept envisages expansion of walking paths and cycling infrastructure.

Other

The Strategy for Innovative Development for the period 2019–2021 (2018 Decree of the President No. 5544) is the first document of this kind. Its major target is to bring Uzbekistan into the 50 top countries under the Global Innovation Index (Uzbekistan has not participated in this index in 2016–2018). The Strategy includes measures on improved financing of innovation, development of information and communication technologies (ICT), development of science, and technology transfer. The Strategy mentions effective use of resources but places no emphasis on green technology.

The 2015 Concept on Developing E-Commerce in the period 2016–2018 (2015 Resolution of the Cabinet of Ministers No. 353) and the 2018 Programme of Measures on Developing E-Commerce in the period 2018–2021 (2018 Resolution of the President No. 3724) provide for regulatory and technological measures to ease administrative barriers and develop e-commerce in the country – a direction generally considered to have lower environmental impacts than traditional shopping. However, expanding access to the Internet in rural and remote areas and enhancing access to data remain the prerequisites before more sophisticated Internet use (including e-commerce) becomes accessible to all.

Among other matters, the 2015 Programme for Development of National Infrastructure for Quality Assurance until 2020 (2015 Resolution of the Cabinet of Ministers No. 298) provides for the promotion of management systems ISO 9001, ISO 14001, OHSAS 18001 and ISO 50001 among public enterprises in Uzbekistan.

The 2017 Decree of the President No. 5066 recognizes that the key challenges of the disaster risk management system are in the areas of preparedness, disaster risk reduction, poor forecasting of disasters, insufficient awareness among the population and poor use of ICT. It approves the Programme of Comprehensive Measures to Further Improve Disaster Prevention and Response, which is focused on raising the efficiency of preparedness and response activities. The measures also include improving the structure and staff capacity of the Ministry of Emergencies, introducing ICT to Ministry activities and better equipping rescue teams.

Several policy documents were adopted to reduce the use of paper, in particular the 2010 Resolution of the

Cabinet of Ministers No. 155 that approved the Set of Additional Measures to Ensure Economizing on Paper and its Rational Use. Apart from reduction of paper consumption per se, measures aim at more efficient use of ICT and electronic documentation in governmental bodies.

Towards strategic environmental assessment

The country is not a party to the 2003 Protocol on Strategic Environmental Assessment to the ECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) (chapter 6). Strategic environmental assessment (SEA), as provided for in the Protocol or in Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment, does not exist in Uzbekistan.

As at early 2019, the 2000 Law on Ecological Expertise provides that draft state programmes, concepts and schemes for the development of production, economic sectors and the social sector are subject to SEE (even without a clause on their potential impact on the environment). The 2018 Regulation on SEE (2018 Resolution of the Cabinet of Ministers No. 949) does not provide more detail on the SEE of this category of documents except that such SEE is to be carried out by the Centre for State Ecological Expertise. As at early 2019, policy documents such as state programmes, comprehensive programmes, programmes, concepts, roadmaps, action plans or “measures” do not undergo SEE. The only category of policy documents for which SEE is carried out is urban planning documents.

In 2018, at the request of Uzbekistan, ECE experts prepared two reviews of the national legislation (one vis-à-vis the provisions of the Espoo Convention and the other vis-à-vis the provisions of the Protocol on SEA) (chapter 6). They have also prepared proposals on improving the legislative framework on environmental assessment, including opportunities for the introduction of SEA. This exercise has greatly facilitated awareness about the concept of SEA in Uzbekistan. Nevertheless, key challenges for the introduction of a fully fledged SEA system include raising understanding and acceptance of the SEA tool among the sectoral planning authorities.

1.3 Sustainable Development Goals

Millennium Development Goals

The experience with the Millennium Development Goals (MDGs) in Uzbekistan has several aspects that have relevance for the country’s approach to the

Sustainable Development Goals. First, Uzbekistan has adapted the global MDGs to its national circumstances by setting national targets and indicators – an approach followed in the period 2016–2018 for the Sustainable Development Goals. Secondly, MDGs were referred to in a number of policy documents in Uzbekistan throughout the entire MDG implementation period, which made them well integrated into the national development agenda.

Uzbekistan has been tracking progress with the achievement of the national MDG indicators, although this was not a regular activity. No specific MDG-related action plan was developed at the start of the implementation process, but the Government has adopted an action plan for implementation of the MDGs for the period 2011–2015 (called the Set of Additional Measures to Implement the Millennium Development Goals in the period 2011–2015 (2011 Resolution of the Cabinet of Ministers No. 21)).

Official reports on MDGs implementation were issued in 2006 and 2015. The key challenge identified in the 2015 report is reducing disparities in MDGs implementation among various groups in the population, including the rural and urban population, men and women, young people, people with disabilities and others. This challenge remains relevant for the achievement of the Sustainable Development Goals.

Defining the national Sustainable Development Goals

Process

Unlike many other countries, Uzbekistan has commenced the process of defining the national Sustainable Development Goals and targets rather early. The United Nations Country Team played a crucial role in getting the process started but the Government has undoubtedly taken full control of the process from the very beginning. The United Nations Country Team has then taken a support/advisory role. Important support to the process was provided by the joint United Nations–World Bank Mainstreaming, Acceleration and Policy Support (MAPS) mission, which visited the country in April 2018. The MAPS mission was particularly useful in identifying the challenges and actions needed on the monitoring and evaluation side, in addition to identifying the three acceleration areas for the country’s progress in implementation of the 2030 Agenda for Sustainable Development (towards more efficient and accountable governance systems; social policy for inclusive development; towards sustainable and resilient natural resources management).

In February 2016, the Cabinet of Ministers (2016 Decision of the Cabinet of Ministers No. 111) approved the composition of the Coordination Council for the Development and Implementation of Measures on Adaptation of the United Nations Sustainable Development Goals. It also approved the composition of six working groups to develop the national Sustainable Development Goals and targets in six thematic areas. The Decision assigned global targets among the working groups and included an action plan with timeframes and responsibilities for the entire process of defining the national goals. The Ministry of Economy coordinated the overall process.

The Coordination Council's membership was purely governmental. Academic institutions (all financed by the Government) were involved in the process of defining the national targets from the outset as part of the expert groups. Some expert groups also included the National Association of NGOs, the Committee of Women of Uzbekistan and the Ecological Movement of Uzbekistan. However, in Uzbekistan, these organizations are supported by the Government and closely linked to the Government (e.g. the Chair of the Committee of Women of Uzbekistan is ex officio the Deputy Prime Minister of the country, while the Ecological Movement of Uzbekistan was allocated by the legislation 10 per cent of seats in the lower chamber of the national parliament (Oliy Majlis) during the period 2008–2019).

Public consultations on the list of national Sustainable Development Goals were organized twice – in February–March 2017 and in May 2018 – by posting the draft resolution for adoption of national goals on the governmental portal (<https://regulation.gov.uz>) for comments; two and four comments were received, respectively. Overall, the involvement of and consultations with civil society in the process of defining the national Sustainable Development Goals were limited. Furthermore, there was no involvement of local authorities – which, if it did occur, would ensure that the regional and urban/rural differences are taken into account in the definition and achievement of the national goals.

The work to define the national Sustainable Development Goals resulted in the adoption of national goals and targets by the Cabinet of Ministers in October 2018 (2018 Resolution of the Cabinet of Ministers No. 841).

National goals

The list of national Sustainable Development Goals includes 16 national goals (of 17 global goals, with Goal 14 on oceans excluded) and 125 national targets.

In many cases, the adaptation of global targets basically meant the use of terms and concepts common for Uzbekistan in the national targets. In some cases, the adaptation was driven by political considerations; however, some topics that had previously been too sensitive for the Government, such as domestic violence, remittances or fossil fuel subsidies, were integrated into the national targets without changes.

A general observation on the entire set of national targets is that, while they adapt the global targets to Uzbekistan's context in terms of the language or concepts used, with very few exceptions, they do not additionally assign the national target values to the global targets. When target values are part of the global targets (e.g. achieve “universal” access, or “reduce by half”), these target values have largely been kept in the national targets. The advanced global deadlines (by 2020) have been dropped in several national biodiversity-related targets (15.1, 15.2, 15.5, 15.8 and 15.9). In some other cases, the advanced global deadlines were delayed (e.g. from 2020 to 2025 in target 3.6 on road accidents) or postponed from 2020 to 2030 (in target 6.6 on water-related ecosystems and in target 12.4 on sound management of chemicals and all wastes) in the equivalent national targets.

For environment-related targets, the lack of national equivalents for global targets 12.3 (By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses) and 15.6 (Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed) is clearly noticeable. It is not clear why target 15.a about financial resources for biodiversity was nationalized while target 15.b about financial resources for forest management was not; global indicators for these two targets are the same but the targets themselves are different. For some national targets, significant changes in wording are observed (e.g. target 12.7 where sustainable public procurement is narrowed to application of ecological standards in public procurement or target 15.9 narrowed down to national strategies and programmes, omitting local ones.) Also, some global targets were not nationalized at all, perhaps because their indicators repeat the indicators under other targets. This is the case, in particular, for several targets under Goal 13 on climate change and for target 12.2 (By 2030, achieve the sustainable management and efficient use of natural resources).

Institutional set-up for coordination of implementation and monitoring

In addition to defining the national Sustainable Development Goals, the 2018 Resolution of the Cabinet of Ministers No. 841 approved the institutional architecture for their implementation and monitoring and a roadmap on implementation of the national goals.

The Coordination Council on Implementation of National Sustainable Development Goals, headed by the Deputy Prime Minister, is vested with three major tasks:

- Organize the work of ministries and agencies to implement the national goals and targets and ensure intersectoral coordination and an integrated approach to the achievement of the goals;
- Ensure the inclusion of the national goals and targets during the development of sectoral, regional and target programmes, strategies and concepts;
- Review the reports of ministries, agencies and working groups on implementation of the national goals and targets.

The composition of the Coordination Council includes ministers and vice-ministers plus the Committee of Women and the Republican Council for Coordination of Local Self-Government Bodies. In other words, the Coordination Council is purely governmental. International organizations are not part of it. The Ministry of Economy and Industry serves as the secretariat of the Coordination Council.

The Coordination Council is supported by six expert groups (on economic well-being, social protection, public health, education, environment and good governance). The composition of the expert groups (approved at the first meeting of the Council in December 2018) is largely governmental, with several pro-governmental organizations present, such as the Committee on Women, Union of Youth, Federation of Trade Unions, Independent Institute for Monitoring the Development of Civil Society, and the Chamber of Commerce and Industry. The expert group on environment is led by the Chairperson of SCEEP. The tasks of the expert groups are to: ensure intersectoral coordination and an integrated approach to implementation of national goals; prepare concept papers on each goal and prepare annual action plans; and ensure overall monitoring of national goals.

An additional piece of the institutional architecture for implementation and monitoring of the national Sustainable Development Goals is the Interagency

Working Group on national indicators, led by the State Committee on Statistics. Its composition was approved in December 2018 at the first meeting of the Coordination Council.

Sustainable Development Goals in the national policy framework

The adoption of the list of national Sustainable Development Goals by a resolution of the Cabinet of Ministers is in itself a measure of inclusion of the goals in the national policy framework. At the same time, while the national Sustainable Development Goals derive from and build on the national strategic documents, their better integration in the national policy framework is yet to be achieved. Quantitative targets and indicators are largely absent in strategic documents in Uzbekistan. Therefore, explicit integration of the national Sustainable Development Goals and their indicators into the various national strategic documents is an important direction for development. Such integration has already started in new policy documents (e.g. the Concept on Development of the Health System for the period 2019–2025 and the Strategy for Transition to Green Economy for the period 2019–2030). Another important aspect is to demonstrate clear linkages between the national Sustainable Development Goals and the 2017 Action Strategy on Five Priority Directions for Development in the period 2017–2021 and clearly integrate the national Sustainable Development Goals into this Strategy's successor document.

Indicators

In February 2019, the Interagency Working Group on national Sustainable Development Goals indicators, led by the State Committee on Statistics, completed its work on the list of indicators and submitted it to the Coordination Council on Implementation of National Sustainable Development Goals for approval. The list of 206 indicators was approved in March 2019. The United Nations Country Team is encouraging the Government to foresee keeping the list of indicators under annual review. The list specifies the indicators but does not include the baseline, midterm and final values to be achieved, although baseline data are actually available for about 70 indicators.

Limited data availability is commonly recognized as the key constraint to Uzbekistan's rapid progress in implementation of the Sustainable Development Goals, with major concerns such as limited access to official data, issues with reliability and quality of official data, lack of data disaggregated by vulnerability criteria and weak intersectoral data

coordination. It is therefore laudable that the 2019 Programme of State Statistical Activities for 2019 (2019 Resolution of the Cabinet of Ministers No. 91) explicitly mentions the monitoring of Sustainable Development Goals and the 2019 Concept to Conduct the Population Census in 2022 (2019 Decree of the President No. 5655) recognizes the challenges related to Sustainable Development Goals indicators.

With regard to environment-related indicators, the most significant drawback is that Uzbekistan did not nationalize the global indicator 3.9.1 (Mortality rate attributed to household and ambient air pollution) (chapter 8). Despite difficulties in producing this indicator, disclosure of data on air-pollution-related mortality is important for taking adequate policy measures to improve air quality.

Reporting and awareness

In February 2019, the State Committee on Statistics launched a section for Sustainable Development Goals on its website (<http://nsdg.stat.uz/>). It includes national Sustainable Development Goals and targets, names the national indicators and presents infographics on the situation in Uzbekistan with regard to some national targets.

The 2018 Resolution of the Cabinet of Ministers No. 841 in its Annex III mentions the preparation of reports on national Sustainable Development Goals starting from 2019. The frequency of national reporting is not set; it will depend on data availability and will vary across the indicators.

Uzbekistan took a decision to prepare a voluntary national review (VNR) and present it at the High-level Political Forum on Sustainable Development in 2020.

The 2018 Resolution of the Cabinet of Ministers No. 841 entrusts the National Television and Radio Company, the National Information Agency and other mass media to regularly cover the national Sustainable Development Goals. In November 2018, the Government, United Nations and World Bank officially launched the national Sustainable Development Goals and the corresponding government resolution. The United Nations Country Team is also implementing an advocacy and awareness-raising campaign on the Sustainable Development Goals.

1.4 Institutional framework of governmental authorities for the environment and green economy

State Committee on Ecology and Environmental Protection

SCEEP is the governmental body in charge of ecology, environmental protection and rational use of natural resources. Its tasks include state environmental control, interagency coordination on environmental issues, state environmental monitoring, environmental education, prevention of environmental offences, and cooperation with civil society on environmental issues. Its areas of work include biodiversity conservation, PAs, air protection, protection of subsoil and waste management.

SCEEP participates in policy development and has regulatory and inspection functions. Unlike in Western European countries, there is no separation of these functions in Uzbekistan and this is common to most areas, not only the environment.

According to the legislation of Uzbekistan (2003 Law on the Cabinet of Ministers and 2019 Regulation of the Cabinet of Ministers (2019 Resolution of the Cabinet of Ministers No. 242)), there are no formal differences between the status of a “state committee” and that of a ministry, in terms of either their functions and powers or the manner of appointment/dismissal or powers of their heads. In other words, the manner of appointment and the powers of the chair of SCEEP are equal to those of a minister. Reportedly, the informal status of SCEEP within the Government is quite high.

Institutional changes

In April 2017, the State Committee for Nature Protection was transformed into the State Committee on Ecology and Environmental Protection (SCEEP) (2017 Decree of the President No. 5024), with the following changes in terms of its mandate and structure:

- The reformed State Committee is subordinated to the Cabinet of Ministers (unlike the previous one that was subordinated to the Oliy Majlis – the status that allowed it to be genuinely independent from the pressure and influences of other competing interests). The Chair of the reformed State Committee is appointed by the President, whereas the Chair of the former State Committee was appointed by the Oliy Majlis;
- The reformed State Committee is assigned new responsibilities on municipal waste management, and:

- A new structure was created inside the central apparatus of the State Committee: the Inspectorate for Control in the field of Waste Generation, Collection, Storage, Transportation, Disposal, Recycling, Burial and Processing, together with its offices in respective territorial bodies of the State Committee in the Republic of Karakalpakstan, oblasts and Tashkent City;
- State unitary enterprises (SUEs) “Toza Khudud” were created under the Committee of the Republic of Karakalpakstan and the departments of ecology and environmental protection of oblasts and Tashkent City with branches in towns and districts (based on former municipal waste services departments under district khokimiyats);
- The Republican State Inspectorate for the Protection and Rational Use of Fauna and Flora of the State Committee for Nature Protection was transformed into the Inspectorate for Control in the field of Protection and Use of Biodiversity and Protected Areas under the State Committee on Ecology and Environmental Protection, and the regional branches were created accordingly;
- The Fund for Ecology, Environmental Protection and Waste Management was created on the basis of the republican and territorial nature protection funds.

In October 2018, further changes were introduced to the structure of SCEEP (2018 Resolution of the President No. 3956):

- The Inspectorate for Control in the field of Protection and Use of Biodiversity and Protected Areas and the Inspectorate for Control in the field of Waste Generation, Collection, Storage, Transportation, Disposal, Recycling, Burial and Processing were merged into the Inspectorate for Control in the field of Ecology and Environmental Protection, with respective changes in territorial bodies;
- A new Republican Association of Specialized Sanitary Cleaning Enterprises was established under SCEEP, with all waste management enterprises (i.e. SUEs “Toza Khudud” in the Republic of Karakalpakstan and oblasts and their branches in towns and districts, SUE

“Makhsustrans” and its district branches, and state enterprise (SE) “Chiqindilarni qayta yuklash va utilizatsiya qilish”) subordinated to it;

- An SUE “Centre for Environmental Information, Introduction of Information and Communication Technologies and Multimedia” was created on the basis of the Centre for Implementation and Development of Information and Communication Technologies and Billing System.

In March 2019, additional changes were introduced to the structure of SCEEP (2019 Resolution of the President No. 4247), connected with the transfer to SCEEP of five state strict nature reserves (zapovedniks) and one biosphere reserve, previously under the State Committee on Forestry.

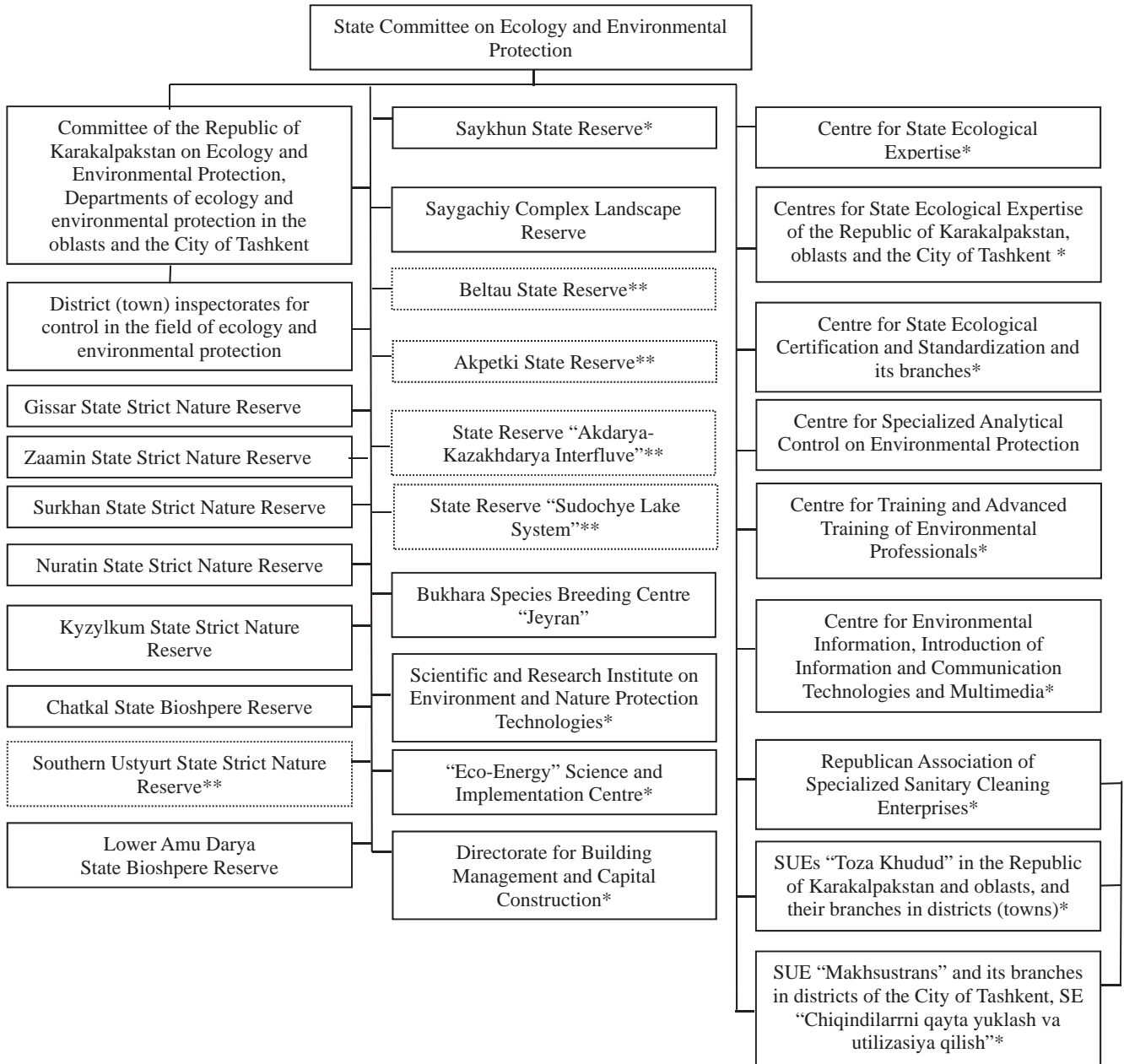
Figure 1.1 shows territorial bodies and subordinated organizations of SCEEP. In addition to organizations indicated on the figure, SCEEP has an advisory public council (chapter 5). The structure of the central apparatus (headquarters) of SCEEP is shown in figure 1.2.

Territorial bodies

There are two levels of territorial bodies:

- The Committee of the Republic of Karakalpakstan on Ecology and Environmental Protection and the departments of ecology and environmental protection of oblasts and the City of Tashkent;
- District (town) inspectorates for control in the field of ecology and environmental protection.

The territorial bodies implement measures and activities on environmental protection and improvement of the environmental situation in their territories. The Committee of the Republic of Karakalpakstan on Ecology and Environmental Protection and the departments of ecology and environmental protection of oblasts and the City of Tashkent issue some permits for the importation and export of ODSs, some logging permits and the conclusions of SEE for project documentation for category III and IV facilities. The district (town) inspectorates for control in the field of ecology and environmental protection do not issue any permits. Overall, compared with other countries, powers assigned to the territorial bodies at oblast and district (town) level are not significant.

Figure 1.1: Organizational structure of the State Committee on Ecology and Environmental Protection

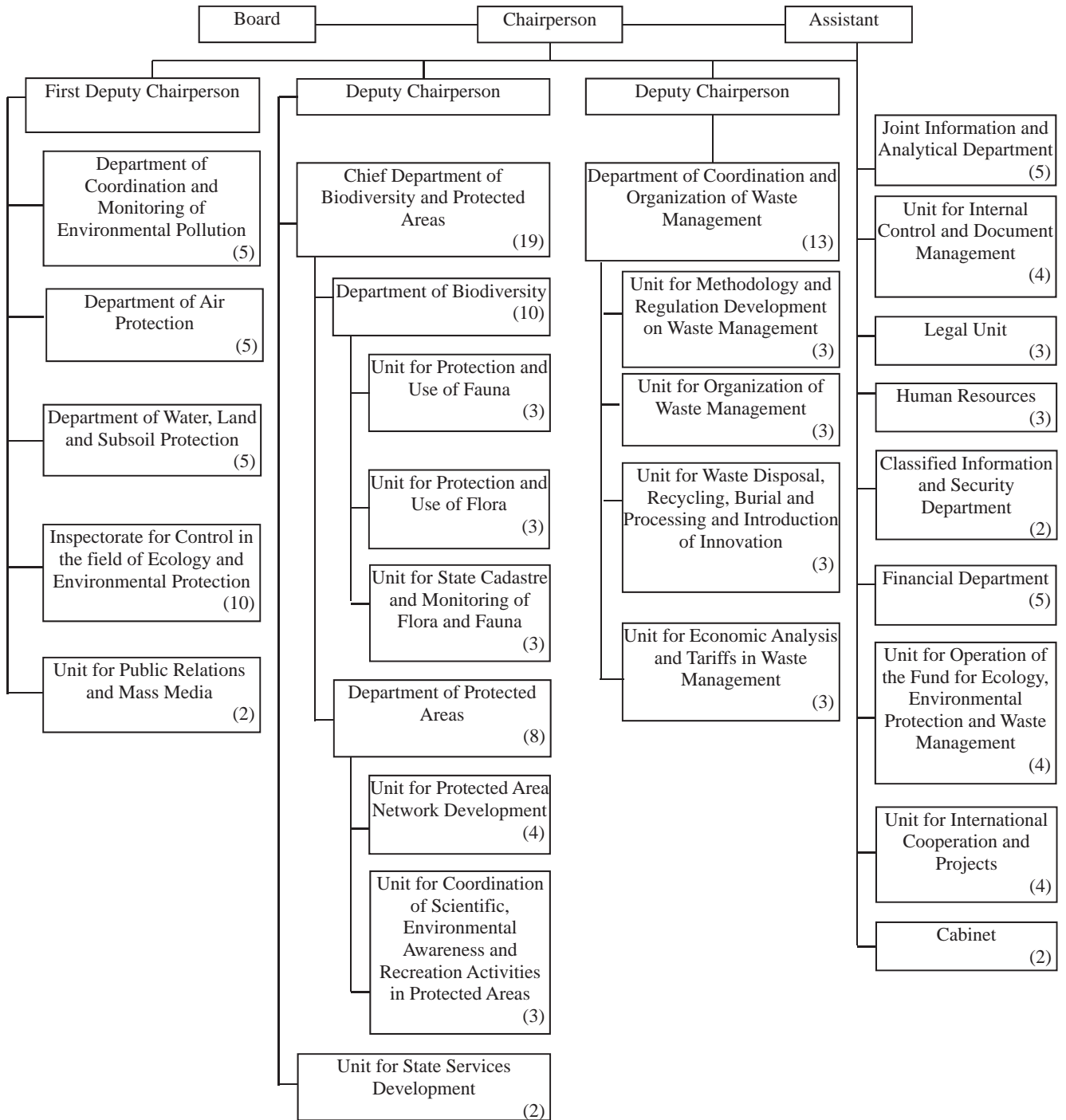
Source: 2019 Resolution of the President No. 4247.

Note: SE = state enterprise; SUE = state unitary enterprise.

* Financed from non-budget funds and funds from economic activities.

** Future PAs, not existent as at mid-2019.

Figure 1.2: Central apparatus of the State Committee on Ecology and Environmental Protection



Source: 2019 Resolution of the President No. 4247.

Note: Staff numbers are indicated in brackets.

Photo 1: State Committee on Ecology and Environmental Protection

Photo credit: Mr. Vadim Ni

Selected subordinated organizations

In April 2017, the Scientific and Research Institute on Ecology and Environmental Protection was created on the basis of Scientific State Enterprise “Ecology of Water Management”, Scientific, Research and Technological Institute “Atmosphere” and Tashkent Scientific and Research Institute “Vodgeo”. In late 2018, the Scientific and Research Institute on Ecology and Environmental Protection was transformed into the Scientific and Research Institute on Environment and Nature Protection Technologies. The reformed Institute is now tasked with facilitating the entire cycle of scientific innovation on environmental protection issues, from piloting scientific ideas to introducing scientific solutions into the production cycle.

The Centre for Specialized Analytical Control on Environmental Protection (CSAC) (until April 2017, the State Specialized Inspectorate of Analytical Control under the State Committee for Nature Protection) is responsible for analytical (laboratory) control and also for analysing the data and for methodological support to territorial bodies of SCEEP on monitoring of pollution sources and analytical control (chapter 4).

The Centre for State Ecological Expertise (until April 2017, the Main Administration for State Ecological Expertise) (<http://davekoekspertiza.uz/>) is responsible for the organization of SEE. Its central office deals with the SEE for draft strategic documents, management plans for PAs, project documentation for categories I and II facilities and for several other categories of materials. Its territorial branches in the Republic of Karakalpakstan, oblasts and Tashkent City deal with project documentation for categories III and IV facilities.

The Centre for Training and Advanced Training of Environmental Professionals (<http://ecomarkaz.uz/>) was created in 2016 and started operation in April 2017. It offers training for environmental professionals and for drivers and other experts about the transportation of waste. In addition to lectures, training programmes include visits to laboratories of various enterprises (chapter 5).

In the period 2017–2019, a number of PAs were transferred under subordination of SCEEP.

Staff

In 2018, SCEEP counted 114 staff in its central apparatus and 2,515 staff in its territorial bodies (table 1.1). A significant increase in staff numbers in 2017–2018 is largely due to the increase in responsibilities on waste management, together with the transfer of enterprises responsible for waste management under subordination of SCEEP.

Sectoral ministries

In February 2018, the Ministry of Agriculture and Water Management was split into the Ministry of Agriculture and the Ministry of Water Management. The Ministry of Agriculture is responsible for implementation of state policy on agriculture and food security, including modernization of the agricultural sector and introduction of resource-efficient and water-saving technologies (2018 Resolution of the President No. 3671). All types of agriculture are under this Ministry, including cotton production.

The Ministry of Water Management (2018 Resolution of the President No. 3672) is responsible for organization of water management based on river basin principles, implementation of limit-based water use, management and modernization of irrigation and land reclamation systems and other hydrotechnical infrastructure, and development of water-saving irrigation technologies and other water-saving measures. Subordinated to the Ministry are 12 basin irrigation system administrations (BISAs) and the Ministry of Water Management of the Republic of Karakalpakstan, as well as many irrigation infrastructure management units. The Ministry coordinates the activities to support water user associations (WUAs) in developing intrafarm networks and hydrotechnical facilities. Responsibilities also include the development of cooperation with water management authorities of other countries, in particular in the Amu Darya and Syr Darya basins.

Table 1.1: Staff of the State Committee on Ecology and Environmental Protection, 2015–2018, number

	2015	2016	2017	2018
Central apparatus (headquarters)	35	35	82	114
Territorial bodies				
Republic of Karakalpakstan	127	127	182	212
Andijan	91	91	162	185
Bukhara	101	101	148	177
Jizzakh	80	80	133	172
Kashkadarya	115	115	167	200
Navoiy	83	83	123	154
Namangan	86	86	138	164
Samarkand	118	118	179	203
Surkhandarya	84	84	143	173
Syrdarya	72	72	115	142
Tashkent	158	158	204	247
Fergana	103	103	178	219
Khozrem	72	72	123	153
Tashkent City	54	54	58	114
Selected subordinated organizations				
Centre for Specialized Analytical Control on Environmental Protection	62	62	62	62
Centre for State Ecological Expertise	..	..	36	41
Centre for State Ecological Certification and Standardization	44	44	46	48
Scientific and Research Institute on Environment and Nature Protection Technologies	..	..	48	45
“Eco-Energy” Science and Implementation Centre	13	13	27	12
Centre for Training and Advanced Training of Environmental Professionals	..	..	19	19
Republican Association of Specialized Sanitary Cleaning Enterprises	..	..	34	34
SUEs “Toza Khudud” in the Republic of Karakalpakstan and oblasts, and their branches in districts (towns)	..	..	9 100	7 000
SUE “Makhsustrans” and its branches in rayons of the City of Tashkent and SE “Chiqindilarni qayta yuklash va utilizasiya qilish”	..	..	10 930	10 930

Source: State Committee on Ecology and Environmental Protection, 2019.

The Ministry of Emergencies is the public administration body in charge of prevention and response to natural emergencies and technological disasters, civil protection, hydrometeorology and operation of hydrotechnical infrastructure. In June 2017, the Centre of Hydrometeorological Service (Uzhydromet) and the State Inspectorate for Control and Supervision over the Technical State and Safety of Large and Particularly Important Water Management Infrastructure (Gosvodhoznadzor), both under the Cabinet of Ministers, were transferred under subordination of the Ministry of Emergencies (2017 Decree of the President No. 5066). In late 2018, Gosvodhoznadzor was transferred to the Ministry of Water Management. In April 2019, Uzhydromet was transferred to the Cabinet of Ministers. There are ideas about the need for establishment of an animal rescue service under the Ministry of Emergencies that could, for example, rescue a bear that got caught in a poaching loop or help a sick animal found in the natural environment.

The Ministry of Investments and External Trade was created in January 2019 by merging the former Ministry of External Trade and the State Committee on Investments (2019 Resolution of the President No. 4135). The new Ministry is responsible for implementation of state policy on state investments, coordination of efforts to attract foreign investments, external trade and international economic cooperation.

The Ministry of Energy is a new ministry created in February 2019 (2019 Decree of the President No. 5646). Three bodies previously under the Cabinet of Ministers were transferred to the new Ministry (Agency for Development of Nuclear Energy, Inspectorate for Control of the Use of Petroleum Products, and Inspectorate for Control in Power Production). Among others, the competences of the new Ministry are to promote the use of innovative technologies and increased energy efficiency in the oil and gas industry and power production and to promote the use of energy-efficient and energy-saving technologies in public administration and state budget-financed organizations. A JSC National Energy Saving Company, created in 2017 (2017 Resolution of the President No. 3238) to promote energy-efficiency measures among governmental bodies and organizations, was dismantled following the establishment of the Ministry of Energy. The Ministry of Energy is now the responsible authority in charge of implementation of policies to raise energy efficiency in all economic sectors and the social sector, introduce energy saving technologies and develop renewable energy (2019 Resolution of the President No. 4422).

The Ministry of Transport is a new ministry created in February 2019 on the basis of the Uzbek Agency of Road Transport (2019 Decree of the President No. 5647). Several governmental bodies (previously state committees and state inspectorates) became part of the new Ministry: the Committee on Roads, the Agency of Civil Aviation, the Inspectorate for Safety of Carriage by Rail and the Inspectorate for Control of Road Construction Works. Among other issues, the Ministry is in charge of developing the state transport policy, effective use of the country's transport potential, improvement of transport logistics and use of advanced information technologies in transport.

In early 2019, the Ministry of Economy was transformed into the Ministry of Economy and Industry in line with the 2019 Decree of the President No. 5621. The tasks of the Ministry include: analysis and forecasting of macroeconomic indicators; elaboration of strategies for development of industry; and active development of state policies on urbanization. The Agency on Urbanization under the Ministry of Economy and Industry was created (2019 Resolution of the President No. 4105). In October 2019, the Ministry of Economy and Industry was assigned the responsibilities to facilitate and implement green economy in the country (2019 Resolution of the President No. 4477).

A Ministry of Innovation Development was established in November 2017 (2017 Decree of the President No. 5264). Its relevant tasks include the promotion of innovation for state and public organizations and integration of scientific knowledge into education and industry. Introduction of green economy technologies is part of the Ministry's mandate. The Ministry promotes innovation in the health sector, economic and financial policies and tax policies. It also deals with promotion of new business models and disseminates scholarships in various fields (trade, sciences, industry and support to start-ups). There is a small unit on ecology and natural resources (two staff) in the Ministry.

The Ministry of Housing and Communal Utilities was formed in 2017 (2017 Decree of the President No. 5017) to ensure implementation of uniform state policy and intersectoral coordination in the housing and utilities sector. It deals with implementation of state programmes on multi-apartment housing, monitoring of the state of the multi-apartment housing fund, and development and organization of implementation of the programmes to build and modernize water supply, sanitation and heating infrastructure. Its responsibilities also include introduction of resource- and energy-saving technologies and equipment in the housing sector and

promotion of the use of modern local construction materials. The former agency Uzkommunkhizmat was transformed into the Agency Kommunkhizmat under the Ministry and is in charge of development and implementation of investment projects with foreign funding in the area of housing and utilities.

The relevant responsibilities of the Ministry of Employment and Labour Relations (reorganized in 2017 from the Ministry of Labour (2017 Decree of the President No. 5052)) include occupational safety. The State Labour Inspectorate is under this Ministry.

Under the Ministry of Finance, an Agency for Development of Public–Private Partnerships has recently been established (2018 Resolution of the President No. 3980).

Other state committees and other actors

The State Committee on Forestry was created in May 2017 on the basis of the Main Department of Forestry of the then Ministry of Agriculture and Water Management (2017 Decree of the President No. 5041). The State Committee deals with: development and implementation of the state policy on forestry; management of the state forest fund and some PAs; afforestation and reforestation; prevention of desertification; monitoring and research of the state forest fund and flora and fauna in the state forest fund; protection of forests from fire, diseases and illegal logging; and development of activities related to non-timber forest products. There are three national nature parks (Zaamin, Ugam-Chatkal and Zarafshan) under the State Committee. The State Committee has territorial bodies in the Republic of Karakalpakstan and nine oblasts, 66 state forestry grounds, 13 state forestry grounds for medicinal plant cultivation and five forestry and hunting grounds.

The State Committee on Geology and Mineral Resources is in charge of geological exploration, use and protection of subsoil resources, including mineral resources and groundwater. It issues the permits for water drilling and for special water use from groundwater resources. Kitab Geological State Strict Nature Reserve is under the State Committee.

The State Committee on Industrial Safety (Goskomprombez) was formed in 2018 on the basis of the former State Inspectorate for Surveillance on Geological Exploration of Subsoils, Safety in Industry, Mining and the Utilities Sector that was under the Cabinet of Ministers (2018 Decree of the President No. 5594). Goskomprombez is entrusted with state

policy and control over radiation and nuclear safety and industrial safety at hazardous industrial facilities.

The State Committee on Development of Tourism was established in 2016 on the basis of the National Company “Uzbektourism” (2016 Decree of the President No. 4861). The State Committee is tasked to develop various forms of tourism beyond the cultural tourism that is now well developed and to make tourism a strategic economic sector.

The main functions of Uzhydromet under the Cabinet of Ministers include: the development of a hydrometeorological observation system; providing government and citizens with information on actual and expected hydrometeorological conditions, on climate change, on the level of environmental pollution and emergency information on dangerous hydrometeorological phenomena; monitoring the state of crops and pasture vegetation; and air, soil and surface water monitoring.

The International Innovation Centre for the Aral Sea Region under the President (<https://iic-aralsea.org/>) was established in January 2019 upon the initiative of the Ministry of Innovation Development and the State Committee on Forestry (2018 Resolution of the President No. 3975). The Centre is tasked to work in cooperation with international organizations and donors to implement innovative solutions in salty lands of the Uzbek part of the Aral Sea region on afforestation, bioenergy, crop cultivation, livestock and pasture management, adaptation to climate change and other areas.

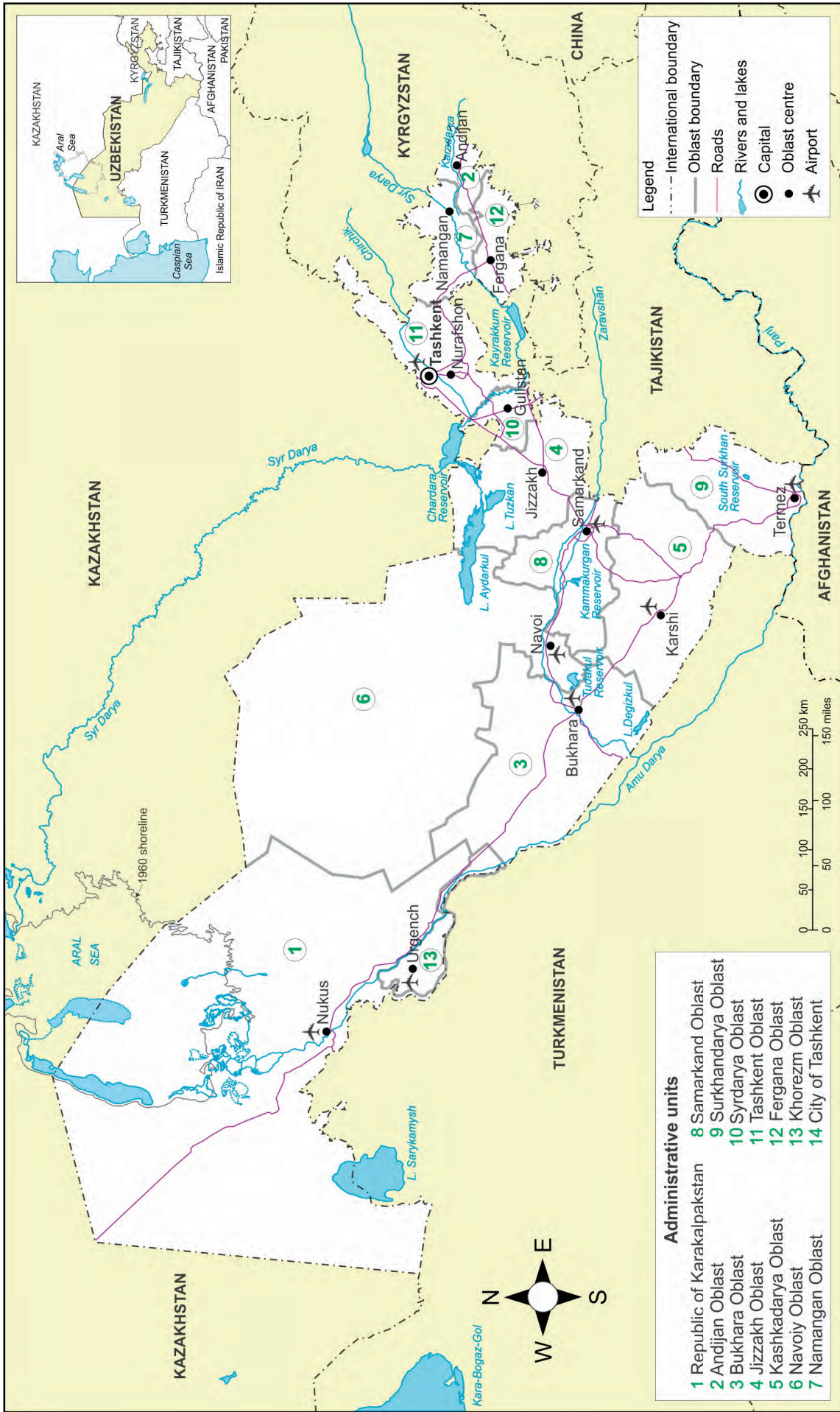
A Directorate for Aydar-Arnasay Lakes System was created under the State Tax Committee in 2017 (2017 Resolution of the Cabinet of Ministers No. 124) to develop commercial fishery as well as amateur fishing and tourism in the Aydar-Arnasay Lakes System.

Local authorities

From the administrative point of view, the territory of Uzbekistan includes the Republic of Karakalpakstan, 12 oblasts, 159 districts, 119 cities and towns, 11 districts within towns, 1,071 urban settlements and 267 villages (map 1.1).

Both representative (kengash) and executive (khokimiyat) authorities in a respective territory are headed by a khokim (chief executive official) of an oblast, district or town.

Map 1.1: Administrative map



Source: Prepared by ECE based on the map provided by the State Committee on Land Resources, Geodesy, Cartography and State Cadastre, 2019.
 Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Environmental protection and management of local utilities are explicitly assigned to the competences of local authorities by the Constitution. Despite this, the organizational structure of khokimiyats at oblast, City of Tashkent, town and district levels does not include dedicated environmental protection units (2016 Resolution of the Cabinet of Ministers No. 123). Environmental issues in khokimiyats are therefore dealt with by the units responsible for agriculture, water management, construction, communications or utilities. Kengashes usually have permanent commissions that can be in charge of the environment in addition to several other issues (e.g. the Permanent Commission on Agriculture, Water Management and Environment in the Namangan Oblast Kengash).

Self-government

Unlike in many other countries, self-government (also known as the Institute of Makhalla) is an important dimension of Uzbekistan's governance. Self-government bodies are citizens' meetings in qishloqs, auls (small villages) and urban makhallas; there are more than 10,000 across the country. They are not formally part of the public administration system but in fact are closely connected to it. There is a Republican Council for Coordination of Local Self-Government Bodies with its own territorial bodies, which is a governmental authority to coordinate and further develop the self-government system.

Self-government bodies play an important role in supporting vulnerable groups (e.g. in deciding on allocation of social benefits). In the environmental field, they are empowered to exercise public environmental control functions and can request and receive reports from enterprises and organizations on issues of environmental protection, sanitary conditions and landscaping. In recent years, they have been active in combating illegal tree felling and contested demolition of residential houses to free space for new construction.

Vertical coordination

The current public administration system is highly centralized. In 2017, Uzbekistan started a large-scale administrative reform (Concept of Administrative Reform, 2017 Decree of the President No. 5185). The reform will address many dimensions of the public administration system. Among other things, it provides for step-by-step decentralization of public administration, increased financial opportunities and responsibilities of public administration bodies at the

local level, actual implementation of the separation of powers for public administration bodies at the local level, and a greater role for local self-government bodies.

As part of the reform, since August 2018, a special administration regime is being piloted in the City of Tashkent (2018 Decree of the President No. 5515). In particular, territorial bodies of several ministries in Tashkent and its districts were transferred under subordination of the khokims of the City of Tashkent and its districts and their heads are now appointed by the khokims upon consent of the respective minister. This should streamline activities at the local level and eliminate the need for coordination between territorial bodies of the ministries and khokimiyats. This pilot arrangement does not cover the territorial bodies of SCEEP.

In the environmental area, the opposite trend, i.e. that of centralization, can be observed with the creation, in 2017, of the SUEs "Toza Khudud" under the Committee of the Republic of Karakalpakstan and the departments of ecology and environmental protection of oblasts and the City of Tashkent with branches in towns and districts based on former municipal waste services departments under district khokimiyats.

Horizontal coordination

In 2018, the number of interagency councils and commissions was drastically decreased (2018 Decree of the President No. 5527). Eighty-one bodies were dismantled, including the Interagency Council on the Kyoto Protocol Clean Development Mechanism (created in 2006), the Republican Commission on Implementation of Additional Measures to Economize on and Rationally Use Paper (created in 2010), the Interagency Council on Industrial Safety (created in 2011) and the Republican Commission on Energy Efficiency and Development of Renewable Energy Sources⁵ (created in 2015). The same Decree introduced stricter rules for the establishment of new interagency bodies.

As at mid-2019, Uzbekistan had two major bodies for horizontal coordination on sustainable development that are instrumental for the country to achieve policy coherence for sustainable development in line with target 17.14 of the 2030 Agenda for Sustainable Development (box 1.1). Furthermore, a new body – the Intergovernmental Council to Promote and Implement Green Economy – was established in October 2019.

⁵ This Republican Commission was reappointed in August 2019. The Ministry of Energy serves as its working body.

17 PARTNERSHIPS
FOR THE GOALS

Box 1.1: Target 17.14 of the 2030 Agenda for Sustainable Development

Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Target 17.14: Enhance policy coherence for sustainable development

Target 17.14 addresses how the country works across policy sectors and coordinates the sectors to achieve joint objectives of sustainable development. It also addresses the extent to which policies in various sectors are coherent and aligned with sustainable development. Uzbekistan's national target 17.14 largely resembles indicator 17.14.1 agreed at the global level and reads: Develop long-term mechanisms to integrate the principles of sustainable development into the decision-making process, and strategies' and programmes' implementation and development.

Uzbekistan has some institutional mechanisms for horizontal coordination on sustainable development issues at the national level, though there are not many interministerial councils created to address the issues of a cross-cutting and intersectoral nature. First, there is the National Commission on Implementation of the Action Strategy on Five Priority Directions for Development for the period 2017–2021, led by the President and consisting of top-level governmental officials and supported by five commissions also composed of high-level governmental officials (2017 Decree of the President No. 4947). Second, there is the recently established Coordination Council on Implementation of National Sustainable Development Goals, led by the Deputy Prime Minister and composed of ministers and vice-ministers (2018 Resolution of the Cabinet of Ministers No. 841). In addition, some horizontal coordination takes place as part of interministerial consultation processes when new legal documents are prepared. However, there is much room for improvement, to open up such bodies to allow effective inputs by other stakeholders along with governmental bodies and institutions. In addition, the scope of such bodies does not currently include all aspects of the 2030 Agenda for Sustainable Development.

There is a good degree of coherence among policy documents in Uzbekistan. Policy documents are largely consistent in terms of goals and objectives set and measures envisaged for their implementation. However, weak points of the planning system refer to reporting on implementation – in particular, the transparency of such reporting. The absence of SEA is a gap in ensuring the solid and coherent integration of environmental and green economy aspects into sectoral policies.

As at early 2019, there are not many interagency bodies relevant to environmental issues. Those that are relevant include the:

- Republican Commission for Coordination and Control of Implementation of the Programme for Comprehensive Development and Modernization of the Drinking Water Supply and Sewerage Systems for the period 2017–2021 (2017 Resolution of the President No. 2910), led by the First Deputy Prime Minister and composed of high-level governmental representatives;
- Republican Commission for Coordination and Control of Implementation of the State Programme for Development of the Aral Sea Region (2017 Resolution of the President No. 2731), led by the Prime Minister and composed of ministers and high-level governmental representatives;
- National Committee on Large Dams (2011 Resolution of the Cabinet of Ministers No. 88) led by the Minister of Water Management and composed of mid-level governmental representatives and members of academia;
- Working Group for the National Action Plan on Implementation of International Commitments on Chemical, Biological, Radiation and Nuclear Safety for the period 2018–2021 (2018 Resolution of the Cabinet of Ministers No. 968), composed of mid-level governmental representatives and members of academia.

Horizontal coordination bodies including representatives of the public along with high-level governmental officials are practically non-existent. Rather, public councils (advisory bodies with participation of prominent citizens, business and NGO representatives, and representatives of the mass media) and self-government bodies (i.e. makhalla) are viewed as means of ensuring that public opinion is taken into account in decision-making processes. Little information about the activities of horizontal coordination bodies is channelled to the public through the media.

1.5 Assessment, conclusions and recommendations

Assessment

In 2019, Uzbekistan is in the midst of intensive reforms of its legal, policy and institutional frameworks, including in the environmental area.

The developments in environmental legislation include the adoption of a brand new Law on Environmental Control in 2013, new Law on the Use of Renewable Energy Sources in 2019, new editions of the Law on Protection and Use of Flora and Law of Protection and Use of Fauna in 2016 and of the Law on Forests in 2018. Several new draft laws are in the process of preparation and the country is about to embark on drafting an environmental code. To date,

the policy framework on environmental protection has been based on five-year programmes of action on environmental protection that facilitated the allocation of substantial funding for environmental protection measures. No such programme was adopted for the post-2017 period but in 2019 the country developed and approved the Concept on Environmental Protection until 2030 as a long-term visionary document for this area.

The ongoing rapid development of the entire national policy framework represents opportunities for mainstreaming environmental protection throughout sectoral policies and legislation. The integration of environmental requirements into sectoral legislation and policies has started in the transport, housing and infrastructure, industry, health and tourism sectors. It is more advanced in the energy and agricultural sectors. Nevertheless, such integration can be characterized as selected developments rather than systematic efforts to green the economic sectors through proactive inclusion of environmental requirements in sectoral policies and legislation. SEA – a key tool for the integration of environmental considerations into sectoral policies – is not available in Uzbekistan.

With regard to the institutional framework, the major development is the change, in 2017, in subordination of the national environmental authority from the Oliy Majlis to the Cabinet of Ministers. Formally, this is a slight decrease in status; however, in practice, the status of SCEEP is still relatively high and its subordination to the Cabinet of Ministers brings increased operational opportunities. Moreover, SCEEP is well respected among governmental authorities and its informal status within the Government is quite high. At the same time, the establishment of new, separate ministries for several major economic sectors during the period 2017–2019 demonstrates the intention of Uzbekistan to rapidly develop its economy. In these circumstances, effective horizontal coordination mechanisms and meaningful public participation become of utmost importance to ensure that environmental protection is not set aside.

Conclusions and recommendations

Sustainable Development Goals

In the period 2016–2018, the country worked intensively to define the national Sustainable Development Goals – the process that culminated in the adoption of the 16 national goals, 125 national targets and 206 national indicators. While some elements of the national targets and indicators may be debatable, e.g. the absence of some global targets and

indicators among the national ones, the national process of adaptation has greatly contributed to ownership and awareness of the Sustainable Development Goals among government officials.

The institutional set-up for coordination of implementation and monitoring of the national Sustainable Development Goals is well defined. It is centred around the Coordination Council on Implementation of National Sustainable Development Goals, headed by the Deputy Prime Minister and supported by six expert groups and the Interagency Working Group on national Sustainable Development Goals indicators. However, the Coordination Council membership is exclusively governmental and the composition of the expert groups is largely governmental.

Sustainable Development Goals are already mentioned in some recently adopted policy documents. Nevertheless, explicit integration of the national Sustainable Development Goals and their indicators into the national strategic documents is an important direction for development.

In February 2019, the State Committee on Statistics launched a section on the national Sustainable Development Goals on its website. In March 2019, 206 national indicators were approved. These are positive steps towards regular reporting on the national Sustainable Development Goals. However, the list does not include the baseline, midterm and final values to be achieved, although baseline data are available for about 70 indicators. The frequency of national reporting is not yet set. In 2019, Uzbekistan took a decision to prepare a voluntary national review in order to present it in 2020.

Recommendation 1.1:

The Cabinet of Ministers should:

- (a) *Ensure regular and transparent activities throughout the entire institutional framework for national Sustainable Development Goals implementation and monitoring;*
- (b) *Ensure the effective participation of civil society in the institutional framework for national Sustainable Development Goals implementation and monitoring;*
- (c) *Actively involve the local authorities in implementation and monitoring of the national Sustainable Development Goals, in particular to reduce the regional differences in the achievement of the national targets;*
- (d) *Ensure that the national Sustainable Development Goals are explicitly integrated into all future strategic planning documents;*

- (e) Define baseline, midterm and final values to be achieved for national Sustainable Development Goals indicators;
 - (f) Ensure the regular preparation of reports on national Sustainable Development Goals implementation;
 - (g) Ensure that a voluntary national review is organized in 2020 with the involvement of all stakeholders in its preparation;
 - (h) Consider reviewing the national targets with a view to encompassing additional targets in line with the 2030 Agenda for Sustainable Development.
- (b) Provision of free online access to the reports on implementation of strategic documents on environmental protection and on sectoral development with a possible impact on the environment;
 - (c) Support to local authorities in the development and adoption of strategic documents on environmental protection.

Strategic environmental assessment

Uzbekistan does not apply the SEA tool for evaluation of environmental impacts of future sectoral strategic documents. The lack of SEA prevents systematic, coherent and comprehensive integration of environmental measures and requirements into sectoral policies, plans and programmes. In turn, introduction of the SEA tool could help Uzbekistan to enhance policy coherence for sustainable development in line with target 17.14 of the 2030 Agenda for Sustainable Development.

As at early 2019, awareness of the SEA tool is still limited in the country. Key challenges for the introduction of the SEA system are raising the understanding and acceptance of the SEA tool among the sectoral ministries.

Recommendation 1.3:

The State Committee on Ecology and Environmental Protection should progressively introduce strategic environmental assessment (SEA) by:

- (a) Developing the legal framework to introduce a fully fledged SEA system in line with the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context;
- (b) Ensuring that SEA and EIA are part of a coherent environmental assessment framework;
- (c) Raising awareness and providing capacity-building on SEA to governmental authorities and other stakeholders;
- (d) Organizing one or more pilot SEAs.

Horizontal coordination

Uzbekistan used to have many interagency councils and commissions, but, in 2018, their number was decreased with a view to rationalizing the activities of such bodies and abolishing ineffective ones. Several interagency councils related to environmental protection issues were then dismantled. As at early 2019, there are not many interagency bodies focused on environment-related issues and those that are

Strategic documents on environmental issues

Strategic planning in Uzbekistan functions relatively well. Strategic documents, including those on environmental protection and on sectoral development with a possible impact on the environment, clearly define timelines and responsibilities for implementation, as well as sources of financing. Financing for implementation of strategic documents is allocated and comes primarily from the state budget. Quantitative indicators of implementation are increasingly used, including those under international indexes. However, only limited information on the implementation of strategic documents is publicly available. Implementation reports are produced but never appear on the public authorities' websites.

As at 2019, strategic planning on environmental protection is developing dynamically at the national level, with the recently adopted Concept on Environmental Protection until 2030 and policy documents on biodiversity and on solid waste management. Ensuring due consideration of issues that have been poorly reflected in the policy documents so far (such as climate change, low carbon development, environmental compliance and enforcement, forest protection, soil protection, environmental noise, etc.) is among the challenges to be faced in current efforts to shape the national-level policy framework.

At subnational level, almost no strategic documents on environmental protection have been adopted by local authorities, despite the relevant responsibilities envisaged by several environmental laws.

Recommendation 1.2:

The Cabinet of Ministers should ensure:

- (a) Comprehensive coverage of the entire spectrum of environmental issues in the national policy framework;

relevant do not cover the entire spectrum of environmental issues typically requiring interagency coordination (climate change, environmental health, chemicals or air pollution). The existing interagency bodies do not include representatives of other stakeholders, such as NGOs, businesses and academia, along with governmental bodies and institutions. Little information about the activities of such bodies is made available to the public. Strengthening the mechanisms for horizontal coordination on issues concerning the environment and sustainable development is crucial for Uzbekistan if it is to achieve its national target 17.14 and global target 17.14 of the 2030 Agenda for Sustainable Development.

Recommendation 1.4:

The Cabinet of Ministers should strengthen horizontal coordination on environmental protection issues by:

- (a) Reviewing the need for interagency coordination in the areas of climate change, environmental health, chemicals and air pollution or other areas requiring such coordination;*
- (b) Ensuring meaningful stakeholder participation in interagency councils and commissions;*
- (c) Making meeting reports of the interagency councils and commissions publicly available.*

See Recommendations 7.2, 17.6.

Chapter 2

REGULATORY AND COMPLIANCE ASSURANCE MECHANISMS

2.1 Permitting and licensing

Permits

Air emissions, wastewater discharge, waste generation and disposal

The permission relating to pollutant emissions (air emissions, wastewater discharge, waste generation and disposal) from regulated activities is documented in Uzbekistan as a positive conclusion of the SEE on limit values for certain pollutants in air emissions or in wastewater discharge and for quantity of waste generation. It follows the EIA procedure, the outcomes of which are also being approved by positive conclusions of the SEE. The State Committee on Ecology and Environmental Protection (SCEEP) is the decision-making authority in both cases.

Both decision-making processes are based on the classification of covered facilities by four categories (category I – high risk, category II – medium risk, category III – low risk, category IV – local impact). As at March 2019, category I consisted of 37 types of high-risk facilities, category II of 32 types of medium-risk facilities, category III of 58 types of low-risk facilities, and category IV of 12 types of facilities with local impact. According to the State Committee on Statistics, the total number of facilities belonging to categories I–IV amounts to 46,000.

Certain facilities are assigned categories I, II and III

by using thresholds or other specified criteria (table 2.1), whereas other facilities are attributed to one category without specifying criteria. For instance, nuclear power stations and other nuclear reactors, waste incineration facilities, installations for the production of ferrous and non-ferrous metals, asbestos, cement clinker and explosive substances are determined as category I activities. The production of paper and board and glass fibre, and the rearing of poultry are determined as category II activities and the manufacture of bricks and tiles, markets, laundries and dry-cleaning are examples of category III activities. Activities with local impact (category IV) include such activities as car repair and car washing enterprises, construction of hotels, residential and administrative buildings, sites for collection of municipal solid waste (MSW) and greenhouses.

The current categorization of activities for environmental regulation and compliance assurance was introduced in November 2018. Previous categorization covered 172 types of regulated facilities; at the end of 2018, this number was reduced to 139. Some facilities are exempted from the requirements on EIA and the setting of emission, discharge, and waste generation and disposal limits. The new categorization lists 12 types of regulated facilities under category IV; there were 32 in the previous list. Also, the categorization of certain facilities has been reconsidered with their transfer to other categories.

Table 2.1: Distribution of selected facilities between categories I, II and III

Activity	Criterion	Category I	Category II	Category III
Thermal power stations	Heat input (MW)	≤ 300	100–299	< 100
Landfills for municipal solid waste	Population equivalent	> 200 000	100 000–200 000	
Processing of waste	Hazardous class of waste	I and II	III	IV and V
Wastewater treatment facilities	Capacity (m ³ per day)	> 280 000	50 000–280 000	< 50 000
Roads	Status	International, national	Regional	Local
Electrical power lines	Status	National	Regional	
Oil and gas processing and transportation	Status of pipelines	National + refineries		Rural settlement
Groundwater abstraction	Status		Inter-oblast	Oblast

Source: 2018 Resolution of the Cabinet of Ministers No. 949.

SCEEP authorizes emission, discharge, and waste generation and disposal limits for many more sources of air emissions and waste than for sources of wastewater discharge. The numbers of authorized limits for wastewater discharges issued by this authority in the period 2014–2018 amounted to approximately one tenth of the numbers of authorized limits for air emissions and generation of waste (table 2.2). This is because operators of municipal wastewater facilities are entitled to approve wastewater discharge limits for their clients directly.

Water abstraction

The abstraction of water from rivers, lakes, water reservoirs, ponds and canals, as well as from groundwater, requires a permit for special water use and water consumption. Three governmental bodies share the competence on the issuance of such permits.

SCEEP issues permits for the water abstraction from lakes, rivers, streams and other natural sources of surface water, e.g. glaciers, groundwater from aquifers and mines. According to the Open Data Portal (<https://data.gov.uz>), in 2017, 573 such permits were issued by SCEEP.

The Ministry of Water Management issues permits for special water use and water consumption from water reservoirs, ponds and irrigation canals, as well as from drainage systems. In both cases, the issuance of permits for special water use or water consumption is subject to annual limits set by the issuing authority. In the period 2014–2016, the Ministry of Water Management issued eight such permits at the national level (3 in 2014, 1 in 2015 and 4 in 2016). No permits for special water use were issued by this authority in 2017–2018.

As of 1 April 2018, the State Committee on Geology and Mineral Resources issues permits for special water use from groundwater. Before 1 April 2018, SCEEP was responsible for the issuance of permits for special water use from groundwater. In 2018, the State Committee on Geology and Mineral Resources issued 388 such permits and SCEEP issued 598. The number

of issued permits was 557 in 2017, 557 in 2016, 737 in 2015 and 832 in 2014.

Permits for special water use are usually valid for five years.

The procedure for issuance of permits for water abstraction differentiates such water users as operators of water reservoirs, pumping stations, irrigation networks (basin, regional and district), energy installations, amelioration expeditions and water user associations (WUAs). Persons who abstract less than 5 m³ per day or consume water from municipal networks of drinking water supply are exempted from obtaining this permission. In the case of agricultural WUAs, their individual members use water for irrigation on the basis of a permit issued to the relevant WUA that provides them with water supply services. Members of WUAs use water on the basis of contracts with their associations.

Use of natural resources

SCEEP is the competent authority for the issuance of all permits for the use of wild fauna, including their specimens and derivatives. It issues permits for the following uses of wild fauna:

- Catching (hunting) species that are not listed in the Red Book of Uzbekistan;
- Catching species that are listed in the Red Book of Uzbekistan;
- Catching species for captive breeding;
- Exporting/importing CITES species, specimens and derivatives, including for zoos;
- Exporting/importing species, specimens and derivatives which are not on the CITES lists.

SCEEP shares the competence on the issuance of permits for the use of wild flora with the State Committee on Forestry. The latter is responsible for the issuance of permits on the use of wild flora on lands designated to the category of the state forest fund, whereas the former issues such permits on all other lands of Uzbekistan.

Table 2.2: Emission, discharge and waste generation and disposal limits issued by the State Committee on Ecology and Environmental Protection, 2014–2018, number

	2014	2015	2016	2017	2018
Air pollution	128	164	251	304	276
Wastewater discharge	27	19	43	32	21
Generation of waste	134	149	225	289	283
Total	289	332	519	625	580

Source: State Committee on Ecology and Environmental Protection, 2019.

SCEEP issues permits for the following types of use of wild flora:

- Special use of plants;
- Harvesting species that are listed in the Red Book of Uzbekistan;
- Cutting trees and shrubs that are not part of the forest fund;
- Exports/imports of CITES species, specimens and derivatives, including for botanical gardens;
- Exports/imports of species, specimens and derivatives which are not on the CITES lists.

Since October 2014, SCEEP has been the competent authority to issue permits on species listed in the Red Book of Uzbekistan; before that date, the Cabinet of Ministers had the sole competence. After the change of this competence (2014 Resolution of the Cabinet of Ministers No. 290), the Cabinet of Ministers should agree on the permits issued by SCEEP on the use of species listed in the Red Book of Uzbekistan. The transfer of the power from the Cabinet of Ministers to the Committee weakens the regime of protection of

rare and endangered species as it made it easier to obtain such permits.

Ozone-depleting substances

Imports to and exports from Uzbekistan of certain ODSs listed in annexes of the 2019 Resolution of the Cabinet of Ministers No. 17 require a permit issued by SCEEP. As at March 2019, the annexes mention 96 ODSs. The issuance of permits for imports of the listed ODSs to Uzbekistan is also subject to national quotas set for the period 2018–2030. The importation and export of certain equipment containing the regulated ODSs also require a permit from SCEEP.

Integrated permitting

Uzbekistan does not apply either integrated permitting for prevention and control of pollutants or best available techniques (BAT). Maximum allowable concentrations (MACs) are the basis for authorizing air emissions, wastewater discharge and waste disposal limits in Uzbekistan.

Photo 2: Muskrat (*Ondatra zibethicus*) on the outskirts of Samarkand City



Photo credit: Ms. Mariya Gritsina

Public participation in permitting

The permitting process does not provide for public participation in the relevant decision-making processes. The time frames for the authorization of emissions, discharge and waste generation and disposal limits for regulated facilities (category I – 20 calendar days, category II – 15 calendar days, category III – 10 calendar days, category IV – 5 days) are too short to enable any public participation.

Licensing

Environment-related licensing covers:

- Use of underground resources (mining of oil and gas, precious and rare metals, gemstones, uranium, non-metallic mineral resources);
- Use of ionizing radiation sources (16 licences issued in 2017, 18 licences issued in 2018);
- Design, construction and exploitation of high-risk and potentially dangerous facilities (362 licences issued in the period 2009–2015).

Use of underground resources, including mineral resources

The use of underground resources requires licences for mining mineral resources, including separate licences for mining oil and gas, precious and rare metals, gemstones and uranium, and obtaining permits for drilling wells for use of groundwater. In 2018, 202 permits were issued for drilling wells to use groundwater for different needs, including for drinking, irrigation and drainage. As at March 2019, data on issued mining licences for the use of other underground resources were not accessible for the public on the websites of the respective licensing authorities and the Open Data Portal.

Radioactive sources

The production, use, storage, maintenance, transportation, processing and disposal of radioactive materials require a licence from the State Committee on Industrial Safety. The licensing authority involves representatives of SCEEP, the Ministry of Internal Affairs, Ministry of Health and Ministry of Emergencies in this decision-making process by the establishment of an intersectoral commission.

2.2 Environmental impact assessment and state ecological expertise

National context

Having its roots in the Soviet approaches to environmental approvals of planned economic and other activities, the existing system of project-level environmental assessment comprises two distinct but interlinked elements: EIA⁶ and SEE.

The concept of EIA in Uzbekistan has not changed since 2010. EIA is required for the activities listed as categories I, II, III and IV for the purposes of environmental regulation as well as for periodical updating (every three years) of the operating conditions for relevant existing facilities. EIA should also be conducted for such facilities in the event of their extension, reconstruction, technical modernization, or changing technological processes that may have an impact on the environment and human health. The State assigns the responsibility for carrying out an EIA study and for the preparation of EIA documentation to the project developer, who usually hires EIA experts to perform the task. No qualification requirements, such as licensing or certificates, are set in Uzbekistan in relation to EIA experts.

The scoping as part of the EIA procedure is not provided by the national legislation. Uzbekistan defines requirements for the content of the EIA documentation that are not fully consistent with Appendix II of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention); though the country is not a party to, and so not bound by, the provisions of this Convention.⁷ For instance, the country's requirements do not include the Convention's requirements on no-action alternative, non-technical summary, identification of gaps in knowledge and uncertainties encountered in compiling the required information.

EIA is a part of the environmental decision-making process on planned activities that is followed by SEE. The EIA documentation is subject to review by SCEEP's Centre for State Ecological Expertise (categories I and II activities) and relevant centres of the Republic of Karakalpakstan, oblasts and the City of Tashkent (categories III and IV). Together, these centres reviewed EIA documentation at the national

⁶ The term EIA in Uzbekistan, despite its name, should be distinguished from what is generally understood as EIA procedure under the Espoo Convention or EU EIA Directive. While the same term is used, it reflects slightly different practices.

⁷ In 2018–2019, Uzbekistan intensified its cooperation with the Espoo Convention. In particular, two reviews of the legal and institutional frameworks of Uzbekistan vis-à-vis the provisions of the Espoo Convention and its Protocol on SEA were prepared (chapter 6).

and local levels for 27,500 projects in 2016, 32,510 projects in 2017 and 33,752 projects in 2018.

The activities for which EIA is required are determined on the basis of the lists of four categories of activities included in the Regulation on State Ecological Expertise, which was updated in 2018 (2018 Resolution of the Cabinet of Ministers No. 949). Their scope is very broad in comparison with Annex I of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), Appendix I of the Espoo Convention or Annex II of the EU EIA Directive (Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment). For instance, the list of activities that are subject to EIA in Uzbekistan includes markets, laundries and dry-cleaning enterprises, vehicle repair services, furniture manufacturing and repair, sites for storage of MSW, greenhouses and printing houses. In the absence of a screening procedure in Uzbekistan, all such activities are subject to the EIA and SEE requirements.

As a rule, the EIA procedure can be conducted in either one or two stages. The one-stage EIA procedure is applicable to category IV activities and requires developers to submit draft declarations on environmental impact. In the two-stage EIA procedure, developers submit draft declarations on environmental impact (the first stage) and thereafter declarations on environmental consequences (the second stage). The two-stage EIA is required for categories I, II and III activities. The stage of draft declarations on environmental impact should be at an early stage of the decision-making process and before financing of relevant projects. The stage of declarations on environmental consequences takes place after construction and before commissioning. The 2018 Regulation on State Ecological Expertise also entrusts the SEE authorities to determine, for certain reviewed activities, the three-stage EIA procedure, by requesting a developer to conduct an additional EIA study after the review of a draft declaration on environmental impact. However, the statistical data for the period 2014–2018 do not provide evidence of its practical application, even by

SCEEP's Centre for State Ecological Expertise (table 2.3).

The development of certain plans, programmes and policies is subject to SEE (chapter 1). As at March 2019, the requirement for SEE was applied only in relation to draft urban master plans. No examples of its actual application to other strategic documents were provided by SCEEP. No statistical data are available on the SEE of draft master plans.

Time limits

The time limits for the SEE of the submitted EIA documentation, as approved by the 2018 Resolution of the Cabinet of Ministers No. 949, are very tight if a thorough review of the proposed activities on the basis of the submitted EIA documentation is expected. In some cases, the SCEEP Chairperson may extend the time limit for the review of category I activities for up to 20 calendar days, but such an exemption is not applicable for the other three categories (table 2.4). Thus, these time constraints are particularly relevant when proposed activities with likely significant environmental impact are determined as categories II, III or IV activities that often require the thorough expert review of voluminous EIA reports.

Public participation

Public participation is explicitly required at two stages of EIA – the submission of declarations of environmental impact and the submission of declarations of environmental consequences. In both cases, this refers to public hearings as the only form of public participation, but there are no detailed procedures of public participation in EIA in Uzbekistan. The presented examples of conclusions of SEE show that, in some cases, public authorities do consider compliance by project developers with the requirement for public hearings. However, in most observed cases in Tashkent City during the EPR expert mission, representatives of the public obtained access to information and public participation opportunities after the beginning of construction rather than at the EIA stage.

Table 2.3: Review of EIA documentation by the Centre for State Ecological Expertise under the State Committee on Ecology and Environmental Protection, 2014–2018, number

Type of reviewed EIA documentation	2014	2015	2016	2017	2018
Declaration on environmental impact	875	891	1 130	1 213	1 619
Declaration on environmental consequences	286	316	492	468	491
Total	1 161	1 207	1 622	1 681	2 110

Source: State Committee on Ecology and Environmental Protection, Centre for State Ecological Expertise, 2019.

Table 2.4: Time limits for decision-making under the 2001 and 2018 Regulations on State Ecological Expertise

Decision-making process	Time limit	
	2001 Regulation	2018 Regulation
Category I activity	30 calendar days	20 calendar days
Category I activity (possible extension of consideration)	2 months	20 calendar days
Category II activity	30 calendar days	15 calendar days
Category II activity (possible extension of consideration)	2 months	not applicable
Category III activity	20 calendar days	10 calendar days
Category III activity (possible extension of consideration)	1 month	not applicable
Category IV activity	10 calendar days	5 calendar days
Category IV activity (possible extension of consideration)	1 month	not applicable

Source: 2018 Resolution of the Cabinet of Ministers No. 949; 2001 Resolution of the Cabinet of Ministers No. 491.

There is no regular review by the SEE authorities of compliance by developers with the public participation requirements prescribed by the legislation. There are cases when developers provided false information during the conduct of public hearings. Also, in some cases, developers can construct a facility for an activity which is not subject to EIA and then switch it to an activity which is subject to EIA, e.g. dry-cleaning and laundries, thereby bypassing the public participation requirements.

Public ecological expertise

The 2000 Law on Ecological Expertise allows NGOs and citizens to conduct public ecological expertise on a broad scope of proposed and ongoing activities. Conclusions of this type of ecological expertise are advisory and, according to interviewed representatives of civil society and NGOs, this instrument of engagement of the public in environmental decision-making was not used in the period 2010–2018. The reasons are that conducting public ecological expertise requires human and financial resources from the NGOs or citizens who organize it, but the outcomes are merely advisory for decision-makers.

Transboundary context

There are no provisions on the procedure of transboundary EIA in the national legislation. No cases of practical application of transboundary EIA were identified in Uzbekistan as at March 2019.

2.3 Environmental standards

Emission standards

The emission standards are maximum permissible quantities of pollutants in air and wastewater discharges, quantities of generated waste and limits for waste disposal. The requirement on their setting applies to the categories I–IV activities classified as for EIA. The process of setting environmental standards for regulated facilities consists of two stages. The first stage is the identification of the sources of air emissions, wastewater discharges, generation and disposal of waste. The identified sources of pollution should be documented as inventories of sources of pollution and submitted for approval by SCEEP's relevant territorial department. At the second stage, calculated limits of air emissions, wastewater discharges, generation and disposal of waste are submitted for approval to SCEEP for category I activities or to its territorial departments for categories II–IV facilities. The pollutant permits are not issued as such but are documented as conclusions of SEE on submitted emission limits.

Air

The setting of limits for air emissions is based on their MACs. Air emissions limits differ for oblasts and some cities of Uzbekistan and depending on classes of hazard (1–4) of pollutants by the application of different factors (shares of MACs) (table 2.5).

Table 2.5: Air emission limits per oblast and selected cities by class of hazard of pollutants

Oblast or city	Class of hazard of pollutants			
	1	2	3	4
Tashkent, Fergana, Andijan and Namangan Oblasts, cities of Tashkent, Navoiy, Bukhara and Samarkand	0.17	0.20	0.25	0.33
Bukhara, Jizzakh, Kashkadarya, Navoiy, Samarkand, Surkhandarya and Syrdarya Oblasts	0.20	0.25	0.33	0.50
Republic of Karakalpakstan and Khorezm Oblast	0.25	0.33	0.50	1.00

Source: 2014 Resolution of the Cabinet of Ministers No. 14.

Wastewater

The setting of limits of wastewater discharges is also based on their MACs. Operators of facilities discharging wastewater directly into water bodies or onto terrain should have discharge limits approved by conclusion of the SEE. Operators of municipal wastewater facilities are entitled to approve wastewater discharge limits for their clients (municipal environmental standards). Also, according to the 2010 Resolution of the Cabinet of Ministers No. 11, the municipal environmental standards should be agreed by SCEEP or its territorial departments. However, the municipal environmental standards are not included in the exhaustive List of Permission Documents for Business Activities (2013 Resolution of the Cabinet of Ministers No. 225). Thus, there is no state regulation of a considerable proportion of wastewater discharges and no information in the public domain on compliance of facilities with their municipal environmental standards (box 9.3).

Noise

The maximum permissible level of noise at workplaces is 80 dB with application of differentiation depending on types of work. The maximum permissible level of noise in buildings and adjacent territories varies for different functional types of buildings and the noise frequency. There is no set permissible level of noise from transport, with the exception of aircraft.

Ambient quality standards

The system of ambient quality standards has not changed since 2010. It is based on the application of MACs of certain pollutants in ambient air, water and soil as defined by decisions of the Chief State Sanitary Doctor. The 2011 Sanitary Rules and Norms (SanPiN) No. 0293-11 contains a list of MACs of 485 pollutants for air in settlements.

MACs for surface water cover 61 pollutants and parameters. MACs are set separately for: (i) water for drinking, cooking, washing, laundering and household needs (cultural functions and households needs); and (ii) water bodies used for fishery.

MACs for soil are defined for 35 substances considered as typical for anthropogenic impacts, and for 109 pesticides.

Product standards

Sanitary rules and norms and hygienic standards are the main regulatory instrument for setting product standards in Uzbekistan. The main focus of the sanitary product standards is on food, food components and additives, and toys.

Food

The 2010 SanPiN No. 0283-10 sets maximum amounts for certain food additives and maximum residue limits for pesticides in food. For instance, the regulated food additives include antibiotics, grisin, bacitracin, chloramphenicol in meat, meat products and poultry, penicillin, streptomycin, chloramphenicol and tetracycline antibiotics in milk and dairy products, streptomycin, chloramphenicol and tetracycline antibiotics in eggs and egg products, polychlorinated biphenyls (PCBs) in fish and fish products, and benzopyrene in smoked meat and fish. The 2001 SanPiN No. 0109-01 sets hygiene standards (maximum residue limits) for pesticides on vegetables, fruit and certain food products. Food containing GMOs requires quantitative testing prior to decision-making by the Ministry of Health on its admission to the market.

Construction materials

Regulatory acts related to the use of construction materials set requirements on asbestos-containing materials and polymer materials. The 2004 SanPiN No. 0168-04 lists permitted asbestos-containing materials and the use of other such materials requires sanitary epidemiological conclusions (i.e. approval) by the Ministry of Health. The use of polymer construction materials is allowed on the basis of conducting a hygiene assessment and obtaining a hygiene certificate issued by an accredited testing laboratory.

Toys

The 2018 SanPiN No. 0354-18 set safety standards and requirements on toys. It lists limits for certain toxic substances contained in materials used by toy manufacturers, including different types of plastic, rubber, wax, paper, cardboard, wood, ceramics, glass, fur, textile and painting materials. The list of regulated chemical substances and products used in toys includes lead, mercury, chrome, cadmium, arsenic, zinc, tin, aluminium, barium, formaldehyde, styrene and dibutyl phthalate and the document sets limits for those chemicals.

2.4 Compliance assurance mechanisms

Self-monitoring and reporting by regulated entities

In Uzbekistan it is mandatory for regulated entities of categories I–IV to conduct environmental self-monitoring. However, there is no requirement for them to put reports of self-monitoring in the public domain. Reports should be disclosed upon request by environmental enforcement authorities and at the time an inspection is taking place. Such reports are not available to the public. Operators are obliged to notify SCEEP or its territorial departments in cases of exceeding the set emission limits.

Citizen involvement in compliance monitoring (public environmental control)

The national enforcement policy aims at reduction of inspection checks by governmental bodies and more active engagement of citizens in compliance monitoring.

However, there are no efficient complaint-based monitoring procedures for effective citizen involvement in environmental enforcement. Public awareness of environmental aspects of industrial activities is at a low level. There are very limited opportunities for members of the public to obtain such information at the EIA stage of an industrial development. Companies do not disclose environmental information related to their ongoing activities, whether through voluntary reports or publicly accessible databases or inventories of chemicals or pollutants released to air, water and soil. Also, there is a lack of NGOs specializing in environmental enforcement and practising environmental litigation.

Citizens' environmental concerns focus on smaller projects in the close vicinity of their homes, e.g. construction of cafes, shops and community service centres, tree felling and waste issues. Thus, there is an obvious lack of citizen engagement in monitoring of environmental compliance of projects and operating facilities and installations with significant environmental effects.

Public inspectors

The 2015 Model Provisions on Public Inspectors entitle any citizen to apply for the status of a public environmental inspector. From 2017, thousands of citizens received SCEEP-led training and obtained identity cards as public environmental inspectors (table 5.1). However, there are no official statistics on

inspection and enforcement activities by these public environmental inspectors.

Environmental audit

Environmental audit remains a rarely used tool of self-monitoring of environmental compliance, despite the regulation on environmental audit approved by the 2015 Resolution of the Cabinet of Ministers No. 286. No concrete examples of environmental audits in Uzbekistan were provided as at March 2019. SCEEP developed a draft law on environmental audit but the draft has not yet been adopted.

SCEEP's Centre for State Ecological Certification and Standardization and some private companies conduct audits on environmental management systems (EMS).

Inspections

The previous inspection procedures have been changed in Uzbekistan. As of 1 January 2017, non-scheduled inspections were cancelled. The only exemption was provided at that time for short-term non-scheduled inspections to check alleged non-compliance with the legislation on the basis of complaints by citizens and legal entities and, with their approval, by the authorized body on coordination of inspections and enforcement. Further, scheduled inspections and inspections to check the execution of previous orders regarding an administrative offence were cancelled and the new inspection procedures were introduced on 1 September 2018 (2018 Decree of the President No. 5490). The major novelty was introduction of risk analysis to inspection planning.

As of 1 April 2019, inspections based on complaints by citizens and legal entities or initiated by inspectorates on the basis of risk analysis of business activity shall be approved by the Authorized Official under the President on Protection of Rights and Lawful Interests of Business Entities (Business Ombudsperson) and they should be conducted within 1–10 days (2019 Decree of the President No. 5690). Furthermore, 29 specific types of inspection can be conducted after prior notification of the Business Ombudsperson and data are registered in the united registry of inspections. Two of the 29 types of inspection are directly relevant to environmental compliance and enforcement, namely, monitoring of large sources of pollution at facilities agreed by the Business Ombudsperson and monitoring of relevant sites by SCEEP to prevent the burning of waste, fallen leaves and grass, and tree felling.

Environmental inspections

SCEEP regularly conducts the monitoring of sources of air and water pollution for compliance with emission and wastewater discharge limits, as well as the monitoring of sources of soil pollution for compliance with MACs. The Centre for Specialized Analytical Control on Environmental Protection (CSAC) and relevant units of SCEEP's territorial departments perform this monitoring; they should monitor sources of air pollution monthly, sources of water pollution quarterly and sources of soil pollution twice a year (chapter 4). Although these activities are formally called "monitoring", they are subject to the regulation of inspections by the Business Ombudsperson and, in essence, they are part of periodical environmental inspections of the listed facilities agreed by the Business Ombudsperson.

Although the staff of CSAC and relevant units of territorial departments are not entitled to apply sanctions for non-compliance, they report such cases to SCEEP's Inspectorate for Control in the field of Ecology and Environmental Protection. The monitoring by CSAC is subject to possible follow-up enforcement activities by the inspectors.

In 2018, the number of monitored facilities dropped from the average 390 per annum in the period 2013–2017 to 342. However, in 2019, CSAC is going to increase its monitoring coverage to 558 facilities (table 2.6).

CSAC's regular monitoring of sources of pollution covers a small proportion of them, mostly facilities of categories I and II. Monitoring of environmental compliance by other regulated facilities, of categories I–IV, is the subject of inspections by SCEEP's

Inspectorate for Control in the field of Ecology and Environmental Protection.

The application of scheduled environmental inspections of facilities continued to decrease during the reviewed period (from 1,867 planned inspections in 2008 to 780 in 2017). The scheduled environmental inspections were cancelled from 1 September 2018 and replaced by inspections on the basis of risk analysis of business activity, including outcomes of the monitoring of sources of pollution at facility level. Meanwhile, the application of non-scheduled inspections, including those triggered by citizen complaints, was very rare; e.g. there were only 13 in 2017. As at March 2019, no statistical data were available to assess the efficiency of environmental compliance assurance on the basis of risk analysis of the activities of facilities, as introduced from 1 September 2018.

The introduction of the new inspection procedures in 2017–2018 led to a change in the focus of monitoring of environmental compliance, from areas that became restricted for inspections to areas that were not subject to restrictions. The total number of conducted environmental inspections was even higher in 2018 (18,309) than in 2016 (16,511); however, in 2018, more than a half of them (8,576) were conducted on MSW, compared with only 1,113 such inspections in 2016, i.e. the number of inspections related to MSW increased by 7.7 times over that period (table 2.7). Meanwhile, the number of inspections on air pollution in 2018, compared with 2016, dropped by 1.57 times, on water by 1.45 times, on land by 1.88 times and on industrial waste by 1.43 times. Planning inspections on the basis of risk analysis represents difficulties for enforcement authorities, especially when it comes to environmental inspections of industrial and mining facilities.

Table 2.6: Monitoring of sources of pollution at facility level by the Centre for Specialized Analytical Control, 2013–2019, number

	2013–2017 (average)	2018	2019 (plan)
Air	167	157	264
Water	119	110	171
Soil	104	75	123
Total	390	342	558

Source: State Committee on Ecology and Environmental Protection, Centre for Specialized Analytical Control, 2019.

Table 2.7: Environmental inspections and cases of non-compliance detected by the State Committee on Ecology and Environmental Protection, 2016–2018, number

	2016		2017		2018	
	Inspections	Non-compliance	Inspections	Non-compliance	Inspections	Non-compliance
Air	3 119	3 645	2 447	2 699	1 989	3 294
Water	2 364	3 375	1 568	2 214	1 629	2 339
Industrial waste	653	4 498	606	3 522	456	5 637
Municipal solid waste	1 113	719	3 454	375	8 576	198
Land	1 377	2 186	1 154	2 058	732	1 515
Fauna	526	311	2 483	384	345	342
Flora	1 258	1 114	390	911	942	785
Fishery	6 101	3 528	6 464	3 350	3 640	3 180
Total	16 511	19 376	18 566	15 513	18 309	17 290

Source: State Committee on Ecology and Environmental Protection, 2019.

Forests

Inspections by the State Committee on Forestry aimed at enforcement of the requirements on forest protection and prevention of forest fires require neither the consent nor notification of the Business Ombudsperson as they are based on guarding and patrolling sites. Before the establishment in 2017 of the State Committee on Forestry, the compliance monitoring on forests was conducted by the Main Department of the Ministry of Agriculture and Water Management and SCEEP. As at March 2019, the competence of SCEEP is limited to inspections on protection of fauna and flora outside the state forest fund.

Fish resources

SCEEP's inspectors conduct the compliance monitoring and enforcement of requirements on fish resources protection. They do it on the basis of patrolling designated fishing grounds and other potential places for poaching. There were 785 detected cases of non-compliance with the fish protection requirements in 2018, 911 in 2017 and 114 in 2016.

Industrial safety

Two types of inspection on industrial safety at facilities can be conducted on notification of the Business Ombudsperson. One is the inspection by the State Committee on Industrial Safety of compliance with industrial, radiation and nuclear safety at the facilities agreed to by the Business Ombudsperson. In 2017, 3,227 such compliance checks were conducted and 4,001 were conducted in 2018. The second type of inspection allowed on notification of the Business Ombudsperson is the safety check of 273 dams and other hydrotechnical installations. It is the competence of the State Inspectorate for Control and Supervision over the Technical Status and Safety of Large and

Particularly Important Water Management Infrastructure (Gosvodhoznadzor) of the Ministry of Water Management. Gosvodhoznadzor conducts visual surveillance of all regulated facilities annually and instrumental inspection of each regulated facility once every 3–5 years.

Joint inspections

The practice of joint inspections is widespread in Uzbekistan, e.g. joint visits by representatives of various inspectorates to illegally constructed sites. There is also an established practice of joint monitoring of compliance with emission standards on vehicles by inspectors of SCEEP, the road safety police of the Ministry of Internal Affairs and the State Sanitary and Epidemiological Surveillance Service (SSESS) of the Ministry of Health. It takes place regularly, namely, twice a year, from 10 April until 10 May and from 10 August until 10 September.

2.5 Non-compliance response

Administrative measures

Administrative measures for environmental non-compliance, in most cases, are limited to the application of monetary measures, namely, administrative fines. For certain types of offences on fauna, namely, poaching and illegal trade, the application of a fine is supplemented by the confiscation of illegally possessed species (specimens) and equipment and vehicles involved in the offence. Non-monetary measures are actively used in a few areas of the environmental regulation and compliance assurance. For example, in the area of industrial safety, in 2018, inspectors imposed fines in only 79 of 14,494 detected cases of non-compliance; the most commonly applied measure was the issuance of a prescription for corrective action. A similar approach is applied in the area of monitoring of

compliance with dam safety requirements.

As at March 2019, fines for environmental administrative offences were in the range of 0.1–150 minimum salaries. The sizes of administrative fines that can be applied for certain types of environmental non-compliance are clearly disproportionate to the nature of the offence and harm that can be caused. For instance, conducting activities without a positive conclusion of the SEE can entail a fine of 1–3 minimum salaries even if it concerns construction of a large industrial facility with significant environmental effects. Another example is illegal trade in CITES species, which can often be an organized international crime but would only entail a fine of 0.3–1.0 minimum salary for a citizen and 1–3 minimum salaries for an official. Furthermore, no criminal sanction can be imposed for illegal trade in CITES species that are not listed in the Red Book of Uzbekistan. In such cases, the amounts of administrative fines do not constitute a deterrent. The economic benefits that can be gained from the illegal activity clearly outweigh the size of fines imposed. For comparison, a fine for dumping garbage, a routine and widespread offence in Uzbekistan, varies in the range of 0.5–3 minimum salaries for a citizen and 5–10 minimum salaries for an official. One of the reasons for this disproportionality is that administrative sanctions cannot be imposed directly on legal entities.

Criminal measures

Uzbekistan applies criminal sanctions in response to environmental non-compliance as a last resort and they are applied to the most serious offences. Where

administrative sanctions are available, criminal sanctions are usually used where the administrative sanctions have failed to change behaviour.

Most cases of criminal prosecution for environmental non-compliance in the period 2010–2018 were for poaching and illegal harvesting of flora species with significant environmental damage (112 of 188 cases, 59.6 per cent), followed by initiating forest fires with significant damage to the environment (43 of 188 cases, 22.8 per cent) (table 2.8).

The following criminal penalties were applied for criminal offences during the reviewed period: deprivation of liberty, correctional works, personal restraint, arrest, criminal fine and engaging the offender in public works. The application of criminal sanctions for environmental non-compliance in industrial activities remains rare as criminal liability for managers of non-compliant companies is set for a few criminal offences only.

2.6 Environmental liability, insurance and compensation

Environmental liability is applied for an activity or inaction causing environmental damage (civil liability) and/or considered an administrative or criminal offence. The civil liability can be applied to both individuals and legal entities and, in most cases, at the same level. The administrative and criminal liability is fault based and applies to guilty individuals and, in cases of legal entities, to their guilty officials.

Table 2.8: Criminal prosecution for environmental non-compliance, 2010–2018, number

Criminal offence	Cases
Non-compliance with environmental safety requirements (Art. 193)	4
Non-compliance with requirements on environmental pollution (Art. 196)	3
Non-compliance with requirements on use and protection of soil and subsoil (Art. 197)	11
Damage to and destruction of crops, forest and other plantations (Art. 198)	43
Non-compliance with veterinary and sanitary rules and standards (Art. 200)	2
Non-compliance with requirements on the use of fauna and flora (Art. 202)	112
Non-compliance with requirements on water use (Art. 203)	2
Non-compliance with the regime of protected areas (Art. 204)	11
Total	188

Source: General Prosecutor's Office, 2019.

Administrative and criminal offences in certain areas of environmental non-compliance may involve compensation for damage inflicted on the environment by pollution and waste disposal or the use of fauna and flora in non-compliance with legal and regulatory requirements. The 2018 Resolution of the Cabinet of Ministers No. 820 regulates the calculation and sets differentiated rates for environmental pollution and waste disposal when it exceeds the authorized air emission, wastewater discharge or waste disposal limits. In this case, 74 per cent of compensation payments can be used for carrying out restoration activities as they are transferred to the Fund for Ecology, Environmental Protection and Waste Management within SCEEP (or, in the case of municipal wastewater discharge, to the Fund for Development of Housing and the Municipal Sector operated by the Ministry of Housing and Communal Utilities), while 26 per cent is transferred to the national budget. The 2014 Resolution of the Cabinet of Ministers No. 290 provides for differentiated compensation rates for numerous types of environmental damage to fauna and flora, e.g. for cutting trees in settlements, forests, natural parks, illegal hunting, fishing, hay harvesting and pasturing, etc.

In essence, the environmental liability is imposed by means of administrative or criminal law, meaning that enforcement is confined to actions brought by public authorities. The legislation of Uzbekistan does not include provisions and procedures allowing direct legal action by individuals, NGOs or other private parties, for harm in the form of personal injury,

property damage or economic loss caused by the violation of environmental legislation.

The 1992 Law on Nature Protection sets provisions on compulsory and voluntary environmental insurance and refers to the legislation that should define the scope, procedure and terms of environmental insurance. These provisions on environmental insurance are not yet implemented.

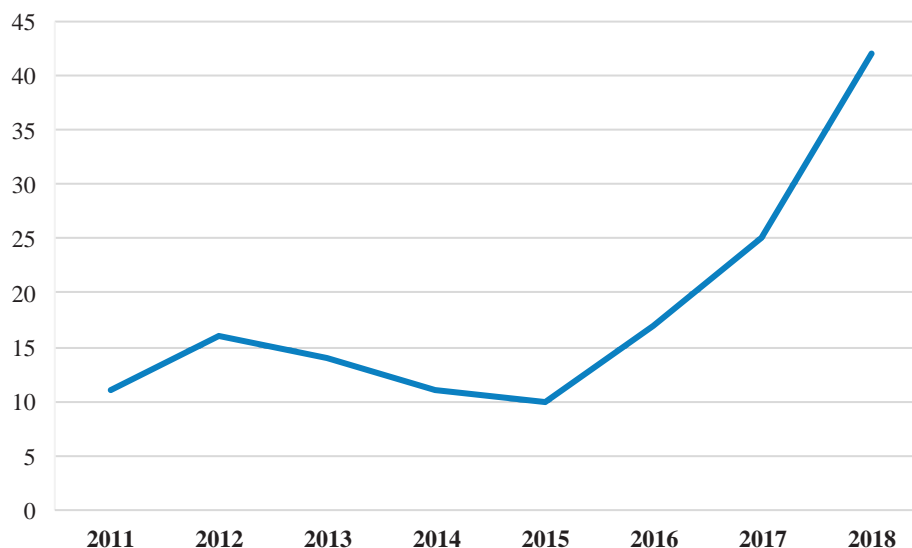
2.7 Voluntary compliance promotion instruments

Environmental management systems

As at 31 December 2018, according to the ISO Survey, there were 42 valid certificates for ISO 14001 in Uzbekistan (figure 2.1). According to SCEEP, the mining and smelting plants in Almalyk and Navoyi, refineries in Ferghana and Bukhara, and Knauf Gips Bukhara are among the ISO 14001-certified companies.

The Government's interest in promoting environmental management system (EMS) certification is growing, due to the opening market for foreign investments. Since 2016, the Uzbek Agency for Standardization, Metrology and Certification (Uzstandard) has been accrediting certification bodies for management systems in the country. A number of companies provide services in Uzbekistan to deliver ISO 14001 certification, including SGS Tashkent Ltd, SERT Management, DQS System and SOCOTEC Certification International.

Figure 2.1: Valid ISO 14001 certificates, 2011–2018, number



Source: International Organization for Standardization, 2019.

Labelling

No national environmental labelling scheme existed in 2019. Uzstandard adopted the ISO 14020 series of standards on environmental labels and declarations (as national standards), namely:

- ISO 14020, Environmental labelling: General principles;
- ISO 14021, Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling);
- ISO 14024:1999, Environmental labels and declarations – Type I environmental labelling – Principles and procedures;
- ISO 14025, Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

Certain products and services, including food products, a market and a shop labelled as “ECO” and observed in Tashkent City, are obviously far from fulfilling the criteria set for these eco-labelling schemes. In fact, they are no different from other markets and shops in Tashkent and their products and services are not of higher environmental standards. In this case, the label “ECO” is used to attract more customers but is not based on any eco-certification scheme.

In May 2019 the first ever Regulation on voluntary eco-labelling of products was approved in Uzbekistan (2019 Resolution of the Cabinet of Ministers No. 435) to set rules for eco-labelling of products and prohibit the use of eco-label without a certificate.

Corporate social responsibility

Numerous companies have declared their commitment to corporate social responsibility (CSR), including

some oil and gas, mining, pharmaceutical and construction companies and a mobile phone operator. A few of them report on relevant activities on their websites and through mass media. Based on such publications, the coverage of environmental consequences of their business operations is at a very low level and, in some cases, they refer to what should be legal requirements on them. The low level of public environmental awareness in Uzbekistan does not provide incentives for companies to integrate environmental aspects of their activities, such as GHG emissions and carbon footprints, MSW separation, using recycled materials and sustainable mobility policies, into their CSR policies.

Voluntary environmental reporting by companies

As at March 2019, the business environment is lacking established schemes providing incentives for companies to engage in voluntary environmental reporting. The current national policy priority is to reduce the Government’s interventions in the economy. This is an important constraining factor for public authorities wanting to promote voluntary environmental disclosures by companies. Another factor constraining the promotion of voluntary environmental reporting in the country is low engagement in relevant international initiatives such as the Extractive Industries Transparency Initiative (EITI) (chapter 15) and low levels of awareness about such tools as the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises.

The current stand of Uzbekistan vis-à-vis target 12.6 of the 2030 Agenda for Sustainable Development is described in box 2.1.

Box 2.1: Target 12.6 of the 2030 Agenda for Sustainable Development



Goal 12: Ensure sustainable consumption and production patterns

Target 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

Uzbekistan nationalized global target 12.6 without changes and approved global indicator 12.6.1 (Number of companies that publish reports on rational use of resources) as the national indicator for this target. As at March 2019, even large companies in the country were not involved in the international initiatives on sustainability reporting. However, in January 2019, the President of Uzbekistan, by Resolution of the President No. 4124, requested large mining and smelting companies to report from 2020 on:

- The incorporation of corporate governance disclosure in accordance with principles and standards of the Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR);
- Sustainability reporting, including on economic, social and environmental aspects, in accordance with the Global Reporting Initiative (GRI).

The engagement of large Uzbek companies in such global initiatives as ISAR and GRI would be a step towards sustainability reporting and disclosure of relevant information.

2.8 Legal, policy and institutional framework

Legal framework

Uzbekistan has an extensive range of laws regarding protection of the environment and the use of natural resources, including the laws on Nature Protection (1992), Water and Water Use (1993), Subsoil (1994/2002), Ambient Air Protection (1996), Protection and Use of Fauna (1997/2016), Protection and Use of Flora (1997/2016) and Ecological Expertise (2000). The conceptual approaches of these laws on regulatory mechanisms have not changed since 2010. However, the Cabinet of Ministers updated procedures, requirements and conditions for the issuance of various permits relating to the environment:

- 2014 Resolution of the Cabinet of Ministers No. 14 approved the Regulation on the order of preparation and approval of draft emission limits, which covers the authorization of air emissions, wastewater discharge, waste generation and disposal limits;
- 2018 Resolution of the Cabinet of Ministers No. 949 approved the new Regulation on State Ecological Expertise, which covers the procedure of issuing the SEE conclusions;
- 2013 Resolution of the Cabinet of Ministers No. 82 approved the Regulation on water use and water consumption, which covers permits for special water use;
- 2014 Resolution of the Cabinet of Ministers No. 290 approved three regulations: two regulations cover the nature use permits (flora and fauna species) and the third regulation covers CITES permits.

The updated implementing regulations address the changed competences of regulatory authorities. Another direction of the development of the regulatory framework is the promotion of an electronic single-window system served by centres of public services operated by the Ministry of Justice (initially, by local executive authorities (khokimiyats)). Certainly, this single-window system makes life easier for businesses and also prevents abuses by civil servants. As at March 2019, these centres manage a limited number of permits relating to the environment, namely, nature use permits on flora species, water abstraction permits and permits for cutting trees and shrubs outside the state forest fund. Furthermore, some other permitting procedures and conditions were also reconsidered, to reduce the administrative burden on business, in particular small businesses.

The new 2018 Regulation on State Ecological

Expertise (2018 Resolution of the Cabinet of Ministers No. 949) was adopted in place of the 2001 regulation. The new Regulation contains a reduced list of activities requiring EIA. Also, the new legislation provides much shorter time limits for review of the EIA and emission limits by the SEE authorities. A revision of the legal framework for SEE is envisaged in the coming years (2019 Decree of the President No. 5863).

The 2012 Law on the Permitting Procedures in Business Activities aims at limiting permits and licences required for business. The 2013 Resolution of the Cabinet of Ministers No. 225 defines the exhaustive list of permits, including for ODSs and the use of natural resources and underground resources, and prohibits the introduction of new permits not provided by the 2012 Law.

The 2013 Law on Environmental Control expands and governs in much greater detail relations concerning the environmental compliance review. Further, the Cabinet of Ministers approved (by 2014 Resolution of the Cabinet of Ministers No. 216 and 2015 Resolution of the Cabinet of Ministers No. 286) a number of regulations and guidance documents (model provisions) for the implementation of requirements of the Law on different types of environmental control. The approved documents include:

- Regulation on the Procedure of Conducting State Environmental Control;
- Model Provisions on the Procedure of Conducting Internal Environmental Control;
- Model Provisions on the Procedure of Conducting Environmental Self-Monitoring;
- Model Provisions for Environmental Service (of public authorities and companies).

As at March 2019, the procedure for conducting inspections and detecting administrative offences is prescribed by the 1998 Law on State Control of Activities of Economic Entities and the 2000 Regulation on Procedure for Conducting Inspections and Maintenance of the Register of Inspections. The system of inspections was reconsidered in 2018 and the National Council for the Coordination of Enforcement and Control has ceased its activities as the supervisory body since April of that year. In July 2018, the President of Uzbekistan cancelled scheduled inspections from 1 September 2018 and replaced them with inspections based on risk assessment in combination with complaint-based inspections (2018 Decree of the President No. 5490). Both types of inspection require prior consent by the supervisory body (initially this role was filled by the General Prosecutor's Office and from 1 April 2019 by the

Business Ombudsperson). Also, the 2018 Decree of the President No. 5490 lists the types of inspections that are required to notify the supervisory body and be registered in the united registry of inspections. In September 2018, the General Prosecutor approved the temporary Regulation on the procedure of receiving consent and conducting inspection checks of business entities by enforcement authorities (2018 Order No. B-55).

Since 2010, amendments were introduced to several environment-related articles of the 1994 Code on Administrative Liability (Articles 65, 70, 72, 74, 75, 76, 77, 81, 82, 91, 161, 163, 163¹). In most cases, the changes related to the increase in the scale of penalties, but in a few cases, the content of the offence was amended. Several new articles were introduced related to offences in waste management (Articles 91¹, 91², 91³), breach of rules for the provision of water supply and sanitation services (Article 163²) and breach of rules for sediment control and riverbank stabilization (Article 70¹). Nevertheless, penalties for environment-related offences remain extremely low. For example, for destruction of Red Book fauna species, citizens are sanctioned only to the level of 0.5–2 minimum salaries (US\$12–US\$48), whereas, for illegal logging, citizens are sanctioned only to the level of 0.33–1 minimum salary (US\$8–US\$24).

In the period 2010–2018, sanctions were amended in all environment-related articles of the 1994 Criminal Code (Articles 193–204), and the content of several environment-related crimes was modified (Articles 198, 200, 202, 204). Sanctions in the Criminal Code are generally proportionate. One new crime was introduced in March 2019 – inaction to prevent unauthorized occupation of irrigated land (Article 197¹).

Policy framework

The 2017 Action Strategy on Five Priority Directions for Development for the period 2017–2021 defines as key tasks: reduction of the Government's interventions in the economy; strengthening the protection of private property; and incentivizing the development of small business and private enterprises. The main strategic goals of this reform are to provide favourable conditions for business activities, attract foreign investments and, by 2022, reach the level of inclusion in the top 20 countries in the Doing Business report of the World Bank and International Financial Corporation.

The Concept of Administrative Reform (2017 Decree of the President No. 5185) sets a number of policy

measures for the future to implement these strategic goals and tasks:

- Reduction of excessive administrative regulation with the reorientation of governmental executive bodies from struggling with consequences to addressing sources and conditions of current challenges;
- Transfer from enforcement by governmental bodies to public control in some areas of regulation;
- Reduction of the scope of procedures for issuing licences and permits and promotion of voluntary compliance instruments (such as mandatory liability insurance, declaration of conformity).

Further, the 2018 Resolution of the President No. 3852 sets measures to improve the investment climate in relation to proposed new activities and construction, including:

- Providing lands to legal entities for permanent use without a specified purpose and by stipulating prohibited types of construction activities on a given land plot;
- Reconsidering the list of activities that are subject to review by SEE;
- Cancelling the requirement on the review of SEE for certain activities with local environmental effects regardless of their environmental impact.

The policy framework relies too much on self-regulation by companies and it lacks clearly defined objectives of environmental protection and sustainable development to be implemented by public authorities, including by the application of SEA, EIA, regulatory and enforcement tools. Furthermore, the current policy priorities of industry self-regulation and voluntary environmental compliance by companies entailed, in some cases, more regulatory pressure on individuals, e.g. increased attention by enforcement authorities on MSW or tree-felling violations. The current policy is based on the assumption that government regulation and enforcement is an administrative burden for business development. It does not address how it can be used to achieve some other objectives of government policy such as the competitiveness of Uzbek companies on international markets with growing demands for sustainable production and services.

The recently adopted Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863) envisages a range of measures in the field of environmental regulation (SEE and certification) and state environmental control. These measures include the revision of legislation on SEE, transition

to the use of BAT, transition from the method of individual determination of environmental standards to setting general standards for industrial sectors and the introduction of international standards on environmental management systems (EMS). Effective implementation of these measures would certainly contribute to improving environmental regulation and ensuring compliance with environmental legislation.

Institutional framework

The key governmental body performing the environmental regulatory and enforcement functions in Uzbekistan is SCEEP. Its competence covers SEE/EIA, pollution prevention and control, use and protection of fauna and flora outside the forest fund, ODSs, water abstraction from natural water objects, and construction and operation of underground facilities for waste storage and disposal, as well as promotion of voluntary environmental compliance instruments.

A number of subordinated organizations and departments of SCEEP deal with environmental assessment, permitting, inspection and enforcement (figure 1.2), including:

- Centre for State Ecological Expertise – EIA and approval of emission limits documented as SEE conclusions;
- Centre for Specialized Analytical Control on Environmental Protection (CSAC) – monitoring of air emissions and wastewater discharges by certain large installations;
- Centre for State Ecological Certification and Standardization – eco-certification;
- Inspectorate for Control in the field of Ecology and Environmental Protection – inspection and enforcement, issuance of permits on wild fauna and flora and for cutting trees in settlements;
- Department of Air Protection – permitting on ODSs.

At the regional level, SCEEP is represented by territorial departments on ecology and environmental protection and centres of SEE of the Republic of Karakalpakstan, oblasts and the City of Tashkent. At the local level it is represented by inspectorates of districts and towns (figure 1.1).

Environmental regulation (permitting and approval of SEE conclusions) and enforcement (inspection) functions are not always separated in Uzbekistan. In most cases, permitting and inspection is done by different sub-units of SCEEP, but this is not always the case. The flora- and fauna-related permits issued by SCEEP are issued by its Inspectorate for Control in the

field of Ecology and Environmental Protection, which also does the inspection checks. Furthermore, as the moratorium on inspections reduced the workload of inspectors, heads of territorial departments on ecology and environmental protection of the Republic of Karakalpakstan, oblasts and the City of Tashkent could redistribute the work on permitting and inspection among various departments, without always observing the separation of regulatory and enforcement functions. In such cases, the lack of clear separation of regulatory and inspection functions potentially creates conflict of interest and opportunities for abuse.

All inspections by enforcement authorities in Uzbekistan require approval by or prior notification of the Business Ombudsperson. Its Unit on Coordination of Inspection of Activity of Business Entities (8 staff members) serves these activities at the national level. Territorial offices in the Republic of Karakalpakstan, oblasts and the City of Tashkent (3–4 staff members in each office) assist the Business Ombudsperson to deal with issues at the regional level. Before 1 April 2018, the National Council for the Coordination of Enforcement and Control supervised the inspections and for one year (between 1 April 2018 and 1 April 2019) the General Prosecutor's Office performed these supervisory functions.

The Ministry of Water Management issues permits for special water use for irrigation. The Department of Water Use and Implementation of Water Saving Technologies issues permits at the national level, while 12 basin irrigation system administrations (BISAs), the Ministry of Water Management of the Republic of Karakalpakstan and 43 irrigation system administrations (ISAs) issue permits at the subnational level (chapter 9).

At the end of 2018, the State Inspectorate for Control and Supervision over the Technical State and Safety of Large and Particularly Important Water Management Infrastructure (Gosvodkhoznadzor) was transferred from the Ministry of Emergency Situations to the Ministry of Water Management. It had been moved from the Cabinet of Ministers to the Ministry of Emergency Situations in June 2017. The State Inspectorate inspects 273 dams and other hydrotechnical installations to determine their hazard potential and reviews the design and construction of new and reconstructed dams. As at March 2019, the Inspectorate had 15 staff members at the national level and three staff members per region.

The State Committee on Geology and Mineral Resources (Uzbekgeology) issues licences for mining of mineral resources, except for oil and gas, precious

and rare metals, gemstones and uranium. It issues permits for drilling wells and permits for special use of groundwater. The Licensing Unit and the Permission Procedure Unit of Uzbekgeology deal respectively with licensing and permitting issues at the national level. The Inspectorate for Control of Mining and Geological Activities, a subordinated organization of the State Committee, licences mining of metallic mineral resources at the national level and its oblast departments provide licences for mining non-metallic mineral resources. The Inspectorate and five regional inspectorates (which each cover two to three oblasts) conduct inspection and enforcement on compliance with requirements on protection of mineral resources. The issuance of permits for special water use on groundwater and drilling wells is the responsibility of 14 territorial hydrogeological stations of Uzbekhydrogeology (a subordinated organization of the State Committee) at the regional level. The hydrogeological stations also conduct activities at the regional level on monitoring of compliance with requirements on protection of groundwater, and enforcement in cases of their violation.

The State Committee on Industrial Safety is responsible for the licensing, inspection and enforcement of mining of precious and rare metals, gemstones and uranium, as well as of activities in the production, use, storage, maintenance, transportation, processing and disposal of radioactive materials. This governmental body has a central office and territorial departments in the Republic of Karakalpakstan, oblasts and City of Tashkent, as well as the Almalyk, Angren and Kyzylkum mining and technical inspectorates.

The State Committee on Forestry issues permits for special use of plants and monitors compliance with the legislation on the lands of the state forest fund, including on subordinated national natural parks and hunting grounds. Its 10 territorial departments in the Republic of Karakalpakstan and oblasts issue permits on special use of plants at the regional level. The Department of National Natural Parks and Hunting Grounds of the State Committee on Forestry performs monitoring of compliance and enforcement at the national level, while the administrations of hunting grounds do so at the local level.

The institutional framework in Uzbekistan is undergoing a process of reform, with regular changes of the names of public authorities, their competences and subordination. This has led to inconsistencies in governmental regulatory and enforcement activities, e.g. coordination of the inspection procedures was performed for one year by the General Prosecutor's Office before being transferred to the Business

Ombudsperson. Gosvodkhoznadzor (initially under the Cabinet of Ministers) was subordinated for approximately one year to the Ministry of Emergencies and then became part of the Ministry of Water Management. In some cases, subsidiary legislation refers to various public authorities with regard to the same permit or licensing procedure and there is a lack of clarity for regulated entities and the public on which authority deals with regulatory functions in a certain area.

Information on regulatory and compliance assurance activities

Some information on issued permits in the environmental area is available in the Open Data Portal, which has been in operation since 2015. However, the information presented does not cover all permits and, in most cases, the data are three to four years old.

With regard to information on the outcomes of environmental enforcement activities (i.e. inspections), such information is submitted to SCEEP's Joint Information and Analytical Department at the central level and to the relevant units of SCEEP's territorial departments at oblast level. There is no practice to publish the data on the outcomes of inspection activities. SCEEP does not transmit such data to statistical authorities.

No rules exist for reporting by public environmental inspectors on their activities.

2.9 Assessment, conclusions and recommendations

Assessment

Since 2010, Uzbekistan has actively implemented a number of policy, legal and institutional measures aiming at reduction of the administrative burden and improvement of general "business-enabling conditions". This concerned, inter alia, environmental regulatory and compliance assurance mechanisms such as environmental permitting and inspection procedures, as well as profound changes to the institutional framework. Undoubtedly, some of the changes had positive effects for the business environment in the country, in particular the electronic single-window system served by centres of public services operated by the Ministry of Justice.

Nevertheless, self-regulation by industry and voluntary environmental compliance by companies alone cannot ensure favourable conditions for human life and citizens' health, as well as the sustainable

development of the country, without effective governmental environmental regulation and enforcement. In this regard, it is also worth noting that voluntary compliance promotion instruments such as environmental audit, EMS, labelling and voluntary environmental reporting by enterprises are not yet actively applied in Uzbekistan.

The Government is paying more attention to public participation in decision-making and to citizens' active role in enforcement of environmental legislation, but there are challenges in putting these instruments into practice.

Conclusions and recommendations

Environmental impact assessment/state ecological expertise

EIA and SEE remain the key tools for the assessment of environmental risks of planned activities and identification of possible solutions for their prevention and mitigation. EIA is integrated into the SEE procedure, which is undergoing a process of reform, with some changes already adopted and others under consideration by the Government.

The recent changes in the procedure of SEE have limited the possibilities for further development of EIA. The short time limits for conducting SEE do not provide sufficient time to take due account of the outcomes of the EIA, curtailing the possibility of thorough study of relevant documentation by SCEEP as well as for public participation in those decision-making process. Several other aspects in the EIA/SEE legislation of Uzbekistan are not in conformity with the international standards laid down and promoted globally by the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters and the Convention on Environmental Impact Assessment in a Transboundary Context.

Recommendation 2.1:

The Cabinet of Ministers should revise the legal and regulatory framework on state ecological expertise in line with international standards laid down by the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters and the Convention on Environmental Impact Assessment in a Transboundary Context, in particular such aspects of the environmental impact assessment as screening, scoping, effective public participation and transboundary impact assessment, and by extending the relevant time limits.

Inspections

New inspection procedures have been introduced in Uzbekistan instead of scheduled inspections, which previously served as the main instrument for environmental compliance monitoring and detection of environmental offenders. The new system of inspections is based on the assumption that compliance monitoring can be triggered effectively by citizen complaints or by inspectorates on the basis of risk analysis of business activities. However, if this new system is to work, critical elements that are currently lacking must be included, in particular, effective public access to environmental information on planned development projects and ongoing industrial activities.

There has been some refocusing of SCEEP's environmental enforcement activities, from prevention of environmental pollution and industrial accidents to prosecuting environmental offences by small businesses and individuals. In these circumstances, excessive environmental deregulation may, in turn, aggravate the existing environmental pollution caused by industries.

Information on inspection activities by SCEEP is not publicly available.

There is a lack of information and statistical data on enforcement activities by the public environmental inspectors, though, reportedly, thousands of citizens were issued identity cards as public environmental inspectors. While this initiative is potentially a positive development, the lack of data prevents thorough analysis of this tool.

Recommendation 2.2:

The State Committee on Ecology and Environmental Protection should:

- (a) *Develop effective mechanisms for citizen environmental enforcement by ensuring public access to the environmental information on planned and ongoing development projects and by providing incentives to citizens for triggering environmental compliance review through submission of complaints to enforcement authorities, including on environmental aspects of industrial activities;*
- (b) *Develop and implement measures to strengthen the capacity of environmental inspectors for planning inspections on the basis of risk assessment of industrial and mining facilities;*

- (c) *Regularly disclose data and information about the performance of the environmental compliance assurance system;*
- (d) *Ensure that data on activities of public environmental inspectors are available to enable effective use of this tool.*

schemes, and raise public awareness of eco-labelling.

Compliance promotion instruments

Following the request by the President, a draft law on environmental audit has been developed in 2019. The Regulation on voluntary eco-labelling of products was approved in May 2019. The President has also requested large mining and smelting companies to join the global initiatives on voluntary environmental and sustainability reporting – a measure that would bring Uzbekistan closer to implementing Goal 12 and target 12.6 of the 2030 Agenda for Sustainable Development. In the circumstances of the reduction of environmental inspections carried out at enterprises, the application of voluntary compliance promotion instruments is critically important. At the same time, a low level of public environmental awareness and lack of incentives could lead to the pro forma practical application of eco-labelling, eco-certification and voluntary corporate environmental and sustainability reporting.

Recommendation 2.3:

The State Committee on Ecology and Environmental Protection should:

- (a) *Develop and provide incentives for the application of environmental audit;*
- (b) *Raise awareness of global initiatives on voluntary environmental and sustainability reporting by companies;*
- (c) *In cooperation with the Uzbek Agency for Standardization, Metrology and Certification, promote scheme-based eco-labelling, including the application of internationally recognized eco-labelling*

Liability and compensation

One of the challenges in the area of environmental liability is the lack of proportionality of administrative fines set for various types of environmental non-compliance and for environmental offences by individuals and companies. In many cases, the level of administrative fines is too low to act as a deterrent to prevent violations.

The legislation on liability focuses on payment of compensation for harm to the environment. There are no established procedures and provisions to enable individuals and NGOs to claim in the courts compensation for damage to their health and property due to violation of environmental legislation.

The Law on Nature Protection contains provisions on compulsory and voluntary environmental insurance, but they are not sufficient for implementation. No subsidiary legislation has been adopted. The mechanism of environmental insurance does not function.

Recommendation 2.4:

The Cabinet of Ministers should initiate:

- (a) *A review of the proportionality of administrative fines for environmental offences on the basis of consideration of their deterrent effect and possible environmental impact;*
- (b) *The development of legislation providing the right of individuals and NGOs to claim compensation for damage to their health and property due to violation of environmental legislation;*
- (c) *Development of the legal framework enabling the application of compulsory and voluntary environmental insurance.*

Chapter 3

GREENING THE ECONOMY

3.1 Greening the tax and tariff system

Pollution charges

The basic features of the system of pollution charges applied in Uzbekistan have remained unchanged since 2009. Pollution charges are applied to: (i) emissions of air pollutants from stationary and mobile sources; (ii) discharges of water pollutants into natural water bodies and communal sewerage networks and onto land; and (iii) generation of waste. The tax base is the volume (in tons) of emissions, effluent discharges and waste generated. The tax base for emissions of air pollutants from mobile sources (vehicles) is the fuel consumption, measured in tons. The number of pollutants covered by the system is very large, namely, 171 air pollutants for emissions from stationary sources and 84 water pollutants for the discharge of effluents. Charge rates for emissions of air pollutants from mobile sources are applied only to transport vehicles owned by enterprises and related to consumption of nine different fuel types. Charges for waste generation distinguish various categories of toxic and non-toxic waste. Waste that is recycled is not subject to the pollution charge. Waste generation taxes are distinct from the fees to be paid for waste collection, transport and disposal. Legal entities that are fully financed from the state budget are exempted from the payment of pollution charges.

Base tax rates apply to emissions of pollutants up to annual maximum emission limits (“norms”) specified

for each enterprise; these emission limits are, in general, subject to review every three years. Pollution above the established norms is subject to higher charges, which can be up to 10 times the base rates, depending on the size of excess pollution. Conversely, emissions below the annual limits benefit from a “bonus coefficient”, which leads to lower payments.

Pollution charge rates remained unchanged between 2006 and 2016 against the backdrop of high cumulative inflation (187 per cent measured by the average annual Consumer Price Index (CPI)), which eroded any financial incentives for pollution abatement measures from the pollution tax. Against this background, the Government raised all tax rates by 100 per cent in 2017 compared with 2016. Since the beginning of 2019, pollution tax rates are indexed to the official monthly minimum wage. Tax rates are now calculated by multiplying a pollutant-specific coefficient with the level of the minimum wage, which amounts to 202,730 sum (US\$24) since the beginning of 2019. This implies a further increase of all pollution tax rates by 135 per cent compared with the level applicable in 2018 (table 3.1). Adjusted for inflation, i.e. in real terms, tax rates in the first quarter of 2019 were only some 10 per cent above their level in 2006. Given that the minimum wage has been regularly adjusted upwards during the past decade, this indexing scheme should provide better protection of pollution tax rates against erosion through inflation.

Table 3.1: Air pollution charges for emissions from stationary sources, 2016–2019, sum/ton

Pollutants	Sum/ton			US\$ /ton
	2016	2017–2018	2019	2019
NO ₂	491.4	982.8	2 311.1	0.27
NO _x	327.6	655.2	1 540.7	0.18
Ammonia	491.4	982.8	2 311.1	0.27
Sulfuric anhydride	390.0	780.0	1 844.8	0.22
Hydrogen chloride	101.4	202.8	486.6	0.06
Propylene oxide	2 457.0	4 914.0	11 575.9	1.37
Styrene	9 828.0	19 656.0	46 263.0	5.47
Phenol	6 552.0	13 104.0	30 855.5	3.65

Source: 2018 Resolution of the Cabinet of Ministers No. 820; 2016 Resolution of the President No. 2699; 2006 Resolution of the Cabinet of Ministers No. 15.

Notes: Selected pollutants.

Monthly minimum wage since 1 January 2019 = 202,730 sum (US\$24).

Exchange rate: US\$1 = 8,451.4 sum (central bank rate, 9 April 2019).

The significant increases in pollution charge rates have enabled the broad reversal of their erosion through cumulative inflation during the past decade. But the authorities have never examined the environmental effectiveness of the overall system of pollution charges in terms of creating meaningful incentives for pollution abatement based on comparisons with the corresponding pollution abatement costs. Such an exercise is also exceedingly complex and hardly meaningful for such a large number of pollutants. The system is, moreover, administratively complex and onerous for both enterprises and the government administration. It is also impossible to target pollution charges for such a large number of pollutants at specific environmental goals.

The central function of the scheme is to generate revenue for the financing of environmental protection projects by the national environment fund and for the general government budget. Total revenue collected from pollution charges amounted to 14.1 billion sum (US\$1.75 million) in 2018, up from 3.2 billion sum in 2010. This strong revenue growth reflects the combined effect of increasing levels of economic activity and the associated higher volumes of pollution and the doubling of tax rates in 2017, when revenues rose by 56 per cent compared with 2016 (table 3.2). While this represents a relatively important source of revenue for financing environmental protection measures, total annual revenue corresponded, on average, to only some 0.01 per cent of total general government revenue during the period 2015–2018. The tax on waste generation has been the major source of revenue during the past decade; its share in total revenue rose to some 57 per cent in 2018 compared with some 30 per cent for the tax on discharges of polluted wastewater. It should be noted that the strong growth of pollution tax revenues in terms of national currency units is not reflected in the annual revenue figures converted into United States dollars, due to the

continuous depreciation of the sum, which was most pronounced when the exchange rate of the sum was liberalized in September 2017 (table 3.2).

Vehicle-related taxes

Excise duties on motor fuels

Uzbekistan levies excise duties on oil products (gasoline, diesel, jet fuel, LPG) and natural gas, which are divided into taxes paid by domestic producers of these products and those paid by final consumers. Excises paid by domestic producers are ad quantum (per ton) for gasoline, diesel and jet fuel. Tax rates for gasoline are differentiated by octane ratings (80, 91–93, 95). Tax rates per ton for standard diesel are some 15 per cent to 33 per cent lower than for gasoline, depending on the gasoline octane rating.

Uzbekistan operates three state-owned refineries processing mostly domestically produced oil, supplemented by imports of gasoline from the Russian Federation. Many motor vehicles have been converted to run on LPG, which is often easier to obtain. Excises for natural gas and liquefied gas are set ad valorem, i.e. as a percentage of the sales value (excluding taxes) per m³. Tax rates for all oil products were reduced by 90 per cent effective 1 January 2018; at the same time, the rate for natural gas was lowered from 25 per cent to 15 per cent. As a result, tax rates on motor fuels paid by refineries are quite low, e.g. ranging from 32,143 sum (US\$4) per ton of gasoline with RON 80 to 40,889 sum (US\$5) per ton of gasoline with RON 95. The rate for diesel fuel ranges from 27,340 sum (US\$3.4) to 28,425 sum (US\$3.5) per ton. The background for this drastic reduction of excise rates was the liberalization of the exchange rate of the national currency in September 2017, which led to a sizeable depreciation of the sum with associated upward pressure on import prices of oil products.

Table 3.2: Revenues from payments of pollution charges, 2015–2018

	2015	2016	2017	2018
Total (billion sum)	8.65	9.58	14.93	14.13
of which: (as %)				
Emissions of air pollutants – stationary sources	24.55	24.39	26.28	10.51
Emissions of air pollutants – mobile sources	2.58	2.31	1.41	1.59
Discharge of wastewater into water bodies and onto land	19.63	19.88	18.67	22.17
Discharge of wastewater into communal sewerage systems	8.95	9.79	8.02	8.31
Waste disposal	44.28	43.62	45.62	57.41
Total as percentage of general government revenue	0.01	0.01	0.02	0.01
Total (US\$ million)	3.35	3.21	2.87	1.75

Source: State Committee on Ecology and Environmental Protection; International Monetary Fund (IMF) World Economic Outlook Database, April 2019.

Note: Figures in United States dollars were calculated using the average annual exchange rate for the corresponding year.

The other levy (besides value added tax (VAT)) on motor fuels is a tax on consumption of gasoline, diesel fuel and liquid gas, which is paid by final consumers. As of 1 January 2019, this tax has been reclassified as an excise tax. Tax rates are the same for gasoline and diesel fuel. In a similar vein as for the tax levied on domestic producers, tax rates were lowered drastically – by 50 per cent – effective 1 January 2018, to cushion upward pressures on product prices due to higher import costs associated with the adverse exchange rate developments. But the reduction in tax rates was partly reversed in 2019, when rates were raised by some 22 per cent (table 3.3). But tax rates are very low at 285 sum (US\$0.03) per litre for gasoline, diesel and LPG.

Final sales prices of domestically produced motor fuels are regulated by the Government and subsidized. But against the backdrop of increasing reliance on imports of crude oil and petroleum products, the Government has started to gradually phase out the subsidization of domestic fuel prices. In mid-November 2017, the Government raised prices of gasoline with an octane rating of 80 and of 91 by some 40 per cent and diesel fuel by some 70 per cent. For gasoline, the excise tax corresponds to some 6–7 per cent of the regulated price per litre, depending on the octane rating. The excise on diesel fuel accounts for some 6 per cent of the sales price. Costs arising from price control are mainly borne by the three state-owned refineries through the setting of prices that are not cost reflective. The Government continues to provide financial support for the purchase of motor fuels to “certain categories of persons defined by law”, which was raised to 66,700 sum (about US\$8) per month in November 2018. Effective mid-November 2018, the Government decided to liberalize prices of imported higher quality fuels, such as gasoline with

octane ratings from 92 to 98. There is a sizeable gap between the administrated fuel prices and the higher market prices. To illustrate, since mid-November 2018, the regulated price per litre of gasoline (AI-91) was 4,500 sum (US\$0.53) compared with a market price of gasoline (AI-92) of 6,900 sum (US\$0.82). Accordingly, the proportion of excise taxes in the final sales price of higher quality fuels is much lower. Thus, for gasoline with an octane rating of 95, the price per litre is 7,800 sum (US\$0.93), of which less than 4 per cent is accounted for by the excise tax.

Excises on production and imports of road motor vehicles

The Government imposes an excise tax on the production of passenger cars by General Motors Uzbekistan (GMU), which has a domestic monopoly. The state-owned vehicle holding company Uzavtosanoat has a 75 per cent stake in GMU and the remaining 25 per cent is owned by General Motors. The tax base is set as a percentage (ad valorem) of the sales value, excluding excise tax and VAT. The tax is not differentiated based on technical characteristics of cars such as engine types (petrol or diesel), engine size and emission standards. Between 2012 and 2017, when the tax rate amounted to 29 per cent, the main function of the tax was to generate government revenue; another function was to restrain domestic demand, and to provide scope for vehicle exports and associated generation of hard currency income. In the face of deteriorating economic competitiveness and weakening domestic demand faced by GMU, the excise rate was reduced from 29 per cent to 5 per cent (in 2018), then to 3 per cent as of the beginning of 2019 and cancelled for sales contracts concluded after 1 October 2019.

Table 3.3: Consumption tax on motor fuels, 2017–2019

Fuel type	Tax base	Sum			US\$ 2019
		2017	2018	2019	
Sales at petrol stations					
Petrol	litre	465	233	285	0.03
Diesel fuel	litre	465	233	285	0.03
LPG	litre	230	230	285	0.03
CNG	m ³	275	305	360	0.04
Sales outside petrol stations					
Petrol	ton	617 000	308 500	378 480	44.78
Diesel	ton	565 000	282 500	346 275	40.97
LPG	ton	..	436 360	540 645	63.97

Source: 2018 Resolution of the President No. 4086 (Annex 19); and similar resolutions for earlier years.

Notes: Effective 1 January 2019, the consumption tax is officially replaced by a corresponding “excise tax”.

The tax base for sales of petrol, diesel and LPG at petrol stations is 1 litre.

For sales outside petrol stations, the tax base is 1 ton.

Effective 2018, these tax rates also apply to sales of these products for purposes other than motor fuels.

Exchange rate: US\$1 = 8,451.4 sum.

Excise tax is also imposed on imports of all kinds of road motor vehicles (passenger cars, buses, vehicles for transport of goods), in addition to standard customs duties. The excise tax on imports of passenger cars is differentiated by type of engine (petrol or diesel), engine size (in cc) and age of the vehicle (i.e. new or used). The tax base is the engine size in terms of cc. Differences in tax rates between petrol engines and diesel engines are relatively small. However, tax rates per unit of engine size (cc) increase significantly with the age of the vehicle, compared with rates for new cars. (Cars are legally treated as “new” up to the age of 3 years.) To illustrate, for the mid-range petrol engine size (1500 cc to 1800 cc), the tax rate amounts to US\$2.6/cc for a new vehicle; the rate increases to US\$3.5/cc (vehicle age 3–5 years); US\$4.8/cc (vehicle age 5–7 years) and US\$7.2/cc for vehicles more than 7 years old.⁸ Excises on imports of buses (motor vehicles designed to carry 10 people or more) and most categories of vehicles for the transport of goods amount to 70 per cent of the customs value plus a surcharge of US\$3 per unit (cc) of engine size. Current tax rates for these categories do not change with the age of the vehicle. The excises (and customs duties) on imports of road motor vehicles are an example of the Government’s long-standing economic policy based on export-oriented and import-substituting industrialization.

Effective 1 January 2019, two new categories of excises on car imports were introduced: (i) electric cars; and (ii) cars with traditional engines with a customs value of more than US\$40,000 (“luxury cars”) with an age up to 2 years. Both categories of

cars are subject to an excise tax of 20 per cent of customs value, but they are exempted from import duty.

Vehicle registration fees

Imports and domestic purchase of motor vehicles are subject to a one-off fee to be paid when the vehicle is registered with the Ministry of Internal Affairs. From 2009 and up until 2014, the fee was expressed as a percentage of the monthly minimum wage but did not distinguish between the types and categories of vehicle. Fee rates declined with the vehicle age, ranging from 5 per cent of the minimum wage for vehicles with an age of 7 years and higher, to 10 per cent per horsepower unit for vehicles aged up to 3 years. Effective as of 2015, the fee distinguishes three different types of motor vehicles (passenger motor cars; motorcycles; other motor vehicles). For new vehicles, a separate fee, which corresponds to 3 per cent of the sales value (excluding VAT), was introduced (table 3.4). Effective 1 October 2019, in the case of domestically produced vehicles, this fee is paid by vehicle manufacturers. For used vehicles, the charge rate continues to depend on the age of the vehicle and the horsepower of the engine. Fee rates for used vehicles have been increased since 2015 but continue to be inversely related to the age of the vehicle. In 2016, revenues from these fees amounted to 463 billion sum (some US\$155 million at the average annual official exchange rate of that year). Revenues collected are allocated to the Republican Road Fund.

Table 3.4: Vehicle registration fees

Vehicle category	Vehicle age	Tax base	Tax rate (%)
All	New	Sales value	3
Passenger cars	< 3 years	MW per unit of HP	11
	3–7 years	MW per unit of HP	9
	> 7 years	MW per unit of HP	6
Motorcycles	< 3 years	MW per unit of HP	10
	3–7 years	MW per unit of HP	7
	> 7 years	MW per unit of HP	5
Other motor vehicles	< 3 years	MW per unit of HP	16
	3–7 years	MW per unit of HP	13
	> 7 years	MW per unit of HP	9

Source: 2017 Resolution of the President No. 3454 (Annex 22).

Notes: MW = minimum wage (monthly); HP = horsepower. Charge rates effective 1 January 2018.

⁸ Imports of cars produced in Kazakhstan, the Russian Federation and Ukraine, with which Uzbekistan has concluded a free trade agreement, are not subject to customs

duty (subject to presentation of a certificate of origin), and the excise tax amounts to 2 per cent of customs value for cars aged up to 3 years.

Road user fees

Uzbekistan does not apply road user fees, but there is a fee for entry into and transit through the territory by vehicles registered in foreign countries. These revenues, which amounted to 42.1 billion sum (US\$14.1 million) in 2016, are allocated to the Republican Road Fund.

Land tax

Legal entities and individuals that either have property or ownership or user rights, or are leasing land, are subject to land tax.

The basic distinction for land tax purposes is between agricultural land and land for use in cities and rural areas for non-agricultural purposes. Tax rates per ha or m² depend on the location and quality of land, including access to water supply to each land plot, notably for irrigation of agricultural land. Land plots that are used for construction of projects included in the national strategic investment programmes are exempted from the tax during the period of construction. In the case of deterioration of the quality of agricultural land caused by the owner or user of the land, the tax rate applied is the one applied before the deterioration occurred. Effective 1 January 2019, land tax rates were revised, with an increase of some 20 per cent. At the same time, the land tax has also been imposed on micro- and small enterprises subject to a simplified tax regime (“single tax payers”) that own, use or are leasing a land plot of more than 1 ha; previously, they did not generally pay any land tax.

Provisions for punitive tax rates on land plots occupied by unfinished construction objects exceeding the established normative period for finishing the construction were abolished, effective 1 January 2019. The same holds for punitive rates on land plots occupied by vacant buildings and unused production space. Revenues from land tax paid by legal entities are allocated to the state budget; taxes paid by individuals are allocated to the corresponding local authorities. Overall total revenues collected amounted to 1,414.5 billion sum (US\$181 million) in 2018. Taxes paid by legal entities are revenue of the central government budget; taxes paid by individuals are allocated to local budgets.

Property tax

Property tax is imposed on legal entities and individuals. For legal entities, the tax base is the net book value of the immovable property. As of 1 January 2018, movable property, such as machinery and equipment and other fixed assets, is no longer

subject to property tax. Property tax for individuals is payable on residential houses and apartments and other buildings. Up until 2017, the tax base was the inventory value of the property. Effective 1 January 2018, the tax base was changed to cadastral value, which is normally higher than the inventory value because it is closer to the market value. In any case, for both legal entities and individuals, the property tax does not have an environmentally relevant tax base.

Fees for use of natural resources

Water use tax

The abstraction of water from natural sources is subject to payment of a water use tax. Payers are legal entities, individual entrepreneurs and dekhans (partially commercial small farms based on a household plot), which use water from surface or underground sources for their economic activities. Tax rates per m³ of water depend on the type of water source and the kind of economic activity. Rates have been raised significantly in recent years, the major motive being to create incentives for more efficient use of water resources. To illustrate, rates for surface water use by power stations in 2019 are nearly 70 per cent higher than in 2015. Also, a separate tax category was established in 2015 for enterprises that use water for production of non-alcoholic beverages; the corresponding tax rate per m³ has risen by 90 per cent since then (table 3.5). Moreover, as of 2019, a separate tax rate was introduced for industrial enterprises and for vehicle washing stations, thus removing an existing implicit water consumption subsidy. Tax rates for surface water use for industrial enterprises rose from 61.9 sum per m³ in 2015 to 360 sum per m³ in 2019. From the beginning of 2019, small businesses with a turnover of up to 1 billion sum (some US\$120,000) are also subject to the water use tax.

Water used for irrigation in agriculture, which accounts for some 90 per cent of total water use, is not subject to taxation, but there are water withdrawal limits. The tax is only applied to dekhan farmers. The operation and maintenance of large-scale irrigation and drainage systems are financed from the state budget. A large part of these expenditures is accounted for by the costs of electricity for operating the large number of water pumping stations. Water user associations (WUAs) organize the management of water resources at the level of farms. Among the main responsibilities of these associations is the setting and collecting of irrigation service fees. The revenues from these fees are designed to finance, among other things, the maintenance, rehabilitation and improvement of the irrigation systems within their corresponding operational area. But this has turned out to be a

challenge for many of these associations, which struggle to ensure the financial sustainability of their operations. Given that many farmers are lacking the financial resources to pay for these services, these payment schemes have been largely ineffective. In the event, water has been essentially free for many farmers.

There are a number of other tax exemptions, which weaken incentives for more rationale use of water. Water utilities can abstract water for the production of drinking water for the population free of charge; they only have to pay for water resources used for their own needs. This implies that technical water losses do not enter into their operating costs. HPPs that use water

for the operation of hydraulic turbines are also exempted from the tax; but the water resources used by HPPs can be considered as renewable, i.e. there is effectively no consumption of water. In a similar vein, there is a tax exemption for TPPs that charge water back into the water body. Also, water used to wash saline agricultural land is exempted. The water abstraction infrastructure is very old, and there is a pervasive lack of adequate water metering devices; large volumes of water abstracted are unaccounted for or roughly estimated. Revenues from the water resources tax amounted to 140.4 billion sum (US\$18 million) in 2018; these revenues are allocated to local governments, but they are not earmarked for the financing of water sector infrastructure management.

Table 3.5: Tax on water use, 2015, 2019, sum/m³

Water users	Surface water		Groundwater	
	2015	2019	2015	2019
Power stations	17.9	30.0	26.6	50.0
Utilities	34.0	60.0	43.9	80.0
Producers of soft drinks	10 000.0	19 040.0	10 000.0	19 040.0
Vehicle washing stations	..	1 200.0	..	1 500.0
Industrial enterprises*	61.9	360.0	78.6	430.0
Other economic sectors**	61.9	120.0	78.6	150.0

Source: 2018 Resolution of the President No. 4086 (Annex 14); 2014 Resolution of the President No. 2270 (Annex 14).

Notes: * Industrial enterprises, except those indicated above.

** Enterprises in all economic sectors, except those indicated above, including individual entrepreneurs using water in the process of doing business and dekhon farms.

Photo 3: Stormwater channel in Samonids Park, Bukhara City



Photo credit: Ms. Alessandra Fidanza

Tax on use of subsoil resources

Uzbekistan is among the world's largest producers of gold and uranium, and its mining industry also exploits a large variety of other minerals, such as gas, copper, coal and silver. Exploration and mining rights are granted based on subsoil use licences, which are allocated to subsoil users through tenders or direct negotiations. In practice, priority in providing mining rights with respect to large deposits of strategic minerals, such as gold, silver, copper and uranium, has been given to two major state-owned mining companies, the Navoiy Mining and Metallurgical Combine (NMMC) and the Almalyk Mining and Metallurgical Combine (AMMC), or to joint ventures involving them.

The use of subsoil resources is subject to payment of special charges and taxes, which comprise, besides the subscription bonus and the commercial discovery bonus, the subsoil use tax and an excess profit tax.

The subsoil use tax has as its tax base the average weighted market value of the mineral resources produced during the reporting period (quarter or year). These percentage shares range from 4 per cent for coal to 30 per cent for natural gas. The percentage shares for gold, silver and copper were raised considerably between 2015 and 2019 (table 3.6). The utilization of by-products received during extraction of the main natural resources is subject to a tax rate of 30 per cent. Total government revenue from the subsoil use tax amounted to 7,934 billion sum (about US\$1 billion) in 2018. The excess profit tax is levied on a limited number of minerals (natural gas, copper, cement clinker and polyethylene granules). Excess profit is defined as the difference between the net sales revenue (based on existing market prices) and the revenue that

would have been earned at the (lower) statutory prices established by the legislation. The tax rate applied to this excess profit is 50 per cent. Entities operating under production-sharing agreements are exempt from the excess profit tax. Revenues from the excess profit tax amounted to 1,736 billion sum (US\$215 million) in 2018.

The Government mainly levies all these charges in order to appropriate part of the economic rents associated with the exploitation of these natural resources. The influence of these taxes on resource management is limited. The challenge of managing the resource wealth is to design a strategy that takes into consideration the average mineral reserves-to-production ratios (estimated at 20–30 years in 2012) and the revenue dependency ratio, which approached the threshold of 20–25 per cent of total fiscal revenue in 2012, according to the 2013 IMF Country Report. Improved efficiency of natural resource use and greater economic diversification would result in reduced pressure on scarce natural resources and reduce risks to sustainability.

Revenues from mineral resource exploitation are managed through the Uzbekistan Fund for Reconstruction and Development, a sovereign wealth fund, which was created in 2006. Its main objectives are to: (i) accumulate revenue in excess of the established cut-off prices on mineral resources (mainly gold and copper); and (ii) stimulate investment and economic development by extending long-term loans to banks for co-financing of selected strategic government projects. A large part of the accumulated financial assets is managed abroad by the central bank as part of the international reserves.

Table 3.6: Tax on extraction of subsoil resources, 2015, 2019, percentage of market value

Product	2015	2019
Natural gas	30.0	30.0
Coal	4.0	4.0
Copper	8.1	15.0
Tungsten concentrate	10.4	10.4
Uranium	10.0	10.0
Gold	5.0	25.0
Silver	8.0	25.0
Precious and semi-precious stones	24.0	24.0
Cement	3.5	3.5
Sand and gravel mixture	4.0	5.0

Source: 2018 Resolution of the President No. 4086 (Annex 10); 2014 Resolution of the President No. 2270 (Annex 15).

Note: The State Enterprise NMMC pays tax on uranium mining in the manner and amount established by the Ministry of Finance.

Charges for use of forest resources

The types of forest use distinguished in the 2018 edition of the Law on Forests comprise timber harvesting, collection of wild plants (medicinal plants, food plants, feed plants, aromatic plants, dye plants, fruit and nuts), hunting and fishing, cattle grazing, mowing and location of beehives and apiaries. Legal entities and individuals can make use of defined forest areas based on the granting of short-term (up to three years) or long-term (up to 10 years) permits and annual resource use quotas. The Cabinet of Ministers establishes the fee rates for use of biological resources; rates for flora and fauna species listed in the corresponding Red Books are, in general, much higher than rates for other biological resources. For domestic users (individuals and legal entities), rates are indexed to the official monthly minimum wage. Foreign users of forest resources are charged in terms of United States dollars; the corresponding charge rates, when expressed in national currency units, are much higher than those applied to domestic users.

The primary function of forests in Uzbekistan, besides preserving biodiversity and wildlife, is combating desertification and helping reduce other risks such as floods and soil erosion. This explains why commercial harvesting of timber is forbidden, with the exception of sanitation cuttings and thinning, on land of the state forest fund. Non-timber forest products (NTFPs) (such as walnuts, fruit, mushrooms, medicinal and food raw materials) are in high demand for commercial exploitation. Non-timber forest products and services also contribute significantly to livelihoods in rural areas. Annual revenue from the collection of raw materials of wild medicinal plants amounted to 580 million sum (some US\$72,000) in 2018. Annual income from the use of other non-timber products amounted to 133.9 million sum (US\$16,500) in the same year.

Tariffs for municipal waste collection and disposal

Municipal waste management in Uzbekistan is most developed in the City of Tashkent, where the state-owned company SUE “Makhsustrans” has been operating waste collection services since 1990. In recent years, given the rapid growth in population, there has been increasing involvement of private companies in the provision of waste services in the capital, which are competing with SUE “Makhsustrans” for customers on the basis of service quality and price. Official waste tariffs are set by the Ministry of Finance in coordination with local governments. Private households in Tashkent pay a

monthly fee per registered person. The rate per person (since the beginning of February 2019) is 4,500 sum (US\$0.53), up by 15.4 per cent from the rate of 3,900 sum applied since 1 April 2018. Budget organizations and legal entities pay a charge of 54,000 sum (US\$6.50) per m³ of waste collected. The total monthly waste charge for legal entities is calculated according to official waste accumulation norms. There is no separate tariff for waste disposal at the landfill or at dumpsites.

Tariffs are set at a level that has allowed for recovery of operating costs but left little, if any, funding for maintenance and modernization of equipment. Revenues were adversely affected by diminishing bill collection rates, reflecting the deteriorating quality of waste services and ineffective bill collection by waste companies. At the beginning of 2019, the Government reorganized the procedure for payment of waste fees. Waste services are no longer based on bilateral contracts between households and waste companies but, rather, on contracts concluded between local governments and waste companies. In the event, households pay waste fees directly to the local government, which, in turn, pays the waste companies. To ensure strict payment discipline by households, a Bureau of Compulsory Enforcement under the Prosecutor General’s Office has been assigned to recover debts for waste services as well as for other public utility services. Legal entities and individual entrepreneurs continue to have bilateral contracts with waste companies; however, they are obliged to prepay in full for monthly waste services provided or at least to prepay half of standard monthly waste bills.

Fee for plastic shopping bags

Starting from 1 January 2019, it is prohibited for retail shops to hand out plastic bags to customers free of charge. Rather, plastic bags have to be sold at cost-reflective prices. At the same time, the domestic production and importation of polymer film packaging with a thickness of less than 40 microns has been forbidden. The exception is biodegradable polymeric material packaging without handles, which is an integral part of the packaging of goods, as well as being sold by the roll for household use. Plastic bags are made from a polymer substance known as polyethylene.

Extended producer responsibility schemes

Uzbekistan does not yet operate extended producer responsibility schemes for products such as fuel oil, glass, paper, old vehicles, etc.

The current status of Uzbekistan vis-à-vis target 8.4 of the 2030 Agenda for Sustainable Development is described in box 3.1.

Tariffs for water supply and sewerage services

The Ministry of Finance is setting water supply and sewerage tariffs subject to approval by the Cabinet of Ministers. Tariffs distinguish three customer categories: households; budget organizations; and other water consumers, i.e. mainly the business sector. The dominant pattern is that tariffs for households are significantly lower than tariffs for the other two customer groups, which points to cross-subsidies flowing to the household sector. Average drinking water tariffs for private households in Uzbekistan amounted to 711 sum (US\$0.084) per m³ in early 2019, compared with 1,299 sum (US\$0.15) for budget organizations and 1,484 sum (US\$0.18) for the business sector.

Tariffs differ significantly across the country. In early 2019, household drinking water tariffs ranged from 280 sum (US\$0.033) per m³ in the City of Tashkent to 1,100 sum (US\$0.13) per m³ in Namangan Oblast. This could reflect large differences in the costs of producing water at the various locations. In general, costs tend to be lower for large water systems such as in Tashkent, the largest city in Uzbekistan, which may help explain, at least partly, why water tariffs are quite low in the capital. Tariffs for all customer categories were increased significantly in recent years, designed mainly to offset the increasing electricity costs for water companies. Electricity costs account for a large share (some 30 per cent) of total water production costs, and there is considerable scope for improving the efficiency of operations of water companies by means of investments in energy-saving measures. In Tashkent, drinking water tariffs for households rose by 65 per cent and sewerage tariffs more than doubled between 2016 and 2018 (table 3.7).

3.1: Target 8.4 of the 2030 Agenda for Sustainable Development



Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Target 8.4: Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead

As at early 2019, Uzbekistan does not produce the data needed to compile the Sustainable Development Goals indicators 8.4.1 (Material footprint, material footprint per capita, and material footprint per GDP) and 8.4.2 (Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP), although raw material extraction plays an important role in the domestic economy.

In the waste management sector, extended producer responsibility policy is not in place. The rationale of extended producer responsibility schemes is to create incentives for producers to prevent waste at the production stage, take environmental considerations into account at the product design stage and support recycling and materials management goals. The recently adopted 2019 Strategy on Municipal Solid Waste Management for the period 2019–2028 envisages the introduction of methods for collection and recycling of specific waste streams, such as mercury-containing waste, tyres, batteries, used oils and packaging waste, through the development of economic instruments for these purposes.

Ensuring the availability of data necessary to compile indicators 8.4.1 and 8.4.2 to measure progress towards the achievement of target 8.4 is an important task for Uzbekistan.

Table 3.7: Household water tariffs in the City of Tashkent, sum/m³

Effective date	Drinking		Total	Total (US\$/m ³)
	water	Sewerage		
22/11/2018	280	235	515	0.061
01/05/2018	245	210	455	0.054
14/02/2018	195	165	360	0.043
21/07/2017	190	155	345	0.041
01/10/2016	180	115	295	0.035
01/04/2016	170	110	280	0.033

Source: SUE “Suvsoz” (<http://suvsoz.uz/abonentam/tariffs/>).

Notes: Drinking water tariffs excluding surcharge of 100 sum per m³ levied since the beginning of 2018. Exchange rate: US\$1 = 8,420 sum (9 April 2019).

Nevertheless, current water tariffs are not yet fully cost reflective; at best, they allow for recovery of operating costs. Many water utilities companies have accumulated severe debts, which also include unpaid electricity bills, exacerbating existing problems of unreliable supply and poor water service quality. Investments in the water sector infrastructure rely largely on funds allocated from the state budget and concessionary loans from foreign donors; however, in the absence of cost-reflective tariffs that would ensure the financial sustainability of water sector operations, these funds have been in short supply. The counterpart to this is a largely obsolete water sector infrastructure and a corresponding large pent-up demand for infrastructure investments to modernize and extend the water sector network.

The lack of financial sustainability of water companies reflects not only tariffs that are too low but also inefficiencies in bill collection. In Tashkent City, the bill collection rate of the local water company (SUE “Suvsoz”) was around 85 per cent in recent years. Low bill collection rates also reflect the inability or unwillingness of water companies to levy penalty payments or cut off consumers from water supply. Given the magnitude of this problem across the country, the Government introduced stringent measures designed to ensure adequate payment discipline. As of 1 January 2018, all customers of water supply and wastewater services are subject to 100 per cent prepayment of average monthly bills. Failure to make prepayments will lead to enforcement measures, which can extend to complete disconnection from water supply. Reconnection is subject to the payment of a fine.

Installation of water meters for gauging water consumption is obligatory for non-household consumers but not for residents. According to the Ministry of Housing and Communal Utilities, in Tashkent City, some 43 per cent of households had no meters installed in 2018. Households without meters pay for water services based on water consumption norms per person. The tariff per m³ of drinking water, moreover, is 50 per cent higher than the standard tariff for metered consumption since 2013. Sewerage tariffs applied to households without water meters are the same as the standard tariff. In general, households without meters pay higher water bills than a comparable household with metered consumption. Moreover, normative billing entails consumers having to pay the same amount even when consumption declines due to interruptions in supply. The recent significant increase in water tariffs should also provide stronger incentives for households to install water meters. Metering of water consumption would not only increase the operational efficiency of water

companies but also lead to more rational use of water resources by consumers. The costs of water meter installation are, in principle, borne by the consumers. The Government has launched a programme to increase the proportion of households with water meters and is looking for financing sources for the purchase of water meters and related equipment to be installed during the period 2019–2021.

To mobilize domestic funds for investments in the water sector infrastructure, the Government decided in 2017, *inter alia*, to levy a surcharge on drinking water tariffs, which are allocated to a newly created Housing and Utilities Development Fund under the Ministry of Housing and Communal Utilities. The level of the surcharge is set by local governments. In Tashkent City, this levy had already been introduced in 2018, and it amounts to 100 sum (US\$0.012) per m³. Effective as of 2019, the surcharge of 100 sum per m³ is also to be applied to the provision of sewerage services in the city. Outside Tashkent City, as of April 2019, this surcharge has been set at 50 sum per m³ for both drinking water and sewerage services. The surcharge is paid by private households and budget organizations. Enterprises also pay a special surcharge.

While such a measure may provide some additional funds for financing investments in the water sector infrastructure, the key requirement is to achieve the financial sustainability of water companies by means of applying cost-reflective tariffs. This is also the basic condition for attracting private investors within the framework of public–private partnerships. The Government is aware of this and, in April 2019, adopted a new tariff methodology (“cost plus”) for the calculation and implementation of average tariffs, which should allow full cost recovery, including an allowance for capital depreciation (2019 Resolution of the Cabinet of Ministers No. 309). The application of these tariffs, which are subject to approval by the Ministry of Finance (the official price regulator), is envisaged as of 2020. At the same time, the Government is preparing a programme to introduce water meters for all water consumers.

Energy tariffs

The Government owns and manages the energy sector. The sector operates under the supervision of the Cabinet of Ministers, which also regulates energy tariffs, which are computed by the Ministry of Finance. Tariffs for electricity and gas supply are set at a single countrywide rate for each of the customer categories. Tariffs for households are subsidized; legal entities pay rates that are much higher than those applied to households. The Government has, however,

aimed at maintaining average tariffs at a level that allows for recovery of operating and maintenance costs.

Tariff increases above the inflation rate helped to improve the financial performance of the power sector in recent years. Household electricity tariffs rose by some 60 per cent between 2015 and the end of 2018, compared with an average increase in the CPI of some 40 per cent. Nonetheless, energy prices are still below marginal long-term costs.

Against this background, the energy sector has been adversely affected by a lack of funds for modernization, rehabilitation and expansion of the supply infrastructure. There are large technical and commercial losses in the energy transmission and distribution systems. Electricity generation mainly relies on gas; given that the domestic gas price is significantly lower than international prices, this leads to high annual revenue losses. Another consequence is that such a policy is blunting domestic price signals that could create incentives for demand-side energy efficiency improvements. Effective as of the beginning of 2019, the Government introduced an “experiment” with a two-block electricity and gas tariff for households in the Yunusabad district of the City of Tashkent. Energy consumption in the second consumption block is subject to a 20 per cent higher tariff than energy consumption in the first block.

In April 2019, the Government adopted a new tariff methodology designed to create the basis for the gradual transition to full cost recovery tariffs by 2023 and established a regulatory body for tariff-setting, the Interdepartmental Tariff Commission under the Cabinet of Ministers (2019 Resolution of the Cabinet of Ministers No. 310). In this context, it is also planned to introduce provisions for targeted social assistance for low-income and vulnerable groups in the population and increase the installation of modern electricity meters. If implemented, these measures would help improve the financial sustainability of energy companies and would also enable stronger private sector participation in the energy sector.

In the face of deteriorating bill collection rates, the Government has also decided on measures to improve the payment discipline of energy consumers and aims to introduce a unified bill collection system for utility services. Since 1 July 2017, private households have to pay their monthly electricity and gas bill by the tenth day of the following month. Legal entities are

subject to full prepayment of their monthly energy consumption.

District heating tariffs

District heating (space heating and hot water supply) to urban settlements has traditionally been supplied by companies owned by municipalities. Most of these companies have been transferred to the Ministry of Housing and Communal Utilities, established in April 2017. The largest district heating system is operated in Tashkent City, which accounts for some 70 per cent of total heat production in the country. The district heating systems were put into operation some 30 to 50 years ago and are, by design and due to long-time underinvestment in maintenance, rehabilitation and modernization, technically largely obsolete. To a large extent, heating bills are based on consumption norms, due to a lack of metering in the corresponding buildings. Tariffs are set at levels that allow only for recovery of operating costs. Bill collection rates amounted to 87 per cent in Tashkent City in recent years. Given the poor state of the district heating infrastructure, the quality of heating services is low; gradual increases in tariffs to cost-reflective levels and new investments are needed to improve the performance of the sector.

Support for renewable energy sources

The Government launched efforts in 2015 to increase the use of renewable energy in Uzbekistan. In 2017, it also set renewable energy targets for new hydro, photovoltaic (PV) solar and onshore wind power for the period 2018–2021.

Traditional RES support schemes such as feed-in tariffs and competitive bidding/auctions have not been envisaged so far. There are, however, provisions for support in the form of investment tax credits and reduction in import taxes for RES technologies. Private ownership of renewable energy generation is legally authorized. A constraint on the use of RES is the abundance of traditional domestic energy sources and the prevailing fossil fuel subsidies.

In May 2018, the Government signed a power-purchasing agreement⁹ with a Canadian-based company (SkyPower), which will invest US\$1.3 billion in the construction and operation of PV solar energy facilities across the country, with a total capacity of 1 GW. A power-purchasing agreement provides a set of incentives, which notably include

⁹ This foreign direct investment is expected to create thousands of jobs; at the same time, it is an example of a PPP agreement.

exemption from customs duties, corporate income tax, VAT and land tax. There is also a sovereign guarantee that, if Uzbekenergo, the state-owned energy company, fails to purchase the power generated by the PV solar plants, the necessary funds shall be provided from the state budget. These guarantees may also be extended to other successful bidders for solar power projects so as to create a level playing field.

In August 2018, the International Finance Corporation (IFC) signed an agreement with the State Committee on Investments and Uzbekenergo to provide financial advisory services designed to attract private investors on a competitive basis for the design, financing, construction and operation of solar power facilities, with a total project value up to US\$1 billion, on a PPP basis.

3.2 Greening the subsidies system

Tax reliefs

The 1992 Law on Nature Protection provides for a range of instruments designed to provide incentives for economic entities to reduce adverse environmental impacts of their activities by offering tax benefits and preferential credits for investing in pollution abatement and resource-saving technologies. In a similar vein, the 2002 Law on Waste stipulates that companies that develop and produce equipment for waste disposal, waste reduction and waste recycling are eligible for financial benefits originating from the national environment fund, the state budget and other sources. Effective as of 2018, the state-owned waste companies engaged in municipal waste management (SUE “Makhsustrans” and SUE “Toza Hudud”) are exempt until 1 January 2023 from fees to be paid for the registration of purchased new special domestic vehicles, land tax and customs fees on imports of special equipment for municipal waste management that is not produced in the domestic market. There is no information on the actual use made of these schemes.

Fossil fuel subsidies

The Uzbek energy sector continues to be the source of large implicit (indirect) subsidies for the rest of the economy. The International Energy Agency has estimated that, in 2017, subsidies for fossil fuels that are consumed directly by end-users or used as input to electricity generation amounted to US\$5.24 billion, corresponding to 10.9 per cent of GDP. Gas accounted for 72.1 per cent of the total, electricity for 25 per cent and oil for 2.9 per cent. In 2010, fossil fuel subsidies

corresponded to a sizeable 30 per cent of GDP. However, this substantial decline in subsidies relative to GDP masks the fact that total subsidies in terms of national currency units increased by 48 per cent in 2017 compared with 2010. But this increase was more than offset by the strong growth in nominal GDP by a factor of 4 over this period, reflecting the combined effect of robust economic growth and high cumulative inflation.

Reducing fossil fuel subsidies continues to be an important challenge for the Government, which has embarked on a path of gradually increasing energy prices to cost-reflective levels.

Existing energy subsidies are not well targeted because they benefit rich households more than the poorest, given that the former consume larger volumes of energy. Moreover, low energy and fuel prices for domestic consumers have depressed the financial resources that the energy sector needs for the rehabilitation and expansion of the energy sector infrastructure. Low energy prices are also blunting incentives for investments in energy efficiency, which is potentially a large source for reducing energy consumption and related fossil fuel subsidies. Raising energy prices to cost-recovery levels would strengthen the financial position of the state-owned energy companies and promote more efficient resource allocation. Reducing fossil fuel subsidies would also allow redirection of the freed financial resources to measures designed to combat climate change and promote environmental protection.

The current stand of Uzbekistan vis-à-vis target 12.c of the 2030 Agenda for Sustainable Development is described in box 3.2.

Subsidies to agriculture

Agriculture, especially the production of cotton, is a major pillar of the Uzbek economy. The cotton sector is centrally regulated based on annual production targets and the setting of official procurement prices paid by the Government to farmers. The state procurement price for raw cotton has been significantly lower than world market prices, which has been tantamount to an implicit tax on farmers and has become an important source of Government revenue. The mirror image of this was a lack of incentives for farmers to achieve the set production targets. Against this background, the Government announced large increases in the guaranteed procurement price in 2017 and 2018.

Box 3.2: Target 12.c of the 2030 Agenda for Sustainable Development**Goal 12: Ensure sustainable consumption and production patterns**

Target 12.c: Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Uzbekistan nationalized the global target 12.c without changes. This target aims at the rationalization of fossil fuel subsidies that encourage wasteful consumption. The relevant indicator (12.c.1) is the amount of fossil fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels. There has been some progress in reducing fossil fuel subsidies relative to total GDP (from 30 per cent of GDP in 2010 to 10.9 per cent of GDP in 2017), but, overall, this proportion is still very high in Uzbekistan. Information on the amount of fossil fuel subsidies as proportion of total national expenditure on fossil fuels is not available.

Measures to be implemented in order to achieve progress towards target 12.c on the rationalization of fossil fuel subsidies include:

- (a) Gradually removing fossil fuel subsidies for enterprises and the population by raising energy tariffs to cost-reflective levels and ensuring adequate targeted assistance for household consumers who are in a vulnerable position;
- (b) Removing existing subsidies for regulated prices of transport fuels.

The low procurement prices for raw cotton were, in the past, partly offset by a range of state subsidies provided to farmers, especially those involved in cotton production, for fertilizers, pesticides, petrol and diesel fuels for agricultural machinery and equipment, and irrigation. The subsidy for irrigation comprises the operation and maintenance costs of irrigation systems, including the electricity costs of irrigation pumping stations. Irrigation subsidies associated with the cotton policy led to farmers' deteriorating interest in investing in more efficient irrigation techniques. A large part of the subsidies is provided by state-managed banks in the form of targeted loans at preferential interest rates, which are significantly lower than market rates. The actual value of these subsidies is difficult to calculate but may have amounted to US\$525 million in 2016.¹⁰ In March 2018, the Government announced measures designed to reduce input subsidies for mineral fertilizers and fuels to cotton producers.

In December 2018, the Government announced measures for subsidizing the installation of water-saving technologies (drip irrigation) by farmers producing raw cotton. State support amounts to 8 million sum (US\$960) per ha of sown area of raw cotton. In addition, the Government will partly reimburse interest payments on loans from commercial banks taken up by farmers for financing the installation of drip irrigation technologies. The

total funds allocated for 2019 for the reimbursement of farmers' costs for the introduction of drip irrigation technologies amounts to 120 billion sum (some US\$14.5 million). Moreover, imports of components of drip irrigation technology by cotton farmers and manufacturers of drip irrigation technology are exempt from excise duties until 1 January 2021.

3.3 Investing in environmental protection and green economy

Implementation costs for environment-related strategies, programmes and plans

In 2013, the Government launched a five-year Programme of Actions on Environmental Protection for the period 2013–2017 (2013 Resolution of the Cabinet of Ministers No. 142). The general objective was to improve environmental conditions in the country based on a wide range of measures, including investments in pollution abatement in industry, improvements to municipal infrastructure, enhancement of environmental monitoring, development and extension of the PA network, development of environmental legislation, environmental education and the promotion of international cooperation with a focus on transboundary pollution issues. The Programme was designed as the main instrument for public policy planning in the environmental field within the

¹⁰ Nodir Djanibekov and Marten Petrick, "Recent changes in Uzbekistan's cotton procurement: Implications and reform agenda ahead", paper prepared for the American Economic Association conference, 2019, December 2018.

framework of economic reforms in Uzbekistan. However, a comprehensive review of its achievements and problems encountered is lacking. A summary implementation report presented to Oliy Majlis by SCEEP in July 2018 indicated that total funds spent amounted to 303.4 billion sum (US\$37.5 million at average 2018 exchange rates); in addition, funds denominated in foreign currency units of US\$809 million and €0.14 million were disbursed. There has been no other environmental action programme launched since then.

Investments in environmental protection and green economy are, however, an integral part of the 2017 Action Strategy on Five Priority Directions for Development for the period 2017–2021, which identifies the major priority directions of reforms, which include, among others, economic and social development and liberalization, as well as governance and public administration reform. The Strategy also defines targeted programmes for modernization of the major economic sectors, which also include improvements in the areas of public utility services (water supply and sewerage, municipal waste management, energy supply, public transport) and expanding the use of RES. Overall, the Government has planned investment projects in the various economic sectors worth US\$40 billion during the period 2017–2021.

The wide range of government policies, programmes and projects to further develop the basic physical structures and facilities (buildings, roads, energy supply, etc.) of the country, moreover, brings into focus the importance of a comprehensive assessment of related impacts on ecosystems and associated ecosystem services, notably the changes in the economic value of ecosystem services compared to the environmental baseline (no change). These policy appraisals should typically take place in the context of cost-benefit analysis. Economic valuation of ecosystem services is still in its infancy in Uzbekistan, but is strongly advocated for in the 2019 Sixth National Report to the Convention on Biological Diversity (CBD).

Besides domestic financing sources, it will be necessary to attract foreign investment and the associated transfer of advanced technologies to attain the development targets. Therefore, the Government has also planned to open additional free economic zones in the Samarkand, Bukhara, Fergana and Khorezm Oblasts. The Ministry of Investments and External Trade was established in 2019 with the remit to coordinate the design and implementation of a unified state investment policy and attract foreign

investment. More generally, these investment programmes would also support progress towards the implementation of the Sustainable Development Goals, given that they focus on the accumulation of human capital (education, health) and real capital (public infrastructure) and the importance for Uzbekistan of creating jobs for a large proportion of the working-age population during its current demographic transition.

Green public procurement

The 2018 Law on Public Procurement defines the general requirements for the process of public procurement, including procedures for competitive bidding for all types of goods (works, services) that meet the established criteria. Before the adoption of this Law, public procurement was regulated by more than 30 regulatory acts, which adversely affected the integrity, transparency and openness of the procurement system and made it vulnerable to corruption. The Law establishes comprehensive procurement principles and stipulates that the implementation of public procurement must take into account “the priorities of socioeconomic policy, including the creation of high-tech and innovative industries and the preservation of a favourable environmental situation”. While the Law creates the foundations for modernizing and improving the public procurement system, its effectiveness depends, to a large extent, on investments in capacity-building and upgrading the professionalism of officials involved in procurement and contract management. This would also help in promoting the implementation of sustainable public procurement policies in line with target 12.7 of the 2030 Agenda for Sustainable Development (box 3.3).

Public sector environmental protection expenditures

The state budget system of Uzbekistan comprises the state budget (central government and regional/local budgets), budgets of state trust funds for special purposes (such as the Republican Road Fund) and budget of the Fund for Reconstruction and Development, a kind of sovereign wealth fund. Combined, these budgets constitute the so-called consolidated state budget. Besides the state budget, there is a system of extra-budgetary funds of budget organizations, such as ministries and state committees, which are financed by special non-tax charges, administrative fines and financial sanctions. Part of this system of extra-budgetary funds is the environmental fund of Uzbekistan.



Box 3.3: Target 12.7 of the 2030 Agenda for Sustainable Development

Goal 12: Ensure sustainable consumption and production patterns

Target 12.7: Promote public procurement practices that are sustainable, in accordance with national policies and priorities

Public procurement accounts for about one third of the consolidated state budget expenditures (or about 10 per cent of GDP) in Uzbekistan. Target 12.7, as nationalized by Uzbekistan, calls for the “enhanced use of environmental standards in procurement practices”. The 2018 Law on Public Procurement provides the legal foundation for raising public procurement policies and practices to levels corresponding to international standards being met by more advanced economies.

Whereas the Law is a clear step forward, the Government has not yet developed an effective policy framework and allocated sufficient human resources for public procurement of works and services in order to be able to base purchasing decisions not on a price-only criterion but to use a multi-criteria approach that considers various dimensions of quality, notably environmental impacts, in addition to price.

The 2019 ECE Recommendation No. 43 on Sustainable Procurement (Minimal common sustainability criteria for sustainable procurement processes to select micro-, small and medium-sized enterprise suppliers) provides modern guidance to governments in designing sustainable public sector procurement policies and regulation.

Consolidated state budget

Expenditures on environmental protection funded from the general government budget (consolidated state budget) are mainly designed to finance the operating costs of the competent government authorities and miscellaneous activities related, inter alia, to the maintenance cost of PAs and financial support for the rehabilitation and extension of the municipal waste sector and water sector infrastructure. The major source of these financial resources has been the central government budget, with a conspicuous exception in 2017, when there was a surge in local government environmental expenditures.

Overall, environmental protection expenditures accounted only for a small share in total general government expenditures during the period 2012–2019, with a peak of 0.15 per cent in 2017. The proportion of environmental expenditures relative to GDP was, accordingly, even smaller, at some 0.02 per cent (table 3.8). However, the consolidated state budget does not include a number of off-budget funds operated by ministries, state committees and other governmental bodies, among which is the environmental fund.

Environmental fund

From 2009 until mid-2017, Uzbekistan operated a system of extra-budgetary environmental funds that comprised the Republican Fund for Nature Protection and 14 regional funds. All these funds were under the former State Committee for Nature Protection and its territorial representatives at the local level. The Republican Fund played a more residual role in this scheme, because its main funding source was a 25 per cent share in revenues accruing to the system of local

funds. This system required extensive coordination about local priorities, which had to be agreed with the former State Committee and rendered cumbersome the pursuit of national priorities, given the limited financial endowments of the Republican Fund. In order to improve the efficiency and effectiveness of the use of scarce resources, the authorities decided to merge the Republican Fund and the 14 regional funds into a new fund: the Fund for Ecology, Environmental Protection and Waste Management (hereafter, the Fund) in October 2017. The Fund is located within SCEEP.

The Fund is managed by a council, which is headed by the Chairperson of SCEEP. Further members are other representatives of SCEEP and other state bodies, and research and non-governmental, non-profit organizations working in the field of ecology and environmental protection. The annual work programme agreed by the council is submitted to the Cabinet of Ministers for final approval. Reviews and selection of proposed projects are based on a special internal regulation on the procedure for the selection of executors for the implementation of projects and activities. The operations of the Fund are administrated by the Unit for Operation of the Fund within SCEEP (figure 1.2), which is also in charge of organizing public tenders for the implementation of projects. SCEEP has to report on a quarterly basis on its financial transactions to the Ministry of Finance, which is in charge of state control over the effective use of the resources of the Fund. A project implementation report has to be submitted to the Cabinet of Ministers on a half-yearly basis.

The sources of revenue of the Fund are the payments of pollution charges, fines for violation of environmental standards and environmental damage

caused, and permit fees for the felling of trees outside the state forest fund. The proportion of revenue from pollution charges allocated to the Fund was raised to 74 per cent as from the beginning of 2018, compared with 40 per cent in 2009. Effective as of 1 December 2018, the 74 per cent share of revenues from payments for excessive discharge of pollutants into municipal sewerage networks of cities and towns is allocated to the Fund for Development of Water Supply and Sanitation Systems under the Ministry of Housing and Communal Utilities. The other revenue sources are a proportion of the fines for violations of environmental regulations (74 per cent) and payments for environmental damage caused and excessive use of natural resources (40 per cent), and 74 per cent of fees for issuing permits for felling trees outside the state forest fund. The remaining share of all these revenues is allocated to the state budget. Total annual revenue of the Fund amounted to 22.4 billion sum (US\$2.8 million) in 2018. On average, pollution charges accounted for 62 per cent of total revenue during the

period 2014–2018; the share of permit fees for the felling of trees outside the state forest fund was 27.75 per cent (table 3.9).

Expenditures of the Fund are based on the execution of an annual programme, which has to be approved by the Cabinet of Ministers. The three major categories, which accounted for an aggregate share of 83.4 per cent of total expenditures during the period 2014–2018, were: (i) the co-financing of projects (49.3 per cent); (ii) financing of construction of environmental facilities, purchase of equipment and maintenance (18.7 per cent); and (iii) territorial development of environmental protection (15.4 per cent). Annual expenditures peaked at 7.58 billion sum in 2018, reflecting a sharp rise in co-financing of projects, while there was a decline in expenditures for most of the other spending categories. In 2018, co-financing of projects accounted for 82.3 per cent of all expenditures of the Fund (table 3.10).

Table 3.8: General government expenditures on environmental protection, 2012–2019, billion sum

Unit of general government	2012	2013	2014	2015	2016	2017	2018	2019
Budgetary central government	10.41	14.35	18.80	21.15	22.79	31.29	..	..
Local government	2.24	7.55	7.25	6.10	6.03	72.12	..	..
Total general government expenditure on environmental protection	12.65	21.90	26.05	27.25	28.82	103.40	47.08	65.67
Total general government expenditure	29 768.96	36 761.40	43 805.40	51 086.30	57 169.80	68 904.10	103 006.80	125 778.00
Expenditure on environmental protection (% of total government expenditure)	0.04	0.06	0.06	0.05	0.05	0.15	0.05	0.05
Expenditure on environmental protection (% of GDP)	0.01	0.02	0.02	0.02	0.01	0.04	0.01	0.02
Total government expenditures as % of GDP	30.40	30.42	30.04	29.73	28.59	27.12	30.94	29.55

Source: IMF, Government Finance Statistics (<http://data.imf.org/?sk=a0867067-d23c-4ebc-ad23-d3b015045405>); IMF, World Economic Outlook database, April 2019 (www.imf.org/external/pubs/ft/weo/2019/01/weodata/index.aspx); State Committee on Ecology and Environmental Protection, direct communication.

Notes: General government expenditures by function (COFOG).

Local government comprises the Republic of Karakalpakstan, 12 oblasts and the City of Tashkent.

Data for 2018 are preliminary; data for 2019 are planned expenditures.

Table 3.9: Revenues of the environmental fund, 2014–2018, billion sum

	Billion sum					Average	US\$ million
	2014	2015	2016	2017	2018	2014–2018 (%)	
Pollution charges	5.97	9.20	10.15	15.60	15.86	61.82	1.964
Fines and lawsuits	1.45	1.92	1.99	1.89	2.34	10.43	0.290
Permit fees for felling of trees	5.51	4.76	7.28	3.72	4.22	27.75	0.523
Total	12.93	15.88	19.41	21.21	22.41	100.00	2.777

Source: State Committee on Ecology and Environmental Protection, 2019.

Notes: Exchange rate: US\$1 = 8,072 sum (average rate for 2018).

Table 3.10: Expenditures of the environmental fund, 2014–2018

	2014	2015	2016	2017	2018
Total (billion sum)	1.96	1.84	1.52	2.78	7.58
Total (US\$ million)	0.85	0.71	0.51	0.53	0.94
of which: (%)					
Co-financing of projects	25.19	47.41	73.66	17.97	82.31
Territorial development of environmental protection	23.51	32.63	18.20	2.41	0.00
Construction and maintenance of environmental facilities	30.44	7.28	1.52	49.96	4.15
Environmental education	6.49	2.23	3.06	2.88	0.00
Research and development work	6.00	2.68	0.65	19.86	4.55
Other	8.36	7.76	2.90	6.92	9.00

Source: State Committee on Ecology and Environmental Protection, 2019.

Note: Figures in United States dollars were calculated using the corresponding average annual exchange rate.

Fund for Development of Water Supply and Sanitation Systems

A Clean Water Fund was established in 2017 with the main rationale of providing a guaranteed source of financing for investments in the construction and rehabilitation of the domestic water supply infrastructure within the framework of the Programme for Comprehensive Development and Modernization of the Drinking Water Supply and Sewerage Systems for the period 2017–2021 administered by the Ministry of Housing and Communal Utilities. In November 2018, the Clean Water Fund was transformed into the Fund for Development of Water Supply and Sanitation Systems, with the additional task of financing investment projects for the construction and rehabilitation of sewerage networks and facilities. The initial capital endowment of the Fund amounts to US\$248.1 million in 2019, which includes US\$131.8 million allocated from the state budget and US\$95.6 million from international financial institutions (IFIs) and foreign countries. Other sources of the Fund are the revenues collected from the surcharges on drinking water and sewerage tariffs introduced in 2018.

Forestry Development Fund

The Forestry Development Fund was established in 2016, when it was under the Forestry Department of the Ministry of Agriculture and Water Management. The Fund was transferred to the State Committee on Forestry at the time of its creation in July 2017. The main purpose of the Fund is to provide financial support for programmes designed to promote the development of forestry, as well as nature reserves and other PAs on the lands of the forest fund. Whereas the State Committee on Forestry is financed from the state budget, its regional forestry departments have to be

financed from the own resources of the Fund. The financing sources for the Fund are: fees collected for processing and issuing permits for collecting plant species, except those that are listed in the Red Book; fines for damage inflicted on flora and fauna; 50 per cent of fees for various types of forest use, such as livestock grazing, collection of firewood (without felling trees) and cutting trees and shrubs in permitted locations; and soft loans and grants from international donors. In 2018, the Fund had total revenues of 45.05 billion sum (US\$5.6 million), of which 39.64 billion sum (US\$4.9 million) were actually spent.¹¹ The balance was carried over to 2019. The purchase of tree seedlings accounted for 68 per cent of total expenditures.

Republican Road Fund

The Republican Road Fund (RRF), which was established in 2003, is the central state body for financing the construction, repair and maintenance of public roads. The revenues of the RRF stem from a special mandatory levy paid by legal entities, vehicle registration fees and transit fees for foreign vehicles. According to the 2015 World Bank assessment “Uzbekistan – Regional Roads Development Project”, total revenue of the RRF has been broadly sufficient to ensure adequate maintenance of all roads, meaning that the financing of construction of new roads has to rely on state budget resources and international loans. Total revenue of the RRF amounted to 4.2 billion sum (US\$527 million), corresponding to 1.2 per cent of GDP in 2018.

The Government has been reviewing the potential of PPPs and the introduction of road user charges to improve maintenance and further develop the road network.

¹¹ Figures in United States dollars were calculated using the average annual exchange rate for 2018 (US\$1 = 8,069.6 sum).

Environmental protection expenditures in the enterprise sector

Uzbekistan has an extensive annual reporting system on current environmental protection expenditures in the enterprise sector. These expenditures comprise, in principle, intermediate consumption (purchases of energy, materials), compensation of employees for environmental protection activities and purchases of environmental protection services from specialized producers. Some 1,300 large enterprises and 3,000 micro- and small enterprises currently respond to the questionnaires of the State Committee on Statistics. Total current expenditures on environmental protection amounted to 470.4 billion sum in 2017, corresponding to 0.2 per cent of GDP; some 98 per cent of this is accounted for by large enterprises (table 3.11). The indicator used for measuring the size of enterprises is the number of employees. In Uzbekistan, however, this indicator differs among the various sectors of the economy. There is, moreover, no statistical category of “medium-sized” enterprises in Uzbekistan. Environmental expenditures of large enterprises are available by environmental domain; in 2016–2017, 57.34 per cent was spent on water protection (table 3.12).

Foreign direct investment

The authorities have stepped up efforts to attract foreign direct investment (FDI), which has been volatile in recent years. The cumulative inflow of FDI

is still among the lowest among the countries of the Commonwealth of Independent States. Only 1.8 per cent of registered companies (some 5,500) have participation of foreign capital; most of them operate in production industries. The Government has used free economic zones, which provide tax and customs incentives to attract foreign investors with a focus on modern high-tech and localizing production, such as deep domestic processing of mineral resources and production of competitive products with high value added.

The 2017 Decree of the President No. 4933 was issued to simplify procedures and speed up the process of sale of state property and to eliminate administrative barriers to privatization. The overall improvement in the business climate since the launch of economic reforms is reflected in the upward movement of Uzbekistan in the World Bank’s Ease of Doing Business rating to rank 76 (out of 190 countries) in 2018 from rank 166 in 2011. Well-designed government policies can help catalyse FDI in directions that contribute to promoting environmentally sustainable growth and development. One example of this was the recent agreement with a Canadian-based company to invest in renewable energy production in Uzbekistan. However, such policy for greening FDI to address environmental challenges in the country is still at an early stage. There is great potential for the Government to create conducive conditions for the private sector that help overcome barriers that are impeding green FDI.

Table 3.11: Current environmental protection expenditures in the business sector, 2012–2017, billion sum

	2012	2013	2014	2015	2016	2017
Large enterprises	415.0	334.1	333.7	363.3	363.6	462.8
Micro- and small enterprises	8.5	2.9	3.0	4.1	4.2	7.6
Total	423.4	337.0	336.7	367.4	367.8	470.4
Total (as % of GDP)	0.43	0.28	0.23	0.21	0.18	0.19

Source: State Committee on Statistics, Main indicators of nature conservation, rational use of natural resources, forestry and hunting in 2017; and previous editions.

Table 3.12: Current environmental protection expenditures in the business sector by environmental domain, 2012–2017, billion sum

	2012	2013	2014	2015	2016	2017
Total	415.0	334.1	333.7	363.3	363.6	462.8
of which (as %):						
Water	62.3	44.5	44.3	48.2	57.0	57.3
Air	25.0	35.8	33.9	28.6	20.4	16.6
Land	11.4	17.9	20.7	22.0	21.2	25.2
Biological resources	1.3	1.8	1.1	1.2	1.4	0.9

Source: State Committee on Statistics, Main indicators of nature conservation, rational use of natural resources, forestry and hunting in 2017; and previous editions.

Note: The category “land” includes expenditures for collection, transport and disposal of waste.

China is among Uzbekistan's main trading partners and a significant source of FDI inflows. The total stock of FDI from Chinese companies amounted to some US\$500 million at the end of 2018. Uzbekistan is among the 65 countries covered by China's Belt and Road Initiative (BRI) (box 3.4), which consists primarily of the Silk Road Economic Belt, linking China to Central and South Asia and onwards to Europe. These are mainly transport (road or rail) infrastructure projects that are largely financed – based on loans – by China but may also involve newly created multilateral financial institutions, namely, the Asian Infrastructure Investment Bank (AIIB) and the Silk Road Fund. These projects, which are slated to be mainly executed by Chinese state-owned companies, do not, however, fall under the category of FDI. (FDI is defined as net inflows of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor.) These infrastructure projects will, however, help improve the transportation networks in Uzbekistan, which, in turn may stimulate inflows of FDI and promote economic growth based on a broader and deeper integration of the national economy into global value-added chains.

A first project implemented in Uzbekistan under the BRI – the construction of the 19.2 km Kamchiq railway tunnel – was started in 2013 and completed in 2016. There is poor information on other BRI projects in Uzbekistan. Some projects are branded as BRI but overall there is no official attribution of specific projects to BRI. In any case, the large scale of these infrastructure projects has led to widespread concerns about their environmental risks. How these risks are avoided or mitigated is largely determined by environmental policies in the host countries of these projects, but this depends also on the capabilities and political will of host countries to enforce such policies. Large infrastructure projects call for EIA and, notably, early-stage SEA before the projects have already moved to an advanced planning stage. There is also a role for the multilateral development banks that are providing co-financing, to impose conditions that are more stringent than those of individual host countries and thereby help “green” these projects. In this context, standards developed by the IFC and World Bank are often used as benchmarks for good international industry practice (GIIP) for multilateral, bilateral and commercial loans.¹²

Box 3.4: Uzbekistan and the Belt and Road Initiative

There is no published official register of Chinese investments in BRI projects in Central Asian countries. A recent study by the Central Asia Data-Gathering and Analysis Team (CADGAT), based on an assessment of diverse information sources, puts the number of implemented/ongoing BRI-related projects in the five Central Asian countries from the time of the announcement of the BRI in 2013 until the end of 2018 at 261. Of these, 237 projects (91 per cent) were financed on a bilateral basis; the others were multilateral projects. The total BRI-related investments in the five Central Asian countries over this period amounted to US\$136.25 billion. The large bulk of investments were made in Kazakhstan (US\$90.86 billion, or 66.7 per cent) and Turkmenistan (US\$24.84 billion, or 18.2 per cent). The total number of projects implemented in Uzbekistan is 43, of which 38 were on a bilateral basis. The total investment volume in Uzbekistan amounted to US\$4.64 billion, corresponding to 3.4 per cent of the total investments for Central Asia.

Only two of these 43 projects, however, are branded (i.e. publicly reported) as BRI projects, namely (i) the construction of the electrified Andren-Pap railroad with electrification of the Pao-Kokand-Andijan section (124.14 km) (jointly supported by the Fund for Reconstruction and Development of Uzbekistan, the World Bank and the Exim Bank of China) and (ii) the modernization of the coal mining enterprises of JSC Shargunkumir (supported by the Chinese Development Bank and the Exim Bank of China).

Chinese investments in Uzbekistan (including multilateral projects) have strongly focused on mineral and petroleum exploration and processing (US\$2.21 billion or 47.7 per cent of the total) and rail and road connectivity projects (US\$1.27 billion, or 27.4 per cent). Investments in industry projects amounted to US\$0.92 billion (19.9 per cent). Energy connectivity projects accounted for 4.4 per cent, and agriculture and food accounted for only 0.6 per cent.

Source: Vakulchuk, R. and others (2019). BRI in Central Asia: Overview of Chinese Projects. 10.13140/RG.2.2.13032.52488/1. Available at

www.researchgate.net/publication/333673045_BRI_in_Central_Asia_Overview_of_Chinese_Projects

Note: CADGAT was established by the Norwegian Institute of International Affairs (NUPI) and the OSCE Academy in 2009. The purpose of CADGAT is to produce new cross-regional data on Central Asia that are publicly available.

¹² Elizabeth Claire Losos and others. “Reducing environmental risks from Belt and Road Initiative investments in transportation infrastructure”, Policy Research Working Paper, No. WPS 8718 (Washington, D.C., World Bank Group, 2019).

Development assistance

Uzbekistan has been receiving official financial assistance on a bilateral and multilateral basis, which has consisted mainly of loans made on concessional terms and grants (official development assistance (ODA)), with the main general objective to promote economic development and social welfare. Major bilateral donors in recent years were Germany, Japan, Korea, the Netherlands, Sweden, Switzerland and the United States. Multilateral donors active in Uzbekistan include the Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), European Union (EU) institutions, International Bank for Reconstruction and Development (IBRD), International Development Association (IDA) and IFC. Total disbursements of ODA (net of repayments of principal) amounted to US\$638.3 million in 2017, up from US\$457.3 million in the preceding year. Development assistance has focused mainly on financing of investment projects in agriculture, energy, transport and communications, water supply and sanitation and water resources management. Disbursements of ODA for infrastructure projects amounted to US\$401.5 million (63 per cent of total net ODA) in 2017.¹³

3.4 Eco-innovations

Eco-innovations are a special class of innovations, which relate mainly to environment-related research and development (R&D) and technologies. The defining feature of eco-innovations is that, throughout their life cycle, they reduce environment pollution and increase the efficiency of resource use compared with relevant alternatives. Both innovation in general and eco-innovation are critical for achieving sustainable development. This pertains, notably, to target 8.4 of the 2030 Agenda for Sustainable Development, which calls for improving resource efficiency in consumption and production and decoupling economic growth from environmental degradation.

There is no systematic collection of information on eco-innovation activity in Uzbekistan. Examples of eco-innovation in the country are: the (planned) installation of wind and solar power plants; measures to improve the energy efficiency of buildings; the domestic production and installation of energy-saving lamps; the introduction of drip irrigation technologies in agriculture; and the organizational improvements in

solid waste management at the local level. It may be surmised, however, that there is great scope for further implementation of eco-innovations in all major sectors of the economy.

Uzbekistan has placed innovation at the heart of its economic development strategy, recognizing that, in the long run, innovation is the main driver of increases in economic well-being. The past economic model has led to inadequate integration into global supply chains, low technology transfer and weak innovative activities, which are reflected in the low productivity and weak international competitiveness of most domestic firms. The national innovation system, i.e. the network of public and private institutions that are funding and performing R&D activities and are using the results of R&D for the commercial exploitation of processes and products, is underdeveloped (chapter 4). Existing obstacles for innovative development are a number of systemic problems as well as lack of capacities and potential. The Global Innovation Index (GII) 2015 ranked Uzbekistan 122nd of 141 countries.¹⁴ Uzbekistan was not ranked at all in the GII in 2016–2018. Domestic R&D expenditure corresponded to only 0.2 per cent GDP in 2017 compared with a global average of 1.7 per cent (World Bank) (box 4.2).

The Government has adopted in recent years a number of policy documents and measures designed to promote innovative activities. A Ministry of Innovation Development was established at the end of 2017, which is responsible for the design and implementation of domestic innovation policy. At the same time, a new fund to support innovative activities was created. The Government has also adopted the Strategy for Innovative Development for the period 2019–2021 (2018 Decree of the President No. 5544), which has as its main objectives improving the quality and coverage of education at all levels, strengthening the scientific potential and effectiveness of R&D and increasing public and private sector investment funds for innovative activities. Of critical importance will be to strengthen the absorptive capacity of domestic firms, i.e. the ability to identify, assimilate, transform and use external knowledge, research and practice.

3.5 Green jobs

A green job is broadly defined as any decent job that contributes to preserving or restoring the quality of the

¹³ Asian Development Bank, “Basic statistics 2019”. Available at www.adb.org/publications/basic-statistics-2019.

¹⁴ Soumitra Dutta, Bruno Lanvin and Sacha Wunsch-Vincent, eds., *The Global Innovation Index 2015: Effective Innovation Policies for Development* (Ithaca, New York, Cornell University; Fontainebleau, INSEAD; Geneva, World Intellectual Property Organization, 2015).

environment, whether it is in agriculture, industry, services or administration.¹⁵ When measuring the number of green jobs, statistical agencies, such as Eurostat, usually focus on jobs in the environmental goods and services sector, which comprises mainly wastewater and waste management, production of renewable energy and energy-saving measures. Green jobs also encompass workers who are involved in making the production processes of their companies more environmentally friendly (e.g. air pollution abatement) or having them use fewer natural resources. Data on the number of green jobs and the related environmental/economic sectors are not available for Uzbekistan.

There is high unemployment in Uzbekistan, and there is a very large informal sector, which is estimated at some 60 per cent of total employment in 2018, according to the Ministry of Employment and Labour Relations. Creation of green jobs is mentioned among key principles of the Strategy for Transition to Green Economy for the period 2019–2030. The expansion of the green economy and the shaping of required skills for green jobs should help in promoting higher levels of employment and decent work in line with Sustainable Development Goal 8 and target 8.3.

3.6 Public–private partnerships in support of the green economy

A properly designed and implemented PPP can be a source of additional private sector funding as well as technical and management expertise in areas such as the provision of public utility services (e.g. water supply and sanitation) and financing of public infrastructure such as roads.

Uzbekistan lacks experience with the use of PPPs and has still to build an efficient and transparent legal and institutional framework for the implementation of PPPs in line with internationally acknowledged standards. The Law on Public–Private Partnerships was adopted recently – in May 2019. The EBRD is providing technical assistance to support the design and development of an investor-friendly PPP regime in the country. As a first step to creating the required institutional capacities for coordination and management of PPPs, the Agency for the Development of Public–Private Partnerships was established under the Ministry of Finance in October 2018. The 2018 Resolution of the President No. 4040 calls for an increased role for PPPs in the modernization and management of the water supply and sewerage sector.

To date, private sector cooperation with the public sector has been mainly limited to long-term production-sharing agreements in the automobile and minerals sectors and the establishment of free economic zones for attracting FDI. In 2018, the IFC signed a mandate with the Government to help increase the country’s renewable power capacity and encourage private sector investment in Uzbekistan’s renewable energy sector. The project involves the establishment of a PPP between the state-owned national power utility (Uzbekenergo) and a private sector company, designed to mobilize know-how and capital for the construction and operation of a 100 MW solar plant. This is planned to be the first phase of a larger initiative to generate up to 1 GW of solar energy.

3.7 Legal, policy and institutional framework

Legal framework

Pollution charges

Pollution charges are levied in accordance with the Laws on Nature Protection, on Ambient Air Quality and on Waste. Charge rates, payments modalities and other details are regulated by the 2018 Resolution of the Cabinet of Ministers No. 820 “On measures to further improve the economic mechanisms for the protection of nature”, which entered into force on 1 January 2019. Until the end of 2018, pollution charges were regulated by the 2003 Resolution of the Cabinet of Ministers No. 199 (no longer in force).

Taxes

Taxes on land, property (real estate), water use and subsoil resources, and excises on motor vehicles and energy products such as motor fuels are regulated by the 2007 Tax Code. Effective tax rates are determined in resolutions of the President. Rates for 2019 were set in the 2018 Resolution of the President No. 4086 “On the forecast of the main macroeconomic indicators and parameters of the state budget of the Republic of Uzbekistan for 2019 and budget guidelines for 2020–2021”.

The rates of customs duties on imports and excise tax rates were set in the 2017 Resolution of the President No. 3303 (no longer in force) and 2018 Resolution of the President No. 3818. Excise tax on domestic production of passenger motorcars is established in the 2017 Resolution of the President No. 3454 and 2018 Resolution of the President No. 4086.

¹⁵ International Labour Organization; United Nations Environment Programme.

Administrative price controls

Prices of motor fuels and other energy resources (electricity, gas, heating) are set by the Cabinet of Ministers, (e.g. 2018 Resolution of the Cabinet of Ministers No. 897 “On the gradual change of prices and tariffs for fuel and energy resources”).

Use of forest resources

The use of forest resources is based on the Law on Forests, Law on Protection and Use of Flora and Law on Protection and Use of Fauna. The 2014 Resolution of the Cabinet of Ministers No. 290 “On the settlement of the use of biological resources and on the procedure for passing licensing procedures in the field of environmental management” determines, inter alia, the fee rates for use of flora and fauna species, the distribution of payments made to various state agencies, and the procedures and fees for export and importation of wild flora and fauna.

Tariffs for utility services

Tariffs for municipal waste management, water supply and sewerage services, energy and heat supply are set by the Ministry of Finance in coordination with the Government. The methodology for tariff-setting is based on the 2010 Resolution of the Cabinet of Ministers No. 239. The reorganization of the payment procedures for utility bills since 2018 is regulated by various decrees of the President, such as the 2018 Decree of the President No. 5580 “On measures for fundamental improvement of the system of payments for the collection and removal of municipal solid waste” and 2018 Resolution of the President No. 3981 “On measures to accelerate the development and ensure the financial sustainability of the electricity industry”. A new tariff methodology and measures for electricity tariff reform were launched by the 2019 Resolution of the Cabinet of Ministers No. 310 “On measures to further improve the tariffs policy in the electrical industry”. In a similar vein, a new tariff methodology for the application of cost-reflective tariffs for water supply and sewerage services was adopted in 2019 Resolution of the Cabinet of Ministers No. 309 “On measures to improve the development, approval and setting of regulated prices (tariffs) for water supply and sewerage”.

Support for renewable energy sources

The legal framework for renewable energy development was established with the 2015 Resolution of the President No. 2343 “On the Programme of Measures to Reduce Energy Intensity and Introduce Energy Efficient Technologies in

Economic Sectors and the Social Sector for the period 2015–2019”. The 2017 Resolution of the President No. 3012 “On the Programme of Measures for Further Development of Renewable Energy and Energy Efficiency in Economic Sectors and the Social Sector in the period 2017–2021” sets renewable energy targets for new hydro, solar PV and onshore wind power for the period 2018–2025. The involvement of PPPs in this area was launched with the 2018 Resolution of the President No. 3687 “On additional measures for the implementation of investment projects in the field of renewable energy sources”.

The 2019 Law on the Use of Renewable Energy Sources provides, inter alia, for the legal regulation of measures of state support and incentives for the use of RES. Tariffs for electricity produced from RES will be set based on competitive bidding.

Public sector environmental protection expenditures

The basic rules governing the structure, components and processes of Uzbekistan’s budgetary system are defined in the 2013 Budget Code. Annual budget laws are adopted by the Oliy Majlis, which is the supreme body of state power.

Environmental fund

The Law on Nature Protection provides the legal foundation for the establishment of an environmental fund. The new fund operating since 2018 is regulated by the 2017 Resolution of the Cabinet of Ministers No. 375, which approves the Regulation on the order of formation and use of resources of the Fund for Ecology, Environmental Protection and Waste Management. This resolution has rendered invalid the 1993 Resolution of the Cabinet of Ministers No. 246 “On approval of the Regulation on the Funds for Environmental Protection”. The 2018 Resolution of the Cabinet of Ministers No. 820 “On measures to further improve the economic mechanisms for the protection of nature” stipulates the distribution of revenues collected from pollution charges between the Fund for Ecology, Environmental Protection and Waste Management and the state budget as of 1 January 2019.

Forestry Development Fund

The legal foundation for the Forestry Development Fund is the 2017 Decree of the President No. 5041 “On the establishment of the State Committee on Forestry” and the Regulation on the order of formation and use of funds of the Forestry Development Fund of the

State Committee on Forestry (2017 Resolution of the Cabinet of Ministers No. 530).

Fund for Development of Water Supply and Sanitation Systems

The Fund was established by the 2018 Resolution of the President No. 4040 “On additional measures for the development of drinking water supply and sewerage systems”. This Fund is the successor of the Clean Water Fund, which was tasked with providing financial resources for the development of the drinking water networks. The Clean Water Fund was established by the 2017 Resolution of the President No. 2910 “On the programme of development and modernization of drinking water and sewerage systems for the period 2017–2021”.

Public procurement

Public procurement is regulated by the 2018 Law on Public Procurement.

Public–private partnerships

The 2019 Law on Public–Private Partnerships was adopted to enhance the legal framework for PPPs. The 2018 Resolution of the President No. 3980 “On priority measures to create a legal and institutional framework for the development of public–private partnership” has established the Agency for the Development of Public–Private Partnerships under the Ministry of Finance. The 2018 Resolution of the President No. 4040 provides the legal foundation for the use of PPPs for the provision of water supply and sewerage services.

Policy framework

Uzbekistan’s commitment to green economy is clearly stated in the policy document adopted in October 2019, the Strategy for Transition to Green Economy for the period 2019–2030 (2019 Resolution of the President No. 4477). The Strategy has the following priority areas:

- Increased energy efficiency in key economic sectors;
- Diversification of energy resources consumed and the development of RES;
- Climate change mitigation and adaptation, increased efficiency of the use of natural resources and conservation of natural ecosystems;
- Development of financial and other mechanisms to support green economy.

Implementation of the Strategy is to be ensured by the Intergovernmental Council to Promote and Implement Green Economy (composed of ministers and chairpersons of state committees). It is planned to prepare annual action plans for implementation of the Strategy. The Strategy does not include any assessment of costs of its implementation. Furthermore, no mechanism for reporting on implementation is envisaged by the Strategy.

The Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863), adopted in October 2019, provides for a number of measures to improve the use of economic instruments in support of environmental protection. The Concept envisages reduction of the amount of controlled pollutants; ensuring the dependence of pollution charges on the volume of emissions and discharges and their level of hazard to the environment and public health; and the introduction of feed-in-tariffs for renewable energy. It is also planned to develop a mechanism for the economic valuation of biodiversity and ecosystem services.

Institutional framework

The central state management body for environmental policy design and implementation is the State Committee on Ecology and Environmental Protection. Other relevant bodies include, notably, the State Committee on Forestry, the Ministry of Water Management and the Ministry of Agriculture, as well as the State Committee on Geology and Mineral Resources. The Ministry of Finance plays a central role in the design and implementation of public finance matters, including environment-related taxes. The Ministry of Economy and Industry is the key authority in charge of green economy. Local authorities have a mainly executive function in matters of environmental policy.

In October 2019, an Intergovernmental Council to Promote and Implement Green Economy (2019 Resolution of the President No. 4477) was established in Uzbekistan. Its members are predominantly ministers, deputy ministers and chairpersons of state committees.

Coordination among institutions responsible for environmental protection at national, regional and local levels

There is limited information on the coordination of environmental policy measures and related expenditures between central government and the regional/local government levels. More generally, the financial resources of local governments appear to

have been largely insufficient to effectively implement the tasks delegated to them in areas such as municipal waste management, water supply and sewerage and heat supply.

3.8 Assessment, conclusions and recommendations

Assessment

In the context of a wave of major economic reforms initiated by the President since 2016, there has been marked progress towards greening of the economy in several areas. These include, notably: tariff reform for utility services; raising the water use tax; liberalization of prices of imported motor fuels; mobilization of funds for upgrading of municipal infrastructure for water supply and sewerage services and solid waste management; paving the way for a larger role for the private sector in the provision of utility services within the framework of PPPs; and establishing the basis for a more effective public procurement system. The Strategy for Transition to Green Economy for the period 2019–2030 firmly states the country's commitment to green economy.

These positive developments contrast with the fact that the existing, old system of pollution charges has remained largely unreformed, with the main exception that charge rates are now better protected against erosion through inflation; however, these charges are mainly designed to generate revenue for the environmental fund and the state budget.

Total public sector spending on environmental protection appears to be rather low in view of the existing environmental challenges.

Conclusions and recommendations

Pollution charges

The system of pollution charges is operated without a government strategy concerning environmental policy targets to be achieved. The number of air and water pollutants subject to payment of charge rates is also much too large for this. Air pollution charges can be an effective tool when they are targeted at a few major pollutants and a few major emitters, such as power plants and large industrial facilities, which is the practice in many industrialized countries. It is also questionable whether hazardous air and water pollutants and hazardous waste should be subject to pollution charges and would not better be controlled based on stringent regulations in permits. The air pollution charges for mobile sources (enterprise vehicles) amount to double taxation, given that

enterprises also have to pay the standard excise rates on motor fuels as do owners of private passenger motor cars.

Recommendation 3.1:

The State Committee on Ecology and Environmental Protection should:

- (a) *Reform the system of pollution charges by focusing on (a few) major air and water pollutants;*
- (b) *Abandon the pollution charges on enterprise vehicles to avoid double taxation;*
- (c) *Replace the pollution charges on industrial waste with cost-reflective tariffs for waste collection, transport and disposal;*
- (d) *Ensure effective pollution control and abatement by a judicious combination of pollution charges and command-and-control regulation.*

Taxation of fuel

There has been little progress in the area of taxation of transport motor fuels, such as petrol and diesel. Tax rates are very low and hardly provide incentives for fuel savings. The Government has liberalized prices of imported higher quality fuels, but prices of domestically produced motor fuels continue to be regulated and subsidized.

Recommendation 3.2:

The Cabinet of Ministers should continue with the liberalization of prices of motor fuels and raise tax rates on motor fuels, taking into account the development of incomes of the population.

Utility tariffs

The Government has made progress on reform of tariffs for utility services (energy, water, waste) by bringing them closer to cost-recovery levels. Tariffs below cost-recovery levels provide across-the-board benefits to all households, which mainly favour those with higher incomes, given that they tend to consume more energy and water resources than lower-income households. Low energy and fuel prices for domestic consumers have, moreover, depressed the financial resources that the energy sector needs for the rehabilitation and expansion of the energy sector infrastructure. Low prices are blunting incentives for investments in energy efficiency, which is potentially a large source for reducing energy consumption and related fossil fuel subsidies. In the water sector, more rational use of water resources could also be achieved by installing water meters, which are lacking for a large proportion of the population and at the point of

water abstraction. Implementation of a governmental programme to increase the proportion of households with water meters during the period 2019–2021 is crucial in this respect.

Also lacking is an effective mechanism for providing targeted social assistance for vulnerable consumers, including lower-income households that are facing higher utility charges due to more cost-reflective tariffs. The latter is one of the instruments for ensuring that the poor and vulnerable have adequate access to basic services in line with target 1.4 of Sustainable Development Goal 1.

Recommendation 3.3:

The Cabinet of Ministers should:

- (a) *Continue the process of gradually bringing utility tariffs to cost-recovery levels;*
- (b) *Support measures designed to ensure comprehensive and accurate water metering from the stage of water abstraction to the stage of final water consumption;*
- (c) *Design an effective mechanism for providing targeted social assistance to ensure vulnerable consumers have adequate access to utility services.*

Support for renewable energy

The Government has identified the introduction of renewable energy as one of its priorities under the 2017 Action Strategy on Five Priority Directions for Development for the period 2017–2021. The 2019 Law on the Use of Renewable Energy Sources, provides, inter alia, for incentives for the production of renewable energy. The increased use of renewable (solar, wind) energy can be expected to be associated with multiple benefits in terms of energy security, economic efficiency, new business opportunities and associated job creation, as well as health benefits from reduced use of fossil fuels. But a government strategy concerning support schemes needed for the promotion of renewable energy is lacking, which creates investor uncertainty. A major constraint on the promotion of RES is the abundance of traditional domestic energy sources and the prevailing fossil fuel subsidies, which impede progress with target 12.c of the 2030 Agenda for Sustainable Development related to the rationalization of fossil fuel subsidies. At the same time, the planned phasing out of fossil fuel subsidies should continue taking into account the considerations of all parts of the population, according to the “leave no one behind” principles.

Recommendation 3.4:

The Cabinet of Ministers should continue the planned phasing out of fossil fuel subsidies and the ongoing transition to cost-reflective energy tariffs, while coordinating and synchronizing them with the introduction of effective renewable energy sources support schemes, incentives, such as feed-in tariffs, and competitive bidding auctions for promoting the increased use of renewable energy.

Tax on use of water resources

The tax on use of water resources (water abstraction) was reformed by better differentiation of user categories and raising tax rates with a view to creating stronger incentives for water savings and eliminating existing implicit subsidies. A major exemption remains in that water companies do not have to pay for water abstracted for the purpose of supplying drinking water to households and other final users. Another exemption is that water abstracted for irrigation in agriculture is free. Moreover, revenues from the water use tax are allocated to local governments for spending on general purposes, although the water abstraction infrastructure is very old and needs rehabilitation and modernization.

Recommendation 3.5:

The Cabinet of Ministers should:

- (a) *Apply the water use tax to all water abstracted by water companies;*
- (b) *Review the costs and benefits of introducing water abstraction charges for irrigation water to recover the costs of water delivery to the operational areas of water user associations;*
- (c) *Earmark revenues from the water use tax for the financing of water sector infrastructure management.*

Environment-related funds

The Government has replaced the former system of environmental funds, which was dominated by local funds and left only a more residual role for a so-called national environmental fund, by a single national fund – the Fund for Ecology, Environmental Protection and Waste Management. In the context of limited financial resources, this may provide more scope for focusing on national priorities without neglecting existing and emerging regional/local environmental problems. The operational rules and procedures of the national fund are not very transparent. There is also no published annual report on revenues at the disposal of the Fund for Ecology, Environmental Protection and Waste Management and on revenues and expenditures on individual projects in the various environmental

domains supported by the Fund. In a similar vein, expenditures on environmental protection financed from the consolidated state budget do not include off-budget funds of budget organizations such as the Forestry Development Fund and the Fund for Development of Water Supply and Sanitation Systems.

Recommendation 3.6:

The Cabinet of Ministers should ensure the publication of detailed annual reports on revenues and expenditures of the Fund for Ecology, Environmental Protection and Waste Management, Forestry Development Fund and Fund for Development of Water Supply and Sanitation Systems.

Public-private partnerships

Uzbekistan has started developing the institutional and legal framework for the establishment and effective management of PPPs, which are seen as a means for obtaining private financing for procuring and maintaining public sector infrastructure in sectors such as public utilities and transportation. Target 17.17 of the 2030 Agenda for Sustainable Development encourages the formation of effective PPPs as a resourcing strategy. However, PPPs have a number of benefits and costs and should therefore be carefully designed.

Recommendation 3.7:

The Cabinet of Ministers should:

- (a) *Strengthen efforts to establish an effective and transparent public-private partnership (PPP) framework that meets advanced international standards;*
- (b) *Ensure that the administrative capacities and competencies for the evaluation of the benefits and costs of PPPs are developed.*

Public procurement

The 2018 Law on Public Procurement provides the legal foundation for raising public procurement practices to levels corresponding to international standards met by more advanced economies. The Law paves the way for green public procurement by establishing that the implementation of public procurement must take into account “the preservation of a favourable environmental situation.”

As at early 2019, the Government has not yet developed an effective policy framework and allocated sufficient human resources for public procurement of works and services in order to be able to base purchasing decisions not on a price-only criterion but to use a multi-criteria approach that considers various dimensions of quality, notably environmental impacts, in addition to price. This would allow public procurement to deliver “value for money” and, at the same time, promote the greening of public procurement in line with target 12.7 of the 2030 Agenda for Sustainable Development. Useful guidance in this respect may be drawn from the 2019 ECE Recommendation No. 43 on Sustainable Procurement.

Recommendation 3.8:

The Cabinet of Ministers should:

- (a) *Ensure that subsidiary legislation on public procurement is developed to enable the use of a multi-criteria approach that considers, inter alia, environmental impacts;*
- (b) *Allocate sufficient human resources and raise the capacity of staff working on green public procurement.*

Chapter 4

ENVIRONMENTAL MONITORING, INFORMATION AND SCIENCE

4.1 Environmental monitoring networks

Air

Since 2010, the number of air quality monitoring stations operated by Uzhydromet has decreased from 66 to 63 stationary posts. Atmospheric air pollution monitoring data is also collected at four other posts, where air sampling is carried out by laboratories of industrial enterprises or by the State Sanitary and Epidemiological Surveillance Service (SSESS) of the Ministry of Health. Atmospheric air pollution monitoring is carried out in 25 cities and settlements.

The 63 stationary posts operated by Uzhydromet are located in:

- Tashkent (13 stations);
- Fergana, Samarkand (four stations each);
- Almalyk, Angren, Andijan, Bekabad, Bukhara, Navoiy, Namangan, Chirchiq (three stations each);
- Gulistan, Karshi, Kokand, Nukus, Sariosiya, Urgench, Shakhrisabz (two stations each);
- Denau, Kagan, Kitab, Margilan (one station each).

Four other posts are located in:

- Mubarek (two stations at the Mubarek gas processing plant);
- Nurabad (one station at the Novo-Angrenskaya state district electric power station);
- Yangiyul (one station at the UzChimProm biochemical plant).

There are no automatic monitoring stations in the network. Monitoring is carried out daily, six days a week, three times a day (07:00, 13:00 and 19:00) at stationary posts of Uzhydromet. Samples are manually collected using air pumping through special absorbers for 20 minutes according to methodological guidance provided by Uzhydromet, and are analysed at the respective regional laboratory.

In total, 13 pollutants are monitored by Uzhydromet. However, not all these pollutants are monitored at every location. The most covered locations in terms of the number of parameters (8–10) covered are Almalyk, Angren, Andijan, Bekabad, Navoiy, Samarkand, Tashkent, Fergana and Chirchiq (table 4.1).

From August 2017, four heavy metals – cadmium, copper, lead and zinc – are also being monitored by Uzhydromet in Almalyk, Angren, Bukhara, Kokand, Navoiy and Tashkent Cities. In 2018, these four heavy metals were also monitored in Fergana City.

Uzhydromet also monitored PM₁₀ and PM_{2.5} during the period 2011–2017 under the scope of a joint project with WHO. Measurements of PM₁₀ and PM_{2.5} were carried out at only one station in Nukus and another in Tashkent (chapter 8). These measurements started in August 2011 and were discontinued in 2017 because the particles filters ran out and internal procurement rules have prevented Uzhydromet from successfully procuring new filters.

SSESS of the Ministry of Health monitors seven pollutants: dust, sulphur dioxide, carbon monoxide, nitrogen dioxide, hydrogen sulphide, hydrogen fluoride, ammonia.

Industrial enterprises monitor nine pollutants: dust, sulphur dioxide, carbon monoxide, nitrogen dioxide, hydrogen sulphide, phenol, hydrogen fluoride, ammonia, total hydrocarbon content. The two posts located at the Mubarek gas processing plant and one located at the Novo-Angrenskaya electric power station regularly monitor sulphur dioxide and nitrogen dioxide. The post located at the UzChimProm biochemical plant regularly monitors dust, sulphur dioxide and nitrogen dioxide.

Uzhydromet stations are divided into urban “background” stations in residential areas, “industrial” stations in the vicinity of enterprises and “transport” stations near highways or in areas with heavy traffic (table 4.2).

Table 4.1: Monitoring of air pollutants by location

	Dust	Sulphur dioxide	Carbon monoxide	Nitrogen dioxide	Nitrogen oxide	Ozone	Phenol	Solid fluoride	Hydrogen fluoride	Ammonia	Sulphates	Formaldehyde	Chlorine
Almalyk	✓			✓	✓	✓	✓	✓	✓	✓			
Angren	✓	✓	✓	✓	✓	✓	✓			✓		✓	
Andijan	✓	✓	✓	✓	✓					✓			
Bekabad	✓	✓	✓	✓	✓	✓		✓	✓	✓			
Bukhara	✓	✓	✓	✓	✓		✓			✓			
Gulistan	✓	✓	✓	✓	✓				✓				
Denau	✓			✓									
Kagan	✓			✓									
Karshi	✓			✓									
Kitab	✓			✓									
Kokand	✓		✓	✓	✓					✓			
Margilan	✓			✓									
Mubarek	✓			✓									
Navoiy	✓		✓	✓	✓	✓	✓			✓			
Namangan	✓		✓	✓	✓								
Nukus	✓		✓	✓	✓		✓						
Nurabad	✓			✓									
Samarkand	✓		✓	✓	✓		✓	✓	✓	✓			✓
Sariasiya	✓		✓	✓	✓				✓			✓	
Tashkent	✓		✓	✓	✓	✓	✓		✓	✓			
Urgench	✓			✓									
Fergana	✓		✓	✓	✓	✓	✓			✓			
Chirchiq	✓		✓	✓	✓	✓	✓			✓			
Shakhrisabz	✓			✓									
Yangiyul	✓			✓									

Source: Review of the state of air pollution in cities of the Republic of Uzbekistan on the territory of activities of Uzhydromet for 2018.

Table 4.2: Air monitoring stations operated by Uzhydromet

Type	Location	Number per location
Background stations	Tashkent	3
	Bukhara, Fergana	2
	Almalyk, Angren, Andijan, Bekabad, Kagan, Kitab, Navoiy, Namangan, Samarkand, Urgench, Chirchiq, Sharisabz, Margilan	1
Industrial stations	Tashkent	8
	Samarkand	2
	Almalyk, Angren, Andijan, Gulistan, Karshi, Kokand, Navoiy, Namangan, Nukus, Urgench, Fergana, Chirchiq	1
Transport stations	Tashkent	2
	Almalyk, Angren, Andijan, Bekabad, Bukhara, Gulistan, Denau, Karshi, Kokand, Navoiy, Namangan, Nukus, Samarkand, Fergana, Chirchiq, Sharisabz	1

Source: Review of the state of air pollution in cities of the Republic of Uzbekistan on the territory of activities of Uzhydromet for 2017.

Note: Four posts located in Mubarek, Nurabad, Yangiyul are not included.

The assessment of ambient air pollution is conducted in accordance with 2011 SanPiN No. 0293-11 “Hygienic standards of MACs of pollutants in the atmospheric air of populated areas in Uzbekistan”.

Surface water

Uzhydromet-operated network

In 2018, monitoring of the chemical composition of surface waters was conducted at 86 posts and 109 gauges located at 59 water bodies, while in 2009, surface water monitoring was conducted at 83 posts and 109 gauges located at 61 water bodies.

Monitoring of the chemical composition of surface waters is carried out by the surface water pollution monitoring laboratories of Uzhydromet in Tashkent and Fergana. Samples are manually collected at monitoring posts, stored in specific plastic bottles or glass containers, and transported to Uzhydromet’s surface water pollution monitoring laboratories for analysis. No analyses are carried out in the regional offices of Uzhydromet (other than in Tashkent and Fergana).

Chemical analysis is carried out to determine salt composition components, biogenic substances and other main and specific pollutants. Fifty-three parameters are monitored on a monthly basis for determining the hydrochemical composition of water: suspended substances, acidity, oxygen, oxygen saturation, carbon dioxide, rigidity, chlorides, sulphates, hydrocarbons, sodium, potassium, calcium, magnesium, mineralization, chemical oxygen consumption, biological oxygen demand 5, nitrogen

ammonium, nitrogen nitrite, nitrogen nitrate, amount of nitrogen, phosphates, silicon, electrical conductivity, redox potential, phosphorous common, iron common, copper, zinc, nickel, chromium common, Cr-VI, Cr-III, lead, mercury, cadmium, manganese, arsenic, phenol, oil products, synthetic surfactants, fluorine, cyanides, propane, dichlorodiphenyldichloroethane (DDE), insecticide, DDT, hexachlorane, lindane, DDD, metaphos, boutifos, dalapon, carbophos.

The location of posts where the monitoring of chemical composition was performed by Uzhydromet in 2018 is shown in table 4.3.

Monitoring of hydrobiological indicators of surface waters is conducted biannually, in spring and autumn. The main purpose of the hydrobiological monitoring is to assess the biological class and ecological condition of watercourses in comparison with the general level of water mass pollution.

In 2018, monitoring of surface waters using hydrobiological indicators was conducted at 27 gauges located at 10 water bodies: seven rivers (Kyzylcha, Dukantsay, Akhangaran, Ugam, Chirchik, Syr Darya, Kyzylsay) and three canals (Bozsu, Salar and Karasu).

The hydrobiological condition of the watercourses and the level of their pollution were determined by the indicators of periphyton and zoobenthos. Macrophytes were used as an auxiliary indicator. The final conclusion on the quality of water in the monitored gauges was made on the basis of formal saprobiotic indexes and changes in composition, structure and ecological state of aquatic biocoenoses.

Table 4.3: Uzhydromet network for monitoring of chemical composition of surface waters

	Water body	Number per water body
Rivers	Zarafshan	6
	Amu Darya, Syr Darya, Chirchik	5
	Akhangaran	4
	Kashkadarya	3
	Surkhandarya, Akdarya, Karadarya, Margilansai	2
	Obizarang, Karatag, Sangardak, Khalkadjar, Sherabad, Tankhizydarya, Amankutansay, Naryn, Isfairamsai, Kokandsai, Gedjigen, Zaaminsu, Kyzylcha, Dukantsai, Abdzhazsai, Pskem, Chimgansai, Ugam, Aktashsai	1
	Lakes	Arnasay, Western Arnasay	1
Canals	Karasu, Salar, Bozsu	2
	Left-bank canal of the Chimkurgan reservoir, supplying canal of the Kattakurgan reservoir, outlet canal of the Kattakurgan reservoir, Grand Fergana canal, South Fergana canal, North Fergana canal, derivation canal of the Farkhad hydropower plant, right-bank canal of the Tuyabuguz reservoir, Kirov canal, Yuzhno-golodnostepsky canal, South Bukhara canal	1
Water collectors and reservoirs	Siab collector, Srednekyzyltepinsky collector, Shuruzyak collector, GPK-S, Tuyamuyun reservoir, Kaparas reservoir, Sultansanzhar reservoir, Yuzhnosurkhan reservoir, Chimkurgan reservoir, Kattakurgan reservoir, Andijan reservoir, Tuyabuguz reservoir, Charvak reservoir	1

Source: Yearbook of surface water quality in the territory of activities of Uzhydromet for 2018.

Uzhydromet's network of surface water monitoring also includes 19 hydrology observatories in 13 regions and 131 hydrological observation posts (located in 10 lakes and 121 rivers), where the following parameters are monitored: water level, water temperature, water flow and turbidity. Observations are carried out twice a day (at 8:00 and 20:00); when raining, observations are carried out every three hours. Most hydrological observations are usually carried out manually using old measuring equipment, and transmission of observed data is also mostly processed manually.

Uzhydromet also conducts background monitoring of surface waters in the Chatkal State Strict Nature Reserve in accordance with approved hydrological phases. In 2017, Uzhydromet conducted hydrobiological analysis of the Kyzylsai River in the Reserve.

Other networks

The State Committee on Geology and Mineral Resources monitors content of radionuclides and a number of toxic metals in the river waters of the Chatkal-Kuraminsk region's depleted uranium deposits and the Zarafshan river valley once every six months.

The State Inspectorate for Control and Supervision over the Technical State and Safety of Large and Particularly Important Water Management Infrastructure under the Ministry of Water Management monitors irrigation collector and

drainage water flows as well as quality (notably, mineralization level). Monitoring of irrigation collector and drainage water quality is carried out quarterly on 87 main collectors.

Groundwater

The State Committee on Geology and Mineral Resources keeps annual records of fresh, brackish and mineral groundwater.

The State Committee on Geology and Mineral Resources monitors hydrodynamic and hydrochemical parameters of groundwater on 97 water deposits and 87 springs and wells, and regularly checks 250 group and 28,000 single water intakes and 350 large industrial pollution sources located in all regions of the country.

There are 14 hydrological stations – two of which are located in Tashkent Oblast and one in each other oblast of the country. The work of all 14 hydrogeological stations is coordinated by the Groundwater Monitoring and Cadastre Centre of SUE "Uzbekhydrogeology".

Monitoring activities help to determine irregularities of seasonal and long-term hydrogeochemical and hydrodynamic groundwater regimes in natural and abnormal conditions, and allow the formation or depletion of groundwater reserves to be forecast.

As at January 2018, there were 1,495 observation wells in the network under the State Committee on Geology and Mineral Resources, 1,236 of which are located at 97 groundwater reserves, 165 at or near pollution sources and 94 at hydrotechnical facilities, rivers and canals.

There is an intention to expand the groundwater monitoring network to 2,650 observation wells by January 2022 (2017 Resolution of the President No. 2954), as the current groundwater monitoring system is considered by Uzbekistan as not sufficient for timely and comprehensive assessment of negative factors affecting the pollution of aquifers, depletion of groundwater resources and flooding of settlements.

The State Committee on Geology and Mineral Resources, the State Committee on Ecology and Environmental Protection (SCEEP) and the Institute of Seismology of the Academy of Sciences approve the monitoring methodology, how frequently and in what form monitoring information should be provided, and the timelines for providing monitoring information.

Groundwater level regime and springs flow are measured by the State Committee on Geology and Mineral Resources three times a month, and once a month in desert areas. The chemical composition, particularly mineralization, is monitored by collecting samples during the vegetation and non-vegetation period. Self-discharging and production wells are monitored by the State Committee on Geology and Mineral Resources during their assessment.

The State Committee also conducts daily monitoring of groundwater levels to determine the indicators for earthquake forecasting at five monitoring posts: Nukus, Bukhara, Gazli, Karshi and Syr Darya. Operational information is provided to the Forecasting Commission of the Academy of Sciences to assess seismic activity.

Drinking water

SSESS of the Ministry of Health monitors pollution of surface waters and water bodies used for drinking water supply and recreation on a quarterly basis.

The Ministry of Health approves annual workplans for SSESS regional centres on monitoring water bodies in accordance with the State Standard “Drinking Water. Hygiene requirements and quality control” (O’zDSt 950:2011). The State Standard also provides the methodology on monitoring the quality of drinking water prior to its supply to the distribution networks.

SSESS has one national and 14 regional laboratories, where drinking water quality is monitored at different stages of treatment processes.

The number of water sampling posts located at water intake facilities, clean water reservoirs, pressure drains and the water supply distribution networks is approved in coordination with the regional bodies of SSESS.

Monitoring of water quality in centralized drinking water supply systems is carried out by certified laboratories of water supply enterprises. In 2018, the laboratories of water supply enterprises carried out drinking water quality monitoring using 8–11 indicators on a daily basis and 20–25 indicators on a monthly basis.

In 2018, the laboratories of water supply enterprises carried out drinking water quality monitoring using brief analysis indicators (total microbial number, number of *E. coli* bacteria, flavour, smell, turbidity, pH, permanganate oxidation, phyto and zooplankton) on a daily basis and using general physico-chemical analysis indicators (arsenic, nitrates, nitrites, lead, fluoride, dry residue, iron, rigidity, manganese, copper, polyphosphates, sulphates, chlorides, synthetic surfactants, petroleum products) on a monthly basis, collecting 90,000 samples at intakes of water supply distribution networks. A snapshot on drinking water monitoring in the capital is presented in box 4.1.

Box 4.1: Drinking water monitoring in Tashkent City

In Tashkent City, SUE “Suvsoz” monitors the quality of drinking water provided to households and enterprises on a daily basis. Sampling and analyses are carried out every hour at 10 chemical-bacteriological laboratories. Water comes from two groundwater and five surface water sources and is supplied through seven water facilities: Boz-Su, Kibray, Southern, Kadyrynsky, Kara-Su, Sergeli and Bektemir.

There are 366 manual monitoring posts located in all boroughs of Tashkent City. In 2010, there were 320 manual monitoring posts. The operational condition of all monitoring posts is checked on a monthly basis in accordance with the approved maintenance and repair work plan.

Monitoring data is not publicly available, but reports are provided to the Tashkent City government, the Ministry of Housing and Communal Utilities and other government agencies upon request.

In accordance with the requirements of the O'zDst: 950:2011 standard, a total of 47 indicators are monitored, including microbiological, parasitological, toxicological, organoleptic and radioactive pollution indicators.

There are five types of water quality analysis:

- Brief analysis monitors the main bacteriological indicators – total microbial number, number of *E. coli* bacteria, taste, smell, turbidity, pH;
- General physico-chemical analysis monitors the most common components in water, both natural and introduced in the process of water treatment – arsenic, nitrates, nitrites, lead, fluoride, dry residue, iron, rigidity, manganese, copper, polyphosphates, sulphates, chlorides, synthetic surfactants, petroleum products;
- Special virologic and parasitological analysis monitors pathogenic intestinal protozoa and helminth eggs;
- Special toxicological analysis monitors highly toxic substances with carcinogenic effects – barium, boron, cadmium, molybdenum, nickel, mercury, selenium, strontium, chromium, cyanides, volatile halogenated hydrocarbons, benzene, benzopyrene, pesticides, phenol, chlorophenol and other potential chemical pollutants;
- Special radiation analysis monitors total alpha and beta radioactivity, as well as radionuclide pollution, where appropriate.

The content of each type of analysis and the periodicity for each type of monitored indicator are established in water quality control schedules, developed by water supply enterprises and approved by SSESS.

Special radiation analysis and sampling frequency are approved by local governments and SSESS depending on the radiation situation, but should be conducted at least once a year.

Soil and land

SCEEP monitors soil pollution in all regions of the country twice a year, in spring and autumn, using the following parameters: chlorides, sulphates, phosphates, nitrates, fluorine, calcium, phenol,

petroleum products, ammonium, heavy metals, carbonate, bicarbonate, chlorine, organochlorine pesticides and magnesium chlorate.

It also monitors soil pollution once every six months at industrial waste storage sites, sludge collector sites, tailing dump sites, pesticide burial sites and solid waste landfills (table 4.4).

The State Committee on Geology and Mineral Resources monitors dangerous exogenous geological processes at 746 locations in zones with active dangerous geological processes, such as the formation of landslides and additive cracks, floats, splits, caving, rockfalls, subsidence in mountain and foothill areas, particularly in the Fergana Valley and Jizzakh, Kashkadarya, Samarkand, Surkhandarya and Tashkent Oblasts. Monitoring is carried out between February and June, and during November–December. Reports with recommendations on improvement of the system on prevention and elimination of consequences of environmental disasters and accidents are provided to the Cabinet of Ministers and other central and local government agencies upon request.

Uzhydromet also monitors soil and land pollution. Background pollution of soil is monitored once every six months at the monitoring station located in the Chatkal State Strict Nature Reserve. Pollution of agricultural lands with pesticides is also monitored once every six months in all regions of the country for the following parameters: organochlorine pesticides, hexachlorane, organophosphorus pesticides, phosphamide, herbicides, defoliant (chlorates), pH and humus content.

Since 2016, Uzhydromet has been monitoring soil contamination in cities with large industrial enterprises. In 2016, this was done for Bukhara, Urgench and Chirchik. In 2017 such monitoring was done in Nukus, Uchkuduk and Samarkand. In 2018, 203 soil samples were collected in Kokand, Navoiy and Tashkent to determine the content of heavy metals, mercury, sulphates, nitrate nitrogen, ammonia nitrogen, arsenic, humus, pH, fluorine and petroleum products. Additionally, in 2018, soil around Almalyk and Bekabad Cities was monitored for the content of petroleum products. In 2019, monitoring of soil contamination will be conducted by Uzhydromet in Andijan, Bekabad and Namangan.

Table 4.4: Soil pollution monitoring by the State Committee on Ecology and Environmental Protection at special sites

Type	Oblast	Name of site
Industrial waste storage	Bukhara	Radioactive waste landfill (7.1 ha)
	Navoiy	Two industrial waste landfills (24 and 56 ha respectively), construction waste landfill of the Zarafshan Construction Department (20 ha), industrial waste landfill of the State Enterprise “Navoiy Mining and Metallurgical Plant” (6.4 ha)
	Samarkand	Industrial waste landfill of the State Enterprise “Navoiy Mining and Metallurgical Plant” (40 ha)
	Tashkent	Radioactive waste landfill of the former “Uzalmazzoloto” enterprise (68 ha), burial ground for physical nuclear isotopes managed by the Academy of Sciences (315 ha), landfill of toxic wastes of the former enterprise “Zargarlik” (0.64 ha)
Sludge collector	Bukhara	Open sludge collector of the Bukhara Oil Refinery and “Uzbekneftegaz” (0.26 ha)
	Kashkadarya	Sludge collector of the JSC “Uzkimesanoat” (4.7 ha)
	Navoiy	Two sludge collectors of the JSC “Electrohimpzavod” and JSC “Uzkimesanoat” (5.34 and 125 ha respectively), one sludge collector of the JSC “Navoiyazot” (10 ha)
	Samarkand	Sludge collector of the “Samarkand-Geology” (0.4 ha), sludge collector of the JSC “Samarkand kime zavodi” (181.96 ha)
	Surkhandarya	JSC “Jarkurganefit” and “Uzbekneftegaz” sludge collector (0.03 ha)
	Syrdarya	Four sludge collectors of the Syrdarya thermal power plant and JSC “Uzbekenergo” (1.4, 1.15, 1.45 and 2 ha respectively)
	Tashkent	Four sludge collectors of the JSC “Maksam-Ammofos” (268.8 ha), Almalyk Mining and Metallurgical Plant (153 ha), Uzbek Refractory Metals Plant (40 ha), JSC “Maksam-Chirchik” (10 ha)
Fergana	Four sludge collectors of the Ferghana Oil Refinery and “Uzbekneftegaz” (0.5 ha), JSC “Fargonaazot” and JSC “Uzkimesanoat” (8 ha), Altyaryk Oil Refinery and “Uzbekneftegaz” (0.26 ha), JSC “Kuvashoyshifer” and JSC “Uzstroyaterialy” (3 ha)	
Tailing dumpsite	Jizzakh	Marjanbulak mine (46 ha)
	Kashkadarya	JSC “Uzkimesanoat” tailing dump (50 ha)
	Navoiy	Four tailing dumpsites of the Navoiy Mining and Metallurgical Plant (630, 952, 2,500 and 720 ha)
	Namangan	Almalyk Mining and Metallurgical Plant (40.7 ha)
	Samarkand	Ingichka Metalist enterprise (33 ha)
	Surkhandarya	Almalyk Mining and Metallurgical Plant (12 ha)
	Tashkent	Two tailing dumpsites of the Almalyk Mining and Metallurgical Plant (1,010 and 1,388.6 ha), one tailing dumpsite of the Navoiy Mining and Metallurgical Plant (83 ha), and Brichmulinsk tailing dumpsite (7 ha)
Pesticide burial	Republic of Karakalpakstan	Karauzyak (12.5 ha)
	Andijan	Zaurak (3 ha)
	Bukhara	Kunjikala (2 ha)
	Jizzakh	Bogdon (5 ha)
	Kashkadarya	Pachkamar (3.3 ha)
	Navoiy	Malikchul (3.3 ha)
	Namangan	Bogibaland (11.4 ha)
	Samarkand	Sezagan (2 ha)
	Surkhandarya	Navruz (5 ha)
	Syrdarya	Yangier (1.5 ha)
	Fergana	Akbarabad (0.8 ha)
	Khorezm	Okmachit (4 ha) and Tuprokkala (1 ha)
Solid waste landfill	Republic of Karakalpakstan	Nukus city (50 ha);
	Andijan	Andijan (5 ha), Asaki (6 ha), Altykul (3 ha), Markhamat (area not known);
	Bukhara	Bukhara (20 ha), Gijduvan (4,6 ha), Karakul (4 ha), Peshkuy (2 ha), Shafirkan (5 ha)
	Jizzakh	Jizzakh (26.5 ha)
	Kashkadarya	Karshi (46,95 ha)
	Navoiy	Navoiy (10 ha), Uchkuduk (15 ha), Zarafshan (24 ha), Navbakhar (3 ha), Nurata (3 ha)
	Namangan	Namangan (8.2 ha), Kasansay (5 ha)
	Samarkand	Urgut (1.5 ha), Pastdargom (2 ha), Kattakurgan city (10 ha), Narpay (5 ha), Ishtykan (1 ha), Akdarya (2 ha), Paiaryk (5 ha), Koshrabat (3 ha), Solid waste landfill (1.64 ha), Kattakurgan landfill (5 ha), Pakhtachi (5 ha), Tailak (2 ha), Samarkand (10 ha), Jambay (2 ha), Bulungur (7 ha)
	Surkhandarya	Termez (60 ha), Jarkurgan (2 ha)
	Syrdarya	Gulistan (20 ha), Yangier (3.5 ha), Bayaut (3 ha), Syrdarya city (3 ha), Shirin (1.2 ha)
	Tashkent	Bustanlyk (5 ha), Bekabad (3.2 ha), Chirchik (10 ha), Almalyk (6 ha), Urta-Chirchik (5 ha), Zangiata (8 ha)
	Fergana	Kokand city (23 ha), Margilan (11 ha), Besharyk (5 ha), Furkat (2 ha), Uzbekistan landfill (4 ha), Ferghana landfill (1 ha)
	Khorezm	Bagat (1 ha), Gurlen (5 ha), Kushkupyrt (7 ha)

Source: Programme of Environmental Monitoring for the period 2016–2020.

The State Committee on Land Resources, Geodesy, Cartography and State Cadastre monitors concentrations of organochlorine pesticides and heavy metals as well as soil salinity and nutrient content (nitrogen, phosphorus, potassium) in all regions on a quarterly basis. The State Committee also monitors the salinity of irrigated lands in the Republic of Karakalpakstan, Kashkadarya, Navoiy and Samarkand Oblasts (706,400 ha) and Andijan, Bukhara, Namangan, Surkhandarya, Tashkent and Fergana Oblasts (798,900 ha). It also carries out monitoring of soil pollution related to the operations of the Tajik Aluminum Company in the northern districts of Surkhandarya Oblast.

The State Committee also conducts periodic accounting of land composition and compiles an inventory of reclaimed agricultural lands of the country.

SSESS of the Ministry of Health also monitors soil pollution in accordance with SanPiN No. 0191-05 “Sanitary maximum permissible concentrations and tentatively permissible concentrations of exogenous harmful substances in soil”. The following indicators are monitored twice a year, in spring and autumn: benzopyrene, vanadium, manganese, tungsten, dicofol (kelthane), cobalt, copper, molybdenum, nickel, coal flotation waste, lead, sulfur, sulfuric acid, phosphates, furfuryl, chromium, alfamethylstyrene, benzene, cumene (isopropylbenzene), hydrogen sulfide, styrene, formaldehyde, liquid complex fertilizers, complex granular fertilizers, nitrates, potassium chloride, acids, arsenic, mercury, lead + mercury, antimony, toluene, fluorine, zinc.

Noise

No noise monitoring activities are carried out by governmental institutions or organizations in Uzbekistan under the state environmental monitoring programme.

Radioactivity

Uzhydromet measures natural radioactivity of air and collects radioactivity samples at 82 stations across the country. Sampling is carried out once a week, except for major industrial complexes, where sampling is carried out twice a week.

The State Committee on Geology and Mineral Resources monitors the content of radionuclides in rivers near depleted uranium deposits located in the Chatkal-Kuraminsk area and the Zarafshan River valley once every six months. It also monitors radiation and the content of radionuclides in soil of

depleted uranium deposits, as well as radiation in large settlements every six months.

SCEEP monitors radiation of soil in large settlements of the country and depleted uranium deposits on an annual basis. It also monitors two radioactive waste landfills located in Bukhara and Tashkent Oblasts once every six months.

Biodiversity

Most biodiversity monitoring is conducted in PAs, in particular those having the legal status and dedicated personnel, although, as of 2018, the populations of some rare and threatened Red Book species were also monitored outside PAs.

Field studies are regularly conducted on 11 species of animals included in the Red Book, including one reptile species (Central Asian cobra) and 10 mammal species (chapter 11).

As at 2019, regular monitoring of selected wildlife species listed in the Red Book is carried out by scientific departments of individual PAs with the support of the Academy of Sciences. For example, the Tien-Shan brown bear is monitored in Ugam-Chatkal State Biosphere Reserve (SBR), Gissar State Strict Nature Reserve (SSNR) and Kitab SSNR; Turkestan lynx is monitored in Ugam-Chatkal SBR, Chatkal state biosphere strict nature reserve (SBSNR) and Gissar SSNR; and Przewalski’s horse, goitered gazelle and Asiatic wild ass are monitored in the Species Breeding Centre (SBC) “Jeyran” (chapter 11). For plant species listed in the Red Book, monitoring is conducted only in the Gissar SSNR, by specialists from its scientific department.

The State Committee on Forestry also carries out flora and fauna monitoring activities for selected species on the lands of the state forest fund and the hunting grounds. Also, the Uzbek Fishery Association conducts the autumn count of the number of game animals inhabiting the territory of 41 hunting and fishing farms, including waterfowl, pheasant and keklik, as well as certain species of mammals, such as hare, wild boar and mountain goat.

In 2015–2016, the International Fund for Saving the Aral Sea (IFAS) Agency in Uzbekistan conducted monitoring of more than 230 species of birds on Lake Sudochie. In 2017, as part of the “Monitoring biodiversity of the South Aral Sea region wetlands” project, the IFAS Agency and the Uzbekistan Society for the Protection of Birds (UzSPB) organized field studies on Jyltyrbas Lake.

Nevertheless, despite numerous activities being carried out, long-term research on wild species of flora and fauna, especially key Red Book-listed fauna species, suffers from the lack of continuity. The geographical scope of biodiversity monitoring is limited, and the quality is influenced by the lack of scientific personnel to conduct such monitoring (chapter 11).

Forests

Forest management enterprises conduct annual seasonal evaluations of forests under their responsibility, and report monitoring results in a statistical form to the State Committee on Forestry and the State Committee on Statistics.

No modern forest inventory has been carried out since 1987, and a comprehensive scientific inventory of Uzbekistan's forest resources is not yet available. Nonetheless, during the period 2016–2019, progress was made towards the development of a sustainable

forest management (SFM) plan including SFM criteria and indicators and elements for a new forest reporting system, under the scope of a joint ECE–FAO (Food and Agriculture Organization of the United Nations) project in collaboration with the State Committee on Forestry. The SFM plan is yet to be approved.

4.2 Analytical laboratories

Ministry of Health

SSESS of the Ministry of Health has one national, 14 regional and 193 city and district-level laboratories.

The Scientific Research Institute of Sanitation, Hygiene and Occupational Diseases under the Ministry of Health has 11 specialized laboratories based in Tashkent, including the water and soil hygiene laboratory, the atmospheric air hygiene laboratory, the laboratory of hygiene and toxicology of pesticides and fertilizers and the analytical chemistry laboratory.

Photo 4: Wild ass (*Equus hemionus*) in the Species Breeding Centre “Jeyran”



Photo credit: Ms. Mariya Gritsina

SUE “Suvsoz”

The SUE “Suvsoz” based in Tashkent City has 10 chemical-bacteriological laboratories, where tests on drinking water quality are carried out daily on an hourly basis.

Uzhydromet

Uzhydromet has 22 analytical laboratories, six of which are based in Tashkent: air pollution monitoring, soil pollution monitoring, surface water pollution monitoring, radioactive pollution monitoring, physico-chemical methods of analysis and hydrobiological laboratory. The Fergana Oblast office of Uzhydromet has two laboratories monitoring air and surface water pollution, while all other regional laboratories under Uzhydromet analyse air pollution samples only. All 22 analytical laboratories are certified.

State Committee on Ecology and Environmental Protection

SCEEP has 15 analytical laboratories: the Centre for Specialized Analytical Control on Environmental Protection (CSAC) based in Tashkent and regional laboratories in each of 12 oblasts, the Republic of Karakalpakstan and Tashkent City. Four analytical laboratories are accredited (CSAC and the regional laboratories in Tashkent, Fergana and Surkhandarya Oblasts). Eleven analytical laboratories are certified. All of them monitor air, surface water and soil pollution.

There is currently no portable (mobile) laboratory capacity to monitor sources of pollution.

4.3 Availability of environmental information*Data reporting by enterprises*

Self-monitoring of emissions is carried out only by large industrial enterprises (e.g. cement plants). The self-monitoring information is submitted by the enterprises to the respective territorial bodies of SCEEP.

Pollution-at-source monitoring by CSAC

Companies subject to pollution-at-source monitoring – notably, companies of categories I and II – are monitored by CSAC under SCEEP. CSAC’s pollution-at-source monitoring includes the monitoring of air emissions from enterprises (on a monthly basis), discharges from wastewater treatment plants in water bodies and from other enterprises in urban wastewater

collection systems (every three months), and soil contamination (carried out twice a year, in autumn and spring). Although these activities are formally called “monitoring”, in essence they are part of periodical environmental inspections of the listed facilities agreed by the Business Ombudsperson (chapter 2).

In 2018, monitoring of air emissions at source was carried out in 157 enterprises (mostly industrial facilities), wastewater monitoring in 110 enterprises, and soil contamination in 75 enterprises (including tailings and sludge pits of large industrial enterprises, oil refineries and oil depots, large mineral fertilizers and toxic chemicals warehouses, pesticide burial grounds and former agricultural airfields) (table 2.6). CSAC consolidates data from pollution-at-source monitoring activities in its electronic monitoring database.

Statistical data

The Department of Agriculture and Ecology Statistics of the State Committee on Statistics collects environmental statistical data. Such data is collected through statistical forms covering data on air emissions at source; generation, disposal and storage of wastes; environmental protection costs and environmental pollution payments; land reclamation; forest areas and reforestation; and hunting.

In 2017, the number of environmental statistical data forms has been reduced, mostly by merging several forms into one, in order to simplify data collection, but the volume and content of collected data has not changed. As at 2019, the following six environment-related statistical forms are in use:

- 1-ECO: report on nature protection;
- 2-ECO: report on protected areas;
- 3-ECO: report on land reclamation;
- 1-OX: report on forestry;
- 1-OX: report on hunting activities;
- 1-KV: report by small and micro-enterprises on nature protection.

Environment-related data are made publicly available by the State Committee on Statistics in the publications “Main Indicators of Nature Protection and Rational Use of Natural Resources, Forestry and Hunting” (published annually) and “Uzbekistan in Figures”, which are both distributed in a limited print run as sales publications only. Outside the system of governmental authorities, environmental statistics are made available upon request and only for a fee. While a significant revamping of the State Committee on Statistics’ website was undertaken in 2017 and many statistics started to be published online following the

2017 Resolution of the President No. 3165, as at October 2019, the State Committee on Statistics does not yet upload environmental statistical data onto its website except for two tables (“Protected areas” and “Air emissions by oblast”).

The System of Environmental-Economic Accounting (SEEA) has not yet been introduced in Uzbekistan. It is envisaged to gradually develop and introduce SEEA through joint efforts of ministries and agencies.

The State Committee on Statistics devotes significant attention to gender statistics and maintains a dedicated portal (<https://gender.stat.uz/>); however, no gender and environment statistics are collected. This is an important area to develop considering the requirements for gender-disaggregated information for monitoring the Sustainable Development Goals.

Databases

Pollution sources monitoring database

CSAC under SCEEP maintains a “pollution sources monitoring database” and a portal for internal use, with data on air emissions, wastewater discharges and soil contamination (miz.uznature.uz). The online portal has been operational since 2013. Access to the online portal is password restricted since it is used as an internal tool for collecting data from the territorial offices of SCEEP – entered directly into the system by specialists in each oblast – as well as for centralized data management.

All data entered in the database are georeferenced in preparation for future integration with geographical information systems (GIS) tools. While GIS functionalities and analytics are not yet in place due to a lack of funds, the database already enables the extraction of data per pollutant, per period, per region and by other parameters.

CSAC has also developed a portal (<http://csak.uz/ru/>) for both internal and external access, which is still in the pilot phase but is expected to be operational by the end of 2019. In the future, the portal will be used to collect emissions data entered directly by enterprises and will display simplified aggregated data to the public (e.g. number of companies and parameters monitored, but not monitoring results). Government agencies will have full access to the complete database (through a passport-protected level of access), while the public will have access only to aggregated data visualizations. While Uzbekistan is not a party to the Protocol on Pollutant Release and Transfer Registers (PRTR Protocol) to the Aarhus Convention, the development of CSAC’s portal may be a good step

forward towards the establishment in the future of a pollutant release and transfer register in Uzbekistan in line with modern international standards. CSAC is seeking funds to complete the portal and make it fully operational.

State Water Cadastre

The State Water Cadastre, maintained by Uzhydromet, contains annual and long-term data on the surface water regime and resources, as well as information on the use and quality of both surface and groundwater resources.

Work is under way by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) to conclude the development of a digital State Water Cadastre Information System powered by GIS tools under the scope of an EU-funded programme on “Sustainable water management in rural areas of the Republic of Uzbekistan”, which will also digitize the Cadastre of Hydraulic Structures (coordinated by the State Inspectorate for Control and Supervision over the Technical State and Safety of Large and Particularly Important Water Management Infrastructure (Gosvodhoznadzor)) and develop a similar GIS-supported information system.

Once finalized, both cadastre information systems will enable real-time sharing of data and information among all project-participating agencies (Uzhydromet, the State Committee on Geology and Mineral Resources and the Ministry of Water Management) and will also support the preparation of maps and reports. It is expected that selected data from the State Water Cadastre will also be made publicly available online.

State cadastres of flora and fauna

The Academy of Sciences carries out cadastral works for the state cadastres of flora and fauna. Outcomes of research by the Academy of Sciences are provided to SCEEP for inclusion into the cadastres. Due to the lack of targeted funding for cadastral works, the Institute of Botany of the Academy of Sciences collects data on rare species in stages, by administrative regions of the country, within the framework of research projects funded in the form of governmental grants (chapter 11). Some of the cadastre data is georeferenced, particularly data regarding rare plant species listed in the national Red Book.

Environmental indicators and their use

During the period 2010–2011, the then State Committee for Nature Protection improved a database

of 91 environmental indicators (78 short-term indicators, 8 medium-term indicators and 5 long-term indicators) that had been previously developed under the scope of a United Nations Development Programme (UNDP) project that promoted the application of the environmental indicators developed by ECE. The set of 91 indicators includes 20 indicators on atmospheric emissions, 25 on water resources, 14 on land resources, 9 on waste, 6 on biodiversity, 6 on climate change, 5 on public health, 4 on energy and 2 specifically related to the Aral Sea. The improvement made in 2010–2011 referred to the introduction of GIS technology. Furthermore, the overall database was improved for better collection, storage, analysis and sharing of data. There is no evidence that the database is still in use in 2019. According to the State Committee on Statistics, it produces 17 out of 91 environmental indicators; some of these 17 indicators are produced jointly with relevant ministries and agencies.

Indicators and information for the Sustainable Development Goals

In 2018–2019, a national Sustainable Development Goals indicator framework was developed under the leadership of the State Committee on Statistics, building on the global Sustainable Development Goals indicator framework and also taking additional indicators into account. The national indicator framework was endorsed in March 2019, including a total of 206 indicators, of which 46 relate to the environment. Of the 46 environment-related indicators, only nine are considered as Tier I, i.e. have data available and no methodological problems. Others are categorized as Tier II or III, meaning that data on those is currently not collected or not available or that there are gaps in national methodologies.

In some circumstances, the national indicators have a different, usually more limited, scope than the corresponding ones in the global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development, such as:

- National indicator 3.9.1 Mortality rate attributed to the toxic effect of chemicals per 100,000 population (instead of global indicator 3.9.1 Mortality rate attributed to household and ambient air pollution) (box 8.3);
- National indicator 6.1.1 Proportion of population using: a) centralized water supply, b) alternative sources of water supply (instead of global indicator 6.1.1: Proportion of population using safely managed drinking water services) (box 9.3);

- National indicator 7.2.1 Proportion of electricity generated from renewable energy sources in total electricity generation (instead of global indicator 7.2.1 Renewable energy share in the total final energy consumption) (box 12.1);
- National indicator 6.3.2 Water pollution index (WPI) (instead of global indicator 6.3.2 Proportion of bodies of water with good ambient water quality) (box 9.3);
- National indicator 6.4.1 Water consumption per unit of GDP, m³/US\$1,000 of GDP (PPP) (instead of global indicator 6.4.1 Change in water use efficiency over time), although Uzbekistan reported under the global indicator 6.4.1 in 2018 (box 9.3);
- National indicator 11.4.1 State budget expenditure on cultural development per capita (instead of global indicator 11.4.1 (Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)) (box 6.1);
- National indicator 12.4.1 Existence of international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement (instead of global indicator 12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement);
- National indicator 12.5.1 Processing level of municipal solid waste, percentage (instead of global indicator 12.5.1 National recycling rate, tons of material recycled) (box 10.1);
- National indicator 15.4.1 Proportion of protected mountain ecosystems in their total area (instead of the global indicator 15.4.1 Coverage by protected areas of important sites for mountain biodiversity) (box 11.1).

Under target 15.5, Uzbekistan legitimately added the national indicator 15.5.2 The number of species listed in the national Red Book, as the global indicator 15.5.1 Red List Index was inappropriate for the country (box 11.1). However, the absence of two global indicators (6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation and 15.1.2 Proportion of important sites for terrestrial and

freshwater biodiversity that are covered by protected areas, by ecosystem type) among the national indicators of Uzbekistan cannot be explained and justified, especially since Uzbekistan reported on global indicator 6.5.2 in 2018 (box 6.4).

Uzbekistan makes indicator data available to the public through its dedicated national Sustainable Development Goals portal (<http://nsdg.stat.uz/>). The website was designed to provide centralized access to information resources that will track the implementation of Sustainable Development Goals and targets adopted by Uzbekistan. Of the total of 206 indicators in the national indicator framework, as at May 2019, data is provided online for 64 indicators, including 10 of the 46 environment-related indicators (6.3.1, 7.2.1, 7.3.1, 7.b.1, 11.2.1, 11.3.1, 11.7.1, 12.4.2.1, 12.4.2.2 and 12.b.1). The portal is mostly in Russian, with some pages also available in English and Uzbek.

The Roadmap on implementation of the national goals (2018 Resolution of the Cabinet of Ministers No. 841) identifies the need for the development of national indicator methodologies in coordination with the United Nations Statistical Commission and other United Nations bodies, and for the exchange of international experience. It also foresees the inclusion of statistical data collection on national indicators in the State Statistical Work Programme.

Implementation of Shared Environmental Information System (SEIS) principles

Uzbekistan participates in the work of the ECE Working Group on Environmental Monitoring and Assessment and the ECE Joint Task Force on Environmental Statistics and Indicators, which support countries in Europe and Central Asia to establish SEIS by 2021.

Uzbekistan does not yet fully implement SEIS principles of open access to environmental data.¹⁶ While comprehensive sets of environmental data and information (e.g. including environmental monitoring data, environmental indicators and statistics, environmental reports, etc.) are regularly produced and information is stored and processed in the organizations that collect it (i.e. managed at source), it is not easily shared as many and long approvals are required, making it difficult to exchange and submit data in a timely manner in support of reporting processes. In addition, most environmental data and

information is only shared among government agencies, and only a fraction is made available and accessible to the public, mostly upon request and on payment of a fee.

Many periodic reports and bulletins (e.g. regular reports on the outcomes of environmental monitoring produced by Uzhydromet, information bulletins produced by CSAC, etc.) are accessible only to selected government agencies. Other reports, such as the State Committee on Statistics publications “Main Indicators of Nature Protection and Rational Use of Natural Resources, Forestry and Hunting” and “Uzbekistan in Figures” are made available only in print form and through limited print runs and, although available for purchase in print format, are not accessible online. There is very limited online accessibility to environmental data and information.

Environmental reporting and publication of environmental data

State of the Environment Report

According to national regulations, SCEEP is tasked with publishing every year a national report on the state of the environment and use of natural resources. The last edition of the report was published in 2013, covering the period 2008–2011. This last edition of the report is not available online, and no other State of the Environment Report has been produced since.

In addition to being outdated, the latest report is largely descriptive, does not follow the widely used D-P-S-I-R (driving forces–pressure–state–impact–response) analytical framework, nor is it an indicator-based report, in spite of including a variety of informative data and indicators presented in various formats.

Information Bulletin on the State of Pollution Sources and their Impact on the Environment

CSAC under SCEEP produces quarterly reports and an annual Information Bulletin on the State of Pollution Sources and their Impact on the Environment.

The quarterly report and annual Information Bulletin are based upon monitoring data collected by the territorial units of SCEEP and sent to CSAC for processing.

¹⁶ SEIS principles of open access to data: data are managed as close as possible to the source, and data are collected once and shared for many purposes.

The latest annual Information Bulletin covers the period 2013–2017 and includes detailed information and data on air emissions, wastewater discharges and soil contamination at industrial enterprises and other sites. It also includes data on exceedances of pollution levels by individual enterprises, comparing these to established limit values (for air pollution) and relevant MACs (for water and soil quality).

Neither the quarterly reports nor the annual bulletin, and the data therein, are made publicly available.

Information Bulletin on the State of Groundwater and its Use

The State Committee on Geology and Mineral Resources operates a groundwater database on the levels and quality of groundwater and publishes an annual Information Bulletin on the State of Groundwater and its Use, including information on trends in underground water reserves.

This annual bulletin is distributed to approximately 40 government agencies and institutions, including SCEEP, the State Committee on Land Resources, Geodesy, Cartography and State Cadastre, the Ministry of Housing and Communal Utilities, khokimiyats, etc.

Neither the annual bulletin nor the data therein are made publicly available.

Environmental monitoring bulletins and reports produced by Uzhydromet

Uzhydromet publishes a variety of daily, monthly, quarterly and annual information products, including different types of bulletins and reports on its air quality, surface water quality and soil pollution monitoring activities (table 4.5). With the exception of the daily environmental bulletin on air pollution in Tashkent City, no other environmental monitoring information is made publicly available.

4.4 Science and research in support of environmental protection

Policies and priorities

In 2012, the then operational Committee for the Co-ordination of Science and Technology Development under the Cabinet of Ministers formulated eight priorities for research and development to 2020, based on national needs. Two of these research priorities focused on energy and resource savings, and the development of renewable energy, and have led to the establishment of dedicated research institutes. Another

research priority focused on agriculture, biotechnology, ecology and environmental protection, and another on Earth sciences, notably on geology, geophysics, seismology and raw mineral processing. In parallel, in 2012, the institutional reform led to the restructuring of several institutions under the Academy of Sciences with the aim to reorient academic research from basic to applied research.

The Action Strategy on Five Priority Directions for Development for the period 2017–2021 (2017 Decree of the President No. 4947) prompted stronger focus on science and innovation. As part of the large-scale reforms that started in the country in 2017, the Ministry of Innovation Development was created in November 2017 to promote innovation in all sectors of the economy and provide strategic planning and prioritization of scientific research activities and technology development. It is charged with promoting sectoral innovation, also including innovation on environmental protection and environmental management.

The 2018 Strategy for Innovative Development for the period 2019–2021 (2018 Decree of the President No. 5544), together with a roadmap for its implementation, specifically focuses on stimulation of research and innovation, and the creation of scientific laboratories and technology centres at universities and research institutes. Developed with support from UNDP, it focuses on the development of human capital to foster Uzbekistan's competitiveness and innovation. Among other activities, the Strategy promotes the integration of education, science and industry, and an increase in the investment of public and private funds into innovation, science and research. However, environmental protection is not a prominent component of the Strategy. While the Strategy does not define specific sectoral priorities for research and innovation, the roadmap foresees the definition by 1 March 2019 of priority areas of science and technology for the development and financing of targeted state scientific and technical programmes, technology transfer and commercialization. As at June 2019, the planned prioritization of scientific and technological areas/sectors had not yet been carried out.

Scientific research on environment-related issues

Scientific research, applied research and technological development in fields directly related to environmental protection are conducted by several scientific and research institutes. So far, the increased focus of the Government on science and innovation has not manifested itself in significant changes in the

activities of these institutions, either in terms of widening of the scope of research or in terms of enhanced funding, staff or equipment. Applied research on environment-related issues, notably on

renewable energy, is a strong point in activities of the Physics and Technical Institute “Physics-Sun” of the Academy of Sciences but not of other scientific and research institutes.

Table 4.5: Information products regularly prepared by Uzhydromet

Information product	Frequency	Distribution list/target users
Daily environmental bulletin on air pollution in Tashkent city	Daily	Public information posted on the website of Uzhydromet
Monthly air pollution information for Tashkent, Almalyk, Angren, Bekabad, and Chirchiq cities	Monthly	The Cabinet of Ministers, SCEEP, Tashkent Regional Department on Ecology, Tashkent City Department on Ecology, Center for Specialized Analytical Control, Khokimiyat of Tashkent city, the Ministry of Emergencies, the Prosecutor's Office, the Ecological Movement of Uzbekistan, and the laboratories of Almalyk, Angren, Bekabad, Chirchiq cities
Monthly information on high and extremely high environmental pollution events	Monthly	The Cabinet of Ministers, SCEEP and laboratories of Almalyk, Angren, Bekabad and Chirchiq cities
Monthly bulletin on water quality of primary water courses (as per defined hydrochemical indicators)	Monthly	The Cabinet of Ministers, SCEEP, Tashkent Regional Committee on Ecology, Center for Specialized Analytical Control, the Prosecutor's Office, the Ecological Movement of Uzbekistan, the Ministry of Water Management, Uzhydromet in Navoiy, Nukus, Samarkand, Termez, Fergana, Bukhara, and Andijan cities
Monthly bulletin on environmental condition of the primary water courses of Tashkent Oblast and water quality (as per defined hydrobiological indicators)	Monthly Mar.-Nov.	SCEEP, the Ecological Movement of Uzbekistan
Quarterly note on the state of environmental pollution in the Republic of Uzbekistan	Quarterly	SCEEP (for a summary report preparation to the Cabinet of Ministers)
Information on the state of environmental objects of Chirchiq city and the territory adjacent to it following the results of monitoring	Monthly	Center for Specialized Analytical Control of the SCEEP
Information on air and surface water pollution in the area of influence of Tajik Aluminium Company TALCO	Quarterly	Senate of the Oliy Majlis of the Republic of Uzbekistan
Information on surface water quality of the Zarafshan river basin	Quarterly	Senate of the Oliy Majlis of the Republic of Uzbekistan
Data on the air and surface water pollution level in the area of influence of Tajik Aluminium Company TALCO	Monthly	Saryasiyan Air Pollution Monitoring Laboratory
Information on air, surface water and soil pollution in the area of influence of Tajik Aluminium Company TALCO	Quarterly	Center for Specialized Analytical Control of the SCEEP
Information on the state of environmental objects of the Republic of Uzbekistan according to observation data of Uzhydromet in accordance with the 2014 Resolution of the Cabinet of Ministers No. 216	Quarterly	SCEEP
Report on environmental pollution monitoring to prepare a National Report	Annually	SCEEP
Review of the state of air pollution in cities of the Republic of Uzbekistan on the territory of activities of Uzhydromet	Annually	Ministry of Health, SCEEP
Yearbook of soil pollution in the Republic of Uzbekistan on the territory of activities of Uzhydromet	Annually	Ministry of Health, SCEEP
Yearbook of surface water quality in the territory of activities of Uzhydromet	Annually	Ministry of Health, SCEEP
Annual data on quality of terrestrial surface water. Basins of the Syrdarya and Amudarya rivers	Annually	Stored at the Service for Monitoring Air, Surface Water and Soil Pollution as an archive of primary data
Report on surface water quality for the Yearbook on Water Cadastre	Annually	State Water Cadastre Department of Uzhydromet

Source: Uzhydromet, 2019.

Research projects focused on the inventory and assessment of flora and the collection of data on rare plant species are implemented by the Institute of Botany of the Academy of Sciences. Modern geographical information technologies (GIS, remote sensing) are used to conduct cadastral works, geobotanical studies, mapping and assessment of vegetation in the arid zones of Uzbekistan. Since 2012, the Institute has been digitizing the National Herbarium of Uzbekistan, using modern information technologies. The main research product of the Institute is the publication “Flora of Uzbekistan”.

Research activities focusing on the identification and assessment of species are also conducted by the Institute of Zoology of the Academy of Sciences. The Institute maintains seven zoological collections and has a wide range of research activities on entomology and parasitology, focusing on ways to fight pests (particularly, pests present in the agricultural sector). Research is under way on rare and widespread species of vertebrates (reptiles, birds and mammals) with emphasis on the use of non-invasive methods of observation (e.g. camera traps). Forecasting of the impact of radiation in rare animal species is another topic of research.

Research activities in the field of molecular biology, genetics and genomics in support of the development of transgenic varieties of cotton, wheat and other plants are carried out at the Centre of Genomics and Bio Informatics of the Academy of Sciences, founded in 2012. Its main areas of research include: complex analysis of genomes and genetic diversity, proteins and metabolites of agricultural crops, medicinal and industrial plants, using modern genomics and bioinformatics; and development of programmes for modern genetic and cellular engineering of new varieties of plants resistant to pests and diseases and adapted to different soil and climatic conditions. The Centre is also working on developing new salt- and drought-resistant crops of cotton, wheat, pomegranate and potato, particularly for the Aral Sea region.

Fundamental and applied research on high energy physics, solid body theory, semiconductor physics and solar energy transformation is conducted by the Physics and Technical Institute “Physics-Sun” of the Academy of Sciences, founded in 1943. The Institute has eight laboratories, two of which are occupied with solar PV applications and solar thermal applications. The Institute regularly collaborates with SCEEP, providing expertise when required. It also runs a variety of research projects including solar power and solar thermal pilot projects in the horticulture sector (notably solar dryers and greenhouses, solar-powered water pumping) and in rural settlements (solar water

heating, solar-powered water extraction and drinking water distribution). The Institute also collaborates with national manufacturing companies on technological development and production of solar water collectors and solar water heating systems aimed at both the local market and export.

Research aimed at identifying the causes and impacts of pollution events, including research on air and water pollution and its effects on health, on climate change and heat wave impacts on human health, and on mapping of waterborne diseases, is conducted by the Scientific and Research Hydrometeorological Institute of Uzhydromet. The Institute also carries out research on agro-meteorology, notably on soil conditions in pasture lands and on how climate and vegetation type influence evapotranspiration. Hydrometeorological adaptation measures were also the focus of research activities that resulted in the production of maps/atlasses for the Ministry of Emergencies.

Research on industrial emissions reduction, on prevention of surface and groundwater pollution, on waste management and wastewater treatment, and on its applications in industry (including the mining industry) is conducted by the Scientific and Research Institute on Environment and Nature Protection Technologies under SCEEP. The Institute was established in 2017 on the basis of another scientific and research institute, founded in 1962. The Institute collaborates with industrial enterprises on specific research projects. It also carries out research on the prevention of soil salinization. In 2018, the Institute was assigned additional functions geared towards research on technologies decreasing the pressures on biodiversity and its structure was enhanced with the establishment of air, water and soil protection laboratories (2018 Resolution of the Cabinet of Ministers No. 958). In general, the Institute struggles with a lack of funding for applied research in the field of pollution prevention and control technologies, which are not produced in the country and have to be imported.

4.5 Legal, policy and institutional framework

Legal framework

In 2019, Uzbekistan updated the legal framework for environmental monitoring in the country. The new Regulation on Environmental Monitoring (2019 Resolution of the Cabinet of Ministers No. 737) was approved in September 2019 in place of the old one (2002 Resolution of the Cabinet of Ministers No. 111). The new Regulation covers all domains of

environmental monitoring in much more detail. It includes provisions for:

- The creation of a unified geo-information database of the environmental monitoring system to be developed by CSAC;
- Expansion of the scope of the environmental monitoring system into the domains of flora and fauna monitoring;
- The regulation of environmental monitoring data forms and of data sharing and transfer procedures from ministries and agencies to CSAC;
- Large-scale introduction of automatic air quality monitoring;
- The creation of a publicly available ecological map of Uzbekistan to increase public awareness of the state of the environment.

The 2019 Resolution No. 737 also includes provisions for:

- The improvement of equipment in analytical laboratories;
- Centralized procurement of chemical agents, test gases, precursors and other consumables necessary for the operation of the state environmental monitoring network;
- Progressive installation of automatic monitoring of air emissions at source in enterprises of category I;
- Pursuing accreditation of all national and oblast analytical laboratories under concerned ministries and agencies by 1 January 2021;
- Automation of the air pollution monitoring network using funding from international organizations and donor countries.

The 2018 Resolution of the Cabinet of Ministers No. 970 “On measures to strengthen the material and technical resources of the Centre of Hydrometeorological Service under the Ministry of Emergency Situations of the Republic of Uzbekistan” provides for enhancement of Uzhydromet monitoring equipment. Groundwater monitoring is regulated by the 2014 Resolution of the Cabinet of Ministers No. 119, which approves the Regulation on monitoring of subsoil. Monitoring of sources of environmental pollution by CSAC is detailed in the 2017 Resolution of the Cabinet of Ministers No. 377.

The assessment of concentrations of pollutants is conducted in accordance with standards such as SanPiN No. 0191-05 (on soil), SanPiN No. 0293-11 (on air), O’zDSt 950:2011 (on drinking water) and SanPiN No. 0318-15 (on water bodies).

There is subsidiary legislation detailing the

development and maintenance of the State Water Cadastre (1998 Resolution of the Cabinet of Ministers No. 11), State Cadastre of Flora and State Cadastre of Fauna (2018 Resolution of the Cabinet of Ministers No. 914).

Policy framework

Since 2010, environmental monitoring activities have been conducted according to the programmes of environmental monitoring approved by the Cabinet of Ministers every five years:

- Programme of Environmental Monitoring for the period 2006–2010 (2006 Resolution of the Cabinet of Ministers No. 48);
- Programme of State Environmental Monitoring for the period 2011–2015 (2011 Resolution of the Cabinet of Ministers No. 292);
- Programme of Environmental Monitoring for the period 2016–2020 (2016 Resolution of the Cabinet of Ministers No. 273).

Each programme includes overall environmental monitoring goals and strategies, and mechanisms for their implementation.

In 2011, biodiversity was included for the first time in the programme of environmental monitoring. Nevertheless, the geographical scope of biodiversity monitoring remains limited, mostly to selected PAs (chapter 11).

A programme of state statistical works is approved annually by the Cabinet of Ministers.

Scientific support to environmental protection is addressed in the Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863).

Sustainable Development Goals and targets relevant to this chapter

The current stand of Uzbekistan vis-à-vis target 9.5 of the 2030 Agenda for Sustainable Development is described in box 4.2.

Institutional framework

The overall coordination of state environmental monitoring activities is carried out by SCEEP, which collects monitoring data from all other governmental bodies involved in the implementation of the five-year programme of environmental monitoring. The responsibilities of these government bodies in terms of environmental monitoring and sending data to SCEEP (and other relevant bodies) are defined in the five-year

programme on environmental monitoring. Until recently, the responsibilities of sending data were defined in terms of periodicity but there were no specific deadlines for producing and sharing environmental data. The new Regulation on Environmental Monitoring, approved in September 2019, sets not only the periodicity but also deadlines for sending data and information to CSAC under SCEEP. It also defines deadlines for inclusion of data and information by various bodies in the unified geo-information database of the environmental monitoring system (still to be created). The new Regulation also includes details on the format in which data is to be shared and content of the data. Despite these positive developments in the legal framework, actual improvement in the sharing of data is to a great extent dependent on the creation and efficiency of the unified geo-information database.

In addition to overall coordination of environmental monitoring activities, SCEEP is also responsible for monitoring the sources of pollution (including air emissions, wastewater discharges and soil pollution) and terrestrial ecosystems. It is also responsible for carrying out monitoring of fauna and flora in PAs subordinated to SCEEP in cooperation with the Academy of Sciences.

Uzhydromet under the Cabinet of Ministers is the main state authority monitoring air pollution, surface water quality and soil pollution, as well as background radiation.

In addition to soil pollution monitoring activities

carried out by Uzhydromet and by SCEEP (the latter at the sources of pollution), the State Committee on Land Resources, Geodesy, Cartography and State Cadastre also monitors soil pollution, as well as soil salinity and nutrient content, in all regions of the country on a quarterly basis. The State Committee on Land Resources, Geodesy, Cartography and State Cadastre also monitors the salinity of irrigated lands in the Republic of Karakalpakstan and Kashkadarya, Navoiy, Samarkand, Andijan, Bukhara, Namangan, Surkhandarya, Tashkent and Fergana Oblasts. It also carries out comprehensive monitoring of soil pollution related to the operations of the Tajik Aluminum Company in the northern districts of Surkhandarya Oblast.

SSESS of the Ministry of Health monitors air and soil pollution under the scope of the overall responsibilities of the Ministry of Health on sanitary and hygienic environmental monitoring. It also monitors the pollution of surface waters and water bodies used for drinking water supply and recreation.

The Ministry of Water Management monitors mineralization levels in the main parts of water distribution and drainage networks.

The State Committee on Geology and Mineral Resources is responsible for monitoring groundwater pollution and hazardous geological processes.

The scientific departments of protected areas carry out biodiversity monitoring activities with the support of the Academy of Sciences.

Box 4.2: Target 9.5 of the 2030 Agenda for Sustainable Development



Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Target: 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

National target 9.5 has minor differences from the global target. National indicators 9.5.1 and 9.5.2 are identical to the global ones.

In Uzbekistan, domestic expenditure on research and development (R&D) in 2017 accounted for 0.19 per cent of GDP (indicator 9.5.1: Research and development expenditure as a proportion of GDP), varying little since 2010. This is low compared with OECD Member countries, where the average share was 2.37 per cent of GDP in 2017. It is also low compared with the global average: the 2017 Sustainable Development Goals Report by the United Nations indicates that 1.7 per cent of global GDP was devoted to R&D in 2014. It is not possible to identify the impact of R&D on low carbon development and green technology in Uzbekistan.

The number of researchers (in full-time equivalent) per million inhabitants in Uzbekistan was 485 in 2017 (indicator 9.5.2: Researchers (in full-time equivalent) per million inhabitants), compared with 534 in 2010. This is below the world average (1,098 in 2014) and lower than in Europe and Northern America (3,500 in 2014).

Source: State Committee on Statistics (<http://nsdg.stat.uz/goal/12>).

The State Committee on Forestry compiles forest monitoring data from forest management enterprises (leskhozes), which conduct annual seasonal evaluations of forests under their responsibility. It also carries out flora and fauna monitoring on the lands of the state forestry fund and forest hunting grounds.

The Ministry of Innovation Development is responsible for promoting innovation, including on environmental protection. The Ministry approves grants for basic, applied and innovative programmes and projects carried out by scientific, technical and/or research institutes, including grants for research initiatives related to environmental protection.

Participation in international processes

SCEEP and the State Committee on Statistics regularly participate in the work of the ECE Working Group on Environment Monitoring and Assessment and the ECE Joint Task Force on Environmental Statistics and Indicators.

SCEEP has also been participating in meetings under the scope of the PRTR Protocol, although not on a regular basis. Uzbekistan is not a party to the PRTR Protocol.

4.6 Assessment, conclusions and recommendations

Assessment

State environmental monitoring is carried out in accordance with the Programme of Environmental Monitoring coordinated by SCEEP. The air quality, surface water quality, soil pollution and radiation monitoring networks run by Uzhydromet cover all the requirements of the Programme of Environmental Monitoring for the period 2016–2020. Monitoring frequencies and parameters are in line with normative provisions but *automatic* monitoring/data collection, data quality control, processing and transfer is non-existent, preventing any type of continuous monitoring or collection of data in real time and often preventing the timely provision of monitoring data to other relevant institutions including SCEEP as the coordinating authority. Hydrological observations and both processing and transmission of observation data is also mostly carried out manually. The 2019 Resolution of the Cabinet of Ministers No. 737, which approved the new Regulation on Environmental Monitoring, addresses these gaps and is expected to foster improved data collection, sharing and transfer procedures. Regarding atmospheric air pollution, the lack of monitoring of PM₁₀ and PM_{2.5} is a clear drawback; provisions for large-scale introduction of

automatic air quality monitoring stations under Resolution No. 737 are expected to address this problem. While the inclusion, since 2011, of biodiversity monitoring in the five-year programmes of environmental monitoring is an achievement, noise monitoring activities are still not part of the programme of environmental monitoring.

Uzbekistan does not yet fully implement SEIS principles of open access to environmental data. Only a limited number of environment-related data are made publicly available, and almost none is available online. The establishment of an integrated environmental database at SCEEP that would link with the environmental databases of all other public authorities operating environmental monitoring activities under the scope of the Programme of Environmental Monitoring is yet to take place. Most of the environmental reports and bulletins produced by government agencies under the scope of the Programme of Environmental Monitoring are not publicly available.

In March 2019, Uzbekistan progressed with defining 206 national Sustainable Development Goals indicators and operationalizing the national Sustainable Development Goals portal. The challenges include the non-availability of data and methodologies for the vast majority of national environment-related indicators, as well as the limited online availability of data on environment-related indicators on the national portal.

In the absence of sectoral prioritization in the implementation of Uzbekistan's Innovative Development Strategy for 2019–2021, there is also no prioritization of financing for scientific research and innovation in support of environmental protection.

Conclusion and recommendations

Environmental monitoring

Environmental data monitoring/collection, quality control, processing and transfer is mostly undertaken manually, resulting in the unavailability of any real-time data. In the particular case of atmospheric air pollution, PM₁₀ and PM_{2.5} are not monitored. Noise monitoring activities are absent in the five-year programme of environmental monitoring.

Recommendation 4.1:

The Cabinet of Ministers should ensure that:

- (a) *The Programme of Environmental Monitoring includes measures to promote further automation and digitalization of the state*

- environmental monitoring;*
- (b) *The State Committee on Ecology and Environmental Protection, in coordination with Uzhydromet and other relevant government bodies, automates data collection, quality control and transfer in general towards the establishment of a continuous monitoring and real-time pollution data collection system, particularly with regard to the atmospheric air pollution monitoring network;*
- (c) *Noise monitoring activities are initiated and integrated in the Programme of Environmental Monitoring.*

See Recommendation 8.2.

Analytical laboratories

Most analytical laboratories under concerned ministries and agencies with responsibilities in the implementation of the Programme of Environmental Monitoring lack accreditation. Regional laboratories under Uzhydromet analyse air pollution samples only and lack sufficient capacity to analyse water pollution and soil pollution samples. In addition, the Centre for Specialized Analytical Control on Environmental Protection (CSAC) is not equipped with enough portable (mobile) laboratories to enable it to efficiently and effectively respond to high-pollution episodes.

Recommendation 4.2:

The Cabinet of Ministers should:

- (a) *Ensure accreditation of all analytical laboratories under concerned ministries and agencies with responsibilities in the implementation of the Programme of Environmental Monitoring;*
- (b) *Provide resources for Uzhydromet to install surface water quality and soil pollution laboratories in relevant regional offices;*
- (c) *Provide resources to equip the Centre for Specialized Analytical Control on Environmental Protection under the State Committee on Ecology and Environmental Protection with portable (mobile) laboratories.*

State environmental monitoring information system

As at 2019, an integrated environmental information system interlinking the environmental databases of all public authorities operating environmental monitoring activities under the scope of the Programme of Environmental Monitoring is not available. Since

2013, CSAC under SCEEP maintains a “pollution sources monitoring database” and a password-protected online portal with data on air emissions, wastewater discharges and soil contamination. CSAC has also developed a portal (<https://csak.uz/ru/>) that will be used in the future to collect emissions data directly from enterprises, but this data portal has not yet been completed due to a lack of funds. While Uzbekistan is not a party to the Protocol on Pollutant Release and Transfer Registers (PRTR Protocol) to the Aarhus Convention, the development of CSAC’s portal may be a good step forward towards the establishment in the future of a PRTR in Uzbekistan in line with modern international standards.

Recommendation 4.3:

The Cabinet of Ministers should:

- (a) *Allocate sufficient resources to the State Committee on Ecology and Environmental Protection for the establishment of an integrated environmental information system interlinked with the environmental databases of the other public authorities operating under the Programme of Environmental Monitoring and supported by geographic information system (GIS) technologies in accordance with common formats, metadata and interoperability requirements;*
- (b) *Take necessary legislative, policy and practical measures to improve management and facilitate continuous modernization and digitalization of environmental information, including state environmental monitoring information and environmental databases/cadastrs, ensuring their interoperability with geospatial, statistical, health and other information systems by leveraging the use of modern technologies to promote effective information collection, exchange and dissemination to the public;*
- (c) *Allocate sufficient resources to the State Committee on Ecology and Environmental Protection for the finalization of the portal of the Centre for Specialized Analytical Control on Environmental Protection aimed at collecting emissions data from enterprises in support of reporting, data visualizations and the display of monitoring data to the public, and support its further development towards a future pollutant release and transfer register in Uzbekistan in line with modern international standards;*
- (d) *Promote the regular participation of Uzbekistan in activities under the Protocol on Pollutant Release and Transfer Registers with a view to sharing experience and learning*

- from international good practices;*
- (e) *Consider accession to the Protocol on Pollutant Release and Transfer Registers.*

Environmental statistics and indicators

Environmental statistics collected by the State Committee on Statistics are largely not uploaded to the State Committee's website. The System of Environmental-Economic Accounting (SEEA) is not yet introduced in Uzbekistan. There is no evidence that a previously existing database of 91 environmental indicators is still in use.

As for the 46 environmental indicators under the national Sustainable Development Goals indicator framework, only nine have data available and have no methodological problems. Some national environment-related indicators have a more limited scope than the corresponding ones in the global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development. Data are currently provided online only for 10 of the 46 environmental indicators.

Although the State Committee on Statistics collects a significant amount of gender-related data, no gender and environment statistics are collected.

Recommendation 4.4:

The State Committee on Statistics should:

- (a) *Make publicly available on its website the environmental statistics it collects;*
- (b) *Initiate the production of accounts according to the System of Environmental-Economic Accounting (SEEA);*
- (c) *Promote the development of environmental Sustainable Development Goals indicator methodologies and exchange of international experience in reporting on the environmental dimension of the Sustainable Development Goals;*
- (d) *Align some of the national indicators with the global Sustainable Development Goals indicator framework;*
- (e) *Increase the number of environment-related Sustainable Development Goals indicators made publicly available online;*
- (f) *Initiate the collection of gender and environment statistics.*

Recommendation 4.5:

The State Committee on Ecology and Environmental Protection should:

- (a) *Continue with the regular production of its set*

of 91 environmental indicators and produce all remaining indicators in the ECE list of environmental indicators that are relevant to the country;

- (b) *Make these publicly available on its website in line with Shared Environmental Information System (SEIS) principles of open access to environmental data.*

Environmental reporting and improved availability of information

The annual national report on the state of the environment and use of natural resources has not been produced since 2013. The last report covering the period from 2008 to 2011 was largely descriptive and did not follow the widely used D-P-S-I-R (driving forces–pressure–state–impact–response) analytical framework. Most environmental reports or bulletins produced by government agencies in charge of environmental monitoring activities are not made publicly available, impeding the implementation of Shared Environmental Information System (SEIS) principles of open access to data.

Recommendation 4.6:

The State Committee on Ecology and Environmental Protection should:

- (a) *Reinitiate the regular production of the national report on the state of the environment and use of natural resources, ensuring its alignment with the international standards provided through the 2007 ECE Guidelines for the Preparation of Indicator-based Environment Assessment Reports in Eastern Europe, Caucasus and Central Asia and the Aarhus Convention, and taking into account the potential of the national report to contribute to monitoring the implementation of the environmental dimension of the Sustainable Development Goals;*
- (b) *Provide online public access to the national report on the state of the environment and use of natural resources and to other reports and bulletins produced by different government agencies under the scope of the implementation of the Programme of Environmental Monitoring and as part of reporting on implementation of multilateral environmental agreements, so as to provide timely, relevant and reliable information on the state of the environment to decision makers and the public.*

Scientific and technical innovation in the field of pollution prevention and control

There is currently not enough capacity and resources for meeting applied research and technology development needs in the field of pollution prevention and control technologies, resulting in the import of such technologies. Environmental protection is not a prominent component of the Strategy for Innovative Development for the period 2019–2021. The Strategy does not define specific sectoral priorities for research and innovation and, as at June 2019, priority areas of science and technology for the development and financing of targeted state scientific and technical programmes, technology transfer and commercialization are yet to be determined as foreseen in the Strategy's roadmap.

The Scientific and Research Institute on Environment and Nature Protection Technologies under SCEEP, which has extensive experience in developing technologies for reducing industrial emissions, for

waste management and for wastewater treatment, does not have enough resources for applied research in the field of pollution prevention and control technologies.

Recommendation 4.7:

The Cabinet of Ministers should:

- (a) *Ensure that a sectoral assessment of priority areas for research and innovation in line with the roadmap of the Strategy for Innovative Development for the period 2019–2021 is carried out and identify resources needed for promoting applied research and technology development in the field of pollution prevention and control technologies;*
- (b) *Provide the Scientific and Research Institute on Environment and Nature Protection Technologies with sufficient resources for it to further develop applied research on pollution prevention and control technologies appropriate for the territory of Uzbekistan.*

Chapter 5

ACCESS TO INFORMATION, PUBLIC PARTICIPATION AND EDUCATION ON THE ENVIRONMENT

5.1 Access to information on environmental matters

*Active access*¹⁷

The State Committee on Ecology and Environmental Protection

The brand-new website of the State Committee on Ecology and Environmental Protection (SCEEP) (<http://environment.gov.uz>) is operational as of 2019. It provides public access to information related to the structure and activities of the Committee. The website includes some data, mostly of an educational nature (tables, graphs, pie charts), about biodiversity, waste management, ambient air and the ozone layer. Data related to water resources, land resources and subsoil, soil protection, eco-energy, environmental monitoring, environmental control, environmental assessment and environmental certification is either lacking or of limited content. Open data and other information posted on the website are of limited content.

SCEEP uses a Facebook page to promote its work. Every six months, SCEEP organizes a press conference about its activities.

SCEEP representatives participate in talk shows on TV when environmental protection issues are the topic of debates.

Other

On the website of Uzhydromet (www.meteo.uz), the public can access some data on the weather and climate. Uzhydromet provides a short daily environmental bulletin for Tashkent City that in fact covers only air quality and is available only for the given day. It also provides the monthly average temperature and precipitation for Tashkent, Nukus, Samarkand and Termez Cities. No other information

or data related to the state of the environment are available online.

Uzhydromet regularly holds press conferences to report on its activities. It prepares and publishes information to respond to hard-hitting publications on the Internet regarding environmental pollution, as well as upon the request of media representatives.

The public has the opportunity to access laws and by-laws, including on the environment, on the national online database of legislation (<http://lex.uz>) and on a private website (www.norma.uz/).

Since 2015, Uzbekistan has developed an open data portal (<https://data.gov.uz/>). It includes information on 18 spheres of governmental activities, including the environment, population and health. As at mid-2019, the portal contains 5,603 data sets provided by 132 organizations, including SCEEP. Other authorities providing data sets on environmental matters include Uzhydromet, the State Committee on Statistics, the State Committee on Industrial Safety and the khokimiyats of Fergana, Jizzakh, Syrdarya and Tashkent Oblasts. The portal's section on the environment is rather limited in content, not structured by topic (e.g. water, air, biodiversity, waste, etc.) and not easy to navigate. Much of the information provided is of limited use (e.g. the total number of licences is provided without information on licensed activities).

As at October 2019, the State Committee on Statistics (www.stat.uz) does not provide environmental statistics online, except for two tables (chapter 4).

Passive access

Queries from the public are treated according to their type:

- Statements, suggestions and complaints are dealt with within 15 days in accordance with the 2014

¹⁷ Information on environmental matters can be disseminated by governmental authorities to the public (active access) or provided upon request (passive access).

- Law on Appeals of Individuals and Legal Entities; Requests for information requiring additional study or verification and collection of additional documents are dealt with within one month.

Requests for information on environmental matters are received by SCEEP's Unit for Internal Control and Document Management, which distributes the requests to the respective departments and units for response. Requests for information on environmental matters pertaining to the oblasts are forwarded to the respective oblast environmental authorities for response.

In the period 2014–2018, the total number of queries received by SCEEP increased by a factor of 15. It is estimated that, in 2018, requests for information on the state of the environment constituted about 13–15 per cent of the 2,211 queries received. Information on the time taken to provide a response is not available.

In addition to receiving requests in written form (by post or email), SCEEP has a helpline through which it receives about 300 phone calls a year. Most calls are received in spring, summer and autumn and most are related to fishing (in spring) and waste.

Information on environmental matters is provided by SCEEP free of charge, regardless of the format (electronic or hard copy).

SCEEP reports to have never refused to provide information on environmental matters on the basis of having classified it as limited to internal use.

Other sources of information on environmental matters

Information about the legislation on the environment and environmental management, awareness-raising activities and environmental events is distributed through the websites of the Ecological Movement of Uzbekistan (<http://eco.uz>), Ecoforum of NGOs of Uzbekistan (<http://ecoforum.uz>) and other NGOs, and through their pages on social networks. The “hot line” system of the Ecological Movement of Uzbekistan has been in operation since 2009. During that period, more than 4,000 alerts about violations of environmental standards have been received.

The website “Information Eco-network” (<http://sreda.uz>), operated for over 10 years by an environmental journalist, provides articles related to environmental matters. This resource has a dedicated channel on the Telegram and Facebook platforms, reaching out to the public.

Environmental news is published online in *Gazeta.uz*, *Kun.uz* and *review.uz*, and in the magazines *Ecological Herald* (<http://econews.uz/>), *Economic Review* (www.review.uz/) and others.

TV programmes and shows occasionally include TV programmes addressing environmental issues (e.g. “Munosabat”, “Karama-Karshi”, “Sharh +”, *Kalampir*, *Tufsilot*, *Reporter*, and *Assalom Uzbekiston*) and there is one weekly programme dedicated to the environment (“Nahori NashtaEKO”).

Challenges to access to information

Most members of the public interviewed are of the view that information on environmental matters is generally disseminated in a satisfactory manner, meeting the expectations of the public at large, but the quality of information and timeliness of its dissemination remain a challenge.

At the same time, information related to environmental matters that is actually available to the public online or as printed publications is limited. Most of the information posted on websites is laws and by-laws, while information on the work done and results accomplished in the environmental sector is largely lacking on the websites of governmental authorities. The majority of information and statistical data on the environment is not made available online. Information on revenues and expenditures of the Fund for Ecology, Environmental Protection and Waste Management and other environment-related funds is also not available online (chapter 3). Printed publications on the state of the environment are disseminated among governmental institutions only.

It appears that the public at large is satisfied with the current state of affairs because it is not aware of what constitutes information related to environmental matters and what information is collected. Although, in some oblasts (Andijan, Bukhara, Fergana, Khorezm, Namangan, Navoiy and Samarkand), environmental NGOs interact with governmental authorities on environmental protection rather actively and receive environmental information, generally, the public is rather passive and lacks interest in accessing information on environmental matters, which is most probably due to a lack of awareness about its availability, the public's right to it and existing procedures for asking for it. Thus, a big gap exists between the existing opportunity to ask for information and actual demand and interest in doing so in practice.

Members of the public can request SCEEP and its territorial bodies to provide information on

environmental matters and can receive the information that is available, albeit not always in a timely manner. At the same time, some information, such as on fines imposed on specific enterprises for non-compliance with environmental norms, is not provided to the public, even when requested by NGOs.

With the exception of a few active environmental NGOs, the public at large is hesitant to contact national public authorities on environmental matters. In practice, when necessary, members of the public are more inclined to turn to mahalla (self-government bodies) or local authorities (khokimiyats) for information and assistance.

5.2 Public participation in decision-making and access to justice on environmental matters

Environmental NGOs

Overall description

Estimates of the number of environmental NGOs in the country vary, most likely due to the application of different definitions of an “environmental NGO” and counting (or not) the branches of the Ecological Movement of Uzbekistan and members of Ecoforum of NGOs of Uzbekistan. The Ministry of Justice reports nine environmental NGOs registered at March 2019, including two associations of environmental NGOs – Ecological Movement of Uzbekistan with 14 branches in all regions and Ecoforum of NGOs of Uzbekistan consisting of 36 environmental NGOs. According to SCEEP, there are 46 environmental NGOs, including 25 NGOs in Tashkent City. An assessment conducted by the Regional Environmental Centre of Central Asia (CAREC) in 2017 reports 92 environmental NGOs in 2016, of which 51 were active.

The most active environmental NGOs include: Ecological Movement of Uzbekistan, Ecoforum of NGOs of Uzbekistan, Foundation for the Protection of the Aral Gene Pool, Ecosan International Foundation, Uzbekistan Society for the Protection of Birds, NGO “Suvchi”, NGO “Union for the Defence of the Aral Sea and Amu Darya”, NGO “Logos”, NGO “Zarafshan”, NGO “For Environmentally Friendly Fergana”, NGO “Rodnichok”, NGO “Salomatlik Plus Environment”, NGO “Jonli Tabiat”, NGO “Ekomaktab”, NGO “Shokhimardonobod Suv”, NGO “Orzu”, NGO “KRASS” and NGO “Eco-Tib”.

Environmental NGOs operate in the areas of ecology and environmental protection, environmental education, environmental journalism, promoting public involvement in environmental activities,

dissemination of environmental information, sustainable development, climate change, development of mountain areas, biodiversity conservation, water use and gender equality in the management of natural resources.

The presence of one large civil society organization – the Ecological Movement of Uzbekistan, with territorial branches in all regions of the country – is a specific feature of public participation in environmental protection in Uzbekistan. This organization has significant support from the State and, since its establishment in 2008, by law, has had a 10 per cent quota of seats in the lower (legislative) chamber of the Parliament of Uzbekistan (Oliy Majlis). The activities of the Ecological Movement and its territorial branches undoubtedly make a significant contribution to mobilizing the public in the country to solve environmental problems, improve legislation in the field of environmental protection and public health, implement public environmental control, increase public awareness and create an ecological culture among the population. The Ecological Movement is also very active in the international arena. The presence of such an organization is convenient for governmental authorities, since it provides the framework for organized operation of the environmentally minded public. However, the work of the Ecological Movement alone cannot ensure broad public participation in the form in which it is envisaged by current generally accepted international practice.

The system that has been in force since 2008, under which the Ecological Movement of Uzbekistan was allocated 15 of the 150 seats in the Oliy Majlis, and the Chairperson of the Ecological Movement served as Deputy Speaker of the Legislative Chamber, was abolished in the light of the ongoing reforms in Uzbekistan with the adoption of the Electoral Code in 2019. In January 2019, the representatives of the Ecological Movement established a political party called the Ecological Party of Uzbekistan.

Registration

Since 2018, the procedure of registering an NGO has been simplified and, as of 1 January 2019, is done by electronic means. At least 10 members are needed to form an NGO. A period of one month is set for registering an NGO, instead of the previous two months. Notarization of constituent documents during registration is no longer required.

The state duty for NGO registration was reduced by a factor of five. Registration of an NGO at the national and inter-oblast level costs four minimum wages,

about US\$98 at March 2019. Registering an NGO at the local level costs two minimum wages, some US\$49 at March 2019. Registering branches of an NGO is free of charge. It costs 12.5 minimum wages to register an international NGO. It is envisaged to reduce the state duty for NGO registration at the national, inter-oblast and local levels, starting from January 2020.

In the past few years, no new environmental NGO has been registered at the national and inter-oblast levels. The CAREC branch in Tashkent City is the only international environmental NGO registered in the country.

Operation

Since 2014, any NGOs that are not engaged in financial and economic activities for over six months are no longer closed down (2013 Resolution of the President No. 2085).

Since 2018, the procedures for operation of environmental NGOs have been simplified and are less bureaucratic. The oversight of the activities of NGOs has been also simplified since 2018. The events organized by NGOs no longer require approval by the Ministry of Justice; instead, the Ministry is notified of such events. For events organized in Uzbekistan, the deadline for notification was shortened to 10 days before the event, compared with 20 days previously, when approval was required.

When events are organized abroad or international experts participate in events organized in the country, the Ministry of Justice is to be notified 20 days in advance of the event, compared with one month previously, when approval was required.

The rate of the unified social payment related to NGOs' financial resources from sponsorship and membership fees was reduced in 2018 from 25 per cent to 15 per cent. When international funds are used to organize events or support NGOs' activities, approval by the Ministry of Justice is required. NGOs have to obtain permission to receive funds from foreign grants into special accounts opened in any bank. In practice, such approval was granted in 2018 to CAREC only. As at March 2019, there are no other cases of NGOs organizing events with foreign funds.

A number of reforms and measures have been initiated as a follow-up to the 2018 Decree of the President No. 5430 "On measures to fundamentally enhance the role of civil society institutions in the process of democratic renewal of the country". For instance, pensions are now paid to retired employees of NGOs.

For some activities and events, such as meetings of NGOs' governing bodies or activities conducted upon decisions by the Oliy Majlis, the President, the Cabinet of Ministers and the local authorities and based on state programmes and national plans, an abbreviated form of notifying the Ministry of Justice three days before the event is applied. Such notification format and deadline also apply for activities conducted within the state grants and state social procurement.

The procedure for reporting on activities by NGOs was also simplified. Since 2018, NGOs report on their work to the Ministry of Justice and the State Committee on Statistics only once a year by submitting an annual report. They also report quarterly to the tax authority. The format for reporting to the Ministry of Justice was made simpler by merging the previous three reporting forms into one and decreasing the number of questions. Since January 2019, the annual reporting to the Ministry of Justice is done electronically.

The procedure for monitoring and studying NGO activities by judicial authorities was established in August 2018. The decision to carry out an NGO study is required to be issued no less than 10 days before the commencement of the procedure of NGO study and the NGO head is to be notified on the same day. The duration of the NGO study is up to 30 days, with a possible extension for another 30 days.

Since 2008, a Public Fund to Support NGOs and Other Civil Society Institutions under the Oliy Majlis issues calls for grant proposals and social service procurement for NGOs.

SCEEP provides grants for NGOs from the Fund for Ecology, Environmental Protection and Waste Management. The Fund's Board comprises 14 members, including one from an environmental NGO.

Grant programmes for NGOs are also announced by the GEF Small Grants Programme. The GEF Small Grants Programme Committee in Uzbekistan includes a representative of an environmental NGO.

NGO Houses are being established in Tashkent City, the Republic of Karakalpakstan and at oblast level in accordance with the 2018 Decree of the President No. 5430. The idea behind this is to provide premises with zero rental for new NGOs and for NGOs operating in the areas of social importance. For instance, in Urgench City, such a house was opened in September 2018, hosting 19 NGOs rent free, including the local branch of the Ecological Movement of Uzbekistan. The initiative envisages using unused state-owned buildings to accommodate NGOs rent free; however,

NGOs are reluctant to move into such premises, which are often in a poor state.

Procedures and tools for public participation in decision-making

The public at large and NGO representatives are poorly engaged in decision-making on environmental matters. Detailed procedures to ensure and enable effective public participation in decision-making on environmental matters, including on projects, activities, strategic documents and legislation, are lacking. It is mostly NGOs that work closely with the environmental authorities that are invited to participate in consultation processes. For example, the Ecological Movement of Uzbekistan was engaged in setting quotas for hunting and fishing by participating in a relevant interdepartmental commission. Governmental authorities do not assign human and financial resources specifically for promoting public participation and monitoring this area.

Public councils

Public authorities began to consider how to involve civil society in decision-making in order to implement the 2018 Decree of the President No. 5430. They began to establish public councils as advisory bodies under governmental institutions. However, public councils cannot provide the opportunity for all interested representatives of the public and NGOs to participate in decision-making on environmental matters.

The Public Council under SCEEP was established in July 2018. As at March 2019, the Public Council, chaired by a representative of academia, is composed of 18 members, including one representative of environmental NGOs and one environmental journalist. Between July 2018 and February 2019, the Public Council held four meetings. Minutes of meetings and other information about the work of the Public Council are not available online. SCEEP lacks the capacity to service the work of the Public Council properly. A public council was established in 2011 under the then State Committee for Nature Protection, but no information on its activities is publicly available.

A public council was established in 2018 under the Tashkent City Khokimiyat, because of the public outcry about tree felling. The council established 14 thematic commissions, including one on the environment and sustainable development. The council focuses its work on matters of the highest concern for citizens, such as the cutting down of trees, the state of sidewalks and streets, lighting and road

safety. SCEEP participates in meetings and provides information to this public council, as requested.

Ecological expertise

The public has the opportunity to initiate public ecological expertise. In practice, public ecological expertise is not conducted, mainly due to the financial implications but also because of the advisory nature of its conclusions (chapter 2).

Also, when public hearings are organized as part of the EIA process, the public concerned has the right to participate; however, in practice, the information about public hearings is not disseminated adequately, resulting in the eventual participation of representatives of environmental NGOs who have been invited personally, e.g. by phone. Sometimes, such hearings are not organized at all. Documents and materials for the public hearings are not made available to the public in advance. Overall, as at early 2019, public participation in EIA is under development, requiring the establishment of clear procedures aligned with international practices (chapter 2).

Public environmental control

Individuals, local self-government bodies and environmental NGOs can conduct public environmental control in line with the provisions of the 2013 Law on Environmental Control. In 2018, SCEEP, in cooperation with the Ecological Movement of Uzbekistan and with support from local khokimiyats and makhallas, trained thousands of NGO and makhalla representatives, who received training certificates and identity cards as public inspectors of environmental control. The training prepared public inspectors to conduct inspection activities and submit their outcomes to the district (town) inspectorates in the field of ecology and environmental protection for consideration and action. Data on the activities of public environmental inspectors are not analysed (chapter 2).

Hearing information from and reports of senior managers is one of the forms of public environmental control. The Ecological Movement of Uzbekistan organizes public hearings of information provided by senior managers of enterprises, organizations and oblast departments on ecology and environmental protection. Such hearings conclude with the adoption of recommendations that are then transmitted to governmental authorities, enterprises and other organizations.

Strategic planning and legislation

Since 2018, draft laws and by-laws (including those that approve strategic documents) are made available online on a dedicated website (<https://regulation.gov.uz>). Members of the public can use their existing accounts on social platforms to post comments. The period available for commenting is 16 days.

Of the 12 draft documents posted by SCEEP from December 2018 to April 2019 for comments, despite their being viewed over 1,000 times, only one document received two comments, both made by the same person. The draft concept on environmental protection until 2030, placed for comments in June 2019, received no comments. The low participation could be attributed to the lack of expertise in the topics covered by the documents and a cautious attitude to openly providing comments. In addition, the timeframe of 16 days is too short to mobilize the public.

Petitions

Citizens of Uzbekistan can initiate online petitions, including on environmental matters, through a dedicated web portal (meningfikrim.uz), in order to urge national and subnational authorities to initiate legislative reforms. In the environmental area, there have been two examples of using this instrument.

In 2018, a petition called for reform of the system of tree protection in cities and villages. It garnered 12,565 votes and was considered by the Legislative Chamber of the Oliy Majlis, which took a number of decisions requiring action, mostly by SCEEP.

Another petition referred to measures to prevent cruelty to animals. Having gathered 10,651 votes, it was considered in 2019 by the Legislative Chamber, which approved several decisions requiring action, mostly by SCEEP.

Social media

Members of the public are active on social media platforms (e.g. Telegram, Facebook), where they actively discuss issues that affect the life of the urban population, e.g. the cutting down of chinar trees in Tashkent and other cities, demolition of residential buildings in the territories allocated for the construction of enterprises or multi-storey buildings, or infill development.

Public participation in international forums

Representatives of the Ecological Movement of Uzbekistan are regularly included in national delegations participating in international meetings and events. This is not the case for other environmental NGOs.

NGO representatives actively participate in international meetings and events but not as part of national delegations.

Members of the public and representatives of environmental NGOs, except for the Ecological Movement of Uzbekistan, are not involved in the decision-making process about participation of the country in new multilateral environmental agreements (MEAs).

Environmental defenders

The issue of environmental defenders being able to operate in safety, including questions surrounding their possible persecution, is generally not spoken of. Persecution is neither confirmed nor denied. Reportedly, at least one case of intimidation of environmental defenders by governmental authorities occurred during the period 2012–2017, leading to discontinuation of the activities of the NGO involved.

Access to justice

In accordance with the legislation, members of the public can challenge decisions, acts and omissions of the public authorities and developers/operators related to environmental matters before the higher public authorities, the Human Rights Ombudsperson and in the courts.

There are no examples of environmental NGOs or representatives of the public filing cases on environmental matters in the courts.

Generally, the public at large is not aware of the possibility of appealing to the courts on issues related to environmental matters, and those who are aware are reluctant to do so.

There are no special environmental courts in Uzbekistan. Cases related to environmental protection are to be considered as part of criminal, administrative, economic and civil judicial procedure.

Individuals are exempted from payment of state duty in civil and administrative courts when challenging the actions of governmental officials. NGOs are exempted from payment of state duty in civil and administrative

courts when challenging the decisions of state bodies or actions of governmental officials that violate their rights and legitimate interests. In practice, there are no examples of such cases.

The Human Rights Ombudsperson has functioned in Uzbekistan since the mid-1990s. In 2015, the Human Rights Ombudsperson received 255 environmental-rights-related complaints (out of a total 12,373 complaints). Activity reports after 2015 are not publicly available. There is no other independent body to which the public could turn for advice regarding their environmental rights.

5.3 Legal, policy and institutional framework on access to information and public participation

Legal framework

The 1992 Law on Nature Protection stipulates that residents of Uzbekistan have the right to unite in public organizations for the protection of nature, and to request and receive information about the state of the environment and measures taken to protect it. Furthermore, the Law declares open access to information on the state of the environment and requires publication of its main indicators by state bodies on ecology and environmental protection. These provisions do not seem to be fully implemented as at March 2019. Also, access to information on environmental matters, which is broader in scope than information on the state of the environment, is not fully covered by the national legislation.

The 1997 Law on Guarantees and Freedom of Access to Information and the 2002 Law on Principles and Guarantees of Freedom of Information regulate the procedures and deadlines for public authorities to provide information to the public.

The 2014 Law on Openness of Activity of Public Authorities and Administration regulates dissemination of information by governmental authorities about their activities and passive access to information about the activities of governmental bodies.

The 2018 Law on Public Control regulates public control by citizens, self-government bodies, NGOs and the media on activities of state bodies. Public control includes sending queries and requests to state bodies, participation in open collegial meetings of governmental bodies, public discussion, public hearing, public monitoring, public expertise, the study of public opinion and hearings of reports and information from government officials, including on environmental issues.

The 2014 Law on Social Partnership regulates the interaction of state bodies with NGOs and other civil society institutions in the development and implementation of programmes of social and economic development of the country, and of legal acts and other decisions affecting the rights and legitimate interests of citizens, including in the area of environmental protection and public health.

The 2013 Law on Environmental Control governs certain aspects of access to environmental information and public (citizens, self-government bodies and NGOs) participation in decision-making on environmental issues, including through public environmental control and the establishment of a system of public inspectors of environmental control.

The legislation in the area of access to information and public participation is rapidly developing with new acts of subsidiary legislation recently adopted, such as the: 2013 Resolution of the President No. 2085 “On Additional Measures to Assist the Development of Civil Society Institutions”; 2015 Resolution of the Cabinet of Ministers No. 232 “On measures to further improve the governmental portal of Uzbekistan on the Internet, taking into account the provision of open data”; 2018 Resolution of the Cabinet of Ministers No. 125 “On measures for further improvement of activities of information services of the state authorities and administration”; 2018 Resolution of the President No. 3837 “On measures to organize the activities of public councils under state bodies”; 2018 Decree of the President No. 5430 “On measures to fundamentally enhance the role of civil society institutions in the process of democratic renewal of the country”; and 2019 Resolution of the President No. 4273 “On additional measures to ensure openness and transparency of public administration, as well as increase the country’s statistical potential”.

The main legal framework regulating the activities of NGOs is still largely based on old, outdated laws and by-laws, such as the 1991 Law on Public Associations in Uzbekistan, 1999 Law on Non-State Non-Profit Organizations, 2007 Law on Guarantees of Activity of Non-State Non-profit Organizations, 2005 Resolution of the President No. 107 “On measures to assist the development of civil society institutions in Uzbekistan” and the 2008 Joint Resolution of the Legislative Chamber and the Senate of the Oliy Majlis No. 842-I “On measures to strengthen support for NGOs and other civil society institutions”.

Often, detailed specifications, procedures and guidance are lacking for the effective implementation of public participation. Governmental institutions struggle to implement new legislation and procedures

because they lack adequate capacity and expertise and have no tradition in the area of access to information, public participation and access to justice in environmental matters.

Policy framework

There is no specific strategic document on access to information, public participation and access to justice in environmental matters. The Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863) underlines the need to establish an effective mechanism for mandatory public participation in environmental decision-making and covers some aspects of access to information on the environment.

The Action Strategy on Five Priority Directions for Development for the period 2017–2021 provides for the development of civil society, increased dialogue with the population, promoting the rule of law and reforming the judicial system. These activities should normally lead to increased access to information and public participation.

Sustainable Development Goals and targets relevant to this section

The current status of Uzbekistan vis-à-vis selected targets of Sustainable Development Goal 16 of the 2030 Agenda for Sustainable Development is described in box 5.1.



Box 5.1: Selected targets under Goal 16 of the 2030 Agenda for Sustainable Development

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Implementation of the environmental dimension of Goal 16 in Uzbekistan is at the inception phase. Legal provisions are being put into place to promote effective governance. However, implementation on the ground is lagging behind. Due to a general absence of tradition and experience in this area, without concerted efforts from all governmental authorities and institutions working on environmental protection and in the areas that have an impact on the environment, the country will not be able to achieve the environmental dimension of Goal 16 by 2030. During the nationalization of Goal 16's internationally adopted targets and indicators, many global targets and indicators incurred modification, often resulting in a narrower scope.

Target 16.6: Develop effective, accountable and transparent institutions at all levels

The global target was adopted at national level in modified wording, aiming to “Increase effectiveness, accountability and transparency of government institutions at all levels”, with two national indicators that are identical to the global ones (16.6.1, Primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar) and 16.6.2, Proportion of population satisfied with their last experience of public services).

Uzbekistan has started action to make its institutions, including those working on the environment or on activities with impact on the environment, more effective, accountable and transparent.

SCEEP operates a new website that is attempting to increase the transparency of its activities. Further steps in the field of accountability could include making available online financial information related to the activities of the Fund for Ecology, Environmental Protection and Waste Management. To increase its effectiveness, SCEEP could look into establishing effective measures to enhance the implementation of planned activities and the quality of results achieved.

To increase transparency, Uzbekistan operates an open data portal (<https://data.gov.uz/>) that includes information in the environmental field. However, the current approach to organizing this data needs to be revisited to make it useful for the public.

Moreover, the country has an open budget website (<https://openbudget.uz/#/budget>) on which aggregated information on state budget expenditures are posted for eight categories of expenditure, including for environmental protection. However, these data are not helpful as they do not provide any details, only showing exactly the same aggregated data for planned and incurred expenditures on environmental protection for each of the four years 2016–2019, where incurred expenditures are 3.9 times bigger than the planned expenditures in each of the four years.

To assess public satisfaction with the public services provided by SCEEP, as well as by other institutions in possession of information on environmental matters or overseeing activities that have an environmental and human health impact, specific surveys could be conducted on a regular basis with a view to improving these services.

Practical implementation of target 16.6 remains a challenge and it would require considerable effort to achieve the target by 2030. Developing an institutional tradition and knowledge, enhancing capacity and allocating adequate financial support are prerequisites for making achievement of this target a reality.

Target 16.7: Ensure responsive, inclusive, participatory and representative decision-making at all levels

Uzbekistan's national target 16.7 is to "Increase the participation of citizens, business entities and civil society institutions in the process of preparing and making decisions at all levels of government". The first of the two global indicators (16.7.1) was nationalized by Uzbekistan in a simplified version and the second (16.7.2) was adopted with its internationally agreed wording.

Concerning participation in decision-making on environmental matters, a positive development is the re-establishment of a Public Council under SCEEP in July 2018 to serve as a platform for engaging representatives of the public in decision-making; however, the Public Council alone cannot ensure responsive, inclusive, participatory and representative decision-making on environmental matters at all levels.

Since 2018, the public can participate in the development of legislation by commenting on draft laws and by-laws online; however, thus far, the public does not participate actively in commenting on environment-related draft legislative documents.

The two 2018 Presidential Decrees on measures to organize the public councils and to fundamentally enhance the role of civil society institutions would support the development of public participation in environmental matters, provided they are effectively put into practice.

Uzbekistan can achieve the environmental dimension of the national target by 2030 by increasing the participation of citizens, business entities and civil society institutions in environmental decision-making by going beyond the mechanism of public councils and establishing adequate procedures enabling effective public participation. Specific efforts are to be made to cultivate the in-house expertise in SCEEP and other governmental authorities and to raise awareness and develop the capacity of the public and environmental NGOs, with a view to ensuring their engagement and participation in environmental decision-making at all levels and in all relevant sectors.

Target 16.10: Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements

Global target 16.10 was nationalized with different wording, i.e. to "Increase the information openness of the state bodies and administration for the realization of the right of citizens to information and to ensure the protection of fundamental freedoms of citizens". The target, as adapted nationally, does not include the dimension of ensuring public access, limiting it to increasing the openness of information. Concerning access to information on environmental matters, based on the current limited availability of such information to the public (mostly, just the legal framework is available), without adequate measures and additional efforts, progress on this target would be difficult to achieve.

Global indicator 16.10.1, "Number of verified cases of killing, kidnapping, enforced disappearance, arbitrary detention and torture of journalists, associated media personnel, trade unionists and human rights advocates in the previous 12 months", was dropped altogether by Uzbekistan. While there are no officially recorded cases of persecution of environmental defenders in Uzbekistan, reportedly, cases of intimidation occur.

The second global indicator, 16.10.2, "Number of countries that adopt and implement constitutional, statutory and/or policy guarantees for public access to information", was modified by Uzbekistan to "List of legal acts providing guarantees of citizens' access to information", thereby losing the implementation dimension.

Uzbekistan adopted the Law on Guarantees and Freedom of Access to Information in 1997 and the Law on Principles and Guarantees of Freedom of Information in 2002. In addition, the 1992 Law on Nature Protection provides for the right to have access to information about the state of the environment and to the measures taken to protect it. Access to information on environmental matters, which is broader in scope than information on the state of the environment, is not fully covered by the national legislation.

While several laws on access to information are adopted, allowing the country to consider national target 16.10 as already achieved, their implementation into practice remains a challenge.

Institutional framework

SCEEP's Unit for Public Relations and Mass Media, established in 2017, has two staff; one of these posts is vacant as at March 2019. This Unit is considered responsible for access to information and public participation in decision-making on environmental matters; for these purposes, its staff capacity is not sufficient.

SCEEP's Unit for Internal Control and Document

Management, established in 2014, is in charge of managing queries and requests for information received by the Committee. It has five staff as at March 2019.

In addition, there are 14 specialists in the territorial departments for ecology and environmental protection who are responsible for providing information on environmental matters to the public.

The General Prosecutor's Office carries out activities

to improve the population's understanding of legal matters. More than 2,000 events to raise public awareness of environmental protection and the requirements of environmental legislation have been organized from 2016 to early 2019.

Participation in international agreements and processes

Uzbekistan is not a party to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), which provides the highest international standards in these three areas. The country does not benefit from the capacity-building and policy development activities undertaken under the Convention and the experience of other countries that are parties to the Convention. Since 2018, the Government has renewed its cooperation with ECE on matters related to public participation to enhance its knowledge of the international standards provided through the Aarhus Convention, the Espoo Convention and its Protocol on SEA, and other countries' experience in implementing these treaties.

Governmental authorities are engaged in the implementation of several projects conducted by the office of the Organization for Security and Co-operation in Europe (OSCE) Project Coordinator in Uzbekistan that aim to enhance access to information and public participation and promote good governance. In 2016, on the premises of Namangan Territorial Branch of the Ecological Movement of Uzbekistan, and in 2018, at the Tashkent Territorial Branch of the Ecological Movement, projects have been implemented with the assistance of the Office of the OSCE Project Coordinator in Uzbekistan to establish information resource centres to facilitate public dissemination of environmental information. Many projects supported by OSCE include activities related to promoting and improving access to information, public participation and access to justice in environmental matters.

5.4 Environmental education and education for sustainable development

In 2017, young people aged up to 16 years constituted 30.2 per cent of Uzbekistan's population and those aged from 16 to 24 years constituted 15.8 per cent. Thus, nearly half the population (46 per cent) is potentially engaged in the education system at various levels.

There is no gender imbalance in enrolment at the primary and secondary school levels, where the female to male ratio was close to 1.0 in 2017. However, in

higher education there are lower female than male enrolment levels. In 2017, the ratio of female to male enrolment was 0.67.

Integration of environmental education and education for sustainable development (ESD) into curricula

Preschool education

As at 2019, preschool education provided for 3- to 7-year-old children is not compulsory in Uzbekistan. Since December 2018, mandatory free-of-charge preschool education for 6- to 7-year-olds, preparing them for school, is being piloted in eight districts and three cities in the Republic of Karakalpakstan, Fergana Oblast and Tashkent City. Full coverage of all 6- to 7-year-olds in the country is expected by 2021 (in 2018, 44.9 per cent of 6-year-olds were enrolled in preschool education).

Following the adoption in 2018 of the State Programme for Pre-school Educational Institutions "Ilk Kadam" (First Step), developed with support from the United Nations Children's Fund (UNICEF), environmental education is carried out during classes called "Acquaintance with the World Around Us", "Experiments – Science" and "Acquaintance with Nature". Each year, 36 classes are held on the first two themes jointly and 36 classes on the third theme, for 3- to 4-year-olds and 4- to 5-year-olds. Five- to 6-year-olds and 6- to 7-year-olds receive 72 classes dedicated to the first two themes and 36 classes to the third theme. The teaching methodology includes role playing, games and excursions in the natural environment. Each preschool education institution maintains a "natural history corner", involving children in taking care of the plants.

Preschool education focuses on environmental education. While some ESD elements related to the environmental dimension (such as developing competences to demonstrate respect for the environment, and to understand the role of human beings in transforming the world, as well as classes to learn about nature, develop awareness of the importance of nature in people's lives and the need to protect the planet) are included in the new State Programme "Ilk Kadam", ESD as an approach is not integrated into the preschool education system.

Primary school education

Primary education is compulsory for 6- to 7-year-old to 9- to 10-year-old children.

Environmental education takes place during study of

the subject “The World Around Us” for 1st and 2nd grade children and “Nature Study” and “Ethics” for 3rd and 4th graders.

The children’s encyclopaedia “Olam Khakida bir Olam Malamot” (“A World of Information about the Universe”), developed in 2008 and used by preschool and primary school children, provides information about the world around us, and the weather, climate and biodiversity of Uzbekistan.

Primary school education contains environmental education, while ESD is not integrated into primary education.

Secondary school education

Secondary school education is compulsory. In 2014–2015 the curriculum was revised and during the period 2016–2018 teachers underwent training on the revised curriculum, which is being gradually introduced into secondary education.

Environmental education is included in curricula for students of grades 5–11 across various subjects, integrating information on conservation and respect for nature and its resources, and issues related to climate change. These issues are mostly addressed in the lessons on Botany, Zoology, Biology, Geography, Chemistry, Physics, and “Man and Human Health”. In 11th grade, students receive 20 hours of Ecology studies. In addition, environmental issues are considered in the lessons on History, Literature, Russian and foreign languages. Issues related to climate change and human influence on nature are also studied in extracurricular activities, excursions and hikes in the natural environment. About two hours per academic year during the weekly classroom hour are dedicated exclusively to environmental education.

Environmental themes are also addressed in other discussions during the classroom hour (box 5.2).

Based on activities to organize “eco-groups” in secondary schools Nos. 37, 50 and 53 of Shakhrikhan District of Andijan Oblast, a methodological manual titled “Ecologic Tarbiya va Soglom Bola” (“Environmental Education and the Healthy Child”) was developed in 2014.

In addition, activities are carried out to promote the “Climate Box” manual (a set of educational game materials for school children on climate change) in institutions involved in general secondary education. Based on these materials, “open lessons” and other events dedicated to climate change are held in a number of schools in the city of Tashkent.

A few other themes of sustainable development, such as issues related to gender equality, human rights, children’s rights, local knowledge and traditions are studied during History (grades 5–11) and State and Law Fundamentals (grades 10–11) classes.

Environmental education is well addressed in secondary school education. ESD is in its inception, addressing a few themes, mostly during classroom hours.

Secondary specialized education and vocational training

Secondary specialized education and vocational training are provided in academic lyceums and professional colleges. Both offer three-year education programmes. Academic lyceums offer in-depth professionally oriented learning, while professional colleges allow students to obtain one or more specializations in selected professions.

Box 5.2 Environmental education in selected Tashkent and Samarkand secondary schools

Tashkent School No. 60 – a public secondary school specializing in the German language – organizes a day of ecology every year and dedicates approximately 25 per cent of discussions during classroom hours to environmental themes. Besides teaching about the environment in Biology, Chemistry, Geography and Physics, the school integrates environmental issues across other subjects and, in particular, in studying the German language. Also, during technology classes, children make handcrafts from natural and waste materials. The school runs an eco-club of 15 members, which meets every month. The concept of separate waste collection and recycling is promoted; however, actual recycling is not done due to the lack of infrastructure in the country to separately collect and process the waste. Teachers undergo a month-long in-service training course every three years, 30 per cent of which is dedicated to environmental education.

Samarkand School No. 33 – a public secondary school – has an environmental group of 15 members (6th to 7th graders), which meets twice a week. The school organizes events and exhibitions dedicated to environmental awareness-raising and protection. School children engage in voluntary commitments, including to protect the environment by saving water and energy and reducing waste at school and at home. To gain practical experience on environmental issues, the school organizes excursions in the natural environment and visits to greenhouses, a paper production factory, the Samarkand Agricultural Institute and the Faculty of Biology of Samarkand State University. Each year, three classroom hours are focused on environmental themes. Parents are involved along with children and teachers in various competitions organized by the school and in preparing handcrafts from natural products and waste.

Photo 5.1: “Nature garden”, Tashkent School No. 60

Photo credit: Ms. Angela Sochirca

Environmental education is included in secondary specialized education and vocational training as part of the general education subjects. Colleges and academic lyceums have 16 hours of ecology studies. ESD is not integrated into secondary specialized education and vocational training.

Higher education

As at March 2019, higher education is provided by 98 universities, including 14 foreign university branches. Many universities have faculties of biology, geography, chemistry and ecology that prepare specialists related to the environmental sector. Every year, about 320 environmental specialists are trained in the country's higher education institutions. Educational and industrial internships and the preparation of final theses often take place at SCEEP.

ESD is addressed by some of the universities, mainly within research- and project-based activities. There is no separate faculty or department on ESD, nor is there a bachelor's or master's degree in ESD. Environmental education, on the contrary, is

compulsory in all higher education institutions as part of the general studies for all specialities, which includes the subject of Ecology. However, as at March 2019, it is feared that this subject may be removed from compulsory subjects for certain specialities to make space for other subjects.

At the National University of Uzbekistan named after Mirzo Ulugbek (NUU), the Department of Applied Ecology and Sustainable Development has been working for over 10 years on the adaptation of ESD to the national needs of Uzbekistan and on ESD promotion and training for teachers. In 2015, a National Training Centre on ESD was established within NUU as part of project-based activities. Several materials for teachers were produced and workshops were organized on ESD, including as a contribution to achieving target 4.7 of the Sustainable Development Goals. Activities included a seminar for managers of NUU (in 2017), three workshops for teachers and methodologists of NUU on the integration of sustainable development, Sustainable Development Goals and global citizenship education into NUU curricula and programmes (in 2018), and several

seminars and open lectures for NUU students (during the period 2016–2018). NUU developed a draft roadmap for introducing principles of ESD and global citizenship into all forms and levels of the education system in Uzbekistan. However, in the absence of political support from the Government, as well as the lack of clear mandates on ESD and a working institutional mechanism on ESD, there is no clarity on how the roadmap could be considered for implementation.

The main university preparing environmental specialists is Tashkent State Technical University (TSTU) named after Islam Karimov. The TSTU Department of Ecology and Environmental Protection has about 40–45 students each year joining the four-year bachelor's course. About 5–10 per cent of students continue with the two-year master's degree, and some continue with doctoral and post-doctoral studies. In 2018/2019, six master's students were studying topics connected with solid and liquid waste

and air pollution. SCEEP, through its Scientific and Research Institute on Environment and Nature Protection Technologies, supports the master's programme by providing a supervisor for each master's student. Some faculty staff work at the Institute. The Department conducts research jointly with the Institute. It also cooperates with other scientific and research institutes under the Academy of Science and with business, for example, the SUE Uzbekneftegaz.

Tashkent University of Law includes a Department of Environmental and Agrarian Law. The Department carries out educational, methodological and research work on environmental law, agrarian law, land law and energy law.

Training of teachers

Teachers with bachelor's and master's degrees are prepared by universities and pedagogical institutes.

Photo 5.2: Exhibition dedicated to environmental protection at Samarkand School No. 33



Photo credit: Ms. Angela Sochirca

The Tashkent State Pedagogical University (TSPU) named after Nizami prepares future educators and teachers in 26 orientations for preschool, primary and secondary schools and vocational education. The TSPU master's degree includes 30 specialist fields of study. Future preschool educators study theory and methodology of familiarization with nature for a total of 354 hours, including 80 hours of practical and 160 hours of self-guided study. Future secondary school teachers study the subject Ecology and Nature Protection (58 hours, including 22 hours of practical and 20 hours of self-guided study). TSPU runs a club called "Tree of Life", which has 22 members.

The Urgench State University, which prepares educators and teachers, benefited in March–April 2018 from several training sessions on environmental education, ESD, sustainable development, Sustainable Development Goals and global citizenship education provided by the NUU Department of Applied Ecology and Sustainable Development. With support from NGO "KRASS" (Urgench), training modules on sustainable development were prepared and training sessions were organized to promote the principles of ESD and sustainable development in the Aral Sea region (Khorezm Oblast and the Republic of Karakalpakstan). In 2011, a UNESCO Chair (department) on ESD was established as part of project activities to enhance the capacity and skills of educators at the university, lyceum and school levels. The Chair on ESD operated in the framework of project-based activities until 2014; in 2016, it was renewed for three years, until February 2019. However, without the political support of the Ministry of Higher and Secondary Specialized Education to formally recognize the Chair on ESD, reporting on the progress achieved and a request to UNESCO for another extension is pending. Thus, as at February 2019, the Chair on ESD is no longer operational.

ESD is not included in the preparation of future educators and teachers during their bachelor's and master's degree studies, as at March 2019.

In-service training of educators for preschool education, done by the Institute of Retraining and Advanced Training of Managers and Specialists of Pre-school Educational Institutions since June 2018, includes a four-hour training module on Life Safety related to environmental education. In 2018, 2,434 preschool education managers and educators engaged in in-service training. In addition, in 2018–2019, workshops for preschool educators are being organized at the local level to train the educators about the substance and educational approaches of the new State Programme "Ilk Kadam". No other special

training is organized on environmental education or ESD.

For general education school teachers of core subjects and areas, including Biology, Geography and Chemistry, regional centres for advanced training and retraining of the public education system at universities hold one-month training courses every five years. The course of 144 hours, comprised of thematic sections, includes materials on ecology and environmental protection. The theme of gender equality was integrated into the programme of retraining of teachers. ESD as an approach is not included in the regular in-service training of teachers.

Scientific and academic studies are conducted by teachers of secondary schools in the City of Tashkent and Andijan Oblast to promote and introduce environmental education and ESD.

Ecoforum of NGOs of Uzbekistan is closely cooperating with schools in the framework of project-based activities and supporting the training of teachers on environmental education. Ecoforum is conducting training for teachers, including on issues of sustainable development and sustainable lifestyle, and facilitating the development of educational and methodological guidance and manuals on environmental education. Several of these materials, such as the teaching guide on Ecology for teachers and the textbooks and practice books on Ecology for grades 1–4 pupils and methodological manual for the textbooks include notions of sustainable development (for 4th graders) and have been approved and recommended for publication by the Republican Education Centre under the Ministry of Public Education.

Non-formal and informal education

SCEEP is raising awareness on environmental issues by organizing various events. In January 2017, SCEEP hosted a round table on sustainable development for the universities of Uzbekistan and, in March 2019, in cooperation with local and international partners, organized the first Hashar Week in Tashkent City, devoted to environmental issues and education of urban residents to sort and dispose of waste correctly.

Environmental education is integrated into extra-curricular activities, which take place at children centres for 7- to 18-year-olds, who participate in groups on local lore and the environment. About 30,000 children are enrolled in these groups. Enrolment costs per month (20,000 sum (about US\$2.40 at March 2019) in urban areas and 10,000 sum (about US\$1.20) in rural areas) are affordable for the population.

The main driving force for the non-formal and informal environmental education and ESD programmes and activities are environmental NGOs.

NGO “Ekomaktab”’s core activities focus on environmental protection, environmental education and awareness-raising. The NGO participated in the development of the GREEN PACK education resource in cooperation with CAREC, and in a number of other projects promoting environmental education.

Ecoforum of NGOs of Uzbekistan has a programme on ESD and environmental education, whereby each project implemented by Ecoforum contains a corresponding ESD or environmental education component. Ecoforum developed a low-cost accessible tool for teaching local communities and families about sustainable development and ecosecurity through secondary schools. Training sessions were organized for local communities and authorities on sustainable tourism, the importance of stakeholder involvement and development of sustainable tourism plans. The organization prepared and disseminated in some remote areas of the country a practical manual for the self-production and use of simple and budget-friendly structures for water and energy saving, sustainable farming and efficient use of natural resources.

The Ecological Movement of Uzbekistan and its territorial branches hold annually more than 300 educational activities and environmental events in the country’s educational institutions dedicated to environmental dates, such as World Wetlands Day, World Water Day, International Bird Day and others. Together with the education ministries, the Ecological Movement organizes competitions for pupils in primary school (e.g. “My native nature”) and students of higher education institutions (e.g. “The best idea for adaptation to climate change”). Since 2009, the Ecological Movement has been publishing the Buloqcha children’s environmental magazine, which is distributed free of charge in schools in Uzbekistan and other Central Asian countries.

Other environmental NGOs, such as NGO “Zarafshan” and Children Environmental Fund “Yashil Tulkin” (Samarkand), NGO “For Environmentally Clean Fergana” (Fergana), NGO “Union for the Defence of the Aral Sea and Amu Darya” (Nukus), NGO “KRASS” (Urgench), NGO “Logos” (Tashkent) and NGO “Rodnichok” (Tashkent Oblast) are engaged in environmental education and public awareness-raising, though mostly on a project basis.

The website “Information Eco-network” (<http://sreda.uz/>) regularly posts articles on environmental concerns and activities for awareness and outreach purposes.

Training of civil servants

In-service training of civil servants is mandatory every three years.

Environmental in-service training is done by SCEEP’s Centre for Retraining and Advanced Training of Environmental Professionals. Since 2017, the Centre has conducted various training courses for the environmental specialists of enterprises, staff of other ministries and institutions, public inspectors, state inspectors from districts, staff of the Centre for State Ecological Expertise and its territorial branches, etc. The training costs five minimum wages (approximately US\$123 at March 2019). Training costs for the staff of SCEEP and its affiliated institutions are covered by the Fund for Ecology, Environmental Protection and Waste Management.

In 2017 and 2018, the Centre provided specialized training to 8,477 persons, each of whom received a certificate (table 5.1). Training courses for the environmental specialists of enterprises last two weeks (72 hours). The Centre also provides 72 hours of training to representatives of bus depots and credit departments of banks that are dealing with loans for projects subject to ecological expertise. In 2019, the Centre introduced a new 36-hour training course for the drivers of waste collection vehicles.

Table 5.1: Personnel trained by the Centre for Retraining and Advanced Training of Environmental Professionals, 2017–2018, number

	2017	2018
Enterprises, ministries, institutions and organizations	128	27
Persons trained who received certificates	552	7 925
of which:		
Staff from enterprises, ministries, institutions and organizations	278	281
Developers	22	32
Public inspectors	18	7 031
Staff from SCEEP and affiliated institutions	234	581

Source: Centre for Retraining and Advanced Training of Environmental Professionals, 2019.

The Centre organizes training courses in its own premises and at the local level. In 2018, the Centre conducted 14 one-week (36 hours) training courses at the local level. In Tashkent City, it also conducted a training of trainers.

SCEEP organizes in-service training for its staff annually, to enhance their qualifications. The training is tailor made to the needs of staff, depending on their work area and responsibilities.

ESD is not integrated into the in-service training of civil servants working in the environmental areas.

Other governmental authorities and institutions each have their own centres for in-service training. Typically, environmental issues are included in the training programmes on an ad hoc basis, depending on the topic deemed necessary at the time of the training, which is tailor made for various civil servant target groups. ESD is not integrated into the in-service training of civil servants.

5.5 Legal, policy and institutional framework on education

Legal framework

The 1992 Law on Nature Protection prescribes mandatory environmental education in all types of educational institutions. Other environmental protection laws include articles related to some aspects of environmental education. There are no provisions on ESD in the legislation.

Policy framework

Concept of Education for Sustainable Development

In 2011, the then State Committee for Nature Protection, the Ministry of Public Education and the Ministry of Higher and Secondary Specialized Education adopted the Concept of Education for Sustainable Development (ESD) (2011 Joint Resolution No. 2/20/305). Key priority areas of the Concept are:

- Integration of the strategic objectives of ESD into the legislation in the sectors of education, environmental protection and socioeconomic development;
- Inclusion of the strategic objectives of ESD in governmental programmes;
- Improvement of the quality of education at all levels of the educational system.

As at 2019, the Concept does not appear to be implemented, in particular with regard to its first two priority areas. The text of the Concept is not available online on any of the governmental websites.

Concept for Environmental Education Development

The Concept for Environmental Education Development and its Action Plan were approved in May 2019 (2019 Resolution of the Cabinet of Ministers No. 434). They include several actions aimed at organizing in a systematic way the process of environmental education and upbringing, promoting environmental knowledge and culture among young people, further improvement of the environment by applying advanced innovative technologies and increasing the knowledge and skills of young people for nature conservation. Most actions are planned for the period 2019–2021. The SCEEP and the three education ministries must ensure quarterly submission to the Cabinet of Ministers of information on the implementation of the Concept and the Action Plan.

Other

The Action Strategy on Five Priority Directions for Development for the period 2017–2021 – the key midterm planning document in the country – includes activities for the development of education. Neither environmental education nor ESD is mentioned in the Strategy.

The Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863) underlines the need to improve the system of continuing environmental education by introducing environmental and sustainable development topics into the curriculum in all levels of education.

The Programme of Actions on Environmental Protection for 2013–2017 (2013 Resolution of the Cabinet of Ministers No. 142) includes among its goals the introduction of ESD, the broad dissemination of environmental knowledge and the improvement of environmental culture. The development of environmental education and ESD are included in one of the five priority directions of the Programme. The Programme includes a long list of concrete actions in the area of environmental education and ESD. As at March 2019, the only activities implemented are the establishment, in 2016, of the Centre for Retraining and Advanced Training of Environmental Professionals under SCEEP and activities by SCEEP to promote environmental protection and raise the environmental awareness of the public.

The Strategy for Transition to Green Economy in the period 2019–2030 (2019 Resolution of the President No. 4477) envisages integration of green economy themes into curricula of higher education and secondary specialized education and in teacher training.

The Second Education Sector Plan 2019–2023, prepared by the Government with the support of UNICEF and endorsed by several development partners, aims to contribute to improving equitable access to quality education at all levels. Safe and enabling learning environments are a strategic priority of the Plan. ESD is included in the Plan as an approach for the development of new curricula and to achieve Sustainable Development Goal 4. The First Education Sector Plan, implemented in the period 2013–2017 with the support of a US\$49 million grant from the Global Partnership for Education, included some ESD training activities conducted by UNDP, in cooperation with UNESCO, on human development, civic participation, gender equality and human rights, in the frameworks of higher and postgraduate education (347 people were trained).

Sustainable Development Goals and targets relevant to this section

The current status of Uzbekistan vis-à-vis targets 4.7 and 12.8 of the 2030 Agenda for Sustainable Development is described in box 5.3.

Institutional framework

SCEEP is in charge of the organization of environmental education, awareness-raising and education, as well as in-service and advanced training of environmental professionals. The Unit for Public Relations and Mass Media is in charge of overseeing environmental education and awareness-raising. The Unit has two staff positions, one of which is vacant as at March 2019. The SCEEP Centre for Retraining and Advanced Training of Environmental Professionals is in charge of environmental training for civil servants and interested representatives of business and civil society. The Centre has eight managerial staff and 17 trainers, including university professors and relevant staff of SCEEP.

The Ministry of Public Education has environmental education as part of its mandate. ESD is not included in the mandate of the Ministry.

The other two education-related ministries – the Ministry of Pre-school Education and Ministry of Higher and Secondary Specialized Education – do not

have environmental education or ESD explicitly included in their mandates.

The Centre for Vocational Education and Training under the Ministry of Higher and Secondary Specialized Education oversees vocational education and training, including the aspects of environmental education.

The Coordination Council for Environmental Education and ESD was established within the framework of the 2011 Concept of Education for Sustainable Development. It was meeting for some three years but discontinued its activities around 2014, reportedly due to a decline in interest from the institutions involved and because of the reorganization and staff changes within SCEEP in 2017. The exact composition of the Council is not known; however, representatives of at least three NGOs (“Ekomaktab”, “KRASS” and Ecoforum of NGOs of Uzbekistan) used to participate in the meetings of the Council. No minutes of meetings of the Council are available.

The Local Education Group, chaired by the Ministry of Public Education, consists of three education-related ministries and other ministries, as well as the International Development Partners’ Group. In August 2018, the Group endorsed the Second Education Sector Plan 2019–2023.

The National Training Centre on ESD was established in 2015 under NUU. The Centre is the leading body in the country working on ESD issues; however, without adequate political and financial support from the Government, this results in ad hoc activities based on the available donor funding.

Participation in international processes

Uzbekistan adopted the ECE Strategy for ESD in 2005 and participated in activities under the Strategy by submitting a pilot national implementation report in 2007 and a national implementation report in 2010. The country did not participate in reporting exercises in 2015 and 2018. Since 2015, the country’s participation in the meetings of the ECE Steering Committee on ESD has not been regular.

Uzbekistan participated in the United Nations Decade on ESD (2005–2014) and in the follow-up Global Action Programme (GAP) on ESD (2015–2019), including by joining the UNESCO Associated Schools Network (ASPnet). ESD-related activities were carried out mostly through projects implemented by several universities, such as NUU, Urgench State University and Fergana Polytechnic Institute, with support from UNESCO.

Box 5.3: Targets 4.7 and 12.8 of the 2030 Agenda for Sustainable Development



Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Target 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

Global target 4.7 has been nationalized by Uzbekistan with different wording, i.e. “By 2030, ensure that all pupils and students acquire the knowledge and skills necessary to promote sustainable development”, thereby not mentioning ESD and the sustainable development themes included in the global target. Global indicator 4.7.1, “Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment”, was nationalized without changes.

Environmental education is addressed well in the country. ESD is not yet integrated into the education system, occurring mostly on an ad hoc basis in project-based activities carried out by universities and NGOs. A few sustainable development themes are included in secondary education.

As at 2019, the 2011 Concept of Education for Sustainable Development does not appear to be implemented. The Coordination Council for Environmental Education and ESD discontinued its activities in 2014. The work of the National Training Centre on ESD, established in 2015 under NUU, suffers from the absence of political support from the Government as well as the lack of clear mandates on ESD in the country.

At the policy level, ESD was included in the Programme of Actions on Environmental Protection for the period 2013–2017, albeit with very limited implementation progress, covering only the environmental dimension of ESD. The Second Education Sector Plan 2019–2023 includes provisions on using ESD as an approach in developing the new curricula, the implementation of which will depend on the follow-up action from the three ministries of education in the country.

Delivering on global target 4.7 and indicator 4.7.1 by 2030 will not be possible for Uzbekistan without concerted and coordinated efforts by the Government and related stakeholders to integrate ESD into formal education at all levels and into non-formal and informal education.



Goal 12. Ensure sustainable consumption and production patterns

Target 12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

Global target 12.8 has been nationalized by Uzbekistan as “By 2030, provide the population with relevant information and awareness about sustainable development and lifestyle in harmony with nature”. Global indicator 12.8.1, which is largely similar to global indicator 4.7.1, was nationalized without changes.

SCEEP is making efforts to provide online information of an educational nature about biodiversity, waste management, ambient air and the ozone layer. The Committee is promoting its activities and raises awareness on environmental protection through press conferences and talk shows and on the Facebook platform. Other institutions (e.g. Uzhydromet and the State Committee on Statistics) have yet to make information on environmental matters in their possession publicly accessible free of charge. Taking into account the cross-cutting nature of the environmental dimension of sustainable development, additional effort is needed from all governmental institutions to ensure the provision of information on environmental matters pertaining to their activities.

Several online newsletters, magazines and websites publish information about the environment and promote environmental awareness. A few NGOs are engaged in environmental education and public awareness-raising, although mostly on project-based activities.

Thus, Uzbekistan started taking action to raise awareness on sustainable development and lifestyles in harmony with nature. However, these activities lack an adequate political mandate and proper coordination among the authorities and institutions involved, as well as effective engagement with civil society. Many activities are project based and lack follow-up. Without additional efforts to ensure that the entire population has access to the relevant information and is aware of sustainable development and lifestyles in harmony with nature, and can make informed choices in that regard, delivering on global target 12.8 by 2030 will be difficult for Uzbekistan.

5.6 Assessment, conclusions and recommendations

Assessment

Access to information and public participation

Access to information in environmental matters is at the inception stage. The ongoing governmental reforms are overwhelming for SCEEP, leaving it with limited resources to deal with processing the information and making it available to the public. Most governmental authorities do not post on their websites information and data on the state of the environment or on results of their activities related to or having an impact on the state of the environment. Furthermore, access to information on environmental matters, which is broader in scope than information on the state of the environment, is not fully covered by the national legislation. Passive access to information is more advanced than active access. The procedure for requesting information is established; however, the quality of information and timeliness of its provision remain a challenge.

Capacity for public participation in decision-making in environmental matters is practically non-existent. The Public Council established for the purpose of serving as a bridge between SCEEP and civil society does not yet fulfil this role, in the absence of information about its activities and without proactively promoting its work and engaging other representatives of the public and environmental NGOs. Furthermore, the Ecological Movement of Uzbekistan cannot replace public participation as it is envisaged by current generally accepted international practice. When necessary, mostly a small circle of NGOs working with governmental authorities is engaged in official governmental efforts to consult the public. Detailed procedures for public participation in decision-making on planned activities and projects are lacking. Except for the Ecological Movement of Uzbekistan, other environmental NGOs are not involved in the decision-making process on joining MEAs or included in the national delegations to international events.

A positive development is the opportunity provided to the public to initiate online petitions, including on environmental matters. Progress was also made in giving the public the opportunity to comment on draft laws and by-laws by posting them online. The instruments of public environmental control (except for the hearings of information provided by managers that are organized by the Ecological Movement of

Uzbekistan) and public ecological expertise do not yet function in practice.

There are no examples of environmental NGOs or representatives of the public filing cases on environmental matters in the courts.

Education

Environmental education is well developed in Uzbekistan. The Concept for Environmental Education Development and its Action Plan, approved in May 2019, aim at ensuring continuous environmental education and raising the ecological culture among population.

ESD is not integrated into the education system and is not implemented in a comprehensive and continuous manner. The country adopted the Concept of Education for Sustainable Development in 2011 but it has not prompted actual changes in the education system. ESD is implemented mostly by environmental NGOs and several universities as project-based activities. Continuity of these efforts is not ensured.

The comprehensive nationalization of ESD at the legal, policy and institutional levels is not achieved. Although such nationalization requires considerable effort and resources, without ESD, achieving many goals and targets of the 2030 Agenda for Sustainable Development will be challenging for Uzbekistan.

Conclusions and recommendations

Access to information

While news related to environmental events and activities is posted on the websites of governmental authorities, and environmental legislation is made available on a dedicated website and on the SCEEP website, other information on environmental matters, including on the state of the environment, is not available on governmental websites to be accessed by the public. In rare cases when information on environmental matters is posted online, as in the case of the Open Data Portal, it is of limited use. Printed publications with information on the environment are disseminated primarily among governmental institutions and not made available to the public on a regular basis.

The procedure to receive and process requests from the public for information on environmental matters is established, with responsibilities assigned and deadlines set. However, a system to monitor the response process, the quality of information and timeliness of its provision is lacking.

The public at large is not sufficiently aware of what information on environmental matters is, its right to request it and the procedures to do so.

Public servants working in the environmental and other sectors with an impact on the environment lack sufficient expertise and capacity for effective provision of information on environmental matters.

Recommendation 5.1:

The State Committee on Ecology and Environmental Protection and other governmental authorities should:

- (a) *Make available online all information on environmental matters in their possession, including the electronic versions of the available printed publications;*
- (b) *Enhance the legal framework, procedures and practical measures to enable effective public access to information on environmental matters in line with international standards;*
- (c) *Establish a system to monitor the effectiveness of procedures related to requests for information on environmental matters;*
- (d) *Organize activities to raise the awareness of the public on information on environmental matters and the rights and procedures to access it;*
- (e) *Organize activities to develop the capacity of civil servants at the national and subnational levels regarding the scope of information on environmental matters and procedures to make information on environmental matters effectively accessible to the public;*
- (f) *Provide adequate human and financial resources to support effective access to information on environmental matters.*

See Recommendations 3.6, 4.4, 4.5 and 4.6.

Enabling activities of environmental NGOs

The procedures for registering and operation of NGOs, including environmental NGOs, were simplified in recent years. However, hindrances to the activities of environmental NGOs remain, such as the requirement to notify the Ministry of Justice of each planned event in the country and abroad and to seek permission to receive international funds. In the past few years, no new environmental NGOs have been registered at the national or inter-oblast levels. Only one international environmental NGO is registered in the country.

Recommendation 5.2:

The Cabinet of Ministers should simplify the procedures for the operation of environmental NGOs in line with international standards.

Public participation

The public at large is not sufficiently aware of its right to participate in decision-making on environmental matters. The 2013 Law on Environmental Control and 2018 Law on Public Control describe the forms of public control over the activities of governmental authorities and the rights and duties of NGOs in this respect. However, detailed procedures to ensure and enable effective public participation in decision-making on environmental matters are lacking. Human and financial resources to enable effective public participation are lacking.

The public is largely not consulted on planned activities and projects. There is no system to monitor if and how the public was consulted on activities and projects. Information about the public hearings, documents for the public hearings and their outcomes are not available to the public in a timely manner and on open access.

The timeframe of 16 days for making comments on draft laws and by-laws is too short to allow meaningful participation of the public and environmental NGOs. There is no transparent system in place to show whether and how comments made by the public were taken into account.

Recommendation 5.3:

The Cabinet of Ministers should:

- (a) *Ensure that detailed procedures are developed and practical measures are taken to enable effective public participation in decision-making on environmental matters (on projects, activities, strategic planning and legislation) in line with international standards, and monitor their implementation;*
- (b) *Ensure meaningful organization of public hearings;*
- (c) *Increase the time frame for commenting on laws and by-laws, at least to 30 days and, for large and complex documents, to 60 days or more, to enable the public to organize for the submission of comments;*
- (d) *Develop the capacity of civil servants at the national and subnational levels and provide adequate human and financial resources to support public participation.*

See Recommendations 2.1, 16.4.

Access to justice

Individuals and environmental NGOs have the opportunity to file cases and appeals in the courts. However, there are no precedents of environmental NGOs or representatives of the public filing cases on environmental matters or appealing an action (or inaction) of state authorities in the courts. There is a lack of awareness among the population that it can exercise such rights. Also, the public is hesitant to seek redress through the courts. In the absence of court cases on environmental matters filed by environmental NGOs or representatives of the public, the capacity of the judicial system has not had the opportunity to develop and might not be adequate to provide effective redress.

Recommendation 5.4:

The Cabinet of Ministers, through the Ministry of Justice, the General Prosecutor's Office and the State Committee on Ecology and Environmental Protection, should:

- (a) *Promote access to justice in environmental matters and raise the awareness of members of the public and environmental NGOs about their rights and opportunities as provided by the legislation in this respect;*
- (b) *Develop the capacity of the judicial system (civil servants, judges, staff of the Human Rights Ombudsperson and relevant training institutions) to provide access to justice in environmental matters to members of the public and environmental NGOs.*

See Recommendation 2.4(b).

Aarhus Convention

Uzbekistan is not a party to the Aarhus Convention, which represents the highest international standards on access to information, public participation in decision-making and access to justice on environmental matters. The country does not fully benefit from the activities undertaken under the Convention and the experience of other countries that are parties to this treaty. The country's judicial institutions do not participate in the activities on access to justice organized in the framework of the Aarhus Convention. An in-depth assessment of the state of affairs in the area of access to information, public participation in decision-making and access to justice in environmental matters, with detailed recommendations on action needed to bring the national legislation in line with the Aarhus Convention, has never been conducted.

Recommendation 5.5:

The Cabinet of Ministers should:

- (a) *Ensure the regular participation of Uzbekistan in activities under the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) with a view to sharing experience and good practice;*
- (b) *Encourage the Supreme Court of Uzbekistan and other relevant bodies (Human Rights Ombudsperson, General Prosecutor's Office) to participate in activities related to access to justice under the Aarhus Convention;*
- (c) *Initiate an in-depth assessment of the state of affairs in the area of access to information, public participation in decision-making and access to justice in environmental matters, with detailed recommendations on action needed in each area, with a view to bringing the national system in these areas in line with the Aarhus Convention;*
- (d) *Consider accession to the Aarhus Convention.*

From environmental education to education for sustainable development

Neither SCEEP nor the three ministries in charge of education issues have a clear mandate to work on ESD. The Coordination Council on Education for Sustainable Development, established in 2011, discontinued its activities in 2014. Several activities related to ESD were carried out and materials were produced, mostly within project-based activities undertaken by academic institutions and environmental NGOs. NUU and several environmental NGOs have accumulated significant expertise in ESD.

Legal frameworks for ESD are not in place. The Concept of Education for Sustainable Development was largely not implemented. The Programme of Actions on Environmental Protection for 2013–2017 included activities on ESD; however, most of these activities have not been put into practice. The country's participation in the activities in the framework of the ECE Strategy for ESD has not been regular.

The timely and effective implementation of the Concept for Environmental Education Development and of its Action Plan, both approved in May 2019, should contribute to the development of the environmental dimension of ESD. However, despite this positive development, there are no specific measures for introducing ESD into the system of

formal, non-formal and informal education in the country.

Overall, the absence of legal, policy and institutional frameworks for ESD is an impediment to the country's progress in achieving targets 4.7 and 12.8 of the 2030 Agenda for Sustainable Development.

Recommendation 5.6:

The Cabinet of Ministers should:

- (a) *Give a mandate on education for sustainable development (ESD) to the State Committee on Ecology and Environmental Protection, including promoting ESD in non-formal and informal education and in-service training;*
- (b) *Give a mandate on ESD to each of the three ministries in the education sector, including for mandatory integration of ESD into the formal curricula at all levels and into teachers' education and in-service training;*
- (c) *Revitalize the work of the Coordination Council on Education for Sustainable Development by revisiting its composition to include all relevant stakeholders and by ensuring its regular activities;*
- (d) *Ensure the integration of ESD into the national legislation and policies and monitoring and reporting on their implementation;*
- (e) *Support the work on ESD by academia and NGOs;*
- (f) *Ensure regular participation by the country in activities in the framework of the ECE Strategy for ESD.*

Retraining and in-service training

In-service training of civil servants is mandatory in Uzbekistan and most governmental authorities and institutions have their own centres for in-service training. The establishment, in 2017, of the Centre for Retraining and Advanced Training of Environmental Professionals under SCEEP is a clear achievement, especially since the Centre serves the needs of interested stakeholders beyond SCEEP.

In-service training for civil servants includes environmental education to various degrees. However, neither the Centre for Retraining and Advanced Training of Environmental Professionals under SCEEP nor the centres for in-service training under other governmental institutions currently include ESD in their training activities.

Recommendation 5.7:

The State Committee on Ecology and Environmental Protection should:

- (a) *Mandate its Centre for Retraining and Advanced Training of Environmental Professionals to integrate ESD into its training activities;*
- (b) *Promote the integration of environmental education and ESD into the training activities of in-service training centres under other governmental authorities.*

Chapter 6

IMPLEMENTATION OF INTERNATIONAL AGREEMENTS AND COMMITMENTS

6.1 General priorities for international cooperation related to the environment and sustainable development

Uzbekistan is undergoing a major transformation in its relationship with the international community. The launch, in 2017, of an ambitious programme of market-oriented reforms, opened a new path of increased participation and reinforced the country's position on the international stage. Uzbekistan aspires to and is striving to play a much stronger and cooperative role in the international landscape. However, this transformation will not be effected at all administrative levels and in all areas of public policy immediately. It will take a few years for the whole system and all those who have a role in it to fully reflect this unprecedented culture of international openness.

Increased regional and international cooperation and integration have become core vectors of this new paradigm, with Central Asian countries being assumed as the main priority of Uzbekistan foreign policy. In the last two years, the intensification of regional integration efforts by Uzbekistan is unquestionable. Some border demarcation issues were overcome, checkpoints were reopened, regional trade was scaled up, power lines were reconnected and the country expressed the willingness and interest to cooperate on large hydropower plant (HPP) construction.

Transboundary water resources management and addressing the Aral Sea disaster continue to stand out as the main priorities of Uzbekistan's international, regional and bilateral cooperation in the field of environment.

The Sustainable Development Goals were embraced by Uzbekistan as overarching goals in its main development policy objectives. The five priority areas identified in the 2017 Action Strategy on Five Priority Directions for Development for the period 2017–2021 are very much aligned with the global Sustainable Development Goals.

6.2 Global and regional multilateral environmental agreements

Conservation and sustainable use of biodiversity and nature

Convention on Biological Diversity

Uzbekistan has been a party to the 1992 Convention on Biological Diversity (CBD) since 1995. The State Committee on Ecology and Environmental Protection (SCEEP) is the competent authority for the CBD. In accordance with CBD requirements, Uzbekistan has prepared national reports on the state of biodiversity (the latest one submitted in 2019) and a thematic report on protected areas (PAs).

To implement the CBD requirements, Uzbekistan adopted the first National Biodiversity Strategy and Action Plan (NBSAP) in 1998 and the second one in 2019. The intensity of legislative and regulatory activities since 2012 on PAs clearly demonstrates the centrality of this instrument – the creation of PAs – in the policy of nature conservation and biodiversity in Uzbekistan. Challenges with CBD implementation include insufficient administrative capacity for implementation, significant gaps in critical information for the management of biodiversity, lack of coordination among institutions involved in PA management and difficulties in implementing cross-sectoral policies (chapter 11). The key concerns are to ensure that the PA network becomes ecologically representative, including all main representative landscapes and ecosystems, and that it is significantly extended. As at early 2019, PAs in the common understanding of the term cover only 4.63 per cent of the country, which is below the CBD Aichi Target 11 set for 2020 (at least 17 per cent of terrestrial and inland water areas).

Uzbekistan joined the 2000 Cartagena Protocol on Biosafety in late 2019 (chapter 13).

Convention concerning the Protection of the World Cultural and Natural Heritage

Uzbekistan has been a party to the 1972 Convention concerning the Protection of the World Cultural and

Natural Heritage since 1993. In 2016, Western Tien-Shan was inscribed onto the World Heritage List as the first natural property, adding to four previously inscribed cultural properties (Historic Centre of Bukhara (1993), Historic Centre of Shakhrisayabz (2000), Itchan Kala (1990), Samarkand – Crossroad of Cultures (2001)). Three properties under the “natural” criterion and three under the “mixed” criterion were inscribed by Uzbekistan to the tentative list in 2008.

The Western Tien-Shan transboundary site combines the natural heritage of territories in Kazakhstan, Kyrgyzstan and Uzbekistan, consisting of 13 component parts covering a combined area of 528,177 ha. In Uzbekistan, Western Tien-Shan comprises two areas: Bashkizylsay (core zone of Ugam-Chatkal State Biosphere Reserve (SBR), and Maydantal (Chatkal State Biosphere Strict Nature Reserve (SBSNR)), with outstanding diversity of plants and animal species, a high level of endemism and many species of global conservation importance.

When Western Tien-Shan was enrolled on the World Heritage List in 2016, some recommendations were included in the nomination, namely, the need to: finalize the transboundary management framework for the property; further develop collaboration in the framework of a tripartite memorandum for management of the property; review and rationalize the boundaries of the components of the property and their buffer zones; and overcome the lack of capacity on transnational management. Although a joint report on the state of conservation of the transboundary property was not submitted to the World Heritage Committee, as it should have been, in 2018,

Uzbekistan submitted a report on the state of conservation of the Uzbek components of Western Tien-Shan. This report underlined the development of a draft memorandum of cooperation on the management and protection of the property prepared by the Committee on Forestry and Fauna of the then Ministry of Agriculture of Kazakhstan, the State Agency for Environmental Protection and Forestry under the Government of Kyrgyzstan and SCEEP of Uzbekistan. This memorandum, signed by the three countries in February 2019, foresees the establishment of a coordinating working group and a monitoring programme for the property.

The main challenges to the property are poaching, cattle grazing, illegal logging, illegal and legal haymaking, illegal harvesting of flowers and unsustainable tourism practices.

The current stand of Uzbekistan vis-à-vis target 11.4 of the 2030 Agenda for Sustainable Development is reflected in box 6.1.

World Network of Biosphere Reserves

Chatkal biosphere reserve (which currently includes two protected areas – the Chatkal State Biosphere Strict Nature Reserve (SBSNR) and Ugam-Chatkal State Biosphere Reserve (SBR)) is the only biosphere reserve of Uzbekistan inscribed in the UNESCO World Network of Biosphere Reserves. It covers the south-western end of the Chatkal range in the Western Tien-Shan Mountains and comprises a high habitat and species diversity.

Box 6.1: Target 11.4 of the 2030 Agenda for Sustainable Development



Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage

Uzbekistan chose national indicator 11.4.1 (State budget expenditure on cultural development per capita) to measure target 11.4. As a stand-alone indicator, this does not allow the assessment of efforts to protect and safeguard the world's cultural and natural heritage. Within “cultural development”, much more is included than the world's cultural and natural heritage.

The country does not produce global indicator 11.4.1 (Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)). Producing global indicator 11.4.1 would allow proper evaluation of Uzbekistan's efforts taken specifically to protect the world's cultural and natural heritage and would better correspond to the intended meaning of target 11.4.

Photo 6.1: Lake Tudakul

Photo credit: Ms. Mariya Gritsina

In 2015, Chatkal SBSNR was subject to a periodic review for not meeting the criteria of the Statutory Framework of Biosphere Reserves. As a follow-up to the recommendation of the International Advisory Committee for Biosphere Reserves, a roadmap on protection and development of the biosphere reserve was adopted in 2017. The Roadmap envisages: updating the inventory of the protection, buffer and transition areas of the biosphere reserve; developing cooperation within the South and Central Asia Man and the Biosphere (MAB) Network, and undertaking scientific studies on biodiversity in the biosphere reserve. The designation of Ugam–Chatkal SBR in 2018 allowed for the establishment of the buffer zone and transition area for the Bashkyzylsai section of it, while, in 2019, works on establishing the buffer zone for the Maydantal section are ongoing.

Uzbekistan is working on a new submission to the UNESCO World Network of Biosphere Reserves, for Lower Amu Darya Biosphere Reserve.

Convention on Wetlands of International Importance, especially as Waterfowl Habitat

Uzbekistan acceded to the 1971 Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention) in 2001.

SCEEP is the Administrative Authority. The Institute of the Gene Pool of Plant and Animals of the Academy of Sciences was the Focal Point for Matters Relating to The Scientific and Technical Review Panel; however, the Institute was dissolved and no longer exists. The role of the National Focal Point for Matters Relating to The Programme on Communication, Education, Participation and Awareness was entrusted to the former State Inspectorate for the Protection and Rational Use of Fauna and Flora (Gosbiocontrol); it is now assumed by SCEEP. The country has not regularly submitted reports to the Convention, having complied with reporting obligations only in 2010 and 2018.

Uzbekistan has two sites designated as Wetlands of International Importance (Ramsar sites), with a combined surface area of 558,400 ha. Lake Dengizkul, designated in 2001, is the largest saline closed water body fed by irrigation run-off in the south-western part of the Kyzylkum Desert, with typical ecological conditions of natural lakes situated in the deserts of Central Asia. In 2008, the Aydar-Arnasay Lakes System, the largest reservoir in Uzbekistan, consisting of freshwater lakes situated in the middle stream of the Syr Darya River and on the irrigated massif of the Golodnaya Steppe and Kyzylkum Desert, became the

second Ramsar site. None of these sites have a management plan.

With the support of Sweden, a proposal for a designation of a third Ramsar site was developed, namely, for Tudakul and Kuymazar water reservoirs, in the south-western part of the Kyzylkum Desert, 23 km east of Bukhara City. Uzbekistan submitted the proposal for designation to the Ramsar Secretariat in 2016 and was then asked to revise the submission with additional information. As at June 2019, no revised submission had been made.

In the last eight years, the country carried out activities for the implementation of the Ramsar Convention, such as: the monitoring of biological diversity in Lake Dengizkul with a focus on hydrophilic bird species; the implementation of the joint project “Protection and rational use of wetlands Lake Sudochoye system on the Ustyurt plateau”, with the technical support of CAREC and financial support of the United States Agency for International Development (USAID); and the development, under that project, of preliminary assessments to inform a proposal for the designation of Sudochoye as a Ramsar site.

The challenges in implementing the Convention remain generally the same as in 2010: the absence of permanent and stable funding devoted to the conservation and restoration of wetlands; the absence of a public policy for the implementation of the provisions of the Convention; insufficient monitoring and control of the use of flora and fauna on the Aydar-Arnasay Lakes System; insufficient monitoring and control of compliance with environmental legislation on Ramsar sites and wetlands in general; and insufficient expertise on wetlands management and ecosystems services. A national wetland inventory, although planned for some years, has not yet been developed. A new and serious challenge is to protect the “Aydar-Arnasay Lakes System” Ramsar Site from being chosen as the location for the future nuclear power plant (chapter 12).

Although Uzbekistan is not part to the Ramsar Regional Initiative for Central Asia,¹⁸ the country recently participated in meetings under the Initiative.

The main priorities for the country for the future are: to strengthen the protection and sustainable use of biodiversity in Ramsar sites; to improve the monitoring of biological diversity on those sites; and

to prepare and approve management plans for all Ramsar sites.

Convention on the Conservation of Migratory Species of Wild Animals

Uzbekistan ratified the 1979 Convention on the Conservation of Migratory Species of Wild Animals (CMS) in 1998. SCEEP is the National Focal Point and the Institute of Zoology of the Academy of Sciences is a member of the Scientific Council. Under the umbrella of the CMS, Uzbekistan signed four memoranda of understanding (MOUs): in 1995 on the slender-billed curlew, in 1998 on the Siberian crane, in 2002 on the Bukhara deer and in 2006 on the saiga antelope (box 6.2). Submission of national implementation and MOU reporting to the Convention Secretariat has been quite regular.

There is no specific plan of action for the fulfilment of CMS obligations in Uzbekistan, but there are legislative acts and strategies that unambiguously contribute to the implementation of the CMS, namely, those relating to biodiversity and PAs.

Agreement on the Conservation of African-Eurasian Migratory Waterbirds

In 2004, Uzbekistan acceded to the 1995 Agreement on the Conservation of African-Eurasian Migratory Waterbirds, which was developed under the framework of the CMS. Reporting obligations have not been complied with since 2008. The nomination of the national focal point is pending, while the Technical Focal Point is entrusted to the Institute of Zoology of the Academy of Sciences.

There are more than 400 bird species recorded in Uzbekistan, of which 200 are inhabitants of wetlands. Of these, 48 species are included in the national Red Data Book (Tashkent, 2009), while 43 species are included in the Red Lists of the International Union for Conservation of Nature (IUCN). Of the 52 international bird areas (IBAs) in Uzbekistan, only 17 completely or partially overlap the existing PAs. The IBAs were classified on the basis of studies conducted by the Institute of Zoology and the Uzbekistan Society for the Protection of Birds (UzSPB) with the support of different international organizations (World Bank/GEF, Ramsar Convention, Wetlands International, WWF Russia). These studies provided information on the most important wintering grounds and stays during migrations and nesting.

¹⁸ The Ramsar Regional Initiative for Central Asia supports countries in that region in implementing the Ramsar Convention and its Strategic Plan for the period 2016–2024.

Box 6.2: Saiga antelope, a good example of cooperation with the joint support of CITES and the CMS

The 2005 Memorandum of Understanding concerning the Conservation, Restoration and Sustainable Use of the Saiga Antelope (*Saiga tatarica*), a critically endangered species included in the national Red List since 2008, was signed by Uzbekistan in 2006. The MoU was developed under the auspices of the CMS and provides an international framework for Kazakhstan, Mongolia, the Russian Federation, Turkmenistan and Uzbekistan, where the saiga occurs, to work more closely together on regional conservation issues. The MoU has been in force since 2006 (for Mongolia, since 2010) and has been signed by all range States and nine cooperating organizations.

The overall saiga population numbers increased from 67,000 in 2006, when the MoU came into force, to 228,000 in 2018, reflecting the good management and joint efforts by the countries and cooperating organizations to implement the Memorandum, as well as the international trade control applied under CITES. Although showing a positive trend, the species experienced sudden dramatic declines, which showed that the measures agreed in 2005 were not sufficient and not adequately adapted to new and growing challenges, such as disease outbreaks, linear infrastructure (fences, railroads, pipelines, roads, etc.), habitat deterioration and poaching.

In 2016, CITES adopted a series of measures, inter alia, to improve trade controls and enhance collaboration between saiga range States and consuming countries, and to support the CMS MoU and implementation of the Action Plan concerning Conservation, Restoration and Sustainable Use of the Saiga Antelope. At the 17th meeting of the Conference of the Parties to CITES in 2016, four decisions directed to range States of the saiga antelope were approved. These decisions instructed the five range States to:

- Fully implement the measures directed to them in the Medium-Term International Work Programme for the Saiga Antelope (MTIWP) (2016–2020);
- Provide information to the Secretariat on the measures and activities they undertook;
- Carefully manage the trade in, and consumption of, saiga products and derivatives;
- Support the development of tools to facilitate the identification, sourcing and determination of age of saiga horns;
- Promote training of, and cross-border collaboration among, enforcement agencies;
- Tackle new illegal trade channels, such as those using social media;
- Collaborate to enhance in situ and ex situ conservation of saiga antelopes, develop joint actions and programmes in support of saiga conservation and restoration, and leverage financial resources for undertaking these activities.

In order to comply with the decisions and to significantly improve cooperation on the protection and conservation of saiga, range States have agreed, in April 2019, on a set of conservation priorities guiding the work under the MoU up to 2025. They reviewed progress in implementing the MoU and its MTIWP 2016–2020 and developed a new work programme covering the period 2021–2025. Strengthened and expanded measures were agreed, namely, encouraging registration, control and monitoring of stockpiles, improving internal market controls for saiga parts and products, harmonizing legislation to implement CITES, and reducing demand for and use of saiga horn in traditional Asian medicines.

Photo 6.2: Bukhara deer (*Cervus elaphus bactrianus*)



Photo credit: Ms. Mariya Gritsina

Convention on International Trade in Endangered Species of Wild Fauna and Flora

Uzbekistan became a party to the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1997. The country has designated SCEEP as the Management Authority. The Institute of Botany and the Institute of Zoology of the Academy of Sciences are designated as Scientific Authority for the Convention. The country fulfilled its biennial reporting obligations only from 2009 to 2014.

The main legal instrument for ensuring compliance with the CITES obligations is the 2014 Resolution of the Cabinet of Ministers No. 290, which includes, in Annex 3, the rules on CITES permitting procedures. The permits are issued by SCEEP, while the agreement of the Cabinet of Ministers and a scientific justification provided by the Academy of Sciences are compulsory. The Resolution also determines poaching tools and bans on importation of such tools into the country.

Despite efforts undertaken to comply with the requirements of the Convention, following the conclusions of the national legislation project conducted by the CITES Secretariat, Uzbekistan was identified by the Standing Committee at its 69th meeting in 2017 as a party whose legislation did not meet the minimum requirements under CITES. Since the beginning of 2018, work is being developed, with the assistance of the CITES Secretariat, to update Resolution No. 290 with a view to ensuring the fully fledged integration of CITES requirements into Uzbek legislation.

The Red Data Book of Uzbekistan (2009) contains 184 endangered species of animals. Of those, 88 endangered species and subspecies are included in the Appendices of CITES. The exports and imports of species included in the Appendices of CITES primarily concern the sale of tortoises, decorative birds and some birds of prey. There is no up-to-date information available on the total number of seizures/confiscations per year, although it can be assumed that it is a significant number, taking into account the available information on some seizures/confiscations in 2013 and 2014.

The current stand of Uzbekistan vis-à-vis targets 15.7 and 15.c of the 2030 Agenda for Sustainable Development is reflected in box 6.3.

Desertification

Uzbekistan ratified the 1994 United Nations Convention to Combat Desertification (UNCCD) in

1995. The National Focal Point is the State Committee on Forestry. The country participates in the work undertaken under the auspices of the UNCCD and has complied with its reporting obligations. National programmes to combat desertification have been adopted.

Desertification and general degradation of land are key problems in Uzbekistan. Uzbekistan adopted the voluntary Land Degradation Neutrality target, “By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world”. The country is benefiting from the support of the Land Degradation Neutrality Target Setting Programme (LDN TSP), a partnership initiative implemented by the Secretariat and the Global Mechanism of the UNCCD, in assessing the possibility of using global indicators proposed by the UNCCD for the assessment of land degradation neutrality and determination of the baseline state of land degradation.

Within the preparation of the 2019 Report on the LDN TSP in Uzbekistan, a comprehensive assessment of the extent to which the territory of Uzbekistan was exposed to the processes of desertification and drought was carried out. The preliminary estimates, based on global and national indicators, point to 26–28 per cent of the total area of the country being affected by degradation. The main “hotspots” are the irrigated and non-irrigated zones of the Aral Sea area.

Uzbekistan is making significant efforts to stabilize and improve the state of land in the Aral Sea region, including the creation of protective forest plantations on the dry bottom of the Aral Sea (chapter 11), land improvement, improving land fertility and restoration of degraded ecosystems. A number of programmes and projects have been prepared and are being implemented in cooperation with international organizations.

Much work has been done to mitigate the effects of soil degradation, in particular, those deriving from the Aral Sea disaster. This can also be attested by the number of projects devoted to sustainable land management and improving land quality in which the country is fully involved:

- GEF/UNDP/State Committee on Land Resources, Geodesy, Cartography and State Cadastre project “Reducing Pressures on Natural Resources from Competing Land Use in Non-Irrigated Arid Mountain, Semi-Desert and Desert Landscapes of Uzbekistan”, 2013–2018;

- GEF/UNDP/SCEEP project “Sustainable Use of Natural Resources and Forestry in Key Mountain Areas Important for Globally Significant Biodiversity”, 2017–2021;
- GEF/FAO/State Committee on Forestry project “Sustainable Management of Mountain and Valley Forests”, 2018–2021;
- Central Asian Countries Initiative for Land Management Programme “Integrated Natural Resources Management in Drought-Prone and Salt-Affected Agricultural Production Landscapes”, 2018–2021.

Air protection, ozone layer protection and climate change

Convention on Long-range Transboundary Air Pollution

Uzbekistan is not a party to the 1979 Convention on Long-range Transboundary Air Pollution (CLRTAP), nor to its eight Protocols. The National Focal Point is SCEEP.

A study on the feasibility of acceding to CLTRAP and to the 1984 Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol) was envisaged in the Programme of Actions on Environmental Protection for the period 2013–2017 but has not yet been concluded.

The country hosted workshops conducted by the CLRTAP Secretariat on emission inventories in 2015 and 2018. CLTRAP has been assisting the country in developing and implementing measures to reduce emissions of harmful substances that lead to transboundary air pollution and on maintaining emission inventories for various sectors of the economy. In 2015, analytical work was carried out to review the national legislation and, as a result, some definitions of the Convention were included in the draft amendments to the Law on Ambient Air Protection. The draft amendments provide for articles on transboundary air pollution and the gradual introduction of more stringent requirements for emissions of pollutants into the atmosphere for stationary and mobile sources.

Box 6.3: Targets 15.7 and 15.c of the 2030 Agenda for Sustainable Development



Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Target 15.7: Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products
Target 15.c: Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities

Uzbekistan nationalized target 15.7 but has not nationalized target 15.c of the 2030 Agenda, possibly because of the similarity of the global indicators.

Poaching of protected species is identified in the Sixth National Report to the CBD as one of the main reasons for biodiversity loss in Uzbekistan. One of the measures used in the country to combat poaching is the establishment of quotas on the procurement of wild species of animals and this is considered to be the most efficient arrangement, which directly influences the level of poaching. In spite of this, among actions to be implemented in the coming years in the area of nature conservation and biodiversity, few are directed to the fight against poaching and trafficking, the most relevant of which is strengthening the capacity of inspectors to prevent cases of illegal hunting and trade. No measure is foreseen that has regard to increasing the capacity of local communities to pursue sustainable livelihood opportunities.

It is difficult to assess the true dimension of poaching and trafficking of protected species because data on the current size of wildlife populations are not available. Therefore, global indicator 15.c.1 (Proportion of traded wildlife that was poached or illicitly trafficked) cannot be calculated. Similarly, no data are available for calculating the national indicator chosen by the Uzbek authorities for assessing target 15.7 (national indicator 15.7.1: Proportion of detected illegal trade in the total trade volume of wildlife flora and fauna and its products).

Collecting data on wildlife populations, assessing data on poaching and trafficking, making data available to the public, promoting awareness-raising campaigns for mobilizing local communities in support of wildlife conservation, strengthening transboundary cooperation with neighbouring countries on the protection of seasonal movements of protected species and on illegal trade, and capacitating the custom controls are priority actions for Uzbekistan to implement in pursuit of targets 15.7 and 15.c of the 2030 Agenda for Sustainable Development.

CLRTAP is increasingly focusing on providing expertise and guidance to the Eastern European, Caucasus and Central Asian countries. In particular, it gives access to technical information and supports task forces under its aegis, such as the Task Force on Techno-Economic Issues. Documents produced by this Task Force can serve as tools for setting emission limit values (ELVs) based on best available techniques (BAT). Unlike EU Best Available Techniques Reference Documents (EU BREFs), which have more stringent BAT-based ELVs, documents produced by the Task Force are specifically developed for countries with transition economies.

Preparatory work is under way to submit to the Cabinet of Ministers a proposal for the accession of Uzbekistan to CLRTAP and the EMEP Protocol; however, there is no information on a time frame for Uzbekistan to accede to either.

Vienna Convention for the Protection of the Ozone Layer

Uzbekistan became a party to the 1985 Vienna Convention for the Protection of the Ozone Layer and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer in 1993. In 1998, Uzbekistan accepted the London and Copenhagen Amendments and, in 2006, the Montreal and Beijing Amendments to the Protocol. Implementation of the Convention and the Protocol is under the responsibility of SCEEP. Reporting obligations have been fulfilled.

Since 2001, Uzbekistan has continuously reduced its consumption of ozone-depleting substances (ODSs). The improvement of import and export regulations for ODSs and products containing ODSs was fulfilled in 2018 (2018 Resolution of the Cabinet of Ministers No. 17), as assumed in Uzbekistan's commitments under the Batumi Action for Cleaner Air.

SCEEP is responsible for issuing permits for importing into and exporting from Uzbekistan certain ODSs and products containing them. There are also bans on imports of products containing ODSs (HCFCs) or dependent on them.

The 2018 Resolution No. 17 includes a regulation on the procedure for allocating quotas for imports of ODSs for the period 2018–2030. Until 2030, a phased withdrawal and a complete ban on imports of ODSs is expected to be implemented. Quotas are set in accordance with decision XIX/6 of the parties to the Montreal Protocol, according to which an accelerated schedule has been adopted for removing ODSs of group I of list C (or HCFCs) from circulation, with full consideration of the risks associated with the use of

alternative substances with high global warming potential. Pursuant to Resolution No. 17, the Customs Committee monitors imports and exports of ODSs and products containing them.

Uzbekistan has received support and technical assistance on ozone layer protection. In the period 2013–2018, Uzbekistan, along with three other countries (Belarus, Tajikistan and Ukraine), took part in a GEF-financed and UNDP-supported project to accelerate HCFC phase-out. Capacity-building activities for customs officers and the refrigeration sector have been realized, along with investments (US\$1.4 million for Uzbekistan). The next reduction step should be 99.5 per cent from the baseline level (1989) in 2020, to complete phase-out by 2030. A new UNDP/GEF joint project, "Complete HCFC Phase-out in Uzbekistan through Promotion of Zero ODS Low GWP Energy Efficient Technologies", started in 2019.

Uzbekistan is a non-Article 5 party to the Kigali Amendment to the Montreal Protocol for the phase-out of hydrofluorocarbons (HFCs). HFCs do not deplete the ozone layer but their global warming potential is 1,000 times more than that of CO₂. For the purposes of the Kigali Amendment, the non-Article 5 parties are divided into two groups. Belarus, Kazakhstan, the Russian Federation, Tajikistan and Uzbekistan form the second group. For this group, the baseline HFC consumption is calculated as the average in the period 2011–2013 plus 25 per cent of HCFC baseline production/consumption. The stages of HFC reduction for Uzbekistan compared with the baseline production and consumption (2011–2013) are 5 per cent by 2020, 35 per cent by 2025, 70 per cent by 2029, 80 per cent by 2034 and 85 per cent by 2036 and thereafter. As at 2019, the country is considering ratification of the Kigali Amendment.

United Nations Framework Convention on Climate Change

Uzbekistan acceded to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) in 1993, and ratified the 1997 Kyoto Protocol in 1999 and the 2015 Paris Agreement in 2018. The National Focal Point is Uzhydromet. Reporting obligations in respect of national communications and GHG emission inventories have been fulfilled, though the preparation of the GHG inventories is almost exclusively financed through project activities supported by donor funds (chapter 7).

The 2017 (Intended) Nationally Determined Contribution ((I)NDC) of Uzbekistan states the overall aim, goals and measures for the country on climate

change mitigation and adaptation until 2030. The main target sector is energy, subordinated to the aspirational target: to decrease specific emissions of GHGs per unit of GDP by 10 per cent by 2030 from the level of 2010.

In order to achieve the 2030 target, Uzbekistan committed to strengthen the institutional capacity and improve the legal framework for renewable energy and energy efficiency. The country adopted a roadmap for renewable energy development in the form of the 2017 Programme of Measures for Further Development of Renewable Energy, Increase of Energy Efficiency in Economic Sectors and the Social Sector for the period 2017–2021 (2017 Resolution of the President No. 3012). This derives from the priorities set within the 2017 Action Strategy on Five Priority Directions for Development for the period 2017–2021 and the associated goal to increase the share of renewables in power production from 12.7 per cent in 2016 to 19.7 per cent by 2025.

The (I)NDC also includes further measures for energy saving aimed at decreasing consumption of primary energy, mainly natural gas. In general, (I)NDC energy-saving measures are the ones included in the 2015 Programme of Measures to Reduce Energy Intensity and Introduce Energy Efficient Technologies in Economic Sectors and the Social Sector for the period 2015–2019 (2015 Resolution of the President No. 2343).

Significant efforts in mitigation in the energy sector have not been accompanied by the same intensity of action in other sectors.

Implementation of Clean Development Mechanism (CDM) projects (table 7.2) within the framework of the Kyoto Protocol has been a success in Uzbekistan and is likely to continue to play an important role for mitigation and adaptation purposes.

Adaptation efforts are also expected in the coming years, including several devoted to the Aral Sea region, in line with the 2015 Comprehensive Programme of Measures related to Mitigation of the Consequences of the Aral Disaster, Rehabilitation and Socio-Economic Development of the Aral Sea Region for the period 2015–2018 (2015 Resolution of the Cabinet of Ministers No. 255). Many adaptation measures are related to agriculture, such as: improvement of the climate resilience of agriculture through diversification of food crop production patterns; conservation of germplasm and indigenous plant species and agricultural crops resistant to droughts, pests and diseases; and development of biotechnologies and breeding of new crop varieties adapted to changing climatic conditions.

Uzbekistan works closely with the Green Climate Fund (GCF) and the Adaptation Fund (AF) under the UNFCCC. The UNDP/AF/Uzhydromet project “Developing climate resilience of farming communities in the drought-prone parts of Uzbekistan” provides examples of good adaptation practices for further dissemination in the country. Uzbekistan has submitted a project proposal to the GCF to prepare a national adaptation plan.

Regional cooperation efforts on mitigation and adaptation to climate change in Central Asia that would materialize in concrete projects on the ground with the participation of Uzbekistan have been insufficient.

Waste and chemicals management

Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

Uzbekistan acceded to the 1989 Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention) in 1996. Uzbekistan has not ratified the Ban Amendment and the Protocol on Liability and Compensation. Implementation of the Convention is under the responsibility of SCEEP. The country has not fulfilled its reporting obligations since 2013.

There have been no developments about the implementation of the Convention since 2010. The legal and programmatic framework on hazardous waste, including its transboundary movements, is today what it was in 2010, mainly based on the 2000 Resolution of the Cabinet of Ministers No. 151 about control of imports and exports of environmentally hazardous products and waste to Uzbekistan and from its territory. Uzbekistan does not have any restriction on exports or on imports of hazardous waste for final disposal or recovery, nor for the transit of waste through the country. Information on transboundary movement of waste in the period 2015–2017 is shown in table 10.8.

Convention on Persistent Organic Pollutants and Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

Uzbekistan acceded to the 2001 Convention on Persistent Organic Pollutants (POPs Convention or Stockholm Convention) in 2019. It is not a party to the 1998 Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC Convention or Rotterdam Convention). SCEEP is the national

authority responsible for POPs. The national POPs inventory dates back to 2009 (chapter 10).

Uzbekistan has been participating in the Strategic Approach to International Chemicals Management (SAICM) process. No close cooperation with international organizations on implementation of SAICM has been identified for a long time, since the preparation of the National Profile on Management of Chemical Substances in 2012. In 2019, a joint project by the United Nations Institute for Training and Research (UNITAR) and SCEEP developed a draft national strategy for the introduction of the Globally Harmonized System of Classification and Labelling of Chemicals in Uzbekistan.

Minamata Convention on Mercury

Uzbekistan is not a party to the 2014 Minamata Convention on Mercury. As at 2019, the country is considering accession to this instrument.

Convention on the Transboundary Effects of Industrial Accidents

Uzbekistan is not a party to the 1992 Convention on the Transboundary Effects of Industrial Accidents (chapter 15).

Public participation

Uzbekistan is not a party to the 1998 Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) (chapter 5) and its 2003 Protocol on Pollutant Release and Transfer Registers (PRTR Protocol) (chapter 4).

Environmental assessment

Uzbekistan is not a party to the 1991 Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), nor to its 2003 Protocol on Strategic Environmental Assessment (SEA Protocol). The country has no practical experience in transboundary EIA (chapter 2). Its legislation does not include an SEA system (chapter 1).

Comprehensive reviews of the legal and institutional frameworks of Uzbekistan vis-à-vis the provisions of the Espoo Convention and its Protocol on SEA were prepared upon the request of Uzbekistan in 2018–2019 with the substantive support of the ECE Secretariat and financial support from the German Federal Environment Ministry's Advisory Assistance Programme and the Government of Switzerland.

The reviews concluded that the legal and institutional frameworks of Uzbekistan are not in line with the Convention and the Protocol, although some elements of the required systems already exist. Uzbekistan has committed to undertake legislative reform with a view to aligning the country's environmental assessment legislation with the Espoo Convention and its Protocol on SEA. However, a number of impediments may hinder the process. These include: (i) limited awareness of the SEA and EIA in line with the Convention and their benefits among the sectoral planning authorities; (ii) gaps and contradictions in the legislative and institutional frameworks; (iii) lack of understanding of the roles and responsibilities of various authorities in the EIA and SEA process; and (iv) limited institutional and human capacities to implement SEA and transboundary EIA initiatives.

Water

Convention on the Protection and Use of Transboundary Watercourses and International Lakes

Uzbekistan acceded to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) in 2007.

In 2011, Uzbekistan accepted the amendments to Articles 25 and 26 of the Water Convention. The amendments open the Convention to the participation of countries outside the ECE region. This has a direct implication for Uzbekistan, in the event that Afghanistan joins the Convention.

The first reporting exercise under the Water Convention, including for assessing the global Sustainable Development Goals indicator 6.5.2 (box 6.4), has had active participation from Uzbekistan.

Protocol on Water and Health

Though Uzbekistan is not yet a party to the 1999 ECE/WHO Regional Office for Europe Protocol on Water and Health, work under the Protocol is ongoing with the Ministry of Health as the lead focal point, in cooperation with the Ministry of Foreign Affairs. Uzbekistan has attended high-level meetings and actively participated in regional activities carried out under the treaty.

Two national awareness-raising workshops on the Protocol took place in Uzbekistan. The first, in 2015, aimed at familiarizing the Uzbek authorities with the benefits of becoming a party to the Protocol. Uzbekistan identified its concerns related to the transboundary provisions of the Protocol and agreed to seek related advice from the Compliance

Committee of the Protocol. In response to this, the Compliance Committee produced, in 2017, an Interpretive Note on the provisions of the Protocol related to transboundary waters. The second event, in 2017, introduced core legal provisions of the Protocol and its role in attaining the 2030 Agenda for Sustainable Development and implementing the Ostrava Declaration on Environment and Health. The briefing was organized back-to-back with a technical workshop on small-scale water and sanitation supplies and water safety plans conducted by the WHO Regional Office for Europe.

As at 2019, the accession process is ongoing and the Ministry of Health is working towards setting up a multi-stakeholder working group to conduct baseline analysis for the target-setting process under the Protocol.

Convention on the Law of the Non-navigational Uses of International Watercourses

Uzbekistan became a party to the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses in 2007.

6.3 Subregional and bilateral cooperation on transboundary waters and environmental protection

Transboundary water cooperation

Subregional cooperation in the Aral Sea

Basin

Transboundary issues in water management are undoubtedly of crucial importance to Uzbekistan, as

the country is a downstream riparian of the Amu Darya and Syr Darya Rivers, with a water dependency ratio of 77 per cent, and its population, especially in the Republic of Karakalpakstan and Khorezm Oblast, has been among the most adversely effected by the Aral Sea disaster (box 6.5). Map 6.1 shows the changes in the area of the Aral Sea since 1960.

The management of transboundary water resources has marked cooperation among countries in this region since the early 1990s. Most of the region's surface water resources are generated in Kyrgyzstan, Tajikistan and Afghanistan and run through Central Asia – crossing the downstream countries of Kazakhstan, Turkmenistan and Uzbekistan – through two main rivers, the Syr Darya and the Amu Darya, which are part of the Aral Sea Basin. Poor in water resources, the Basin's downstream countries are rich in hydrocarbons – exactly the opposite situation to the upstream Kyrgyzstan and Tajikistan.

This uneven distribution of natural resources opens, in principle, a vast field for regional cooperation. In practice, over time, cooperation has faded, especially after initial attempts to establish it.

In the past decade, the intentions of Kyrgyzstan and Tajikistan to develop hydropower projects added another layer of complexity to the already fragile regional cooperation. Concerns were expressed about the possibility that the upstream states would concentrate the water release in winter for power production, thus reducing the availability of water resources for releases for irrigation in spring and summer.

Box 6.4: Target 6.5 of the 2030 Agenda for Sustainable Development (transboundary aspects)



Goal 6: Ensure availability and sustainable management of water and sanitation for all
Target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

One of the two global indicators for this target is the proportion of transboundary basin area with an operational arrangement for water cooperation (indicator 6.5.2). Uzbekistan did not include indicator 6.5.2 in its list of national Sustainable Development Goal indicators.

In 2018 Uzbekistan reported in a timely manner on the global indicator 6.5.2 to ECE and UNESCO and highlighted that, since data related to its transboundary aquifers are lacking, no overall value for indicator 6.5.2 could be provided. For the rivers and lakes component, the value of the indicator for Uzbekistan is 59.3 per cent.

There are several transboundary water agreements and arrangements among the five Central Asian countries, but these focus mainly on the Amu Darya and Syr Darya Rivers and do not cover cooperation on the protection of water ecosystems and water quality. Transboundary groundwater is not covered by any kind of operational arrangement. Possible actions on target 6.5 for Uzbekistan could also include undertaking, in cooperation with neighbouring countries, a thorough inventory of transboundary groundwater to identify the needs for cooperation agreements.

Box 6.5: The Aral Sea disaster

The Aral Sea Basin is shared among Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. Severe over-exploitation of the available water resources, especially from the two main rivers of the region, Amu Darya and Syr Darya, led to an environmental, social and economic disaster.

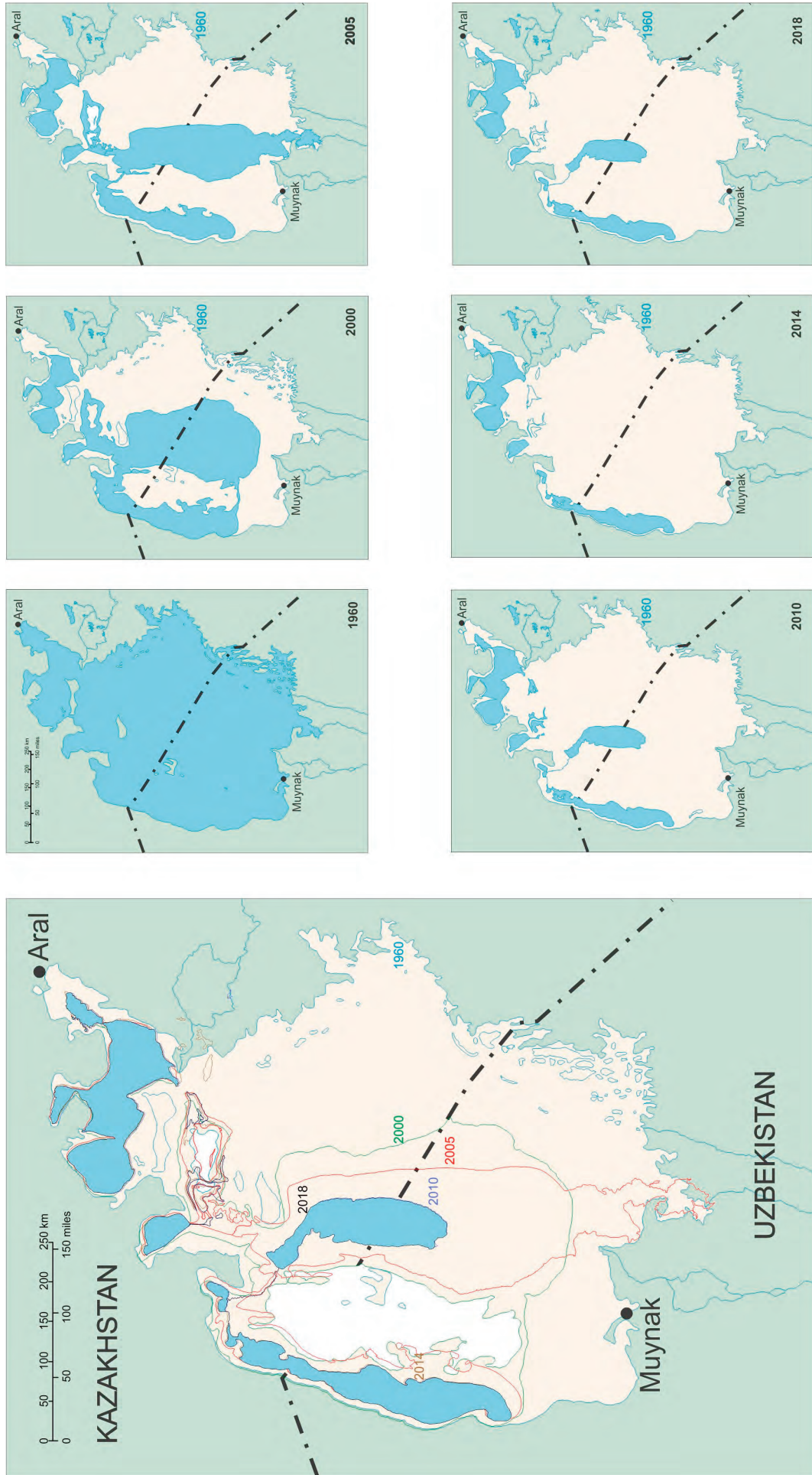
Once the fourth largest lake in the world, the Aral Sea, as a single entity, has disappeared; it has broken into several smaller lakes; in less than 60 years it lost almost 90 per cent of its volume. The landscape has been profoundly modified and the weather conditions in the area have become increasingly inhospitable. The salinization of water and soil has soared. Soil erosion is gradually extending across more and more territory. The collapse of its fishing industry, compromised drinking water and proliferation of dust storms due to the formation of a human-made desert, the Aralkum Desert, are among the consequences.

Despite relevant transboundary cooperation efforts undertaken by the countries of the region, the attention paid by the international community to the disaster and the support channelled to its remediation, and all projects implemented to assist the Aral Sea, the process of disappearance of the Sea has not yet been reversed; it has only slowed down, even though the so called Malyi Aral has been established in Kazakhstan at the outflow of the Syr Darya River and significant work is ongoing in Uzbekistan in the Amu Darya River delta to stabilize important water areas. But overall, the trend will not change unless withdrawals from the Sea's main tributary rivers are significantly reduced.

Photo 6.3: Dried bed of the Aral Sea

Photo credit: Ms. Ana Vukoje

Map 6.1: Aral Sea, 1960–2018



Source: Prepared by ECE based on NASA images, 2019.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

The Central Asian region still does not have a solid overarching legal framework for the management and protection of shared water resources. Only the downstream countries (Kazakhstan, Turkmenistan and Uzbekistan) are parties to the 1992 Water Convention, and only Uzbekistan is a party to the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses. There are, however, several agreements and arrangements among the five countries.

The legal framework for cooperation on the Amu Darya and Syr Darya Rivers was first established through the 1992 Agreement on Cooperation in Joint Management of Use and Protection of Water Resources of Interstate Sources signed by Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. This Agreement is of a general nature and defines the principles of cooperation in the region regarding the use of “water resources of inter-State sources”. Under this Agreement, countries confirmed the principles for water allocation applied in the time of the Soviet Union. However, the Agreement failed to provide the necessary reply to the challenges of a very different reality to that existing when the water allocation principles underlying the Agreement were defined, and its implementation has been widely recognized as inadequate.

Based on the 1998 Agreement between the Governments of Kazakhstan, Kyrgyzstan and Uzbekistan on the Use of Water and Energy Resources of the Syr Darya Basin, protocols were signed annually (from 1999 to 2003) on the use of water and energy resources but implementation of the protocols was often weak. Nevertheless, the Agreement, although much narrower than its predecessors, is exemplary in terms of covering the two main dimensions at stake in the management of transboundary waters in Central Asia – water and energy – among the Syr Darya Basin States. In 2005, with the support of the Asian Development Bank (ADB), a new draft agreement on the Syr Darya was developed to replace the 1998 Agreement, but it was never concluded.

None of the agreements concluded by the five countries properly addresses water quality.

Institutional framework for Aral Sea cooperation

After the dissolution of the Soviet Union, a first regional institution was created to control efficient use and protection of the waters and determine annual limits of water use for each State – the Interstate Commission for Water Coordination of Central Asia

(ICWC). In 1993, the Heads of the Central Asian countries signed an agreement that established the International Fund for Saving the Aral Sea (IFAS), aimed at informing the international community about the Sea’s situation and attracting resources for the Aral Sea Basin Programme (ASBP). Since 1999, the ICWC and another regional cooperation body, the Interstate Commission for Sustainable Development (ICSD, established in 1994), were integrated into IFAS.

The Chair of IFAS is assumed by the Heads of State of the Central Asian States on a rotational basis. Strategic directions for IFAS are jointly formulated by the Heads of the five States. Its Board has responsibility to oversee the implementation of the strategic directions. The Executive Committee (EC-IFAS) has the responsibility to operationalize them.

However, the three main entities that comprise IFAS – the ICWC, ICSD and EC-IFAS – to a certain extent, have overlapping mandates, but they operate rather independently of each other. The 1999 Agreement on the Status of IFAS and its Organizations does not regulate the relationships among them. Each organization has its own system of specialized bodies; some of them do not have the desirable geographical scope. The energy sector is not represented in any of those bodies.

Uzbekistan’s role as Chair of IFAS

Uzbekistan held the IFAS Chair between 2013 and 2016, when a Third Aral Sea Basin Programme (ASBP-3) was being implemented. The four main directions of the ASBP-3 are: integrated water resources management (IWRM); environmental protection; socioeconomic development; and improving institutional and legal instruments.

Financial contributions for the implementation of the ASBP-3 were higher those for ASBP-1 and ASBP-2. However, most of the projects financed were intended to mitigate the consequences of the disaster and not the disaster itself, with afforestation efforts in the Aralkum Desert being a paradigmatic example of this. Moreover, the portfolio of projects was more composed of national projects than of transboundary projects, giving rise to the insufficient impact they generate.

In 2014, while chairing IFAS, Uzbekistan organized an international conference entitled “Development of cooperation in the Aral Sea Basin to mitigate consequences of the environmental catastrophe”, the main purpose of which was to mobilize the efforts of the international community to carry out practical

actions for improving the environmental and socioeconomic situation in the Aral Sea Basin.

Opportunities for subregional cooperation

The weaknesses of subregional cooperation on water are recognized at the political level. The political will to improve the organizational structure and the legal framework of IFAS was expressed in the Joint Statement of the Heads of State of IFAS founders in 2009. Although the Joint Statement provoked a series of discussions on the improvement of subregional water cooperation frameworks, proposed changes have not been implemented.

Central Asian countries have always collaborated within IFAS. From 1992 to the present, there has never been a long-term pause in this cooperation; there were essentially moments of cooling down in cooperation efforts. On the other hand, for many years there were no significant leaps towards more virtuous cooperation, with more expressive results and a more robust legal framework. As at 2019, IFAS continues to work along the strategic and operational directions inscribed in ASBP-3, but it lacks a boost in terms of medium- and long-term policy orientation and, for that very reason, is falling short of the imperative needs imposed by the evolving disaster.

Although Kyrgyzstan decided to temporarily discontinue its participation in IFAS in 2016, in 2017, a new window of opportunities for regional cooperation was opened. Kyrgyzstan and Tajikistan continued to express their intent to build large HPPs, and Uzbekistan expressed its willingness to negotiate the development projects within internationally accepted rules. In 2017, Uzbekistan and Kyrgyzstan signed an MoU on cooperation in the implementation of the Kambarata HPP-1 construction project. In 2018, the summit of the Heads of State of IFAS in Turkmenbashi, Turkmenistan, again discussed the need for reform of IFAS.

Bilateral cooperation

In recent years, bilateral cooperation by Uzbekistan has greatly intensified:

- In November 2016, a joint working group of Kazakhstan and Uzbekistan was created to develop proposals for strengthening bilateral water cooperation. The group meets regularly to discuss the use of water in the middle and lower reaches of the Syr Darya River and other transboundary basins;

- In October 2017, the Presidents of Kyrgyzstan and Uzbekistan signed an intergovernmental agreement on inter-State use of Orto-Tokoy (Kasansay) reservoir in Alabukin District of Djalalabad Oblast in Kyrgyzstan. Also, an MoU between the national energy companies was signed on cooperation in implementation of the Kambarata HPP-1 project;
- In 2016, a working group on rational use of water and energy resources was created by Uzbekistan and Tajikistan;
- In March 2018, a working group on IWRM of Central Asian Rivers was established by Uzbekistan and Tajikistan;
- In March 2017, an agreement on cooperation on water management issues between the ministries responsible for water management of Uzbekistan and Turkmenistan was signed;
- In September 2018, the regulation and composition on a joint working group on environmental protection and water quality was agreed by Uzbekistan and Kazakhstan.

Dam safety

In the past decade, Uzbekistan continued to participate in the project Dam Safety in Central Asia: Capacity-building for Regional Cooperation, implemented by ECE and the Economic and Social Commission for Asia and the Pacific (ESCAP) in collaboration with EC-IFAS within the framework of the United Nations Special Programme for the Economies of Central Asia (SPECA). The project promotes subregional cooperation for information exchange and notification in the case of accidents or emergency situations involving dams. Uzbekistan is the forerunner in the subregion on the topic of dam safety, so its experts have been actively involved in various technical tasks and training in the project. Uzbekistan has benefited from the development of technical documentation related to dam safety under the project.

Since 2017, as a result of the project, Uzbekistan developed direct cooperation with Tajikistan and Kyrgyzstan on the safety and management of specific hydrotechnical facilities. For example, in March 2018, an intergovernmental Agreement on Cooperation to Ensure the Operation of Farkhad Dam was concluded by Tajikistan and Uzbekistan. The Agreement recognizes the Farkhad HPP as a territory of Tajikistan, while the hydrotechnical facility is recognized as a property of Uzbekistan. Tajikistan committed to ensure protection of the facility, while technical maintenance is to be done by Uzbekistan.

Cooperation on other environmental issues

Subregional cooperation

Uzbekistan did not sign the 2006 Framework Convention on Environmental Protection for Sustainable Development in Central Asia, although the country participated in its preparation. The Convention has not entered into force because not all five countries have ratified it.

Events in the framework of subregional cooperation have become much more frequent in recent years, which once again bears witness to the emerging dynamism of Uzbekistan. In 2018, Uzbekistan hosted in Tashkent the Central Asian International Environmental Forum devoted to “Strengthening Cooperation on Environment and Sustainable Development in Central Asia”.

Uzbekistan participates in the subregional cooperation on environmental protection in the framework of the Interstate Commission for Sustainable Development (ICSD).

The first Regional Environmental Action Plan for Central Asia, developed by the ICSD and approved by the IFAS Board in 2003, faced poor implementation. In 2018–2019, following the decision of the 2018 IFAS Board, the ICSD developed the second Regional Environmental Action Plan. The document covers the period 2020–2030. It is structured around the environment-related Sustainable Development Goals and has a strong focus on green economy. Implementation is expected to be financed through budgetary funds and environmental funds of participating Central Asian countries, and donor contributions. As at October 2019, the document was adopted by the ICSD under the title “Regional Environmental Programme for Sustainable Development in Central Asia” and is pending the approval of the IFAS Board.

In October 2019, Uzbekistan assumed the Chair of the ICSD. The Chairperson of SCEEP became the Chairperson of the ICSD. This provides opportunities for the country to increase its contribution to the environmental cooperation agenda in the Central Asia subregion.

Bilateral cooperation

In 2010, Uzbekistan and Kazakhstan concluded an intergovernmental agreement on the protection, reproduction and sustainable development of saiga (*saiga tatarika tatarika*).

A number of agreements were signed between Uzbekistan and Turkmenistan in 2017, including one between SCEEP and the State Committee on Environmental Protection and Land Resources of Turkmenistan on cooperation on environmental protection and sustainable development.

In early 2019, the Ministry of Energy of Uzbekistan and USAID signed an MoU aimed at implementing projects to improve energy efficiency, promote use of renewable energies and support Uzbekistan’s participation in the Central Asian energy market. There are several examples of ongoing joint projects between the two countries, such as Future Energy, Energy Connections and the Central Asia Regional Electricity Market (CAREM).

6.4 International technical assistance on the environment and sustainable development, including in relation to the Aral Sea

The development of environmental policy and its implementation and enforcement in Uzbekistan has been supported by several donors. As of 2017, a new phase of engagement of donors, including international financial institutions (IFIs), with the country can be observed. The growing partnerships in terms of both the amount of financing and areas of engagement were prompted by the major reforms launched by the Government to move towards a more open and integrated market economic model.

Major donors in the environment and climate change domains in Uzbekistan are Germany, Japan, Switzerland, the United States, EBRD, EU, World Bank, UNDP and ADB. Projects are implemented in the country by OSCE, UNESCO, UNEP, ECE and other organizations.

UNDP’s Country Programme Action Plan (2015–2020) concentrates on technical assistance in support of the objective to balance the effective management of environmental resources with the requirements of continued economic and industrial development. With regard to specific projects, its support has been concentrated on: (i) IWRM and water efficiency; (ii) implementation of the CBD Strategic Plan 2011–2020; (iii) promoting energy efficiency in public buildings; (iv) mainstreaming biodiversity in oil and gas policies and operations; (v) strengthening disaster risk management capacities; (vi) reducing pressures on natural resources from competing land use in non-irrigated arid mountain, semi-desert and desert landscapes; and (vii) implementation of HCFC phase-out. In early 2019, UNDP and GEF, together with SCEEP, agreed to develop and establish a biodiversity conservation information management system.

Almost all financial resources related to UNDP-led projects are derived from GEF. Resources allocated and disbursed by GEF since 2010 are shown in table 6.1. The very small difference between the amounts allocated and the amounts used shows a high capacity for implementation and financial management of projects in and by Uzbekistan.

The World Bank operates primarily through lending rather than subsidies. The World Bank Country Partnership Framework for Uzbekistan 2016–2020 recognizes the more efficient and sustainable use of natural resources, especially energy and water, as both a key challenge and one of the 10 priority areas identified for the country. Increased access to and improvement of the quality of water supply and sanitation services remains an important area of engagement. Improvement of energy security and efficiency and reduction of energy intensity, as well as sustainable agriculture and climate change mitigation, also continue to be among the areas of World Bank intervention. Uzbekistan participates in the Central Asia Energy-Water Development Programme, implemented by the World Bank together with several development organizations to promote energy and water security in Central Asia in the context of a changing global environment.

Since 2010, the World Bank is implementing its Energy Efficiency Facility for Industrial Enterprises Project, which supported the introduction of dedicated credit lines for investment in improving industrial energy efficiency in industrial enterprises. In 2018, the World Bank allocated US\$200 million to these purposes. Small, medium and large industrial enterprises in Uzbekistan will be able to improve energy efficiency and productivity, due to the Project Phase 3 (chapter 15).

The ADB Country Operations Business Plan 2019–2021 for Uzbekistan builds on the current country partnership strategy for Uzbekistan. In the lending pipeline for the period 2019–2021 there is one renewable power project (firm for 2021) and four new projects on water supply and sanitation. Financial

resources programmed for water supply and sanitation amount to US\$645 million.

The EBRD Uzbekistan Country Strategy 2018–2023, approved in 2018, has as one of its three priorities the promotion of green energy and resource solutions across sectors to achieve improved energy and resource efficiency, improved performance and service delivery of municipal infrastructure and increased use of renewable energy.

Within the framework of the new country strategy, the EBRD has approved long-term loans for several infrastructure projects in the areas of water supply and district heating services in Tashkent City and Khorezm and Namangan Oblasts, as well as electricity transmission in Navoiy Oblast.

The EBRD is also responsible for the management of the Environmental Remediation Account for Central Asia (ERA), which was established in 2015 at the initiative of the European Commission and became operational in 2016. ERA's goal is to assist Kyrgyzstan, Tajikistan and Uzbekistan to remediate some of the most dangerous sites left by the past uranium production. The EBRD has concluded a framework agreement with Uzbekistan creating the legal basis for ERA operations in the country.

EU financial and technical assistance to Uzbekistan is based on the Multiannual Indicative Programme 2014–2020 for Uzbekistan, which is in line with the EU Central Asia Strategy for a New Partnership adopted in 2007, and was developed taking into account the Regional Strategy Paper for Assistance to Central Asia for the period 2007–2013. Recent and ongoing EU bilateral cooperation projects in Uzbekistan have focused on a few areas, including energy and environment.

Through the Investment Facility for Central Asia, the EU has supported Uzbekistan in undertaking an investment in the solid waste management system in Samarkand.

Table 6.1: Global Environment Facility resources for Uzbekistan by focus area, 2010–2018, US\$ million

Focus areas	GEF-5 allocation	GEF-5 utilization	GEF-6 allocation	GEF-6 utilization	Total resources used
Climate change	12.770	12.769	11.462	11.345	24.115
Land degradation	4.980	4.978	5.121	5.372	10.351
Biodiversity	1.650	1.408	1.784	1.650	3.058
Total	19.400	19.156	18.367	18.367	37.524

Source: www.thegef.org/country/uzbekistan.

In early 2019, a negotiation process on the draft agreement on expanded partnership and cooperation between Uzbekistan and the EU was launched.

In 2018, the first two European Investment Bank loans to support water infrastructure and energy efficiency in Uzbekistan were approved. A €100 million loan devoted to the financing of water and wastewater projects within the framework of the EU-sponsored Climate Action and Environment Facility will contribute to addressing Uzbekistan's high external water dependency and the scarcity of locally available freshwater resources. The other loan, also amounting to €100 million, will finance a credit line that will support energy-efficiency investments of SMEs, mid-cap companies and private sector entities in Uzbekistan. The start of European Investment Bank operations in Uzbekistan is a clear sign of increased EU support for the country.

UNESCO has promoted awareness-building activities in Uzbekistan to stimulate knowledge and innovation for sustainable management and conservation of freshwater resources and to strengthen institutional capacities for water security.

Germany's cooperation with Uzbekistan has materialized in support of many projects in different environmental domains, such as transboundary water management, drinking water supply, adaptation to climate change, cross-border cooperation on disaster prevention, reduction of GHG emissions and sustainable use of natural resources. In late 2016, an agreement was signed between the Government of Uzbekistan and the Government of Germany on technical cooperation for the implementation of the project "Land use based on ecosystem approach and conservation of the ecosystems in the lower course of the Amu Darya River". The Agreement provides for technical assistance to climate change adaptation.

Water and sanitation are also at the core of the technical assistance provided by Switzerland to Uzbekistan – mostly through partnering with IFIs in water supply and water management projects such as the Regional Rural Water Supply and Sanitation Project in Fergana Valley and the Bukhara–Samarkand Water Supply project.

Japan's technical assistance has been more devoted to the energy sector and its greening.

USAID has been active in Uzbekistan through regional and bilateral projects on water management. "Smart Waters" is a good example of such cooperation. Funded by USAID in Central Asian countries and Afghanistan, the project has been implemented by CAREC since 2015. CAREC established a partnership with the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers within this project and training on the implementation of IWRM has been organized.

6.5 Participation in non-binding processes related to the environment and sustainable development

10-Year Framework of Programmes on Sustainable Consumption and Production Patterns

SCEEP is the National Focal Point for the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP) and a member of the 10YFP in the Global SCP Clearinghouse, although the country has not been very active in the activities developed under the 10YFP, including the surveys. The current stand of Uzbekistan vis-à-vis target 12.1 of the 2030 Agenda for Sustainable Development is described in box 6.6.

Box 6.6: Target 12.1 of the 2030 Agenda for Sustainable Development



Goal 12: Ensure sustainable consumption and production patterns

Target 12.1: Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries

Uzbekistan has nationalized the global target 12.1 and its indicator 12.1.1 without significant modifications.

In Uzbekistan, there is no national strategy or action plan on sustainable consumption and production (SCP) specifically, nor a national strategy or action plan for green economy, green growth, resource efficiency or circular economy addressing SCP as one of the main themes.

However, Uzbekistan has integrated objectives relevant to SCP in some policies devoted to the environment and, in recent years, SCP-related objectives have started to be mainstreamed in sectoral policies, such as agriculture and energy. Although references to SCP are not explicit in the Action Strategy on Five Priority Directions for Development for the period 2017–2021, several of its objectives are clearly aligned with SCP.

Forest-related processes

Uzbekistan participates in activities of the United Nations Forum on Forests (UNFF), although the country did not participate in the reporting cycles under UNFF.

Uzbekistan has been cooperating closely with FAO and ECE on forest issues. In 2018, with the support of these two organizations, the country worked on a set of national criteria and indicators for sustainable forest management. Having a functional forest reporting system is the main and ultimate goal of Uzbekistan. This will be instrumental in monitoring forests and informing decision-making but also in Uzbekistan's continuing to contribute to the Global Forest Resources Assessment.

In 2018, in support of the Bonn Challenge, Uzbekistan committed to restore 0.5 million ha of degraded land by 2030.

With FAO, Uzbekistan developed a project proposal for carrying out a national forest inventory (the last inventory dates back to 1987); as at early 2019, it is looking for additional sources of financing for it.

Environment for Europe process

Uzbekistan submitted several voluntary commitments under the two initiatives endorsed by the ministers at the Eighth Environment for Europe Ministerial Conference (Batumi, Georgia, 2016): the Batumi Initiative on Green Economy and the Batumi Action for Cleaner Air.

Batumi Initiative on Green Economy

Under the Batumi Initiative on Green Economy, Uzbekistan submitted five commitments: (i) adopting a law on alternative energy sources by 2018 to assist the further development of scientific research in the field of alternative energy sources with the aim to improve rational use and saving of energy resources; (ii) reforming, by 2018, existing laws that regulate methods of the use of natural resources, with the purpose of improving the system of incentives for pollution reduction, recycling and disposal of waste, and the development of industries using recycled materials; (iii) developing and adopting a government decision in 2017 on the introduction of an eco-labelling system and joining the Global Ecolabelling Network; (iv) developing, by 2018, a strategy for MSW management aimed at the reduction of the volume of MSW generated and the introduction of a closed cycle of production and consumption; (v) constructing solar power plants with the capacity of

100 MW in Samarkand and Navoiy Oblasts by 2020. Progress has been made over the past two years in relation to almost all commitments. The Law on the Use of Renewable Energy Sources was adopted in 2019 (chapter 12).

The public policy for rational use of natural resources was for many years based mainly on the system of payments for pollution stipulated in the 2003 Resolution of the Cabinet of Ministers No. 199 (no longer in force). In 2018, a set of measures to improve economic mechanisms for the protection of the environment was established through the 2018 Resolution of the Cabinet of Ministers No. 820. Although these new measures do not represent a radical change in the pattern of pollution payments, they nevertheless constitute a step in the right direction, since pollution payment rates are now indexed on the official monthly minimum wage and therefore adjusted for inflation (chapter 3).

Advances in an eco-labelling system for products and services were made. The regulation on the procedure of eco-labelling was adopted (2019 Resolution of the Cabinet of Ministers No. 435) but it is too early to assess its implementation. The country has not yet become a member of the Global Ecolabelling Network.

The country evolved significantly in the area of urban solid waste, having adopted the Strategy on Municipal Solid Waste Management for the period 2019–2028, which sets ambitious objectives for the coming 10 years (chapter 10).

Batumi Action for Cleaner Air

Within the framework of the Batumi Action for Cleaner Air, the following four commitments were submitted: (i) to adopt, by 2019, the amended Law on Ambient Air Protection, taking into account the newly introduced provisions and norms of international conventions and agreements; (ii) to introduce automated control systems at air pollutants emission sources on major industrial installations by 2020; (iii) improvement of import and export regulations for ODSs and products containing ODSs; and (iv) gradual introduction of environmental standards Euro-3 to Euro-5 in accordance with current international standards.

Although the Law on Ambient Air Protection was amended in 2018, the amendments do not cover the strengthening of emission standards for large combustion plants – such amendments are still in the pipeline for adoption. The improvement of import and export regulations for ODSs and products containing

ODSs was fulfilled as assumed in the Batumi commitment. Within the improvement of the monitoring system of air pollutants, the installation of automated control systems in major industrial facilities has not yet materialized. Similarly, work is ongoing to improve the regulatory framework to ensure the gradual introduction of environmental standards Euro-3 to Euro-5 for fuel and vehicles (chapter 8).

EU–Central Asia Working Group on Environment and Climate Change

Uzbekistan is engaged in the EU–Central Asia Working Group on Environment and Climate Change, chaired by Italy, which has provided a platform for discussion of progress in cooperation on the environment, climate change and water among high representatives of five Central Asian countries, the EU, IFIs, international and regional organizations and NGOs. As part of this work, Uzbekistan acquired expertise on how to improve access to the Green Climate Fund, IFIs, the EU Investment Facility for Central Asia and bilateral programmes funding projects on the environment, with a focus on waste and water management, as well as energy and climate action.

6.6 Legal, policy and institutional framework

Legal framework

The conclusion, execution, suspension and termination of international agreements is regulated by the 2019 Law on Treaties. The preparatory process preceding the conclusion of treaties involves coordination with the Ministry of Foreign Affairs, the Ministry of Justice and other ministries and central government bodies concerned. A feasibility study is always done during the preparatory process. The conclusion of a treaty requires approval by the President. The international agreements that Uzbekistan ratifies or accedes to do apply directly in Uzbekistan and have primacy over conflicting provisions of the domestic legislation.

Policy framework

The main document establishing the policy framework in the country – the Action Strategy on Five Priority Directions for Development for the period 2017–2021 (chapter 1) – emphasizes expanding international cooperation and the strengthening of the international image of Uzbekistan among priority directions for development.

Priorities for international cooperation on the environment are defined in the Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863), adopted in October 2019. These include: approval of a national programme for implementation of the Montreal Protocol; development of a national action plan for implementation of the Paris Agreement; building effective long-term partnerships with IFIs and donor countries; and improving the preparation of investment projects and international technical assistance projects. Another priority is to study the feasibility of Uzbekistan’s accession to several new multilateral environmental agreements (MEAs), including the four ECE conventions and protocols thereto, the Kigali Amendment to the Montreal Protocol, and the Minamata and Rotterdam Conventions.

Among priorities for bilateral cooperation the Concept names: the development of cooperation to reduce the risks of exposure to chemical and radiological materials; conducting joint EIAs for facilities located in border areas; designation of transboundary protected areas; and transboundary basin management.

Institutional framework

In 2017, the State Committee for Nature Protection was converted into the State Committee on Ecology and Environmental Protection (SCEEP). Several new sectoral ministries were created in the period 2017–2019, including the Ministry of Housing and Communal Utilities, the Ministry of Energy and the Ministry of Transport. As these changes are recent, the internal reorganization and adjustments within each of the authorities will take time, including with regard to responsibilities for international cooperation.

SCEEP, Uzhydromet and the Ministry of Water Management are the most relevant executing agencies with regard to the MEAs to which Uzbekistan is a party.

Currently, the institutional framework is very fragile in several respects, the first of which lies in the total lack of articulation among the different ministries and state committees in the field of environmental policy. The exchange of information is scarce. In addition, no entity, not even SCEEP, has a firm knowledge of which institutions are responsible for international environmental dossiers, including MEAs, when they are not directly responsible. It is even more surprising that this is so when all the ministries most directly involved in MEAs have an international cooperation department, the primary function of which is to

coordinate and support the other departments in the exercise of their international cooperation competences.

A second aspect is the high turnover of those responsible for the MEAs, especially in SCEEP, without transitional arrangements during managerial change that guarantee that relevant information moves from the outgoing person responsible to the new one. Not all focal points for MEAs are well aware of their roles and responsibilities and this also derives from the failure to ensure proper transition between outgoing focal points and new ones.

Many of the convention secretariats have inaccurate or incorrect information on the focal points designated by Uzbekistan. In some cases, the focal point is no longer even exercising the functions that would be the source of its designation as a focal point. Many of the focal points indicated by the country during the review mission for the preparation of this report were not those that were officially designated by the country to the convention secretariats. This discrepancy has at least one inevitable consequence – the information sent by the secretariats of the conventions is addressed to those who no longer need it, which does not benefit the country.

Almost all national reports and communications prepared by the country are done with the technical support of international agencies and, in some cases, it is clear that not much knowledge remains in the public administration as a result of that work. Many of the focal points work alone on an international agreement for which they are specifically responsible. This situation is not conducive to building sufficient capacities in the administration on the issues involved and undermines the possibility of gaining expertise with the technical assistance received.

Coordination with donors

Some donor coordination efforts were undertaken by UNDP through the United Nations Country Team. The Office of the United Nations Resident Coordinator has recently been established in Uzbekistan. The United Nations Development Assistance Framework for

2016–2020 for Uzbekistan foresees the strengthening of coordination mechanisms. A promising example of Government–donor coordination is the recent establishment of the Multi-Partner Human Security Trust Fund for the Aral Sea Region (box 6.7).

The EU has also frequently pursued coordination with donors, mainly those that support initiatives and projects in similar areas to those of the EU in Uzbekistan, namely, Germany, Israel, Switzerland, the United States, the United Nations system, the World Bank and the ADB.

There is no platform for overall coordination between donors and public institutions and comprehensive information on official development assistance (ODA) is not available. Therefore, donor coordination on the environment is not covered by any formal or stable mechanism.

There are different interlocutors for different donors. The principal interlocutor of the EU is the Ministry of Foreign Affairs. The Ministry of Finance used to act as the main interlocutor for several donors, such as the World Bank and the ADB, but, in recent years, direct contacts between donors and line ministries have been increasing. Progressively, public institutions, especially those in central government, establish their own coordination meetings with donors active in their domains.

The overall objective of the Project “Aid Coordination and Management”, launched by UNDP in June 2013, was to improve the effectiveness of aid flowing into Uzbekistan in the long term, and to strengthen the capacities of relevant government institutions to better coordinate, manage and mobilize external resources. None of the three expected results – development and implementation of a partnership agreement between the Government and development partners; improvement of aid effectiveness at a sector level, through enhanced capacity in the formulation and management of project portfolios; and establishment of an aid information management system to allow recording, financial and thematic tracking and results monitoring of projects and programmes – were fully achieved.

Box 6.7: Multi-Partner Human Security Trust Fund for the Aral Sea region

The Multi-Partner Human Security Trust Fund for the Aral Sea Region, initiated by the President of Uzbekistan, was endorsed in 2018 by the United Nations General Assembly through the Resolution “Strengthening regional and international cooperation to ensure peace, stability and sustainable development in the Central Asian Region” (A/RES/72/283).

The Trust Fund is an unprecedented attempt to better coordinate donor aid to the Aral Sea region of Uzbekistan and increase the effectiveness and impact of government and donor projects in the Aral Sea region of the country. Contributions to the Fund are made by bilateral and multilateral donors and the Government of Uzbekistan. The Fund is administered by a Steering Committee co-chaired by the United Nations Resident Coordinator in Uzbekistan. In March 2019, the first call for proposals was issued.

Despite the foregoing, there are projects that are co-financed by two or more donors, and there are donor-supported projects that are complementary to one another. This is especially so because some donors trigger coordination with others and articulate the projects they will fund with interventions from other donors.

6.7 Assessment, conclusions and recommendations

Assessment

There are many examples of the rapid pace with which Uzbekistan is moving forward towards a more prominent role on the international scene. Uzbekistan has demonstrated its strong will to contribute to enhanced regional cooperation in Central Asia. The country has changed its position on water–energy issues.

Uzbekistan is not a party to a number of relevant global and regional MEAs. In the period 2010–2017, the country has not joined any additional MEAs. At the same time, in the past two years, the country became party to three additional MEAs – the Paris Agreement (in 2018), the Stockholm Convention (in 2019) and the Cartagena Protocol (in 2019).

This new trend is likely to remain in the coming years due to the aspiration of the country to further strengthen its place and role as a full subject of international relations and strengthen its international reputation. There are quite intensive ongoing efforts within the country in preparation of its accession to some agreements.

MEA implementation remains a problem very much related to insufficient administrative capacity, significant gaps in critical information (e.g. for the management of biodiversity) and deficiencies in coordination among institutions.

The country is going through a period of great growth in terms of international cooperation and very likely will have to set up a mechanism that ensures comprehensive and systematic donor coordination in support of Government activities, including on environment-related issues.

Conclusions and recommendations

Institutional aspects of international cooperation on the environment

There are no effective systemic coordination mechanisms on environment-related issues that are the

subject of international, regional or bilateral cooperation. The role and functions of MEA national focal points are not understood or fully exercised. There are gaps in information sharing. The transition costs of the focal points are very high because there are neither mechanisms nor practices to ensure the adequate transfer of knowledge from outgoing focal points to new focal points. In many cases, information on the national focal points of Uzbekistan held by the convention secretariats is outdated.

Recommendation 6.1:

The Cabinet of Ministers should ensure that:

- (a) *Regular and efficient mechanisms for coordination on environment-related issues that are subject of international, regional or bilateral cooperation are in place;*
- (b) *The Ministry of Foreign Affairs has an updated and publicly available database of all focal points of international agreements, in particular, environment-related ones, and relevant authorities display information on focal points of their websites;*
- (c) *Focal points comply with their duties of sharing information and preparing and disseminating meeting reports and that they are properly prepared for performing the functions of focal points;*
- (d) *Information available at the convention secretariats in relation to focal points is always up to date;*
- (e) *Technical capacities to implement and report on multilateral environmental agreements are strengthened.*

Participation in agreements to which Uzbekistan is not a party

There are many relevant MEAs to which Uzbekistan is not a party, including those mentioned below. However, there are clear benefits in joining these instruments, as long as compliance with their obligations is feasible for the country. In this respect, it is commendable that Uzbekistan always does a feasibility study before deciding to join an MEA and works towards enhancing implementation capacities.

Uzbekistan expressed its interest in initiating comprehensive legislative reforms with a view to aligning its environmental assessment system with the provisions of the Espoo Convention and the Protocol on SEA. Taking into account the high pace of economic and infrastructural developments in the country, application of modern EIA and SEA procedures will significantly contribute to the prevention, reduction and control of significant

adverse environmental impacts in the country and in the Central Asia subregion.

The preparatory work for accession to CLRTAP and EMEP is advanced and the country has been closely engaged in the activities undertaken within the Convention. Notably, Uzbekistan strengthened its capacity to prepare emission inventories. Accession to the EMEP Protocol would provide a good basis for rapid accession to the other key protocols of the Convention. This would also give further access to the expert network under the Convention, which can provide guidance on ELVs based on BAT.

Uzbekistan does not have a comprehensive legal framework for chemicals, so there are benefits to the country's adherence to international regimes in this area. Following accession to the Stockholm Convention in 2019, accession to the Rotterdam Convention and Minamata Convention on Mercury would be logical next steps.

The accession process to become a party to the Protocol on Water and Health is ongoing. The Protocol sets the international framework providing support to countries in the implementation of health-relevant water safety measures.

Recommendation 6.2:

The Cabinet of Ministers should consider accession to the:

- (a) *1991 Convention on Environmental Impact Assessment in a Transboundary Context;*
- (b) *2003 Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context;*
- (c) *1979 Convention on Long Range Transboundary Air Pollution, the 1984 EMEP Protocol under the Convention and, subsequently, the three amended protocols to the Convention: the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone amended in 2012, the 1998 Protocol on Heavy Metals amended in 2012 and the 1998 Protocol on Persistent Organic Pollutants amended in 2009;*
- (d) *1998 Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade;*
- (e) *2013 Minamata Convention on Mercury;*
- (f) *1999 Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes.*

See Recommendations 4.3, 5.5, 12.6, 13.4, 14.5, 15.5.

Reporting

The country has had difficulties fulfilling its reporting obligations under several MEAs, such as the Convention on Wetlands of International Importance, especially as Waterfowl Habitat, Agreement on the Conservation of African-Eurasian Migratory Waterbirds, Convention on International Trade in Endangered Species of Wild Fauna and Flora and Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

Recommendation 6.3:

The Cabinet of Ministers should ensure regular fulfilment by Uzbekistan of its reporting obligations under all multilateral environmental agreements the country participates in.

Subregional cooperation on transboundary waters

The existing subregional legal and institutional framework on the management of transboundary waters in place in Central Asia is not adjusted to the challenges that have arisen over the last 30 years. The efficiency problems in the functioning of IFAS persist, despite having been identified and recognized by the member countries. Although the 2009 Joint Statement of the Heads of State of IFAS founders included a commitment to strengthen the legal and institutional framework of the organization, changes have not been implemented in practice.

The new position of Uzbekistan towards more open dialogue on transboundary water issues provides an opportunity for the country to boost the activities of IFAS towards more virtuous cooperation, with more expressive results and a more robust legal framework. In the short run, Uzbekistan could play an important role in initiating the reassessment of the legal and institutional frameworks of cooperation and in bringing Kyrgyzstan back into IFAS cooperation. In the long run, it could facilitate the involvement of the energy sector in the cooperation and the extension of cooperation to water quality issues.

Recommendation 6.4:

The Cabinet of Ministers should ensure the active role of Uzbekistan in facilitating the strengthening of the legal and institutional frameworks of the International Fund for Saving the Aral Sea.

Subregional cooperation on the environment

Uzbekistan's role as Chair of the ICSD (starting in October 2019) provides opportunities for the country to increase its contribution to and play a leading role in the environmental cooperation agenda in the Central Asia subregion. In October 2019, the ICSD adopted the Regional Environmental Programme for Sustainable Development in Central Asia that is pending the approval of the IFAS Board. The document is to be implemented in the period 2020–2030 and is centred around the environment-related Sustainable Development Goals.

Recommendation 6.5:

The State Committee on Ecology and Environmental Protection should facilitate timely approval of the Regional Environmental Programme for Sustainable Development in Central Asia, its implementation and monitoring.

Multi-Partner Human Security Trust Fund for the Aral Sea Region

The Multi-Partner Human Security Trust Fund for the Aral Sea Region is an emblematic initiative of Uzbekistan to streamline donor assistance and strengthen the efforts of the Government and the international community to address the consequences of the Aral Sea disaster. The initiative currently enjoys considerable support from the Government. Continuation of such support, together with efficient functioning and transparency in the operation of the Trust Fund, are prerequisites for maintaining credibility and attracting high levels of interest from the international and donor community.

Recommendation 6.6:

The Cabinet of Ministers should continue to support the Multi-Partner Human Security Trust Fund for the Aral Sea Region, in particular by:

- (a) *Ensuring timely and efficient implementation and monitoring of activities and public availability of related reports;*
- (b) *Increasing advocacy activities to reach out to potential donors;*
- (c) *Continuing its own contributions to replenish the Trust Fund.*

Chapter 7

CLIMATE CHANGE

7.1 Current and foreseeable environmental and economic impacts from climate change

Environmental impacts from climate change

Climate

The climate of Uzbekistan is continental and subtropical, and characterized by significant daily and seasonal fluctuations, with maximum temperatures in summer exceeding 45°C and minimum temperatures in winter dropping well below -20°C.

Overall, weather conditions in the country are expected to become hotter and drier, with more frequent and more intense heatwaves, droughts and modifications in precipitations patterns leading to an increase of related extreme weather events such as heavy rains, floods and mudflows.

Precipitation

Uzbekistan can be considered an arid country, with precipitation highly influenced by the variability of the geographical characteristics of the terrain, with the most precipitation being received by mountainous areas in the south-eastern and eastern part of the country.

According to the 2016 Third National Communication (TNC) to the United Nations Framework Convention on Climate Change (UNFCCC), from 1900 to 2013, no significant trend can be ascertained in respect of variation in total annual precipitation. Climate change is expected to contribute to an overall decrease in precipitation, except for mountain areas during the winter months, where a slight increase in overall precipitation is expected. Despite the overall tendency towards a decrease in precipitation, changes in precipitation patterns are expected to contribute to more frequent extreme weather events such as heavy rain events.

Temperature

According to the TNC, climate change is already having tangible impacts on temperature in the country. From 1950 to 2013, the registered rate of temperature increase corresponded to 0.27°C for every 10 years, a rate of warming more than double the global trend. The increase in temperature was registered during both the summer and winter seasons and corresponds to a marked decrease in the number of frost days and to an increase in the number of days with maximum air temperature exceeding 40°C. The most significant warming trend has been recorded in the northern parts of the country and in the urban centres, with warming in the mountainous areas being less pronounced, while still exceeding the global rate. An increase in the number of tropical nights¹⁹ has also been registered in the whole country, with the strongest trend registered on the plains. According to the scenarios considered under the TNC, it is expected that the increasing trend in average annual temperature will continue. Seasonally, the strongest increase in temperature is expected to occur during the summer months.

Water resources

Uzbekistan is a country characterized by water scarcity, and this issue is expected to be further exacerbated by climate change and increased water demand due to a growing population and expected changes in the distribution of surface water resources in the Aral Sea Basin. The water resources of the country are comprised of the surface resources of the Amu Darya, Syr Darya and other rivers of the Aral Sea Basin. Only around 10 per cent of the water resources are comprised of groundwater.

Shrinkage of glaciers has been recorded on the territory of Uzbekistan. According to the TNC, in the period 1957–2010, the total volume of ice in glaciers was reduced by 24.3 per cent in the Pskem River Basin, by 67.4 per cent in the Kashkadarya River Basin and by 40.1 per cent in the Surkandarya River Basin. According to analysis contained in the TNC, a decrease in glacier area can be expected under all

¹⁹ The definition of tropical night adopted by the TNC refers to nights with a temperature above 22°C, due to the lower humidity in the country.

scenarios developed, with glaciers projected to disappear from the territory of the country in the next 30 to 50 years under the extreme GHG emissions scenario. Analysis of snow cover data presented in the TNC shows a decrease in snow cover area in all scenarios considered. The run-off of the Amu Darya and Syr Darya Rivers is characterized by strong inter-annual variability, which might be further exacerbated by climate change with changes in precipitation patterns.

Climate change is expected to have impacts on water quality as well, in particular in terms of salinization. This is especially problematic considering that only 73 per cent of the population nationwide has access to centralized water supply (figure 9.3). Around 20 per cent of the population of Uzbekistan is already subjected to the effects of water salinization.

The projected decrease in water availability is a serious issue that is expected to impact on many sectors of the economy, as well as human health.

Land and soil

Erosion and salinization are two particular issues affecting the quality of soil in the country that are expected to be exacerbated by climate change. According to some estimates, over 50 per cent of cultivated land in the country is affected by wind erosion, and almost 20 per cent is affected by water erosion. Salinization – with varying degrees of soil salinity – affects around 50 per cent of cultivated land, a percentage that climbs to over 90 per cent in certain areas of the country such as the Republic of Karakalpakstan.²⁰ Variations in precipitation patterns in the country are expected to contribute to an increase in the incidence in mudflows, which in turn are expected to have negative impacts on soil quality.

Climate change is expected to have a negative effect on the quality of soils in the country, contributing to land degradation and desertification.

Forests

Forests account for 3.26 million ha (7.26 per cent of the country's territory) as at 1 January 2018. The forest cover in Uzbekistan can be divided into desert plains forests, accounting for almost 80 per cent of all forest cover, floodplain and riparian forests (so-called tugai forests) and mountain forests. The most prevalent tree species in the country are desert trees

and shrubs such as saxaul, cherkez, kandym and other types of desertic vegetation. Forests have an important role in preventing erosion in mountain areas, fixing sandy terrain in desert areas, providing non-timber forest products and mitigating desert storms.

In recent years, there has been a decrease in floodplain and riparian forest habitats, due to changes in hydrological phenomena. Mountain forests are very diverse, with more than 100 species of trees and shrubs found in these areas. The most prevalent are juniper, pistachio, almond, other nuts, apple and hawthorn. Overall, forests in Uzbekistan are characterized by low productivity, with the exception of tugai forests. Climate change is expected to have a negative impact on forests in the country, in particular by further decreasing productivity of species such as saxaul and increasing the risk of spreading insect pests and forest pathogens.

Additionally, it is expected that climate change will have a negative impact on the health of forests, including a higher incidence of outbreaks of insect pests and forest pathogens. The negative impacts of climate change are expected to be especially felt by tugai forests, as changes in climate conditions and precipitation patterns might negatively affect their habitats, resulting in further reduction.

Biodiversity

Climate change is expected to have a negative impact on biodiversity, in particular through its effects on the intensification of land degradation and desertification. According to the 2019 Sixth National Report to the CBD, aquatic habitats are especially endangered, due to negative consequences associated with the rise in water temperature and increase in salinity. An upward shift of certain habitats can be expected as a result of climate change, with the consequent reduction of the area of alpine and sub-alpine belts expected to negatively influence all species, in particular, large vertebrates. The negative effects of climate change on biodiversity are expected to be especially pronounced in the Aral Sea region and in sub-montane regions of Uzbekistan.

According to the Sixth National Report, some negative effects of climate change on biodiversity can already be identified. In particular, there are upward shifts of heat-loving plants, and changes in migratory patterns of some bird species.

²⁰ Aden Aw-Hassan and others, "Economics of land degradation and improvement in Uzbekistan", in *Economics of Land Degradation and Improvement – A*

Global Assessment for Sustainable Development, Ephraim Nkonya, Alisher Mirzabaev and Joachim von Braun, eds. (Springer, 2016).

Human health

Climate change is expected to have negative impacts on human health in Uzbekistan, in particular regarding health risks associated with high temperatures and inadequate water quality.

Climate change will lead to an increase in temperature, leading to an increase in the incidence of dehydration and heat stroke, especially in the central desert areas. Higher temperatures are also expected to lead to an increase in the incidence of cardiovascular, neurological, genitourinary, gastrointestinal and neoplastic diseases.

Higher temperatures are expected to increase the incidence of diarrhoeal diseases in the country. According to expert assessments, an increase of 1°C–2°C in maximum temperature is directly associated with an increase of 10–13 per cent in the incidence of acute intestinal infections.²¹ Climate change is also expected to increase the risk of vector-borne diseases such as malaria. Water-supply-related issues aggravated by climate change are expected to lead to increased risk of infectious waterborne diseases and malnutrition.

Climate change is also expected to aggravate the incidence of respiratory diseases related to dust-storms, in particular in the Aral Sea region. Dust storms are already a serious health concern in the

country, with WHO estimates assessing the number of affected people at more than 5.5 million. While it is difficult to establish the exact contribution of the changing climate to this number, increasingly arid conditions are certain to have exacerbated the phenomenon.

Economic impacts from climate change by sector

Energy

Climate change is expected to result in an increase in energy demand. In particular, a significant increase in demand is expected for energy for cooling purposes. While climate change is also expected to cause a slight decrease in energy demand for heating purposes, this decrease will not be significant enough to counterbalance the increase in demand for cooling purposes, resulting in an overall increase.

Climate change is also expected to have an influence on energy production. Hydropower, which accounted, on average, for 11.17 per cent of in-country electricity generation in the period 2013–2018 (table 12.5(b)), is expected to be negatively influenced by climate change in terms of productivity, as a result of changes in water availability. At the same time, the country's estimated technical potential for solar energy development is significant: 2,058,000 Gw/y (table 12.10).

Photo 7: Urban sprawl, Bukhara City



Photo credit: Ms. Alessandra Fidanza

²¹ Bettina Menne, Vladimir Kendrovski and James Creswick, "Protecting health from climate change: A seven-

country approach", *Public Health Panorama*, vol. 1, No. 1 (June 2015), p. 11–24.

Energy generation and transmission infrastructure, while in the process of being modernized, can still be considered generally vulnerable to weather conditions, and climate change can be expected to exacerbate this vulnerability.

Industry

No assessment of the impacts of anthropogenic climate change on the industrial sector in the country has been developed. It can be expected that climate change could have negative effects on related infrastructure.

Agriculture

In 2018, the agriculture, forestry and fisheries sector accounted for 32.4 per cent of GDP (table 13.1). In 2018, agriculture accounted for about 90 per cent of the total water use (table 9.2). Almost 95 per cent of the cultivated area has to make use of irrigation for crop growing. The most prevalent crops in Uzbekistan are cotton and wheat, both of which are sensitive to changes in climatic conditions.

Some climate change impacts can already be felt in the sector. According to the TNC, there has already been a marked increase in the length of the vegetation period. While a longer vegetation period has a positive impact on yield productivity for crops such as cotton, it has been accompanied by an increase in the frequency of droughts. Climate change is expected to have serious negative impacts on the sector, with aggravated water scarcity being the greatest threat. Climate change is expected to lead to an increase in the demand of water for irrigation, in an overall condition of decreased water availability in the country. Changing climate is expected to have a negative impact on both crop and livestock productivity, with concerns for food security.

Transport

Climate change is expected to have a negative impact on the transport sector, with the higher frequency and intensity of extreme weather events, particularly flooding and mudflows, expected to negatively affect transport infrastructure in the country. Higher temperatures and protracted heatwaves can also be expected to lead to accelerated deterioration of transport infrastructure.

Tourism

Tourism is a sector of growing importance for Uzbekistan. In 2018, tourism was estimated to have

contributed 3.4 per cent of GDP, with 380,400 jobs directly and indirectly supported by the sector.

There is limited awareness of the impacts of climate change on the sector and current impacts have not yet been assessed. Climate change is expected to have a negative impact on the sector, with higher temperatures and extreme weather events having impacts on sites of historical and cultural significance, as well as on natural sites. The higher incidence of heatwaves in the summer months might result in a decrease in tourist demand.

Health-care systems

The assessment conducted by the WHO Regional Office for Europe in 2018 (chapter 17) demonstrated that the implementation of measures to reduce domestic carbon emissions pledged in the (Intended) Nationally Determined Contribution (I)NDC of Uzbekistan would bring the annual economic benefits from reduced PM_{2.5} emissions and associated mortality and morbidity in the amount of US\$668 million (in 2005 prices) in 2030 and thereafter.

Costs of inaction

Despite the economic impact that climate change is expected to have on various economic sectors in the country, in particular on agriculture, costs of inaction for the different sectors have not been estimated. Considering the high sensitivity to climate change of economic sectors of the country, as well as the vulnerability of the country to extreme weather events, not taking necessary adaptation measures is expected to result in significant costs in the future.

Resources for climate change mitigation and adaptation

Uzbekistan has been very successful in mobilizing international climate finance sources in the past years. According to a study by the OECD, Uzbekistan has managed to mobilize more than US\$1 billion a year in the period 2013–2014 from bilateral donors and multilateral channels. Most of the mobilized funds focused on mitigation measures in the energy sector, with significant resources focusing on adaptation measures in the agriculture sector.

Uzbekistan has also dedicated significant domestic resources to climate-related measures, in particular for mitigation measures in the energy sector. The state-owned electricity system operator, Uzbekenergo, dedicated US\$5 billion between 2011 and 2015 to energy efficiency measures and other measures related to energy sector infrastructure.

7.2 Greenhouse gas emissions from economic sectors

Uzbekistan is a non-annex I party to the UNFCCC, and has submitted, to date, three national communications to the UNFCCC, including inventories of GHG emissions. The latest data, contained in the TNC, issued in 2016 and submitted in 2017, are updated to 2012. The inventory presented under the TNC includes data on emissions and sinks of CO₂, CH₄, N₂O and HFCs, as well as of CO, NO_x, non-methane volatile organic compounds (NMVOCs) and SO₂. A new GHG inventory will be compiled in 2020–2021.

The inventory does not include data on sulfur hexafluoride (SF₆) and perfluorocarbons (PCFs) due to the lack of relevant data.

According to the TNC, in 2012, GHG emissions per capita in the country were 6.9 t of CO₂-eq., while total emissions, excluding land use change and forestry

(LUCF) sinks were 205.2 Mt CO₂-eq. (table 7.1). In comparison with 1990, there has been a 13.7 per cent increase in overall emissions and a 21.6 per cent decrease in emissions per capita. In 2012, the energy sector accounted for 82 per cent of emissions (excluding LUCF removals) for a total of 168.1 Mt of CO₂-eq., and, as such, was the greatest contributor to the country's GHG emissions. The second biggest contribution to GHG emissions comes from the agricultural sector, accounting for 11 per cent of the emissions in 2012, followed by industrial processes and waste treatment, both accounting for slightly less than 8 per cent of the total GHG emissions of the country.

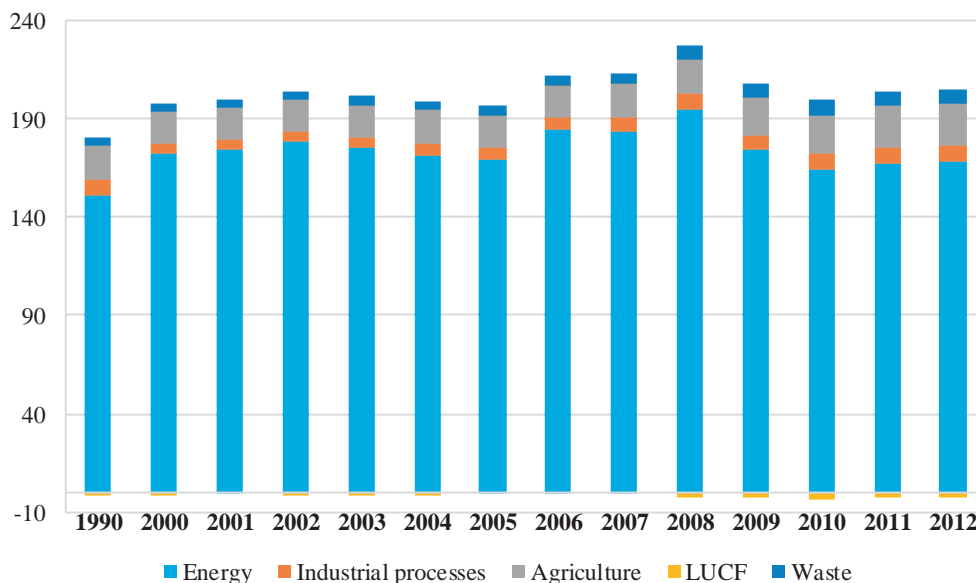
Figure 7.1 illustrates the fluctuation and GHG emission trends by sector in Mt of CO₂-eq. The historical trend of the 22-year period from 1990 to 2012 appears substantially stable, with a gentle, steady increase in emissions, which are being consistently dominated by the energy sector.

Table 7.1: GHG emissions and removals by sector, 1990, 1995, 2000, 2005, 2010, 2012, Mt CO₂-eq.

	1990	1995	2000	2005	2010	2012
Energy	151.2	157.9	172.4	169.2	164.1	168.1
Industrial processes	8.1	5.3	4.9	6.2	7.9	7.8
Agriculture	17	16.7	16.2	16.1	19.9	21.6
LUCF	-1.6	-1.4	-1	0.4	-3.1	-2.9
Waste	4.1	4.3	4.5	4.7	7.3	7.7
Total (including LUCF removals)	178.8	182.8	197	196.6	196.1	202.3
Total (excluding LUCF removals)	180.4	184.2	198	196.2	199.2	205.2

Source: Third National Communication to the UNFCCC, 2016.

Figure 7.1: Total GHG emissions by sector, 1990, 2000–2012, Mt of CO₂-eq.



Source: Third National Communication to the UNFCCC, 2016.

In 2012, CO₂ emissions accounted for 51 per cent of the overall GHG emissions of the country. Historically, they have accounted for about half the total emissions since 1990 (figure 7.2). CH₄ emissions increased substantially, from 30 per cent of total emissions in 1990 to 43 per cent of total emissions in 2012 (converted to CO₂-eq.). The third most represented GHG is N₂O, accounting for 5 per cent of total emissions in 2012. In addition to this, the GHG inventory reports negligible quantities of emissions from HFCs (less than 0.1 per cent of the total emissions when converted to CO₂-eq.).

Energy

Energy is the highest emitting sector in the country, emitting 168.1 Mt CO₂-eq. in 2012 and thus accounting for 82 per cent of total GHG emissions of the country (excluding LUCF removals). The contribution of the sector to overall emissions has increased slightly over the years, with an increase of 11.2 per cent in 2012 compared with 1990. Approximately 75–80 per cent of the electricity in Uzbekistan is produced using natural gas produced in Uzbekistan.

Within the energy sector, most emissions come from fuel combustion, accounting for 58 per cent of emissions in 2012, whereas the remaining 42 per cent is due to fugitive emissions. The fuel combustion category includes fuel combustion by energy industries and by manufacturing and construction industries and fuel combustion for transport. On the other hand, the “fugitive emissions” category includes fugitive emissions due to coal mining and processing, and fugitive emissions in the oil and gas sector. It is worth noting that GHG emissions from methane leakage alone account for more than 68.237 Mt CO₂-eq. per year in 2012, with an increasing trend from

43.628 Mt CO₂-eq. per year in 1990. Methane leakage is a significant issue for the country. Despite the fact that many project interventions, including those financed under the Clean Development Mechanism (CDM), have sought to address the issue, it is a growing source of emissions in the country, with its contribution to overall emissions having increased from 22.9 per cent in 1990 to 33.2 per cent in 2012 (figure 7.3).

Industry and mining

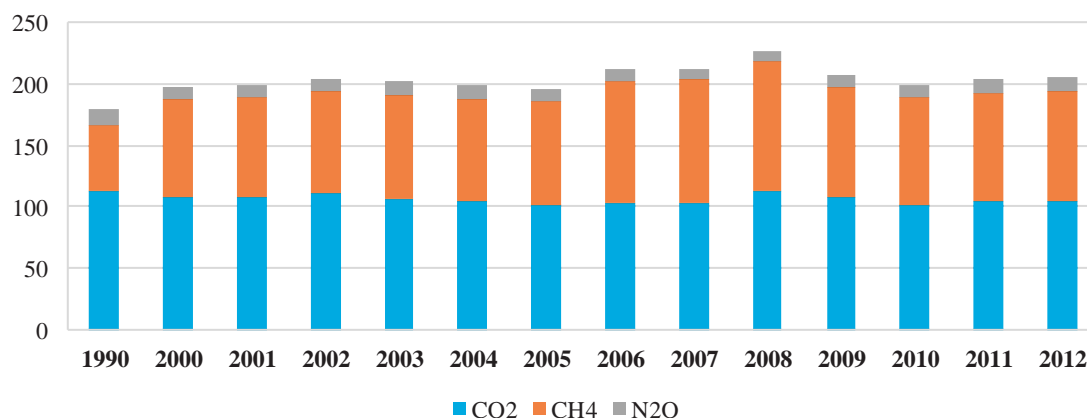
GHG emissions from industrial processes in the country originate mainly from the chemicals industry and construction materials industry. The chemicals industry accounted for 46 per cent of total emissions of the sector in 2012, the mineral products industry accounted for 38 per cent and the metal production industry accounted for 15 per cent (figure 7.4).

The majority of GHG emissions related to the mineral products industry are connected with cement production, while other sources of emissions in this category include lime production and the use of soda ash.

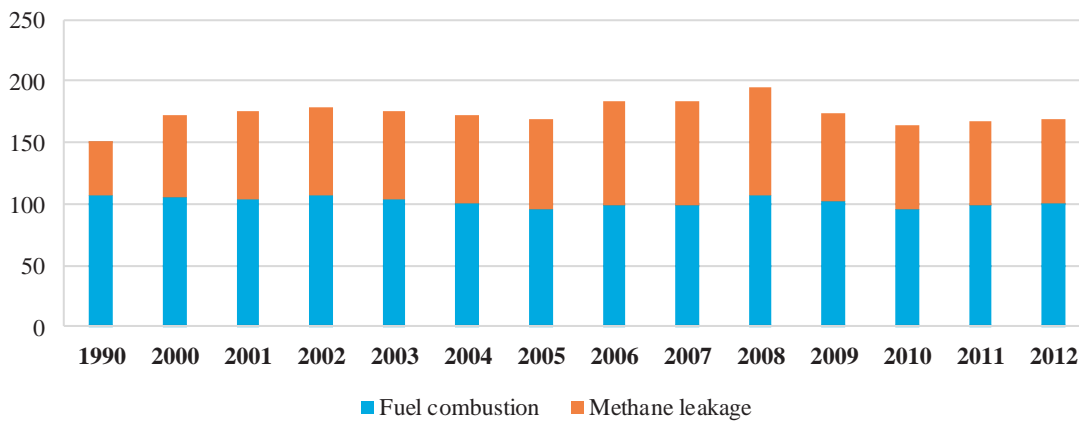
More than 99 per cent of emissions from the chemicals industry are due to the production of ammonia (49 per cent of related emissions) and nitric acid (50.3 per cent of related emissions).

If subdivided by gas, 76 per cent of GHG emissions of the sector in 2012 were CO₂, with N₂O the second highest contributor with 23 per cent and HFCs contributing a modest 1.2 per cent. CH₄ emissions in the industrial sector are negligible – less than 0.05 per cent (table 15.5). The sector’s contribution to overall emissions has decreased slightly over the years, by 3.7 per cent between 1990 and 2012.

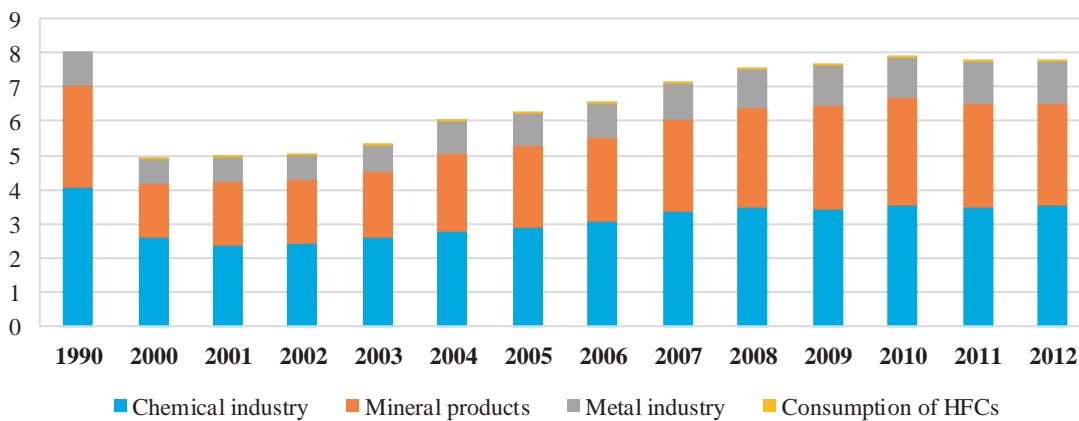
Figure 7.2: Total GHG emissions by gas, 1990, 2000–2012, Mt of CO₂-eq.



Source: Third National Communication to the UNFCCC, 2016.

Figure 7.3: GHG emissions from the energy sector, 1990, 2000–2012, Mt CO₂-eq.

Source: Third National Communication to the UNFCCC, 2016.

Figure 7.4: GHG emissions from the industrial sector, 1990, 2000–2012, Mt CO₂-eq.

Source: Third National Communication to the UNFCCC, 2016.

Agriculture

GHG emissions in the agriculture sector accounted for 10.5 per cent of total emissions in 2012 excluding LUCF. The overall contribution of the sector to total emissions increased by 27.1 per cent between 1990 and 2012 (figure 7.5), mainly due to the increase in methane emissions from enteric fermentation, which is the direct result of a significant increase in the number of cattle. A reduction in nitrous oxide emissions has been registered and is the result of the reduction in use of mineral fertilizers.

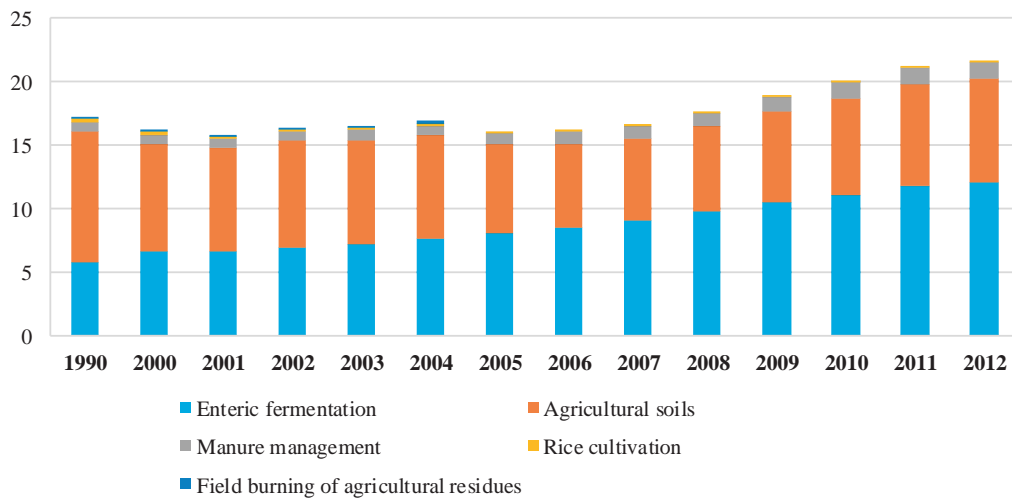
Land use change and forestry

The LUCF sector is the greatest contributor to CO₂ removals. In 2012, the sector's contribution to emissions was -2.9 Mt CO₂-eq. This translates in net sinks corresponding to 2.7 per cent of the total CO₂ emission, 1.4 per cent of total GHG emissions (figure

7.6). A marked increase in removals from 2008 onwards can be explained by intensive afforestation programmes in desert areas. While the overall contribution to emissions of the sector is net negative in most years, there is a shift in the category of land use change from removals to emissions. According to the TNC, this is mainly due to some reduction in pasture areas and significant reduction in the area under rice cultivation.

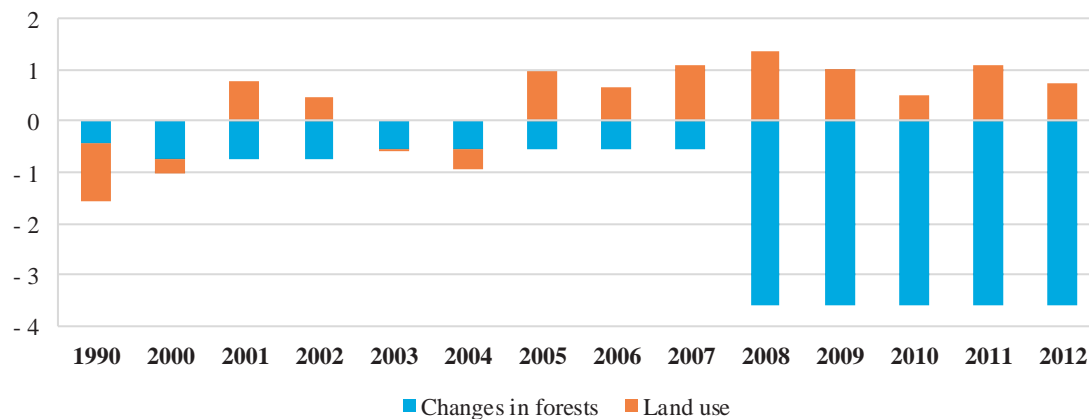
Waste

The waste sector contributed 7.7 Mt CO₂-eq. to GHG emissions in 2012. The GHG emissions of the sector come from CH₄ and N₂O emissions from solid waste disposal on land, industrial wastewater and domestic and commercial wastewater. The inventory does not include emissions related to waste incineration, due to the lack of data.

Figure 7.5: GHG emissions in the agriculture sector, 1990, 2000–2012, Mt CO₂-eq.

Source: Third National Communication to the UNFCCC, 2016.

Note: FAO estimates of the breakdown of GHG emissions from agricultural activities in the period 2010–2016 are shown in figure 13.7.

Figure 7.6: Emissions/removals in the land use change and forestry sector, 1990, 2000–2012, Mt CO₂-eq.

Source: Third National Communication to the UNFCCC, 2016.

GHG emissions from the waste sector showed a steady increase in the period 1990–2012, by 87.8 per cent (figure 7.7). The greatest increase in emissions is in the category of solid waste disposal on land and can be explained by the increase in population in the country. In particular, CH₄ emissions increased by 93.1 per cent from 1990 to 2012.

Transport

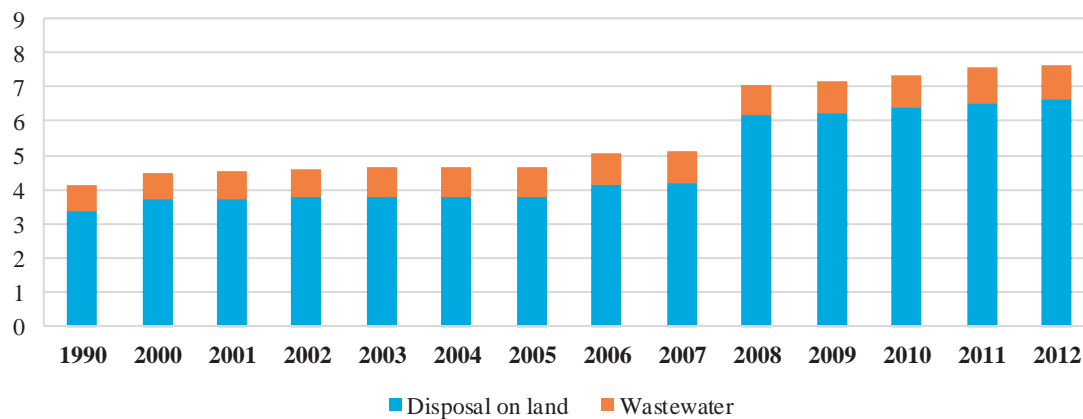
The contribution of the transport sector to overall emissions in the country is relatively limited, accounting for 6 per cent of all GHG emissions in 2012. The largest contributor to CO₂ emissions is road transport (63 per cent in 2012) (figure 14.1).

The transport sector is expected to grow dramatically in the coming decades as the Uzbekistan economy develops further. Chapter 14 and annex IV show the

opportunities for decoupling of transport CO₂ emissions from economic growth in Uzbekistan as demonstrated by the For Future Inland Transport Systems (ForFITS) tool.

7.3 Legal, policy and institutional framework

As at mid-2019, the country has neither comprehensive law nor a strategy regulating climate change mitigation and adaptation efforts. However, climate change issues are, to a certain extent, incorporated into sectoral legislation and major strategic documents. While climate change issues are cross-sectoral in nature, a more integrated legal and policy framework would enable the country to more effectively tackle climate change-related challenges. As at mid-2019, Uzbekistan is in the process of developing a national adaptation plan, with funding being requested from the Green Climate Fund.

Figure 7.7: GHG emissions from the waste sector, 1990, 2000–2012, Mt CO₂-eq.

Source: Third National Communication to the UNFCCC, 2016.

Legal framework

The 1996 Law on Ambient Air Protection is the main legislative basis for climate change mitigation in the country. Specifically, the Law sets air protection standards and contains provisions on measures aimed at reducing GHG emissions, including the use of energy efficiency measures, and self-reporting of GHG emissions by enterprises.

The 1997 Law on the Rational Use of Energy aims to achieve the efficient use of energy through, among other things, encouragement of the use of energy-efficient technologies, while also proposing provisions for economic measures that would encourage rational energy use. The recently adopted 2019 Law on the Use of Renewable Energy Sources aims to facilitate support measures for RES.

The 2009 Resolution of the Cabinet of Ministers No. 245 provides a regulatory framework for supply and consumption of electrical and thermal energy. It also foresees energy saving and efficiency standards for industrial consumers.

The 2013 Decree of the President No. 4512 encourages the development of alternative energy sources, by mandating the Cabinet of Ministers, the Academy of Sciences and other relevant institutions to take measures aimed at developing pilot projects in the field of solar and biogas energy.

Policy framework

Action Strategy on Five Priority Directions for Development for the period 2017–2021

The Strategy identifies the key priorities for the economic development of the country. In recognizing the modernization and intensive development of

agriculture as one of the priorities, the Strategy also recognizes the importance of countering the negative impact of climate change on agriculture and people's livelihoods by emphasizing the centrality of water-saving techniques, as well as of research and development focused on new crop varieties and animal breeds. It also identifies the competitiveness of the country's economy as a key priority, and highlights the reduction of energy and resource intensity, wider utilization of energy-efficient and energy-saving technologies by industries, and wider use of RES, as actions towards the implementation of this key priority.

Strategy for Transition to Green Economy for the period 2019–2030

At present, the Strategy for Transition to Green Economy for the period 2019–2030 (2019 Resolution of the President No. 4477), adopted in October 2019, is considered the central policy document to implement Uzbekistan's commitments under the Paris Agreement and (I)NDC. The Strategy has a framework character. It defines priority areas for both mitigation and adaptation. Its implementation will be ensured through measures included in sectoral plans and strategies.

Strategy for Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 in the Republic of Uzbekistan

This Strategy, together with its action plan (2019 Resolution of the Cabinet of Ministers No. 299) determine priority areas for disaster risk reduction: enhancement of the knowledge base on disaster risks; improved legal and institutional frameworks for disaster risk management; investments in disaster risk reduction measures; and increased preparedness for response to disasters. The Strategy places an emphasis

on implementation of disaster risk insurance. It also provides for development and implementation of local strategies for disaster risk reduction.

Programme of Actions on Environmental Protection for the period 2013–2017

The Programme identifies measures aimed at achieving a more rational use of natural resources. Adaptation to and mitigation of climate change are not specifically highlighted in the Programme.

Programmes on energy efficiency

Several strategic documents on energy efficiency have been adopted in the past decade, including the Programme of Measures to Reduce Energy Intensity and Introduce Energy Efficient Technologies in Economic Sectors and the Social Sector for the period 2015–2019, replaced by the similar programme for the period 2017–2021. Key measures include the replacement of inefficient boilers for space heating and hot water supply in detached houses and state-budget-funded organizations and the improvement of energy efficiency requirements for new buildings.

Comprehensive Programme of Measures related to Mitigation of the Consequences of the Aral Disaster, Rehabilitation and Socio-Economic Development of the Aral Sea Region for the period 2015–2018

The Programme identified priority areas for actions aimed at mitigating the impacts of the environmental catastrophe of the drying of the Aral Sea. Most relevant for this chapter, the Programme foresaw the need for implementation of large-scale afforestation of the dry seabed of the Aral Sea in order to prevent desertification in the region.

Strategic documents developed under international projects

Three other strategic documents relevant to climate change issues have been developed under international projects. Although they are directly referred to in Uzbekistan's 2017 (I)NDC, it does not appear that they have been formally adopted by the Government. These documents are:

- “Uzbekistan towards 2030: Transition to the resource efficient growth model”, developed under the framework of a joint UNDP and World Bank project, identifies concrete measures aimed at reducing the resource intensity of the country's economy by 2030. The identified measures focus mostly on increasing energy efficiency (identified

measures range from the phase-out of incandescent bulbs to the introduction of modern technologies to monitor natural gas losses during transportation), the expansion of solar energy and the intensification of agriculture (identified measures range from altering cropping patterns to significant expansion of water-efficient irrigation methods);

- “Towards Sustainable Energy: Strategy for Low Carbon Development”, developed under the framework of a joint UNDP and Ministry of Economy project, identifies the potential for energy saving and potential measures for improving energy efficiency in the energy sector, in particular regarding electricity, heat energy and energy consumption in buildings;
- “Strategy for improvement of energy efficiency of buildings in Uzbekistan: Directions of reforms and expected benefits” identifies the energy savings potential, as well as concrete measures to be implemented, in the sector in order to reach the identified potential savings by 2020 and 2030.

Sustainable Development Goals and targets relevant to this chapter

The current status of the country vis-à-vis targets 1.5, 11.b, 13.1, 13.2 and 13.3 of the 2030 Agenda for Sustainable Development is summarized in box 7.1.

Institutional framework

Uzbekistan does not have an institution or an intergovernmental committee with the responsibility of coordinating climate change measures in the country. Most mitigation and adaptation activities are implemented through sector-specific institutions with limited overall coordination. The lack of coordination has also been recognized in the TNC as a hindering factor for climate action in the country.

Uzhydromet, currently operating under the Cabinet of Ministers, is the designated National Focal Point to the UNFCCC, the National Designated Entity for Climate Technology Centre and Network (CTCN) and the National Designated Authority for the GCF. Uzhydromet is the main institution responsible for the preparation of national communications to the UNFCCC and for GHG inventories. Uzhydromet's mandate directly includes the implementation of relevant international obligations under the UNFCCC. In accordance with this mandate, this institution coordinates the work to prepare and submit information to the UNFCCC, represents the interests of Uzbekistan in UNFCCC and coordinates activities on climate financing. Uzhydromet lacks a clear, fully fledged mandate to define climate change policies at

the national level. Uzhymet is not responsible for Uzbekistan's participation in the CDM.

including through the promotion of clean technologies and environmental awareness-raising.

The State Committee on Ecology and Environmental Protection (SCEEP) is the focal point for the GEF and the UNCCD. It is responsible for protection of the environment and the efficient use of natural resources,

The Ministry of Economy and Industry is the National Designated Authority for the CDM. As such, it is responsible for coordinating CDM-related activities in the country.

Box 7.1: Targets 1.5, 11.b, 13.1, 13.2 and 13.3 of the 2030 Agenda for Sustainable Development



Goal 1. End poverty in all its forms everywhere

Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters



Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Target 11.b: By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels



Goal 13. Take urgent action to combat climate change and its impacts

Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

Target 13.2: Integrate climate change measures into national policies, strategies and planning

Uzbekistan has not adopted as its national targets the global targets 11.b and 13.1. This is partially explained by the similarity of global indicators 1.5.1/11.5.1/13.1.1, 1.5.3/11.b.1/13.1.2 and 1.5.4/11.b.2/13.1.3.

Partial data on indicators 1.5.1/11.5.1/13.1.1 (Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population) are available from WHO Global Health Observatory (Monitoring Health for the SDGs, 2017). The average death rate in Uzbekistan due to natural disasters per 100,000 inhabitants during the period 2011–2015 was 0.1.

The country has participated in the Hyogo Framework for Action 2005–2015. In 2019, the country adopted the Strategy for Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 in the Republic of Uzbekistan, together with an action plan (global/national indicator 1.5.3).

Concerning global indicators 1.5.4/11.b.2/13.1.3 (Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies), nationalized by Uzbekistan as indicator 1.5.4, there is no evidence of local governments having developed and adopted climate change strategies with the aim to reduce local disaster risk and strengthen resilience to climate-related hazards and natural disasters.

Adoption of the Strategy for Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 in the Republic of Uzbekistan should ensure coherence among the different activities and facilitate learning from good examples to progress towards a holistic disaster risk management regime at all levels in the country (target 11.b).

Currently, Uzbekistan does not have a comprehensive national strategy on climate change adaptation and mitigation. Climate change concerns are, at least nominally, included in most national policies and plans, with a focus on energy efficiency for mitigation and water-saving measures for adaptation. The lack of a comprehensive national strategy on climate change adaptation and mitigation is a barrier to the country achieving progress on targets 13.1 and 13.2.

Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Some efforts are made to integrate climate change issues into secondary school curricula (chapter 5). Climate change is not integrated into curricula of primary education, vocational training and higher education, although some positive ad hoc examples are reported. Uzhymet and local governments, as well as international organizations and NGOs present in the country, have been active in initiatives and campaigns to raise awareness and advance citizens' education and awareness on climate change-related issues, most of these activities being financed through projects.

With respect to indicator 13.3.2 (Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions), the institutional, systemic and individual capacities to tackle climate change are still relatively limited in the country.

In early 2019, the country established the International Innovation Centre for the Aral Sea Region which, among other activities, is active in experimental research on tree species that can adapt to the conditions of the dried Aral Sea bed (chapter 1).

Economic measures

The country has no emissions trading schemes. No carbon tax is in place.

Uzbekistan has had significant success in hosting CDM projects. The country has been hosting 15

registered CDM projects (table 7.2). The active engagement of the country under the CDM has resulted in significant GHG emissions reductions.

Information instruments

A number of activities aimed at increasing the awareness of the general population and of specific target groups have been undertaken. Most of these activities are ad hoc and are conceptualized and implemented under the framework of donor-financed projects.

Table 7.2: Registered Clean Development Mechanism projects

Registration date	Title	Annex I Parties	Focus GHG	Reductions
14 March 2009	Reduction of N ₂ O emissions at shop#25, production line #3 at "Navoiyazot" plant	Japan	N ₂ O	118 900
16 March 2009	Reduction of N ₂ O emissions at shop#25, production line #2 at "Navoiyazot" plant	Japan	N ₂ O	132 500
27 March 2009	Reduction of N ₂ O emissions at shop#25, production line #4 at "Navoiyazot" plant	Japan	N ₂ O	112 500
29 March 2009	Reduction of N ₂ O emissions at shop#25, production line #1 at "Navoiyazot" plant	Japan	N ₂ O	132 500
03 April 2009	Reduction of N ₂ O emissions at "Maxam-Chirchik" plant	Japan	N ₂ O	353 153
10 April 2009	Reduction of N ₂ O emissions at "Ferganaazot" plant	Japan	N ₂ O	170 925
19 December 2009	Akhangaran Landfill Gas Capture Project in Tashkent	Japan, United Kingdom of Great Britain and Northern Ireland	CH ₄	84 908
26 November 2010	Reduced gas leakage at compressor stations		CH ₄	504 000
27 November 2010	Leak Reduction in Above Ground Gas Distribution Equipment in the Gas Distribution Network UzTransgaz–Markazgaz (UzTG)	United Kingdom of Great Britain and Northern Ireland	CH ₄	1 021 137
28 December 2010	Leak Reduction in Above Ground Distribution Equipment in the Gas Distribution Network UzTransgaz–Zhanubgaz (ZhGT)	United Kingdom of Great Britain and Northern Ireland	CH ₄	559 912
17 February 2011	Reducing gas leaks in low pressure and medium pressure gas distribution networks in Fergana Valley	United Arab Emirates, the Netherlands	CH ₄	1 211 629
22 August 2011	Leak Reduction in Above Ground Distribution Equipment in the Gas Distribution Network UzTransgaz–Garbgaz (GGT)	Switzerland, United Kingdom of Great Britain and Northern Ireland	CH ₄	818 166
09 September 2011	Reduction of gas leakages in low- and middle- pressure gas distribution pipelines in Tashkent City and Tashkent Region	United Kingdom of Great Britain and Northern Ireland	CH ₄	1 053 164
07 March 2012	Leak reduction in above ground gas distribution system in the gas distribution networks in Khorezm region and the Republic of Karakalpakstan	United Arab Emirates	CH ₄	232 184
15 January 2014	"Yoshlik" Landfill Gas Capture Project, Uzbekistan	The Netherlands	CH ₄	30 593

Source: UNFCCC CDM Project Search at <https://cdm.unfccc.int/Projects/projsearch.html>

Note: Reductions indicated are estimated emission reductions in metric tons of CO₂-eq. per year, as stated by the project participants.

Under the framework of the project “Climate Risk Management in Uzbekistan”, implemented by UNDP in collaboration with Uzhydromet between 2011 and 2015, more than 3,000 people, including farmers, have been trained in good practices for water conservation and drought mitigation. The project also enabled the preparation of a number of climate change-related publications, such as “Climate Risk Profile”, “Guidelines for Assessing Climate Risks in Uzbekistan”, “Approaches to Assessing Water Availability and Water Consumption in Uzbekistan in a Changing Climate”, among others. A training course on “Climate Change and Climate Risk Management” has been developed for students of higher educational institutions.

Under the framework of the national component of the global project “Climate change adaptation to protect human health”, jointly implemented by UNDP and WHO between 2010 and 2014, a number of brochures and booklets have been developed on the topic of climate change and health. Additionally, a training programme for general practitioners entitled “Health Impacts of Climate Change” has been developed.

The process of preparation of the TNC has also been an opportunity for awareness-raising on climate change issues in the country, with Uzhydromet publishing articles focusing on the results of preparatory studies and holding several press conferences.

In terms of the preparation of GHG inventories, Uzhydromet is quite effective in ensuring the participation of all relevant stakeholders in the process. However, the preparation of the GHG inventories is almost exclusively financed through project activities supported by donor funds. Preparation of GHG inventories is not a regular activity. The most recent GHG inventory available in 2019 includes data only up to 2012. Outdated data makes it difficult to develop evidence-based policies that can be really effective in ensuring climate action. As a non-annex I party to the UNFCCC, Uzbekistan will have to submit a GHG inventory every two years as part of its Biennial Update Reports (BURs) in line with the recently introduced requirements under UNFCCC.

7.4 Adaptation and mitigation

Commitments and scenarios

(Intended) Nationally Determined Contribution

The (I)NDC of Uzbekistan, submitted in 2017, which

became the country’s first Nationally Determined Contribution following the ratification of the Paris Agreement in November 2018, stipulates a carbon intensity target, namely, to decrease specific emissions of GHGs per unit of GDP by 10 per cent by 2030, with 2010 values as reference values. The country plans to reduce the carbon intensity of the economy through the improvement of energy efficiency, decreasing the resource intensity of the economy and increasing the share of renewable energy sources in the country’s overall energy balance. Considering the strong growth of the economy of Uzbekistan, with GDP growth of 191 per cent between 1990 and 2010, and the projected growth of the population to 37 million people in 2030, it is very probable that overall emissions will increase significantly, even if the mitigation target postulated in the (I)NDC is reached.

The (I)NDC also postulates an adaptation objective, mainly focusing on adaptation in agriculture, water management, forestry, the social sector and the Aral Sea region.

Second National Communication to the UNFCCC

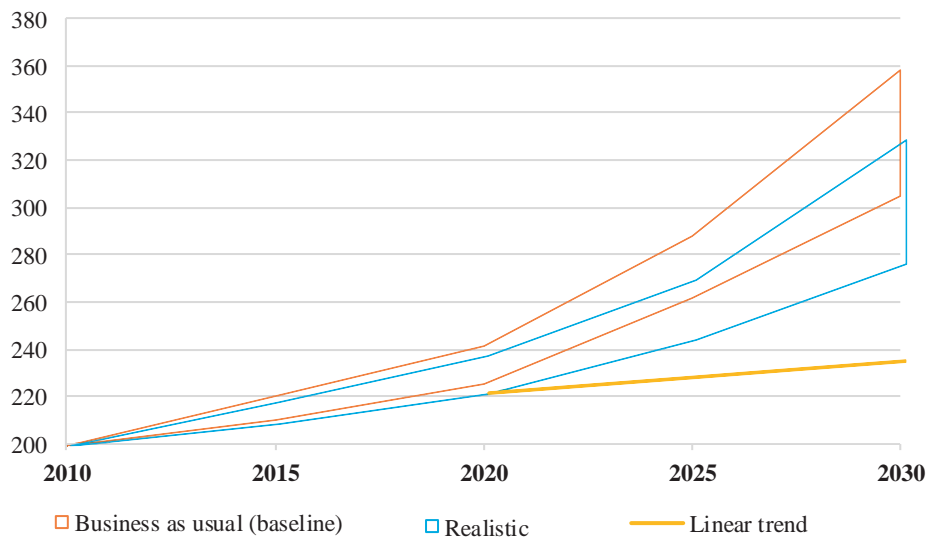
The Second National Communication, submitted in 2008, contained emission predictions up until 2010, 2015 and 2020. The emission predictions for 2010, ranging between 263.1 Mt and 289.4 Mt of CO₂-eq, significantly overestimated the actual emissions for 2010, which amounted to 199.2 Mt of CO₂-eq.

Third National Communication to the UNFCCC

The TNC, submitted in 2016, includes three different emission scenarios until 2030. Methodologically, the TNC uses two approaches for estimating emissions, namely, the Greenhouse Gas Abatement Cost Model (GACMO), under which two scenarios (“business as usual” and “realistic”) were developed, and a linear trend (figure 7.8). Under all three scenarios, Uzbekistan is expecting to see its overall emissions increase, with an increase ranging from a more modest 18 per cent to 80 per cent compared with the baseline year 2010 (199.2 Mt of CO₂-eq).

The two scenarios developed using the GACMO model have been prepared assuming an increase in population to between 36 million and 37 million inhabitants in 2030, and three distinct GDP growth rates (8 per cent per year, variable annual increase between 2.7 per cent and 6 per cent, and 4.8 per cent).

Figure 7.8: Emissions in the business as usual, realistic and linear trend scenarios, 2010–2030, Mt CO₂-eq.



Source: Third National Communication to the UNFCCC, 2016.

Under the GACMO “business as usual” scenario, which assumes no additional measures and an increase in energy consumption proportional to GDP and population growth, emissions are expected to increase steadily, reaching annual GHG emissions between 305 Mt and 358 Mt of CO₂-eq. in 2030, an increase of between 53 per cent and 80 per cent compared with the baseline year 2010. Under the GACMO “realistic” scenario, which assumes additional measures aimed at reducing the carbon intensity of the country’s economy, it is expected that emissions will grow less rapidly, reaching annual GHG emissions between 277 Mt and 330 Mt of CO₂-eq. in 2030, an increase of between 39 per cent and 66 per cent compared with the baseline year 2010.

The “linear trend” scenario has been developed following a linear trend based on the increase of emissions registered between 1990 and 2012, with no additional considerations based on population increase or GDP growth. Under the “linear trend” scenario, it is expected that annual emissions in 2030 would amount to 235 Mt of CO₂-eq., increasing by 18 per cent compared with the baseline year 2010.

More recent, albeit unofficial, data on Uzbekistan’s GHG emissions has been prepared using the World Resources Institute (WRI) Climate Analysis Indicators Tool (CAIT). Data from the WRI CAIT confirm the increasing trend in Uzbekistan’s emissions, which is also recognized in the country’s (I)NDC, and estimates the emissions in 2014 at 214.70 Mt CO₂-eq. According to WRI CAIT data, in 2014, the per capita emissions were 6.98 t CO₂-eq., slightly above both the world average (estimated at

6.73 t CO₂-eq. per capita by WRI CAIT for 2014) and Uzbekistan’s per capita emissions in 2012 (equal to 6.9 t CO₂-eq. per capita according to the TNC). The carbon intensity of the national economy remains high, and more ambitious emission reductions could be achieved through measures to decrease carbon intensity.

Adaptation and mitigation measures

Energy

Since the energy sector is the greatest contributor to GHG emissions in the country, it is the focus of most mitigation measures. Mitigation measures implemented in the sector mostly concern increasing energy efficiency, including energy efficiency in buildings, and increasing the share of renewable energy in the energy balance.

The country intends to increase the share of RES in its energy balance to 25 per cent by 2030, including that of solar energy to 8.8 per cent and that of wind energy to 5 per cent (2019 Resolution of the President No. 4422).

Industry

There is no evidence of sector-wide specific adaptation measures being implemented in industry. With regard to mitigation, measures are being implemented with a focus on fuel and energy saving. They are implemented in the framework of state programmes on energy efficiency.

Agriculture

Most measures in agriculture focus on adapting to new climatic conditions, especially increasing water scarcity. They focus on water-saving measures in irrigation, including but not limited to expansion of drip irrigation networks. Another important adaptation measure for the sector is the shift from cotton to less water-intensive crops. Although cotton continues to be the most prevalent crop as at early 2019, these measures have led to strong growth in horticulture in the country (chapter 13).

Forestry

The most important measures relevant to climate change currently implemented in the sector are the massive afforestation campaigns that the country is currently undertaking in the dried bed of the Aral Sea. Around 500,000 ha of the dried bed have already been afforested with vegetation resistant to desertic conditions, such as the saxaul tree. These afforestation campaigns seem to be already reflected in the increased removals of the LUCF sector, with a significant increase in sinks provided by forests from 2008 onwards.

Additionally, and particularly should the afforestation efforts be successful in diversifying the planted species, these forest plantations could provide much-needed economic opportunities to the impoverished communities that once relied on fishing. The afforestation efforts are also expected to be essential in mitigating dust storms and consequent negative effects on human health.

Transport

According to SCEEP, during the period 2007–2012, 188,000 vehicles have been modified to run on gas fuel. Other mitigation measures in the transport sector concern the gradual electrification of railroad transport.

Despite the potential vulnerability of transport infrastructure to climate change, there is no evidence of sector-wide adaptation measures being implemented.

Tourism

There is little awareness of the necessity for the sector to adapt to climate change. While there are sporadic mitigation measures (focusing mostly on energy efficiency), there is no evidence of sector-wide specific adaptation or mitigation measures being implemented.

7.5 Assessment, conclusions and recommendations

Assessment

Uzbekistan is a party to the UNFCCC, the Kyoto Protocol and, since November 2018, the Paris Agreement. While the country fulfils its reporting obligations and has submitted three national communications under the UNFCCC, the newest data on GHG emissions available in 2019 are from 2012.

In comparison with 1990, the first inventoried year, by 2012, there has been a 13.7 per cent increase in overall emissions and a 21.6 per cent decrease in emissions per capita. The country submitted its (I)NDC in 2017, which stipulates a carbon intensity target (to decrease the specific emissions of GHGs per unit of GDP by 10 per cent by 2030 compared with 2010). However, the economy's carbon intensity remains high.

The country is expected to face increasing temperatures, decreasing water resources and an increase in the frequency of extreme weather events as a consequence of climate change. The decrease in water resources is expected to have serious consequences in a country already struggling with water scarcity. Despite the expected economic impacts, the country has not yet estimated the costs of inaction for the different sectors, in particular for agriculture.

Uzbekistan does not have legislation to specifically address climate change and is also lacking an overall strategic document on the issue. While climate change issues have, to a certain extent, been incorporated into sectoral legislation and major strategic documents, the absence of an integrated legislative and policy framework, as well as the absence of a coordination mechanism, can be seen as obstacles in the country's efforts to tackle the serious challenges posed by climate change.

The effects of climate change are expected to exacerbate the serious consequences of the Aral Sea disaster on the local population. The most important initiative currently undertaken in the Aral Sea region is the massive afforestation in the dried bed of the Aral Sea. These campaigns have the potential to positively contribute to the mitigation efforts.

Conclusions and recommendations

Establishing a strong legal and policy framework

Climate change concerns are being mainstreamed in sectoral legislation and strategic documents. At the same time, there is no evidence of sector-wide specific adaptation measures being implemented in industry, while mitigation measures in industry focus on fuel and energy saving. There is also no evidence of specific adaptation or mitigation measures being implemented in the tourism sector, and the country still has to thoroughly assess the impacts of climate change on tourism, in particular on sites of cultural and historical significance and natural sites.

Despite the fact that climate change concerns are being mainstreamed in sectoral legislation and strategic documents, the country lacks a comprehensive law on climate change and an overall long-term strategy on climate change action. In 2019, the country endorsed the national Strategy for Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 in the Republic of Uzbekistan but local disaster risk reduction strategies are lacking. Developing the legal and policy frameworks and mainstreaming climate change issues and disaster risk reduction, also at the local level, would support Uzbekistan in the implementation of targets 11.b, 13.1 and 13.2 of the 2030 Agenda for Sustainable Development.

Recommendation 7.1:

The Cabinet of Ministers should:

- (a) *Ensure development and adoption of a law on climate action and an overall long-term strategy on climate change adaptation and mitigation;*
- (b) *Ensure the development of local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030;*
- (c) *Ensure that local climate change adaptation and mitigation measures are integrated into local development plans and programmes.*

Strengthening the institutional framework

While sectoral authorities are active in implementing mitigation and adaptation measures, there is no institution with a clear mandate to steer climate change action at the national level. The lack of a coordination mechanism is a hindering factor for climate action. Additionally, sectoral authorities often have limited human capacity when it comes to climate change issues, and while there seems to be a general

awareness of climate change as an issue, sectoral ministries often have a limited awareness of the implications from climate change for the sectors under their responsibility.

Recommendation 7.2:

The Cabinet of Ministers should:

- (a) *Strengthen human capacities of the authorities most relevant for climate change mitigation and adaptation by establishing climate change units with a clear mandate for mainstreaming climate change in the relevant sector;*
- (b) *Establish a mechanism that can ensure the coordination of climate change-related measures at the national level.*

GHG inventory preparation

The process of preparing a GHG inventory is not a regular activity, which is an impediment for effective development of climate change policies and implementation of mitigation and adaptation measures in the country. In order to ensure regular process of GHG inventory preparation in line with current requirements under the UNFCCC, additional financing for this process is needed through the provision of state budgetary resources. The existing GHG inventory does not include data on SF₆ and PCFs.

Uzbekistan does not have an emissions trading scheme.

Recommendation 7.3:

The Cabinet of Ministers should:

- (a) *Ensure a continuous process of preparation of the GHG inventory, including through its additional financing from the state budget;*
- (b) *Provide that the new inventory to be prepared in 2020–2021 also includes data on sulfur hexafluoride (SF₆) and perfluorocarbons (PCFs) and data on emissions related to waste incineration;*
- (c) *Consider establishing an emissions trading scheme.*

Awareness-raising

Despite improvements on climate change awareness, the overall level of awareness on climate change in the country remains limited. Climate change issues have started being integrated into the curricula of secondary school education but are not yet integrated into the curricula of primary education, vocational training and

higher education, as foreseen under target 13.3 of Sustainable Development Goal 13. Most awareness-raising activities are implemented in the framework of donor-financed projects.

Recommendation 7.4:

The Cabinet of Ministers should ensure:

- (a) *Regular and systematic implementation of measures aimed at raising awareness on climate change-related issues;*
- (b) *That climate change-related topics are integrated into the curricula in primary, secondary and higher education and vocational training.*

Impacts on biodiversity

Some negative impacts of climate change on forests and biodiversity are already observed. There has been a decrease in floodplain and riparian forest habitats, due to changes in hydrological phenomena. The negative impacts of climate change are expected to be especially felt by tugai forests, as changes in climate conditions and precipitation patterns might negatively affect their habitats.

The most important measures relevant to climate change currently implemented in the forestry sector are the massive afforestation campaigns in the dried bed of the Aral Sea. These forest plantations are expected to be essential in mitigating dust storms and can provide much-needed economic opportunities for the impoverished communities that once relied on fishing.

Recommendation 7.5:

The Cabinet of Ministers should:

- (a) *Address the issue of the decrease in floodplain and riparian forest habitats due to changes in hydrological phenomena;*
- (b) *Address the issue of the negative impacts of climate change on tugai forests;*
- (c) *Promote the diversification of the planted species in the Aral Sea region, to mitigate the effects of climate change and also to stimulate economic co-benefits for the local communities.*

Energy sector

Climate change is expected to result in an increase in energy demand. In particular, a significant increase in demand is expected for energy for cooling purposes. Climate change is also expected to have an influence on hydropower productivity. At the same time, the country has a significant technical potential for solar energy development.

Recommendation 7.6:

The Cabinet of Ministers should:

- (a) *Promote actions to decrease the energy demand for cooling purposes;*
- (b) *Promote the full exploitation of the solar energy potential, also in line with the targets set in the country's nationally determined contribution (NDC);*
- (c) *Address the negative influences of climate change on the productivity of the hydropower sector as a result of changes in water availability.*

PART II: MEDIA AND POLLUTION MANAGEMENT

Chapter 8

AIR PROTECTION

8.1 Urban and rural air quality

Reporting on air quality

In Uzbekistan, air quality standards are defined as maximum allowable concentrations (MACs). These MAC values are set for 485 pollutants (2011 SanPiN No. 0293-11). The values are set for short-term maxima (20 minutes), for daily means, for monthly means and for annual means. Every pollutant has a defined hazard class (from 1 to 4, with class 1 the most hazardous) (table 8.1).

MACs for dust are defined for 26 categories of dust, including Aral Sea dust, anorganic dust, cotton dust, grain dust, barley dust, corn dust, wood dust, kapok dust and organic polymer dust, with nine different classes of standards (table 8.2). There are no specific standards for PM₁₀, PM_{2.5} and TSP.

To assess the air pollution in a certain area or city, Uzbekistan uses indexes that are related to the MAC values. The most important is the Air Pollution Index, commonly abbreviated as API₅. To calculate the API₅, the average daily mean concentrations of the five most important pollutants – the five substances with the highest MAC values considering their risk class – are divided by their daily mean MAC values and benchmarked by a factor related to the MAC value of SO₂. The substances can be different in different locations. The API is calculated using the formula: $API_5 = \sum (q_i/MAC_i) \exp K_i$, in which q_i is the average concentration of the pollutant i , MAC_i the average daily MAC value of the pollutant and K_i the exponent that depends on the class of dangerous substance compared with sulfur dioxide. The indices are presented on an annual basis.

Table 8.1: Maximum allowable concentrations of selected ambient air pollutants, $\mu\text{g}/\text{m}^3$

Component	Short-term		Monthly mean	Annual mean	Hazard class
	maximum	Daily mean			
Nitrogen dioxide	85.0	60.0	50.0	40.0	2
Nitrogen oxide	600.0	250.0	120.0	60.0	3
Sulfur dioxide	500.0	200.0	100.0	50.0	3
Carbon monoxide	5 000.0	4 000.0	3 500.0	3 000.0	4
Ammonia	200.0	120.0	60.0	40.0	4
Hydrocarbons	1 000.0	..	..	..	4
Dust from Aral Sea soil	500.0	300.0	200.0	150.0	3
Lead (PbO, PbAc)	1.5	1.0	0.6	0.3	1
Lead (sulphide)	9.0	6.0	3.0	1.7	1
Benzene	300.0	200.0	150.0	100.0	2
Phenol	10.0	7.0	5.0	3.0	1
Formaldehyde	35.0	12.0	6.0	3.0	2
Ozone	160.0	100.0	45.0	30.0	1
Cadmium (halides)	1.5	1.0	0.5	0.3	1
Mercury	1.5	1.0	0.6	0.3	1

Source: 2011 SanPiN No. 0293-11.

Table 8.2: Maximum allowable concentrations of dust, $\mu\text{g}/\text{m}^3$

Component	Short-term		Monthly mean	Annual mean	Hazard class
	maximum	Daily mean			
Anorganic dust > 70 % SiO ₂	150	100	80	50	3
Cotton dust	500	200	100	50	3
Grain dust	300	120	60	30	3
Corn, barley, oats dust	500	300	150	50	3

Source: 2011 SanPiN No. 0293-11.

A few other types of indexes for air pollution are also considered for additional information but not used in publications. The standard index is defined as the highest once-measured concentration of a pollutant divided by its (short-term) MAC value. The highest frequency index is the most repeated exceedance in percentage terms of the MAC value of a pollutant.

The final level of air pollution in a city or region is characterized by four classes that are established by the API: Low, Increased, High and Very High (table 8.3).

Table 8.3: Estimation of the air pollution levels by Air Pollution Index

Pollution level	Level of APIs
Low	0–4
Increased	5–6
High	7–13
Very High	>14

Source: Air Pollution Indexes in the cities of the Republic of Uzbekistan 2009–2018. Uzhydromet, 2018.

API is calculated for 25 cities, which gives general information about the ranking of these cities regarding

air quality (table 8.4). The API values are generally low, with the exception of Angren, where the API in the period 2016–2017 was higher than 5. However, for an evaluation of the air quality in the different cities, the use of indexes is less practicable because much information about short-term, mean daily, mean monthly and mean annual concentrations and exceedance of air quality standards for different components is hidden in these indexes. The indexes can be used to rank cities and oblasts, but, for a modern air quality information system, component- and site-specific concentrations must also be available to establish necessary emission reduction measures. As an index does not relate directly to international standards for air pollutant concentrations, such as WHO or EU standards, the environmental and health risks cannot be established as direct consequences of the local concentrations of specific pollutants during different periods.

The assessment of the air quality by directly comparing measured monthly or annual means of concentration levels with, for example, WHO standards or MAC values gives a more direct picture of the situation with respect to the levels of air pollution in Uzbekistan (box 8.1 and box 8.2).

Table 8.4: Air Pollution Index for 25 cities, 2009–2018

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Almalyk	4.43	4.29	3.68	3.91	4.05	4.10	4.00	4.12	4.23	4.30
Angren	4.61	6.25	4.74	4.30	4.72	5.12	4.71	5.32	5.30	4.94
Andijan	2.65	2.39	2.66	3.05	3.35	2.94	3.80	3.32	3.62	3.46
Bekabad	2.25	2.27	2.74	2.83	2.79	2.88	3.20	3.67	3.92	3.93
Bukhara	4.48	4.48	3.51	3.37	3.22	3.38	2.98	3.58	4.32	4.30
Gulistan	2.03	2.11	2.23	2.19	2.18	1.85	1.89	2.33	2.37	2.53
Denau	1.77	1.86	1.98	1.50	1.49	1.49	1.32	1.45	1.22	1.10
Kagan	0.74	0.61	0.70	0.89	0.60	0.80	0.97	1.20	1.21	1.30
Karshi	1.39	1.34	1.32	1.28	1.32	1.30	1.30	1.26	1.25	1.26
Kitab	1.15	1.15	1.17	1.15	1.17	1.15	1.17	1.13	1.13	1.14
Kokand	2.98	2.86	2.64	2.55	3.04	2.29	2.36	2.62	2.79	2.61
Marghilan	1.07	1.15	0.96	0.77	1.00	1.23	1.20	1.28	1.43	1.31
Mubarek	0.31	0.32	0.32	0.31	0.32	0.33	0.33	0.34	0.35	0.49
Navoiy	4.22	3.89	3.72	3.50	3.17	2.93	3.59	3.90	4.06	3.97
Namangan	1.97	1.55	1.29	1.56	1.72	1.93	2.26	3.00	2.95	3.20
Nukus	4.42	4.98	4.65	4.09	4.31	4.01	3.95	4.43	4.55	3.39
Samarkand	1.80	1.55	1.36	1.24	1.62	1.83	1.90	1.74	1.55	2.33
Sariasya	3.06	3.72	3.23	2.29	2.60	2.00	1.59	1.43	1.23	1.17
Tashkent	3.66	3.37	3.32	3.63	3.85	4.04	3.51	3.55	4.10	3.66
Urgench	1.19	1.13	1.77	2.18	1.82	1.90	2.02	2.11	1.24	2.06
Fergana	3.51	3.48	2.98	2.94	3.57	3.84	4.10	4.52	4.38	3.73
Chirchik	2.70	2.51	2.75	2.86	2.69	2.95	3.61	3.61	3.41	3.46
Sjachrisabz	1.16	1.15	1.18	1.17	1.15	1.15	1.17	1.14	1.14	1.14
Janchiul	0.37	0.43	0.55	0.49	0.54	0.54	0.57	0.43	0.41	0.37
Nurabad	1.45	1.19	0.91	0.84	0.68	..	..	..	1.41	1.75

Source: Air Pollution Indexes in the cities of the Republic of Uzbekistan 2009–2018, Uzhydromet, 2018.

Box 8.1: Measured annual mean concentrations of air pollutants in selected cities, 2015–2018

Analysis of data gathered in the monitoring period 2015–2018 shows that, in most of the cities in Uzbekistan, the concentrations of air polluting substances are below the air quality standards.

In some cities, such as Bukhara and Nukus, the annual mean dust levels are 1.3 and 2.7 times (in 2017) and 1.3 and 1.3 times (in 2018) higher than the air quality standards, which almost fully depends on the natural and climatological circumstances in these territories (table 8.5).

Table 8.5: Annual mean concentrations of dust in selected cities, 2015–2018, $\mu\text{g}/\text{m}^3$

	2015	2016	2017	2018
Nukus	300	400	400	200
Tashkent	100	100	200	100
Andijan	200	200	200	100
Bukhara	100	100	200	200
Uzbek MAC Aral Sea dust	150	150	150	150

Source: Uzhydromet, 2019.

There is also a systematic local exceedance of some air pollution standards in cities such as Angren, where the annual mean standards for sulfur dioxide, carbon monoxide, ammonia and ozone were exceeded in 2017 and 2018 by factors of 1.1–1.1, 1.0–1.3, 2.0–1.3 and 2.0–2.2, respectively.

In Bekabad, the annual mean air quality standards for nitrogen dioxide and ozone were exceeded in 2018 by factors of 1.3 and 1.1 respectively, while in Tashkent, the annual mean standard for ozone was exceeded in 2017 by a factor of 1.1, while the exceedance for nitrogen dioxide decreased from a factor of 1.3 in 2017 to no exceedance in 2018.

In Chirchik, the annual mean air quality standards for ozone and ammonia were exceeded in 2018 by factors of 1.2 and 1.3 respectively.

In Almalyk, the annual mean air quality standards for sulfur dioxide were exceeded in both 2017 and 2018 by a factor of 1.1.

In Fergana the annual mean air quality standard for ozone was exceeded by a factor of 2.7 in 2018.

Compared with WHO and EU air quality standards, the air quality standards in Uzbekistan (table 8.1) are the same for NO_2 and ozone, more stringent for CO (by a factor of 2) and less stringent for SO_2 (by a factor of 1.5). For PM_{10} and $\text{PM}_{2.5}$, no air quality standards are stated in the Sanitary Rules and Norms in Uzbekistan. In the period 2004–2010, monitoring of PM_{10} and $\text{PM}_{2.5}$ was performed in the framework of scientific investigations and, from August 2011, Uzhydromet started to monitor PM_{10} and $\text{PM}_{2.5}$ in the ambient air in Tashkent City in the framework of a joint project with WHO and the German Federal Environment Agency, using modern equipment with automated change of filters. The results for the years 2012–2014 show that the PM_{10} concentrations were slightly above the WHO interim target 2 (2.5 times higher than the WHO Air Quality Guideline) and the $\text{PM}_{2.5}$ concentrations followed the same pattern (slightly above interim target 2 and 2.5 times higher than the WHO Air Quality Guideline).

An important part of the air pollution by dust particles in Uzbekistan is due to natural causes. Natural emissions of aerosols to the atmosphere by sandstorms from the Karakum and Kyzylkum Deserts and from dry parts of the Aral Sea, which transport dust from the western to the eastern part of the country, and also transboundary air pollution by dust from neighbouring countries, cause high background levels of dust.

Box 8.2: Monthly mean concentrations of air pollutants in selected cities, 2018

For the cities of Almalyk, Angren, Bekabad, Chirchik and Tashkent, a monthly bulletin (Akhborot) is issued by Uzhydromet in which, for the most important air polluting substances, the possible exceeding factor (fraction of the MAC value based on monthly mean measured values) is determined.

For the year 2018, some monthly exceedances of standards are:

Almalyk: sulfur dioxide (factor of 1.2 max), carbon monoxide (factor of 1.2 max);

Angren: carbon monoxide (factor of 1.2 max), ozone (factor of 1.1 max);

Bekabad: nitrogen dioxide (factor of 1.5 max),

Chirchik: ammonia (factor of 1.6 max);

Tashkent: nitrogen dioxide (factor of 2.1 max), dust (factor of 2.4 max), carbon monoxide (factor of 1.6 max);

Fergana: ozone (factor of 2.0 max.)

Impact of air pollution on human health

In the urban and industrialized areas, exposure to air pollution may lead to health consequences for the population. In the 2018 World Air Quality Report by the Swiss company AirVisual, regions and cities in the world are ranked by the average yearly PM_{2.5} concentration ($\mu\text{g}/\text{m}^3$). In the world capital city ranking, Tashkent ($34.3 \mu\text{g}/\text{m}^3$) is in 15th position, between Sarajevo and Skopje. For reference, the WHO Air Quality Guideline for PM_{2.5} is $<10 \mu\text{g}/\text{m}^3$.

Almost 2 million people in the western part of Uzbekistan (Republic of Karakalpakstan and Khorezm Oblast) experience the direct influence of air pollution by dust blown up from the dried bed of the Aral Sea. High winds carry an estimated 15 million to 75 million t/y of contaminated sand and dust. This dust contains salts, pesticides and heavy metals, and studies and analysis of public health have shown increased morbidity rates due to diseases such as bronchitis, asthma, anaemia, heart diseases and certain types of cancer that are relatively high in these regions. Observation posts to measure PM₁₀ and PM_{2.5} dust fractions have been in operation in the period 2004–2010, and in the period 2012–2014 in Tashkent, to obtain more information about the air quality and to monitor the effects of mitigating measures to stabilize the former sea bottom.

The annual mortality rate (per 100,000 inhabitants) attributed to household and ambient air pollution in Uzbekistan is estimated by WHO at 81.1 in 2016. The rates of most EU countries are under 40, with the exception of Romania (59.3) and Bulgaria (61.8). Indoor air pollution is responsible for 20 per cent of the mortality rate attributed to household and ambient air pollution in Uzbekistan.

Impact of air pollution on livestock and biodiversity

The concentrations of most air polluting substances are highest in industrial and populated areas, where no big concentrations of cattle are present so, in general, the impact on livestock is low. Dust and air pollution (by ammonia, methane, endotoxins) inside animal buildings, caused by indoor breeding, generally has more effect on livestock and domestic animals than outdoor pollution. The big exception in Uzbekistan is the western part of the country that is strongly influenced by the dust emissions from the dried bed of the Aral Sea.

The shrinking Aral Sea has led to dust storms that have caused drier soil, salinization of soil, less vegetation and a decrease in clouds and precipitation. Besides the health effects on the population, strong effects have also been found on the livestock, vegetation and biodiversity in the area. Vegetation in the area has been reduced by 50 per cent and six million hectares of agricultural land have been destroyed.

The Aral Sea disaster has increased the problems of desertification and erosion in adjacent parts of the Aral Sea region in Uzbekistan, especially in areas where water shortage and overgrazing are already a problem.

8.2 Trends in air emission levels

Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP)

Uzbekistan is not a party to the Convention on Long-Range Transboundary Air Pollution (CLRTAP). It has not acceded to the Convention's Protocol on the Long-term Financing of the Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol). In the last few years (2015 and 2018), workshops have been held in Tashkent on emission inventories, jointly organized by ECE with national counterparts, to help develop good quality and accurate emission inventories. Internationally accepted methodologies under the Convention have been compared with existing national methodologies and recommendations have been made on the steps towards accession to the Convention by Uzbekistan.

In May 2018, emission data for Uzbekistan in the official EMEP domain until 2016 have been estimated, calculated and submitted to the (EMEP) Centre on Emission Inventories and Projections by the Meteorological Synthesizing Centre West (MSC-W) (hosted in the Norwegian Meteorological Institute, Oslo) (table 8.6).²² The Centre on Emission Inventories and Projections collects emissions and projections of acidifying air pollutants, heavy metals, particulate matter and photochemical oxidants from parties to CLRTAP. Submitted inventories are then reviewed by nominated experts.

In 2019, SCEEP released emission data on the emission of air polluting substances that are based on inventories prepared by its Centre for Specialized

²² MSC-W provided emission estimates for Uzbekistan as part of the gap-filling procedure; the estimated emission data are then used as input in the EMEP model.

Analytical Control on Environmental Protection (table 8.7).

For SO₂ emissions, there are considerable differences between data submitted to EMEP by MSC-W and data provided by SCEEP. Stationary source emissions of SO₂ are 3–10 times higher in the SCEEP data than in the submission to EMEP. Emission data for SO₂ from SCEEP indicate that SO₂ emissions are relatively high, partly due to refinery emissions and the use of coal in electricity production. SO₂ emissions from electric power plants are in the range of 45–60 Gg/y in the years 2010–2018.

For NO_x, the differences in the emission data between EMEP and SCEEP are less substantial.

Emission data provided by SCEEP for NMVOCs and NH₃ are not complete and lack emission factors for stationary surface sources that are used in the EMEP modelling.

PM₁₀ and PM_{2.5} are calculated by MSC-W as there were no measurements of these fractions, except in the western part of Uzbekistan.

NMVOC emissions for 2017 (mainly hydrocarbons) are estimated by SCEEP to be around 200 Gg/y.

NH₃ emissions, mainly from agricultural sources (fertilization, animal husbandry), are estimated/calculated by MSC-W to be in the range of

200–250 Gg/y. The other sectors have hardly any NH₃ emissions.

With regard to trends in emissions, emission data that are presented by SCEEP show, in general, a steadily rising level for most emissions (SO₂, NO_x, TSP) from 2009 to 2014, with a possible slowing of growth in emissions and some decrease for SO₂ and TSP in the last few years. Data as presented by MSC-W show a decrease for some important emissions (SO₂, NO_x, NMVOCs, CO) but an increase for some other substances (NH₃, PM).

Large sources, such as traffic and electric power plants, have a great impact on emission levels as fuel use is an important factor. Table 8.8 shows the distribution of air emissions by sector for SO₂, NO_x and TSP in 2016.

Ammonia

Ammonia (NH₃) emissions have been increasing since 2005 according to the estimation of MSC-W (table 8.6), due to the rapid growth of animal husbandry that has led to a strong rise in the number of domestic animals. The total emission is caused mainly by manure management in the agricultural sector. Industrial emissions and emissions from other sectors (wastewater treatment) are relatively low and hardly contribute (less than 1 per cent) to the total NH₃ emission.

Table 8.6: Emission trends, 2000, 2005–2016, Gg

	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
SO ₂	176	135	130	107	93	84	84	75	66	56	47	38	29
NO _x	223	200	204	202	199	195	194	191	188	185	182	179	177
NH ₃	151	175	183	186	193	203	212	218	224	230	236	242	248
NMVOC	183	144	141	138	138	141	139	134	130	125	121	116	112
CO	740	594	580	573	568	594	576	560	544	527	511	494	478
PM _{2.5}	15	16	17	18	17	19	19	20	20	21	21	22	22
PM ₁₀	20	22	23	25	24	27	28	28	29	30	31	32	32

Source: MSC-W, May 2018.

Table 8.7: SO₂, NO_x and TSP emissions, 2009–2016, Gg

	2009	2010	2011	2012	2013	2014	2015	2016
SO ₂	243.2	254.9	261.9	268.6	306.8	329.3	319.0	295.1
NO _x	175.0	164.0	167.2	178.5	224.3	232.5	246.2	247.7
TSP	138.2	117.4	123.5	176.6	199.5	188.8	179.3	164.0

Source: State Committee on Ecology and Environmental Protection, 2019.

Table 8.8: SO₂, NO_x, TSP emissions by sector, 2016, Gg

	SO ₂	NO _x	TSP
Electricity, gas*	149.0	77.5	74.9
Industry	123.6	11.2	63.3
Transport and storage	21.9	156.9	15.8
Other	0.6	2.1	10.0
Total	295.1	247.7	164.0

Source: State Committee on Ecology and Environmental Protection, 2019.

Note: * Natural gas treatment (flares).

Heavy metals

Heavy metals are emitted by the metallurgical industry and mining industry, coal-fired power plants, galvanic companies and other industries. Table 8.9 shows emissions of three heavy metals from stationary sources as presented by Meteorological Synthesizing Centre East (MSC-East, based in Moscow) (expert estimates).

The EMEP Centre on Emission Inventories and Projections estimates that most of the anthropogenic deposition of heavy metals in Uzbekistan is caused by transboundary air pollution from neighbouring countries. For lead, the contribution of sources from Uzbekistan is estimated at 23.8 per cent, for cadmium, 25.3 per cent and for mercury, 30 per cent.

The emission data estimated by MSC-East show a decrease of 90 per cent for the lead emissions in the period 1990–2012. For cadmium and mercury emissions, no relevant changes were assessed, due to a lack of reliable data.

SCEEP did not provide data on lead, cadmium and mercury emissions.

Table 8.9: Emissions of Pb, Cd and Hg, 1990, 2012, tons

	Pb		Cd		Hg	
	1990	2012	1990	2012	1990	2012
Emissions	1 870	185	3.4	3.3	6.0	5.9

Source: MSC-East (ru.msceast.org/tables/UZ_table_russ.pdf).

Table 8.10: Emissions of persistent organic pollutants, 1990, 2012

	B(a)P (t)		PCDD/Fs (g TEQ)		HCB (kg)		PCB-153 (kg)	
	1990	2012	1990	2012	1990	2012	1990	2012
Emissions	0.92	0.92	132.00	132.00	1.00	1.00	50.00	12.00

Source: MSC-East (ru.msceast.org/tables/UZ_table_russ.pdf).

The use of leaded gasoline ceased in Uzbekistan in 2008–2009.

Persistent organic pollutants

Persistent organic pollutants (POPs) are not produced in Uzbekistan. There are, however, stockpiles of obsolete pesticides.

The sources of emissions of unintentionally produced POPs (dioxins and furans) to air in Uzbekistan are metallurgical enterprises, hydroelectric and thermal power plants and uncontrolled combustion of waste and fuels, mainly in rural areas. The rural population often still uses biofuel (firewood and cotton stalks) for cooking and heating purposes. In addition, the uncontrolled combustion of MSW is an important source of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs) emissions to air.

Due to the important role of agricultural (cotton and food) production in Uzbekistan, the use of pesticides has been very high in the past. As a result of restructuring in the agricultural and economic sectors, the use of pesticides has been significantly reduced over the last decade (chapter 13). According to MSC-East, in contrast with the emissions and deposition of heavy metals, the greater part of emissions and deposition of POPs originates from national and local emissions, but for substances such as benzo(a)pyrene (B(a)P), the transboundary air pollution from other countries is more important. Secondary emissions (blown up dust) are another source of POPs in Uzbekistan.

Emission data for some POPs are shown in the country-specific report for Uzbekistan by MSC-East. An expert estimate of the emission levels and deposition of POPs in Uzbekistan is presented in tables 8.10 and 8.11.

Table 8.11: Deposition of persistent organic pollutants, 1990, 2012

	B(a)P (t)		PCDD/Fs (g TEQ)		HCB (kg)		PCB-153 (kg)	
	1990	2012	1990	2012	1990	2012	1990	2012
National deposition	129.3	155.4	259.6	248.3	0.2	0.2	19.1	4.6
Deposition from other countries	463.2	1 099.8	169.6	158.9	10.2	2.3	15.1	3.3
Intercontinental (outside EMEP territory) deposition	..	..	91.9	68.8	2 247.7	312.4	36.0	6.0
Secondary sources	58.0	176.5	756.8	681.3	5 236.1	600.6	137.0	35.9

Source: MSC-East (ru.msceast.org/tables/UZ_table_russ.pdf).

Ozone-depleting substances

Since 2002, the consumption of chlorofluorocarbons (CFCs) in Uzbekistan has ceased. The consumption of all ODSs in Uzbekistan has been reduced from 675 tons in 1993 to 1.8 tons in 2009.

The baseline for ODS consumption in Uzbekistan was set at 74.7 ODP tons (1989 HCFC consumption). In 2013, consumption had increased to 4.6 ODP tons (100 per cent HCFCs) and in 2016 to 4.68 ODP tons. In 2017, it decreased to 0.87 ODP tons (a reduction of 98.8 per cent from baseline) (table 8.12), due mainly to the ending of illegal imports of HCFC-22. A slight increase to 2.53 ODP tons was observed in 2018.

From 2013 to 2018, the project “Initial implementation of accelerated HCFC phase out in the CEIT region” was carried out by SCEEP, the Global Environment Facility (GEF) and United Nations Development Programme (UNDP).

By the 2018 Resolution of the Cabinet of Ministers No. 17, Uzbekistan revised its procedure for the importation of ODSs into the country. The revised list of products, for which a permit from SCEEP is no longer required, contains aerosols in cosmetic products, domestic chemicals and insulation panels, assuming that ozone-friendly analogues are already used.

8.3 Performance and gaps in air monitoring networks

The air monitoring network comprises 63 fixed stations located in 25 cities and industrial centres in the country. The observations are performed three times per day, six days per week at fixed stations of Uzhydromet. The methodological management is conducted by the Environmental Pollution Monitoring Service for Air Pollution, Surface Water and Soil of Uzhydromet.

The stations are divided into groups: urban “background” stations in residential areas, “industrial” stations near industrial enterprises, and “transport” stations near motorways or districts with dense traffic (table 4.2). This division is relative because the expansion of city residential areas and location of industrial enterprises mean that it is not easy to clearly define district borders.

There are no automatic monitoring stations in the network. In total, 13 substances are monitored at different locations, including dust (TSP), NO/NO₂, SO₂, SO₃, O₃, CO, NH₃, phenol, formaldehyde, hydrogen fluoride, chlorine and solid fluorides (table 4.1).

The problems in the air quality monitoring network are the lack of automation, inadequate location of some measuring stations, lack of modern sampling and analytical equipment and poor availability of online information.

The 2018 Resolution of the Cabinet of Ministers No. 970 “On measures to strengthen the material and technical resources of the Centre of Hydrometeorological Service under the Ministry of Emergency Situations of the Republic of Uzbekistan” foresees the establishment of new laboratories, rebuilding and modernization of monitoring stations (automation) and modernization of the analytical equipment of Uzhydromet in the period 2019–2022.

Acquiring technical support for an emission inventory and monitoring is a priority flagged by Uzbekistan at the 2017 meeting of the Task Force for Emission Inventories and Projections of CLRTAP.

The development of monitoring of fine dust (PM₁₀ and PM_{2.5}) by automatic monitoring equipment for the cities of Angren and Nurabad is ongoing, based on experience gained by Uzhydromet on a project to measure PM₁₀ and PM_{2.5} in Nukus and Tashkent from 2011 to 2017.

Table 8.12: HCFC consumption, 2009, 2013, 2016–2018, ODP tons

Baseline (1989)	2009	2013	2016	2017	2018
74.70	1.80	4.60	4.68	0.87	2.53

Source: <https://ozone.unep.org/countries/profile/uzb>.

The growth in the number of stations and measurements of additional air polluting substances generates a challenge to obtain skilled and trained personnel to guarantee solid quality control and quality assurance procedures for adequate monitoring and compliance with international standards, such as organized reference methods, on-the-spot calibrations, equivalence tests and data validation.

8.4 Pressures on air quality

Agriculture

Crop agriculture in Uzbekistan needs irrigation so it is mostly located near river valleys and oases. Arable land accounts for around 4 million ha of the 20 million ha total agricultural area. Around 50 per cent of the country's land is arid pasture where mainly sheep and goats are held, sometimes with horses, mules and camels. The most important crop is cotton, but, in the last decade, the country has reduced cotton production and increased food production (chapter 13).

The agricultural sector is the largest source (99 per cent) of emissions of NH₃, which come mainly from the application of animal fertilizer. Because of the large area on which emissions take place, there are no critical levels of nitrogen deposition.

The application of manure from animal husbandry and the use of mineral fertilizers are the main contributors to agricultural ammonia emissions. Ammonia emissions are calculated by applying emission factors considering the different ways of breeding and manure storage, treatment and application. Ammonia emissions have been increasing since 2005 (table 8.6).

Measures to control ammonia emissions are generally operated in livestock housing and directed towards storage and emissions from slurry. Such measures are not yet widely applied in Uzbekistan.

GHG emissions from the agricultural sector accounted for 9.8 per cent of total GHG emissions in the country in 2010. They increased by 27 per cent from 1990 to 2012, from 17,050 Gg CO₂-eq. to 21,648 Gg CO₂-eq. (table 7.1). Methane and nitrous oxide are the main components of the GHG emissions in the sector. Enteric fermentation represented, on average, 55 per cent of GHG emissions from agriculture in the period 2008–2012. GHG emissions from the agricultural

sector have been increasing slightly since 2005 (figure 7.5).

Energy sector

Power and heat generation

According to ESCAP data, in 2016, 80 per cent of power generation was based on fossil fuels and 20 per cent on hydropower. For power generation in TPPs, 90.8 per cent comes from natural gas, 5.3 per cent from mazut and 3.9 per cent from coal (table 12.5(a)). According to national data, on average, 11.17 per cent of power generation in 2013–2018 came from hydropower (table 12.5(b)).

The TPPs run on steam turbine technology with old installations and relatively low efficiencies and they are sometimes in poor condition. The power plants are not strategically situated, as 70 per cent of the power generation occurs in the north while over 90 per cent of the gas production is in the south.

In 2016, 19 per cent of the emissions of SO₂ and 70 per cent of the emissions of NO_x from stationary sources in the country were caused by TPPs.

New developments

Modernization of old TPPs has started and PV solar energy facilities will be built with a total capacity of 1 GW. Construction of new TPPs in Turakurgan City, Bukhara Oblast and Surkhandarya Oblast and extension of a second combined-cycle gas turbine at Navoiy are planned to be commissioned. The EBRD, together with the ADB, have invested in 900 MW combined-cycle gas turbines at the existing Talimarjanskaya TPP.

The Government plans to build a nuclear power station (chapter 12).

In 2020, the installed capacity of hydropower should be doubled (from 2 GW to 4 GW) by the rehabilitation of 14 existing and construction of 18 new facilities. Also, plans for wind energy and the use of biogas will be developed. The target is to raise the share of renewable energy in total generating capacity to 19.7 per cent by 2025.

All these developments will increase the efficiency of power generation, and should, in spite of the growth in electricity production, lead to a net decrease in the use of fossil fuels and help to reduce air pollution of SO₂, NO_x and dust emissions.

Refineries

In 2019, there are three oil refineries in the country, Ferghana, Alty-Arik and Bukhara, with a total annual capacity of around 11 million tons of crude oil. These refineries use crude oil and condensate from natural gas as feedstock but operate below their capacity, due to a decrease in oil production. A new refinery has been commissioned in 2018 by Jizzakh Petroleum, with an aim to produce clean-burning gasoline, diesel and jet fuel (Euro-V quality motor fuels).

Flaring of waste gas (table 12.8) is one of the largest sources of the SO₂ and the NO_x emissions in the country, while leakage is the largest source of NMVOC emissions. The existing refineries in Uzbekistan are planned to be upgraded, with the requirement to install desulfurization units, which should result in improvement of the quality of the fuels produced, to Euro-5 standards; it should also result in reduced air pollution from the facilities through the reduction of SO₂, NO_x, VOC, H₂S and PM emissions. Uzbekneftegaz is working to develop a gas-to liquid (GTL) refinery in the south-east of Uzbekistan with a capacity of 3.6 billion m³ per year to produce 1.5 million tons per year of fuels and other products (“clean diesel”).

Industry, including mining

The industrial sector significantly contributes to GDP and there is considerable potential for further growth, due to the rich stocks of minerals and fossil fuels in the country.

The emissions of sulfur dioxide, hydrocarbons and fine dust from industrial sources are relatively high. In the permits, installation-specific emission limit values (ELVs) are defined by calculating from the MAC values in the defined sanitary zone. This approach generally leads to less stringent emission limits than general ELVs based on internationally defined best available techniques (BAT) for installations (developed under CLRTAP or the EU Industrial Emissions Directive).

The industrial emissions of SO₂, NO_x, and TSP account for 40 per cent, 5 per cent and 38 per cent of the total national emissions respectively. In industrial cities (Angren, Almalyk, Fergana, Navoiy), the influence of

emissions from industry and mining on air quality leads to relatively high APIs.

Transport

The transport sector causes 90 per cent of the CO emissions, 60 per cent of the NO_x emissions, an estimated 17 per cent of the emissions of particulate matter (PM_{2.5}) and less than 10 per cent of the SO₂ emissions. Transport also accounts for 12 per cent of the GHG emissions (CO₂, CH₄, CO, N₂O, NO_x, NMVOCs) in the Fuel Combustion category.

For the last few years, many private cars and buses use LPG (propane) and/or CNG as a fuel. According to the Ministry of Transport, in early 2019, 50 per cent of passenger cars and trucks use CNG (methane), 36.6 per cent use gasoline, 13 per cent use LPG and 0.4 per cent use diesel (gasoil). The Government promotes the use of CNG over LPG, which is promoted for use in domestic food processing.

For gasoline and diesel, Euro-3 has come into force since 2018 (350 mg S/kg for diesel and 150 mg S/kg for gasoline) while Euro-4 has been planned from 2019.

The planned upgrading of the domestic refineries and building of a new refinery should make it possible to fulfil the desulfurization requirements, to reduce SO₂ emissions from the transport sector by a factor of 5–10 and reduce fuel imports.

According to the Ministry of Transport, the average age of the vehicle fleet is 8 years for light duty vehicles, 15 years for trucks and 10 years for buses.

Because of the rapid growth of the vehicle fleet and the age of many vehicles, additional measures are required to ensure that emissions of NO_x decrease, to achieve an improvement in urban air quality. Policy measures have been taken that promote the greening of transport by incentives for cleaner fuels such as CNG and LPG, but other measures, such as the use of hybrid or electric cars and promotion of clean urban public transport, have not been sufficient. A positive development is that, from January 2019, zero customs duty is imposed on vehicles that operate solely on an electric motor.

In 2018, a Chinese manufacturer signed a preliminary agreement with the Ministry of Innovation Development on construction of a new electric car plant in Uzbekistan.

Uzbekistan prevents the importation of cars of foreign production for protectionist reasons, by imposing

heavy customs duties. Cars are manufactured in Uzbekistan under joint ventures between Uzbek and foreign companies, for domestic use and for export. From 2019, Euro-4 emission standards for light vehicles and Euro-IV standards for heavy duty vehicles must be implemented.

As of January 2018, there is a new procedure for a mandatory technical inspection of cars. Validation of compliance of engine exhaust gas emissions to the MACs for CO and hydrocarbons is included in the inspection. For cars fuelled by LPG or CNG, the technical condition of the gas cylinders will be inspected.

Housing

Residential buildings are the largest energy consumer. More than 50 per cent of primary energy is spent on energy supply to the buildings sector. The specific energy consumption per m² of living area in Uzbekistan is almost three times higher than in European countries with similar climatic conditions (e.g. Spain).

Around 40 per cent of residential buildings have access to district heating, according to the 2013 report of the Centre for Energy Efficiency in Moscow. Maintenance of the district heating sector has been neglected for a long period, so the central heating services are not reliable; in some cities, such as Andijan, they have stopped entirely. This causes people to look for inadequate alternatives, such as electric heating or coal- or wood-burning stoves. During the period when heating is necessary, emissions from private households using alternative heating have an impact on the air pollution levels in the cities. In cities and in rural areas, the use of coal and wood for space heating causes unfiltered emission of SO₂, dust and PAHs from low-positioned sources, with significant adverse influence on the local ambient air quality.

To improve energy efficiency, quality and availability of heating services, the Government established the Ministry of Housing and Communal Utilities in 2017. There are 33 district heating companies in the country, most of them transferred to the Ministry of Housing and Communal Utilities. The 2017 Programme for Development of the Heat Supply System for the period 2018–2022 (2017 Resolution of the President No. 2912) is carried out with financial support from the World Bank. Better and more efficient district heating installations are expected to improve the air quality in urban and in rural areas.

Photo 8.1: Cooking *plov* on the streets of Bukhara



Photo credit: Ms. Alessandra Fidanza

Due to the low access to district heating, specific energy consumption from housing in Uzbekistan depends, to a large degree, on the efficiency of space heating equipment used in individual houses. The energy-saving potential in this sector is high, but is not easy achievable, due to the low energy prices that make energy-saving measures unattractive (e.g. long pay-back periods for investments).

There is no financial stimulation (subsidies) to remove unprofitable expenses to promote reconstruction and insulation of private houses and other buildings and more energy-efficient equipment.

The share of the population that used solid fuels such as wood, coal or dung for cooking was 5.5 per cent in urban areas and 25.2 per cent in rural areas (11.6 per cent nationwide) in 2010, and the situation has unlikely improved since then.

Aral Sea

The desiccation of the Aral Sea has led to dust and salt storms in the western part of Uzbekistan, with up to 10

major storms annually. Estimations of the quantity of dust that is airborne vary from 15 million to 75 million tons per year. The bigger dust particles have been found at distances of 500 km from the source, while fine dust (<PM_{2.5}) can remain in the atmosphere much longer and can temporarily form a high proportion of the background dust concentration over large distances.

8.5 Legal, policy and institutional framework

Legal framework

The 1996 Law on Ambient Air Protection covers the right of citizens to clean air and their obligations to take care of the atmosphere, state management in the field of air protection (responsibilities of SCEEP and the Ministry of Health), standards on air quality, maximum permissible emissions of pollutants from stationary sources, industrial air consumption, standards for emissions from mobile sources (vehicles and other equipment), quality of fuels, production and use of chemicals, protection of the ozone layer, spatial planning for enterprise construction and of waste disposal facilities, responsibilities of enterprises (in terms of monitoring and techniques to reduce emissions) and levies for emissions to the air and damage caused. According to the Law, new activities in industrial areas or areas with dense traffic require an SEE/EIA and a health assessment.

In the last 20 years, amendments and additions to the Law have been adopted, the last time in 2019 (referring mostly to renewed definition of powers of the Government and SCEEP). Since 2016, a set of new amendments is under discussion. The draft contains: articles on transboundary air pollution and supplementary standards for the implementation of economic incentives to reduce air pollution; new requirements for the control of harmful actions on the ozone layer and of climate change; and step-by-step introduction of more stringent requirements to meet ELVs for stationary and mobile sources.

The Ministry of Health has issued health-based air quality standards as MACs (SanPiN RUz No. 0293-11, List of hygiene standards regarding MAC values of air-polluting substances in populated areas in the Republic of Uzbekistan).

For technical equipment, many GOST-R standards and certificates are used (e.g. GOST R EH 13528-3-2010 and GOST R EH 13528-2-2010).

The Law on Ambient Air Protection is relevant for GHG emissions reduction, with several articles relating to this. Specific air-related articles in other

laws (1997 Law on Rational Use of Energy, 1993 Law on Water and Water Use, 2000 Law on Ecological Expertise, 1992 Law on Nature Protection) are also relevant legislation on protection of ambient air.

Uzbekistan announced introducing a ban on the import of motor fuels of classes below Euro-3 from 2020 and below Euro-4 from 2023. Uzbekistan intends to ban the import of vehicles of categories M and N equipped with engines that do not meet Euro-4 requirements starting from 2022 (2019 Decree of the President No. 5863).

Policy framework

General policy documents on protection of the environment and sustainable development in Uzbekistan contain many air-related elements, while there is no specific policy document on air protection in Uzbekistan.

Concept on Environmental Protection until 2030

The Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863) provides for the following measures on air protection:

- Use of dust and gas capture systems at stationary sources of pollution;
- Enrichment of coal mined in Uzbekistan in order to increase its calorific value and reduce ash content;
- Stimulating measures to improve the energy efficiency of buildings and use of cleaner fuels in households;
- Transfer of the transport fleet to CNG and electric traction.

Programme of Actions on Environmental Protection for the period 2013–2017

The Programme of Actions on Environmental Protection for the period 2013–2017 provided that air protection would be strengthened by gradually sharpening emission standards and the use of modern abatement techniques, with assistance through international cooperation. The Programme envisaged deeper desulfurization in refineries and chemical plants, gas utilization facilities in oil and gas refineries (instead of flaring), increasing energy efficiency in electricity production by introducing combined-cycle plants, and renewable clean energy sources in the cotton industry. It also envisaged the development of the draft amendments to the Law on Ambient Air Protection. It also provided for the development of a regulatory document on the method for the

determination of fine particulate matter (PM₁₀ and PM_{2.5}) in ambient air. Improving the effectiveness of Uzbekistan's interaction with the international community in the implementation of the requirements of international treaties was also planned.

As at early 2019, the permitting processes in Uzbekistan still follow the traditional approach (SEE, MAC values and sanitary zones that lead to installation-specific ELVs). The sharpening of emission standards by using modern abatement techniques based on guidance documents from CLRTAP or the EU is not yet implemented in the permitting processes. Deeper desulfurization in refineries has been planned but not yet implemented. The draft amendments under which the measurement of PM₁₀ and PM_{2.5} in ambient air can be regulated are not yet adopted.

Programme of Environmental Monitoring for the period 2016–2020

The Programme of Environmental Monitoring for the period 2016–2020 (2016 Resolution of the Cabinet of Ministers No. 273) defines the responsibilities of

ministries, institutions, khokimyats and enterprises for various types of environmental monitoring. For air protection, this mainly concerns Uzhydromet, SCEEP's Centre for Specialized Analytical Control on Environmental Protection (CSAC) and enterprises.

Persistent organic pollutants

Since Uzbekistan is not a party to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and joined the Stockholm Convention on Persistent Organic Pollutants rather recently (in 2019), there are no national implementation plans (NIPs) or specific policy documents on these matters.

Sustainable Development Goals and targets relevant for this chapter

The current stand of Uzbekistan in relation to air pollution aspects of targets 3.9 and 11.6 of the 2030 Agenda for Sustainable Development is described in box 8.3.

Box 8.3: Targets 3.9 and 11.6 (air pollution aspects) of the 2030 Agenda for Sustainable Development



Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

Uzbekistan's national target 3.9 and national indicator 3.9.1 differ from the respective global ones. While the difference in the wording of the national target is not significant, the change of the indicator is. Whereas the global indicator 3.9.1 is "Mortality rate attributed to household and ambient air pollution", the national indicator 3.9.1 is "Mortality rate attributed to the toxic effect of chemicals per 100,000 population", the definition being somewhat vague without a good rationale for it.

It is evident that, in 2019, Uzbekistan is not ready to produce the global indicator 3.9.1 because of the lack of information about PM₁₀ and PM_{2.5} levels. Data on PM₁₀ and PM_{2.5} concentrations are available only for Tashkent City for the years 2012–2014. These data show a slight exceedance of the Interim-2 Targets of WHO, which means a factor 2.5 exceedance of the WHO Air Quality Guidelines. However, in addition to difficulties with the production of the indicator on the mortality rate attributed to household and ambient air pollution, the non-adoption of this global indicator may show that the country is not willing to gather and disclose data on the mortality attributed to air pollution.

Long-term effects of air pollution on morbidity (asthma, bronchitis) have been investigated in a few studies (in the United States and EU) and the results of health impact assessments of air pollution are not easy to transfer to other countries as climate factors, smoking habits and other social factors also play a role. Concentration response information for morbidity effects of air pollution are also known for China from United States–Chinese research (on PM₁₀, SO₂, NO₂ and asthma, cardiovascular disease related to hospital admissions, respiratory symptoms and hypertension).

In Uzbekistan, the annual mortality rate attributed to household and ambient air pollution in 2016 is estimated by WHO at 81.1 cases per 100,000 population ranking the country fifth in the WHO European Region (average of 36.3 per 100,000 population). Air pollution by particulate matter is the most important factor, but other components (NO₂, SO₂, PAH, O₃) also contribute.

Exposure of populations to high levels of air pollution leads to the additional burden of diseases and increased economic costs.

According to a comprehensive 2016 assessment by the World Bank and others, PM pollution causes approximately 19,000 premature deaths in Uzbekistan and costs the economy more than US\$800 million annually in terms of total welfare losses (1.24 per cent GDP equivalent). Total forgone labour output is US\$17 million.



Goal 11: Make cities and human settlements inclusive, safe, resilient and ecological sustainable
Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

Uzbekistan has adopted global indicator 11.6.2 (Annual mean levels of fine particulate matter (e.g. PM_{2.5} and PM₁₀) in cities (population weighted)) as its national indicator, without changes.

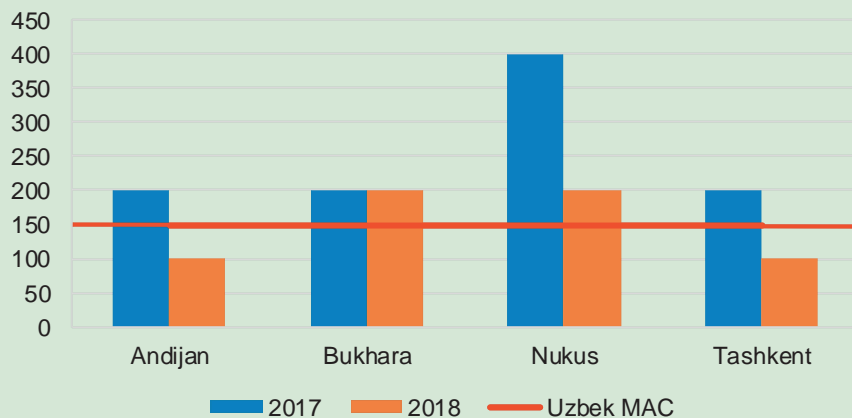
In Uzbekistan, two monitoring posts (Nukus and Tashkent) measuring PM₁₀ and PM_{2.5} have operated in recent years. Initial data from the two cities indicate that PM₁₀ and PM_{2.5} levels are high in comparison with most of the other cities in the region. The air quality in Nukus is affected by dust storms from the Aral-Kum Desert, while in Tashkent, various combustion sources may be predominant.

In view of the scarcity of ground-level data for PM, remote sensing via satellite, combined with modelling and existing surface measurements, has been used for the assessment of population exposure at the country level.

Although PM₁₀ and PM_{2.5} data are scarce in Uzbekistan, based on the measured exceedance of the MAC values for dust described, the probability that WHO Air Quality Guidelines for the mean concentrations of PM₁₀ are exceeded in cities in Uzbekistan is high. In a few cities, the annual dust concentration exceeded the (national) standard of 150 µg/m³ (figure 8.1).

In the coming years, establishing a comprehensive network for the measurement of fine PM is an urgent task.

Figure 8.1: Annual mean dust concentration in selected cities, 2017–2018, µg/m³



Source: Uzhydromet, 2019.

No substantial measures are taken to reduce air emissions from industry, traffic, households and services in order to reduce the mortality and morbidity rates from stroke, heart disease, lung cancer and chronic and acute respiratory diseases such as asthma.

BAT to abate dust emissions as described in guidance documents under CLRTAP or the EU Industrial Emissions Directive are not applied in Uzbekistan. While the need to enhance the monitoring of PM is clearly understood in Uzbekistan, the application of BAT is not promoted and emission reduction plans for air polluting industrial sectors are not developed.

Institutional framework

SCEEP is the primary environmental regulating institution in Uzbekistan and the overall coordinating

authority for air management. It is subordinate to the Cabinet of Ministers and responsible for development and enforcement of environmental policy at national, regional (oblast) and local (district) levels. SCEEP has a central body in Tashkent, regional branches, and institutions providing scientific and technical support. Local executive authorities (khokimiyats) work with the local and regional branches of SCEEP on environmental protection issues (including air protection) and spatial planning.

The tasks of the Centre for Specialized Analytical Control on Environmental Protection (CSAC) under SCEEP are:

- Monitoring and control of sources of environmental pollution and analytical (laboratory) control;

- State control over compliance with environmental legislation, including on ambient air;
- Development and implementation of new methods and techniques of analytical activities;
- Emission inventory of stationary sources;
- Compiling electronic databases of the monitoring results, for the purpose of producing newsletters and quarterly reports.

The Centre of Hydrometeorological Service (Uzhydromet) under the Cabinet of Ministers is the main air-quality-monitoring institution (besides its monitoring of radiation, quality of surface water and the usual meteorological data). Uzhydromet also prepares the information on air quality.

Other governmental bodies that are involved in issues related to air protection are:

- Ministry of Health – sanitary rules and norms on air pollution;
- Ministry of Agriculture – emissions from agriculture;
- State Committee on Statistics – emissions data on air-polluting substances;
- JSC Uzbekenergo – emissions from power plants.

The khokimiyats can also improve the air quality in their territory by taking measures on spatial planning such as the promotion of clean public transport, construction and use of a cycle lane network, stimulation of cycling by shared bicycle initiatives, improved inspection of cars and stimulation of the use of electric cars.

Regulatory, economic and information measures

Permits

Permitting procedures for installations are regulated by the 2014 Resolution of the Cabinet of Ministers No. 14 “On approval of the Regulation on the order of preparation and approval of draft emission limits”. Based on the results of inventories of pollution sources and SEE, values to limit environmental impacts are defined (ELVs to air, discharges to water, waste production) for specific installations. These approved installation-specific ELVs are valid for three years.

The ELVs for emissions to air are established in the draft maximum permissible emission. The maximum permissible emission is the mass of pollutant per unit of time that leads to environmental concentrations that do not exceed the MAC values.

SCEEP inspectors verify an installation’s compliance with the ELVs established for it, as well as its timely implementation of new environmental measures and standards.

Photo 8.2: Cycling in the streets of Bukhara



Photo credit: Ms. Alessandra Fidanza

The emission limits defined for specific large combustion plants in Uzbekistan are generally less stringent in comparison with EU emission standards based on BAT.

The Regulation on SEE (2018 Resolution of the Cabinet of Ministers No. 949) in Annex No. 2 divides enterprises into four categories according to the risk level for the environment (from category I (high risk) to category IV (local, i.e. minor) impact). It is striking that large combustion plants with heat capacity ≥ 300 MW are placed in category II (medium risk), while, in terms of impact, they should be in category I.

All stationary sources of air pollution of categories I and II have to go through permitting procedures at SCEEP on the national level, while stationary sources of categories III and IV (less environmental impact) do so at the regional branches of SCEEP. General binding rules for these installations (ELVs that are generally applicable, legally obligatory and not necessarily taken up in permits) are not used; their use would enhance efficiency and save time, enabling the competent authority to focus on the important installations.

Technical inspections of vehicles

All registered vehicles must undergo regular obligatory technical inspection that also includes validation of compliance of engine exhaust gas emissions of CO and hydrocarbons. For the many cars that drive on LPG or CNG, inspection of gas cylinders is also obligatory. Technical inspections are carried out by private parties along with bodies of the State Service on Road Safety of the Ministry of Internal Affairs. The frequency of mandatory technical inspections is twice a year for vehicles that transport passengers and once a year for private vehicles.

Air emission charges

Companies pay charges for emissions of a number of air pollutants (table 3.1). For emissions in excess of permitted amounts, higher charges are due. Nevertheless, the low level of pollution charges suggests that most pollution charge rates are below the level of marginal abatement costs (chapter 3).

Information

For several cities, (Almalyk, Angren, Bekabad, Tashkent and Chirchik), monthly bulletins (Akhborot) are published by Uzhydromet. However, they are distributed to governmental authorities only (chapter 4).

Yearly reports (Review of the state of air pollution in cities of the Republic of Uzbekistan on the territory of activities of Uzhydromet) are also published by Uzhydromet and disseminated among governmental bodies (chapter 4).

For Tashkent City, daily ecological bulletins are published online by Uzhydromet. In these daily bulletins, mean daily concentrations of sulfur dioxide, nitrogen dioxide, carbon monoxide, phenol, ammonia and hydrogen fluoride and the rate of exceedance of the (daily mean) MAC values at different measuring stations are shown.

The State Committee on Statistics publishes the yearly statistical bulletin about basic indicators on environmental protection, rational use of natural reserves and forestry and hunting, which also contains national data on air polluting emissions, by cities, in total and per substance. Data on emissions to air are based on outcomes of monitoring by SCEEP's Centre for Specialized Analytical Control on Environmental Protection. These data could be used for preparation of a pollutant release and transfer register (PRTR) under the Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention), though Uzbekistan is not currently a party to either the Convention or the Protocol.

8.6 Assessment, conclusions and recommendations

Assessment

Uzbekistan has a large agricultural production, but also mining, oil exploration and industrial activities. The steady economic growth in the last decade and the rapid growth of traffic in the cities necessitate serious management of the air pollution and other environmental problems in the country.

The industrial air emissions, which are relatively high for such components as SO₂, hydrocarbons and dust, combined with the air-polluting emissions by the growing number of vehicles and the emissions (mainly in rural areas) from domestic heating with firewood and other solid fuels, create severe air pollution in industrial and urban areas, which causes serious nuisance and health problems.

State-of-the-art technical measures to prevent air emissions from industry, such as those described by the Task Force on Techno-Economic Issues of CLRTAP or in EU Best Available Techniques Reference Documents (EU BREFs), are at this moment not prescribed in permits and not applied in Uzbekistan.

Conclusions and recommendations

Air quality standards

Uzbekistan uses MAC levels of pollutants as the normative units for air quality. Air quality standards are based on short-term maximum and daily, monthly and annual mean values, but to evaluate the state of air pollution, specific indexes are used that relate indirectly to the MAC values. Indexes can be used as indicative instruments and for comparison of cities

but, in practice, the use of indexes is not a method that gives a clear picture of the real air quality to enable evaluation of human health risks, as can be achieved by applying standards from international practice in terms of concentrations.

Recommendation 8.1:

The State Committee on Ecology and Environmental Protection, together with the Ministry of Health, should draw up a roadmap to transfer the current air quality assessment to air quality standards based on mean pollutant concentrations according to the internationally accepted practices.

Air monitoring

Uzbekistan has a comprehensive air emission monitoring network with 63 fixed posts and measurement of 13 different substances, but developments in the monitoring of some harmful pollutants such as fine dust (PM₁₀ and PM_{2.5}) by automatic equipment are slow. This prevents Uzbekistan from gathering necessary data for global indicators 3.9.1 (Mortality rate attributed to household and ambient air pollution) and 11.6.2 (Annual mean levels of fine particulate matter (e.g. PM₁₀ and PM_{2.5}) in cities (population weighted)) of the 2030 Agenda for Sustainable Development. Furthermore, it prevents Uzbekistan from developing adequate measures to address air pollution, especially in the cities and urban centres, in line with target 11.6 of the 2030 Agenda for Sustainable Development. Uzbekistan has established its own national indicator 3.9.1, which is not related to household and ambient air pollution.

Recommendation 8.2:

The Cabinet of Ministers should:

- (a) *Ensure that the number of parameters measured is increased with PM₁₀ and PM_{2.5} for all measuring posts in vulnerable areas, such as cities and near industrial complexes;*
- (b) *Ensure the introduction of legally-binding national standards and limit values for PM₁₀ and PM_{2.5};*
- (c) *When sufficient data about the concentrations of fine particulate matter have been collected, initiate the adoption by Uzbekistan of the Sustainable Development Goals global indicator 3.9.1 and ensure that information on the mortality rate attributed to household and ambient air pollution is available to decision-makers and the public.*

Best available techniques

Uzbekistan does not have a specific national policy document for the protection of ambient air. The strategy for air quality and air protection management can be derived from other strategic documents such as the Programme of Actions on Environmental Protection for the period 2013–2017. Many actions were envisaged in the Programme, among which is the gradual strengthening of ELVs for air emissions by implementing modern abatement techniques.

Nevertheless, emissions of SO₂, NO_x and dust by electric power plants, oil and gas refineries and other industries are still relatively high, compared with international standards. Much (sulfur-containing) waste gas from oil and gas production is still flared.

BAT to abate air pollutant emissions as described in guidance documents developed under CLRTAP or the EU Industrial Emissions Directive are not applied in Uzbekistan. The application of BAT is not promoted by Uzbek authorities. Emission reduction plans for air-polluting industrial sectors are not developed.

In this regard, documents produced by CLRTAP's Task Force on Techno-Economic Issues can serve as tools for setting the ELVs based on BAT, as they are specifically developed for countries with transition economies. Use of EU BREFs that have more stringent BAT-based ELVs can be the next step.

Recommendation 8.3:

The State Committee on Ecology and Environmental Protection should promote the application of internationally accepted best available techniques to abate air pollution from industrial sources and seek expertise under the Convention on Long-Range Transboundary Air Pollution for this purpose.

Air pollution from the residential sector

Air pollution from the residential sector is an important factor for Uzbekistan's progress in achieving the global and national target 11.6 of the 2030 Agenda for Sustainable Development. Domestic heating is a big source of air pollution in cities in winter. Poor maintenance of district heating installations and the lack of insulation of buildings leads to low energy-efficiency performance. Energy efficiency of houses in Uzbekistan is three times lower than in Western European countries. The use of firewood, coal and other heat sources in individual stoves and furnaces with low emission heights contributes to bad air quality by the emission of fine particulates. The emissions from stoves and furnaces

lead to exceedance of air quality standards (dust, SO₂) in winter.

Recommendation 8.4:

The Cabinet of Ministers should:

- (a) *Stimulate the implementation of measures for energy efficiency in residential buildings, e.g. by enhancing the attractiveness of energy-efficiency measures by guaranteeing a*
- (b) *reasonable pay-back period of costs and setting conditions for better technical maintenance of district heating systems;*
- (c) *Promote the use of low-carbon technology (heat pumps, renewables) and cleaner fuels such as natural gas instead of liquid and solid fuels for individual households;*
- (c) *Promote the use of individual heat-use monitoring devices in apartment buildings.*

Chapter 9

WATER MANAGEMENT

9.1 Water resources

Uzbekistan has favourable conditions for groundwater formation in mountain and intermountain depressions and foothill areas, while, for surface water, the majority of the country lies between two of Central Asia's largest rivers, the Amu Darya and Syr Darya. The two rivers originate in the Pamir and Tien-Shan mountain ranges and chart a north-westerly course towards the Aral Sea.

Extensive canal systems, such as the Amu-Bukhara canal, were built during the Soviet period and have greatly altered water-flow patterns. The Karakum canal, located in Turkmenistan, significantly impacts the natural flow of the Amu Darya.

Artificial lakes and reservoirs have been created, many of which are fed by irrigation run-off. Uzbekistan's largest freshwater lake – Lake Aydar in north-eastern part of the country – was formed as a result of an emergency discharge from the Shardara reservoir (located in Kazakhstan) during the period of severe floods in 1969.

Uzbekistan's water resources are under pressure. A large agricultural demand, growing population, inefficient water use and unfavourable climatic conditions mean that strengthening water management is key to future prosperity.

Groundwater

Throughout Uzbekistan, there are 97 deposits of groundwater, including 19 that are classified as protected natural areas, being zones of fresh groundwater deposits. Of the 19 protected natural areas, 11 are considered as being of national importance and eight of regional (oblast) importance. The natural resources of the Republic of Uzbekistan for fresh and brackish groundwater are estimated at 75.58 million m³/day, which equates to 874.8 m³/s.

The bulk (84.7 per cent) of the groundwater resources are formed in the fold mountain hydrogeological region and total 64 million m³/day (740.8 m³/s) with a salinity concentration of 1 g/l to 3 g/l. The balance of the groundwater deposits, 11.6 million m³/day or 15.3 per cent of all resources, are in the plain regions, with

concentrated deposits in the Fergana Valley (29.6 per cent) and the Tashkent Oblast (13.4 per cent).

The groundwater volume for abstraction is approved on an annual basis. In 2017, it was 17.36 million m³/day (200.9 m³/s), of which the total volume abstracted in 2017 was 15.28 million m³/day (176.9 m³/s) or 88 per cent of the approved abstraction volume. Of the groundwater abstracted, 5 million m³/day (34 per cent) is supplied for household and drinking purposes.

There are 119 cities in Uzbekistan, 1,071 urban settlements and 11,088 rural settlements. Of these, 69 cities (58 per cent), 335 urban settlements (31 per cent) and 2,902 villages (26 per cent) are provided with potable water from groundwater reserves. This correlates to 60–80 per cent of the population using groundwater for drinking water purposes.

As at early 2019, there are about 8,900 registered users of groundwater, abstracting from 27,400 operating wells.

Exploration and research continues, with the aim to increase the capacity of using groundwater resources.

Surface water

The water resources of the Aral Sea basin are principally formed in the basins of the two main rivers, the Syr Darya and Amu Darya.

The Amu Darya River is Uzbekistan's largest river and is formed by the convergence of the Panj and Vakhsh Rivers on the south-western border of Tajikistan, near to the south-east tip of Uzbekistan. The Amu Darya River follows a course parallel to, and at times part of, Uzbekistan's southern borders with Afghanistan and Turkmenistan, before heading north through the Republic of Karakalpakstan towards the southern section of the Aral Sea.

The Syr Darya River is formed in the fertile Fergana Valley where the Naryn and Koradaryo Rivers converge. The Syr Darya River then flows west through Fergana Oblast and northern Tajikistan, turns north to cross through Uzbekistan, and then enters Kazakhstan, eventually reaching the northern section of the Aral Sea.

Uzbekistan's third largest river is the Zarafshan River, which flows westward from the mountains of Tajikistan through east and central Uzbekistan. The total river basin covers 4,000 km² and the river length is 781 km. For the first 300 km, the river flows through Tajikistan, then it enters the Zarafshan Valley, situated in the Samarkand region of Uzbekistan. On entering Uzbekistan, the annual river discharge is 5.3 km³. The river has a number of dams and barrages: Pervomai, Akdarin, Damkhodzhin, Narpai, Karmarin, Shafrikan, Kharkhur and Babkent, and many large and medium-sized canals for irrigation and water supply. Reservoirs, including Tudakul (22,000 ha), Kuyumazar (1,600 ha) and Shurkul (1,600 ha), are located in the middle reaches of the Zarafshan Valley. There are also several reservoirs that contain highly saline water. Four lakes receive drainage water through collector canals: Dengizkul (25,000 ha), Karakyr (12,000 ha), Tuzgan (5,700 ha), and Shurgak (1,600 ha). In the Samarkand and Navoiy Oblasts, the Zarafshan River water is used for irrigating 530,000 ha of land, mainly for agricultural products serving the immediate needs of the population.

Previously, the Zarafshan River was a major tributary of the Amu Darya River; however, overexploitation through irrigation results in the river ending in the Kyzylkum Desert near the city of Bukhara. Uzbekistan has several thousand small streams that also run dry in the desert, principally through overexploitation through irrigation.

The Chirchik River serves the city of Tashkent with water and is a major tributary of the Syr Darya River. The Chirchik is 155 km long with a basin area of

14,900 km². The river is formed at the confluence of the Chatkal River and Pskem River, which form the Lake Charvak reservoir. There are several dams on the river, which serve for both electricity generation and irrigation. All the main canals of Tashkent City and Tashkent Oblast, such as the Bozsu, Anhor, Salar and Buriyar, are fed by the water from the Chirchik River.

The surface water resources of the Amu Darya and Syr Darya river basins, on average (with 50 per cent flow provision), comprise 114.4 km³ annually, of which 78.34 km³ is in the Amu Darya basin and 36.06 km³ in the Syr Darya basin. Annual allocations of surface water of the Amu Darya and Syr Darya river basins between the five countries of Central Asia are determined through the Interstate Commission for Water Coordination of Central Asia (ICWC) (box 9.1).

Artificial and natural lakes

The majority of existing lakes were created as a result of drainage water management or as storage facilities for irrigation. The Ministry of Water Management reported some 80 reservoirs in the country as at March 2019, 40 of which are considered "large" and 55 of which are the direct responsibility of the Ministry of Water Management. These lakes and reservoirs are used for irrigation storage, as part of energy provision or by the Ministry of Emergencies for flood protection. It is envisaged to use some 18 water reservoirs, in addition to irrigation and flood protection, to develop ecotourism and infrastructure for ecotourism.

Box 9.1: Surface water allocation from Amu Darya and Syr Darya river basins

The ICWC, bringing together the water management authorities of five Central Asian countries, agrees on water resources available for vegetative and non-vegetative seasons on the basis of the quotas laid down in the basin schemes of the Syr Darya and Amu Darya Rivers dating back to the 1980s.

The surface water forecasting and allocation is an annual exercise. Hydrometeorology experts give a forecast based upon snow and precipitation fall and water abundance in reservoirs. This forecast limits the withdrawal of the five countries, creating what becomes known as "wet years" or "dry years". Once Uzbekistan has its limit determined by the ICWC, typically in March or April, the available water is divided among the oblasts. At a provincial level, districts are then allocated volumes of water which are then further allocated among water user associations (WUAs). A resolution of the Cabinet of Ministers determines the water allocation for each oblast on an annual basis.

Water for drinking purposes (subject to availability of water supply infrastructure) and for industry are always allocated 100 per cent of their demand in Uzbekistan. Agriculture is the sector in which the allocation may vary from the forecast demand and request.

It is generally accepted that the actual water available can vary plus or minus 30 per cent from the initial water forecasts.

Over past decades, Uzbekistan would typically withdraw an average of 61 km³/year from the surface water sources available. Recent years have demonstrated an average abstraction of 48–52 km³/year.

Photo 9.1: Marsh sandpiper (*Tringa stagnatilis*), Lake Ayakogytma

Photo credit: Ms. Mariya Gritsina

The Aydar-Arnasay Lakes System is located in Jizzakh and Navoiy Oblasts and forms an area of 527,100 ha. It is the largest reservoir in Uzbekistan, consisting of freshwater lakes situated in the middle stream of the Syr Darya River and on the irrigated massif of Golodnaya Steppe and Kyzylkum Desert. The lakes can also act as flood protection when the Syr Darya River floods. The lakes system was added to the Ramsar List in 2008 (chapter 6).

Lake Dengizkul is located in Bukhara Oblast and covers 31,300 ha. It is the largest saline closed water body, fed by irrigation run-off, in the south-west part of the Kysylkum Desert, with typical ecological conditions of natural lakes situated in the deserts of Central Asia. The lake, dried up by the mid-1950s because of overuse for irrigation, has been refilled since 1966 and is very important for maintaining a biodiversity of wetland-dependent species in a largely arid region. Commercial mining of gas in the vicinity of and in Lake Dengizkul is the main human activity. Lake Dengizkul was added to the Ramsar List in 2001 (chapter 6).

9.2 Performance and gaps in water monitoring networks

Groundwater

Uzbekistan currently has 1,495 groundwater observation wells distributed throughout the 14 territorial hydrogeological stations. This figure is forecast to increase to more than 2,650 by the end of

2021 (2017 Resolution of the President No. 2954), in recognition of the need to expand monitoring activity in this area, not least given the high percentage of the population reliant on groundwater for drinking water purposes. At the oblast level, 14 hydrogeological stations collect and process data (chapter 4).

The shortcomings of the groundwater monitoring network include the low number of observation wells. For example, at present, not all the aquifers used to supply water are covered by the monitoring network. In addition, there is insufficient use of instrumentation, particularly for water level measurement. Laboratories are poorly equipped, mobile chemical laboratories are non-existent and there is no equipment to perform hydrogeological testing of wells.

Surface water

Uzhydromet uses 19 hydrology observatories and 131 hydrological observation posts to monitor water flow. The information is provided to concerned agencies, including the Ministry of Water Management and Uzbekenergo. In addition, 86 sampling posts are used to monitor water quality (chemical composition) with analytical laboratories in Tashkent City and within the oblasts. A total of 59 parameters are monitored once per month, comprising 53 chemical parameters and six hydrobiological parameters (chapter 4). Microbiological analysis is completed in 10 locations. Around large cities, parameters including nitrate,

ammonia and oxygen deficiency are used as indicators of general water quality.

The Uzhydromet monitoring programme typically focuses on river water quality upstream and downstream of towns and cities to determine the impact of anthropogenic activities. These data are therefore supported by additional monitoring by entities, including utility operators and SCEEP, which focuses on particular discharges from specific industrial activities.

The monitoring programme for surface water is part of the overall state environmental monitoring programme adopted by the Cabinet of Ministers every five years (chapter 4). In addition to monitoring of water quality, efficiency of use is monitored, e.g. the area of land (ha) irrigated per volume of water (m³) applied. A specialized unit within the Ministry of Water Management with a focus on innovative technologies is responsible for this indicator. Hydrological flows are monitored twice a day, with water monitoring structures a physical asset that belongs to the Ministry of Water Management.

Monitoring water use at the “field level” is considered a significant problem in Uzbekistan. Not all farms have flow-monitoring equipment, with the Ministry of Water Management estimates indicating that less than 50 per cent of farms have the necessary tools for water metering.

Drinking water

Drinking water quality is monitored against the State Quality Standard O'zDst: 950:2011. This standard defines 47 indicators, the frequency of monitoring and the number of drinking water samples taken at control points for analysis of microbiological, chemical and radiological indicators.

In accordance with the requirements of this standard, water supply enterprises carry out laboratory analysis of water sources and the water treatment process before supplying water to the distribution network. Annually, the central laboratories of water supply enterprises develop plans for laboratory monitoring of drinking water quality. These plans determine the number of samples from all control points at water intakes, treatment facilities and networks. Once approved, the sampling programme is coordinated with the oblast sanitary and epidemiological authorities. The Ministry of Health has regulatory oversight and supervision of drinking water quality (chapter 4).

The sampling programme is risk based and linked to the size of the population of the community served. For example, a supply network of a city with a population of more than 50,000 people would require analysis of 1,200 samples per year at a frequency of 100 samples per month. A city of 100,000 people would require double this – 200 samples per month and 2,400 samples per year. The analysis is conducted daily on 8–10 priority indicators and monthly for a wider suite of 20–25 indicators.

9.3 Water quality

Groundwater

On a regional level, groundwater quality is considered generally satisfactory. Localized issues concerning salinity and the impacts of agriculture, industry or anthropogenic activity do occur, but this is dealt with at a local level. For example, groundwater deposits in the middle and lower reaches of the Zarafshan River are no longer suitable for drinking purposes due to the effects of intensive irrigation.

The results of the groundwater monitoring are used to develop quarterly, biannual and annual reports. These are supplemented by annual newsletters and operational reports to support the maintenance of hydrogeological maps tracking groundwater pollution and depletion in the different oblasts of Uzbekistan.

Surface water quality

Uzbekistan uses a Water Pollution Index (WPI) to categorize the quality of surface waters. The WPI determines the arithmetic mean value of six hydrochemical indices, including biochemical oxygen demand (BOD), expressed as fractions of their MAC. There are seven classes of water quality under the WPI, ranging from I (very clean) to VII (extremely polluted). The majority of surface water bodies in Uzbekistan are considered to be in Category III (moderately polluted).

Analysis conducted by Uzhydromet in 2017 and 2018 shows that water quality in the upper reaches of most rivers typically corresponds to class II under the WPI, being characterized by low mineralization of water and low concentrations of nutrients, well within MACs. However, concentrations of copper and phenols were recorded as exceeding the MAC by up to three times in some instances in both years. This is associated with an increased natural geochemical background of metals and the impact of intensive biochemical processes under elevated summer temperatures.

The content of salt (salinity) and sulphates increases from the middle to the lower reaches of the main rivers in Uzbekistan, often being 1.5–6.0 times the MAC. The highest mineralization and sulphate content was recorded in the lower reaches of the Zarafshan River, where the maximum permissible concentrations of sulphates was recorded as peaking at 6.1–12.0 times the MAC. In 2018, in the Aydar-Arnasay Lakes System, Lake Arnasay, which is fed by collector-drainage water, recorded average values of salinity that were consistently 10.3–16.2 the MAC corresponding to WPI class IV (polluted).

The most polluted watercourses reported by Uzhydromet in 2018 were the Siab collector channel in Samarkand and the Salar channel downstream of the cities of Tashkent and Yangiyul (table 9.1). These channels were characterized by high average concentrations of nitrite, in the range 3.4–15.5 times the MAC, and of phenols 2.7–12.9 times higher than the MAC. The quality of water in these channels corresponds to WPI classes IV (polluted) and V (dirty).

Uzhydromet noted in its 2017 and 2018 monitoring reports the absence of or reduction in the concentration of contaminants, including chromium VI, surfactants, arsenic, petroleum, organochlorine and organophosphorus, in the rivers of Uzbekistan. These contaminants were below the respective MAC and lower than observed in previous years. It is hoped that this reflects efforts to tackle pollution and plans are in place to monitor this closely to observe for a long-term trend.

According to Uzhydromet's 2017 and 2018 monitoring reports, anthropogenic factors, in particular pollution, caused various changes in the composition of aquatic biological indicators. This was particularly evident downstream of towns and cities and in sections of rivers flowing through agricultural

zones. Temperature also had a significant impact on biological indicators, with temperature increases as a direct result of discharges of warm cooling water from power plants and also the natural seasonal warming of waters impacting on biological indicators. The impact of high temperatures was particularly evident when water levels were low. Natural hydrological factors were also reported as having a significant impact on biological indicators, with sharp increases in water levels impacting on biological activity in the rivers. In 2018, the water quality in the upper section of the Salar channel was reported as being in rapid decline due to a combination of low flow, elevated water temperature and the impacts of industrial and domestic discharges.

Drinking water

Figure 9.1 demonstrates a time series analysis of chemical and microbiological water quality non-compliance in water bodies used for drinking water supply across Uzbekistan as a whole in the period 2012–2017. Average non-compliance across the period is in the range of 5–10 per cent per year for microbiological analysis and 10–15 per cent for chemical analysis. Non-compliance of chemical analysis in open channels ranges from 16.8–25.2 per cent across the period. Microbiological compliance for urban drinking water supply is found to be marginally better than for rural areas.

9.4 Management of water use and pressures on water resources

Water abstraction and use by sector

The current annual use of water resources in all sectors of the economy of Uzbekistan is, on average, 56 km³, of which about 50.4 km³ (90 per cent) is used in agricultural irrigation. Table 9.2 shows the estimated water use by different sectors of the economy in 2018.

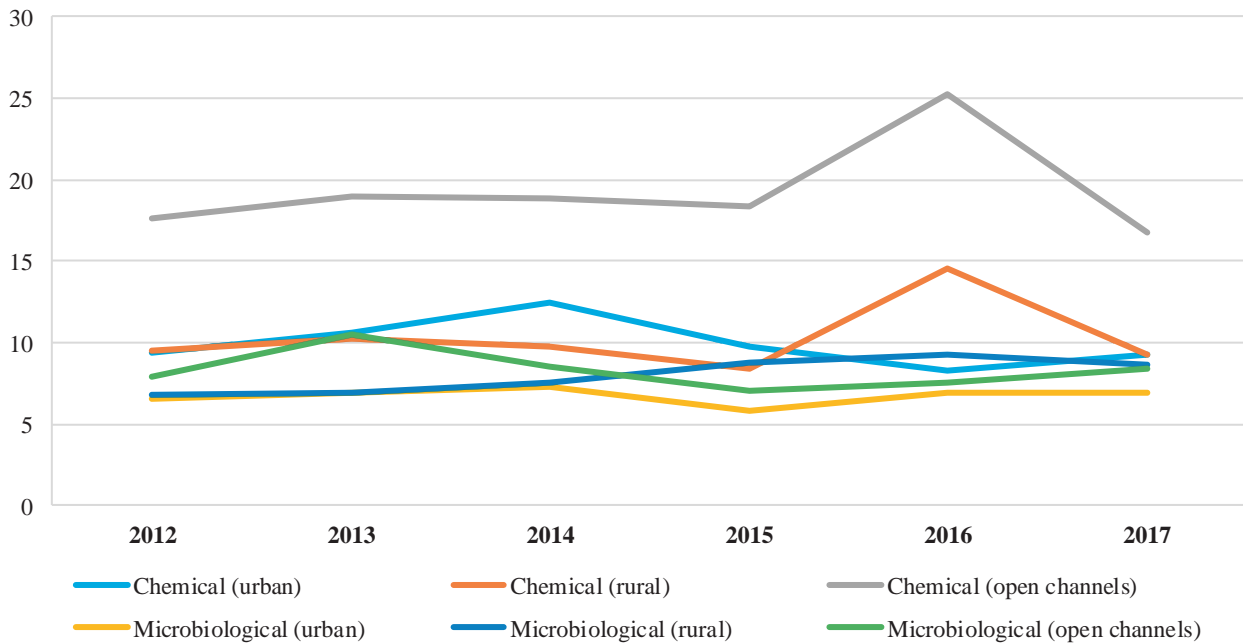
Table 9.1: Most polluted water bodies, 2014–2018

	WPI					MAC exceedances (times) in 2018				
	2014	2015	2016	2017	2018	Nitrites	Copper	Phenols	Ammoniacal nitrogen	BOD ₅
Salar channel – Yangiyul town	4.02	4.22	4.29	4.93	5.96	15.5	3.5	12.9	..	..
Salar channel – Tashkent City	4.74	3.4	3.09	3.29	3.06	5.8	2.5	6.5	2.3	..
Siab collector channel – Samarkand City	4.55	3.91	3.32	3.85	3.99	5.0	3.2	11.7	2.3	..
Zaravshan River – Navoiy City	3.42	2.16	1.52	2.05	1.83	..	1.9	5.2	..	..
Collector GPK-S, Tashkent Oblast	1.37	2.68	1.23	1.2	2.29	..	..	8.2	..	..
Chirchik River – Chirchik City	1.94	1.95	2.47	1.38	2.63	8.5	1.9	2.8	1.6	..

Source: Yearbooks of Surface Water Quality in Uzhydromet Network for 2017 and 2018.

Note: WPI values: ≤0.3 = class I (very clean); >0.3–1.0 = class II (clean); >1.0–2.5 = class III (moderately polluted); >2.5–4.0 = class IV (polluted); >4.0–6.0 = class V (dirty); >6.0–10.0 = class VI (very dirty); >10.0 = class VII (extremely dirty).

Figure 9.1: Average of non-compliant water samples from municipal, rural and open water bodies used for drinking water supply, 2012–2017, per cent



Source: Ministry of Health, 2019.

Table 9.2: Water use by sector, 2018

	km ³	%
Agriculture	50.40	90.0
Communal and domestic	2.30	4.1
Energy	1.30	2.3
Industry	0.73	1.3
Fisheries	0.67	1.2
Other	0.60	1.1

Source: Ministry of Water Management, 2019.

Note: Numbers are estimated.

The current annual demand for water in all sectors of the economy of Uzbekistan is estimated at 64 km³. Future forecasts show that the demand for drinking water supply and in industry and rural areas will increase, while demand in irrigated agriculture will be expected to decrease, due to the application of water-saving technologies and efficient agricultural practices. By 2030, Uzbekistan aims to cap the total required water volume at a maximum of 58.5 km³.

Industry, including mining

The water demands of the industrial sector have a priority over agricultural needs and environmental flow (2013 Resolution of the Cabinet of Ministers No. 82), so the demand in industry is met in full. The industrial and energy sectors of Uzbekistan together abstract more than 2 km³ of water annually, of which 0.9 km³ is consumed. Industry alone abstracts around 0.7 km³ of water annually (table 15.4). Almost half of

the water abstracted is returned in the form of an industrial effluent and these effluents can pose a threat to the environment if not treated at source.

New industrial facilities are prohibited from having run-of-river cooling systems, except in cases when recycling water supply is not technically possible.

Each industrial enterprise has its own norms for its discharge. The norms are calculated and enforced SCEEP, based on the type of industry and volume and composition of the discharge in terms of contaminants. All industrial units are expected to have their own pretreatment facility on site. Many enterprises do not comply with this requirement, due to the prohibitive costs of installation relative to the size of fines for breaching the norms.

Total water consumption for industrial demands is forecast to increase to 3 km³/year by 2030 in line with Uzbekistan's development agenda.

National studies examining future industrial water demand predict strong growth in the mining sector, including of gold, and the oil and gas sector, and the potential for industrial water consumption to double by 2030–2035. Meeting the water demand and also ensuring the adequate treatment of discharges will become a priority. It is expected that industries will be required to adopt water-saving technologies.

Photo 9.2: Upper Chirchik hydroengineering complex on the Chirchik River

Photo credit: Basin Water Organization “Syr Darya”

Agriculture, including irrigation

Agriculture’s share in total water use in the period 2009–2017 has been around 89–92 per cent. Water losses in agriculture amount to 30 per cent of the water use (table 13.4).

The irrigation infrastructure of Uzbekistan is a complex set of hydraulic structures and irrigation systems. The total irrigated area as at 1 January 2018 is estimated as 4.3 million hectares, of which over 2.2 million hectares (51 per cent) is supplied with irrigation water through pumping stations. The drainage area is 3.05 million ha. Irrigated areas are categorized into four types based upon land salinity: 1 = non-saline; 2 = weakly saline; 3 = moderately saline; and 4 = strongly saline. The categorization is based upon the content of salt in the top layer of soil that would be detrimental to crop productivity. Areas 3 and 4 commonly practise leaching irrigation to try and wash the soil and alleviate the salt content. Typically, 15 per cent of irrigation water is currently used for leaching.

There are approximately 180,000 km of irrigation networks, 140,000 km of collector-drainage networks, and 1,693 pumping stations that consume 8.2 billion kW of electricity annually. There are 55 reservoirs with a total capacity of 20 km³, more than 5,000 irrigation wells and 3,451 drainage wells.

Of the 4.3 million ha of land currently used for irrigation, it is believed that 1 million ha would be suitable for application of drip irrigation technology. The suitability of this technology depends on various factors, including soil and water quality. Uzbekistan is also looking at cost-effective and simple technologies and operational practices to improve irrigation efficiency. This includes the use of shallow furrows or irrigating every other furrow (alternative furrows). According to the Ministry of Water Management, the total area under water-saving techniques reached 413,200 ha or 9.6 per cent of irrigated lands in the period 2013–2019.

The 2013 Resolution of the Cabinet of Ministers No. 176 and its subsequent amendments aimed to recognize agriculturists who use water-saving

technologies. Preferential loans for procurement of water-efficient equipment and five-year relief from taxes were included as incentives to adopt water-saving practices. Nevertheless, the application of water-saving techniques is still at a very low level (chapter 13).

Cotton plantations are known to be high users of irrigation water. As at early 2019, 20,000 ha of cotton plantation has drip irrigation installed. There is a target to cover 200,000 ha of cotton fields by drip irrigation by 2025. In parallel, there are plans to reduce cotton production and move towards non-traditional, higher value crops. In 2017, the area in cotton was reduced by more than 40,000 ha.

Measures are being taken to further expand drip irrigation and other water-saving techniques in cotton production (2018 Resolution of the President No. 4087), including subsidies to raw cotton producers for introduction of drip irrigation technologies (8 million sum per ha), exemptions from customs duties for importation of drip irrigation equipment and preferential loans for procurement of drip irrigation equipment.

Energy, including hydropower plants and reservoirs

Ten TPPs and combined heat and power plants (CHPPs) produce 79 per cent of Uzbekistan's electricity and are dependent upon "technical water" for cooling purposes. Water shortage is a key risk to continuity of operation at these plants.

On average, 11.17 per cent of power generated in the period 2013–2018 came from 37 HPPs (table 12.5(b)). As at 2018, there was 1,914 MW of capacity installed. Forecasts are for the installed capacity to double by 2030. The reservoirs supporting the new HPPs will be expected to operate in "irrigation mode" when required. The new HPPs are not expected to significantly influence existing river flow, with existing dams used to balance the water levels.

Households

Drinking water supply

Most (60–80 per cent) of Uzbekistan's drinking water is supplied by groundwater, with the balance provided by surface water or other sources, including artesian wells. Due to widespread cases of unsanctioned use of groundwater, measures are now being taken to streamline activities that include the use of groundwater (2017 Resolution of the Cabinet of Ministers No. 430).

In Tashkent City, 99.8 per cent of the population are connected to the centralized drinking water supply network. This is despite significant growth in the last 5–10 years, with the population increasing from approximately 1.8 million in 2010 to 2.5 million in 2018. The SUE "Suvsoz", which operates the network in Tashkent City, reports a growth from 12,000 customers to 21,000 customers during this period.

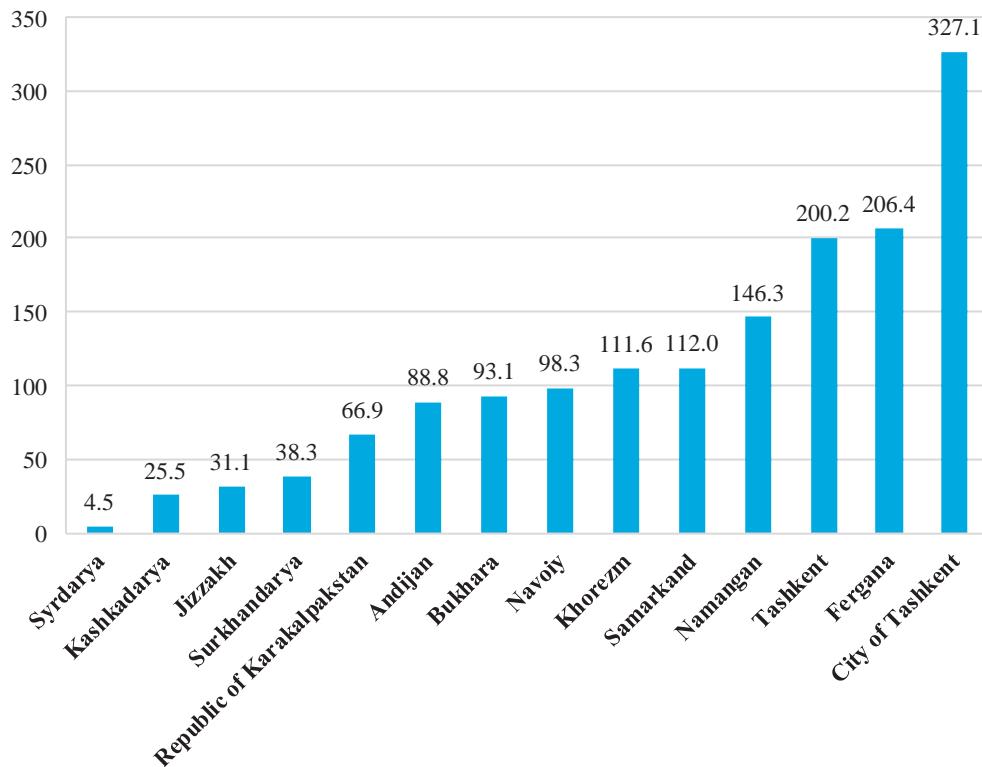
Water meters are compulsory for state organizations and legal entities, but not for the population. Residential customers are either metered or not, with two tariffs available – a volumetric tariff for those on a meter and a flat rate tariff for those who are not. It is estimated that approximately 60 per cent of the connected customers are metered. The consumers typically pay for the meter, with an estimated pay-back time of four years. Figure 9.2 demonstrates the penetration of water meters across Uzbekistan as at the end of 2017. It shows that the City of Tashkent has more than 300,000 water meters installed, while the number of meters in more rural oblasts is very low.

The Government estimates household water use per capita at 123 l/capita/day in 2017 and 124.9 l/capita/day in 2018.

Since 2010, Uzbekistan has carried out extensive work to improve the provision of high-quality drinking water to the population. In the period 2011–2016, approximately 13,000 km of water supply networks, more than 1,600 water wells, and 1,400 water towers and reservoirs were built and reconstructed across the country, increasing access of the population to safe drinking water. In early 2019, the water supply network is approaching 54,000 km in length and has nearly 2,500 pumping stations.

Despite the recent investment, there are still gaps in the provision of high-quality drinking water and sewerage services, with settlements including those in the Republic of Karakalpakstan, Bukhara, Jizzakh, Kashkadarya, Surkhandarya, Syrdarya and Khorezm Oblasts considered disadvantaged. Figure 9.3 illustrates the coverage of apartments and households with access to centralized drinking water supply. It shows that the City of Tashkent has nearly 100 per cent coverage of the population while coverage in rural areas in Samarkand Oblast is as low as 32 per cent. Averaged out, access to centralized drinking water supply is 76 per cent nationwide and 63 per cent in rural areas. Drinking water is delivered by mobile tanker to 10.3 per cent of the population. Box 9.2 shows the differences in access to utility services and the quality of those services.

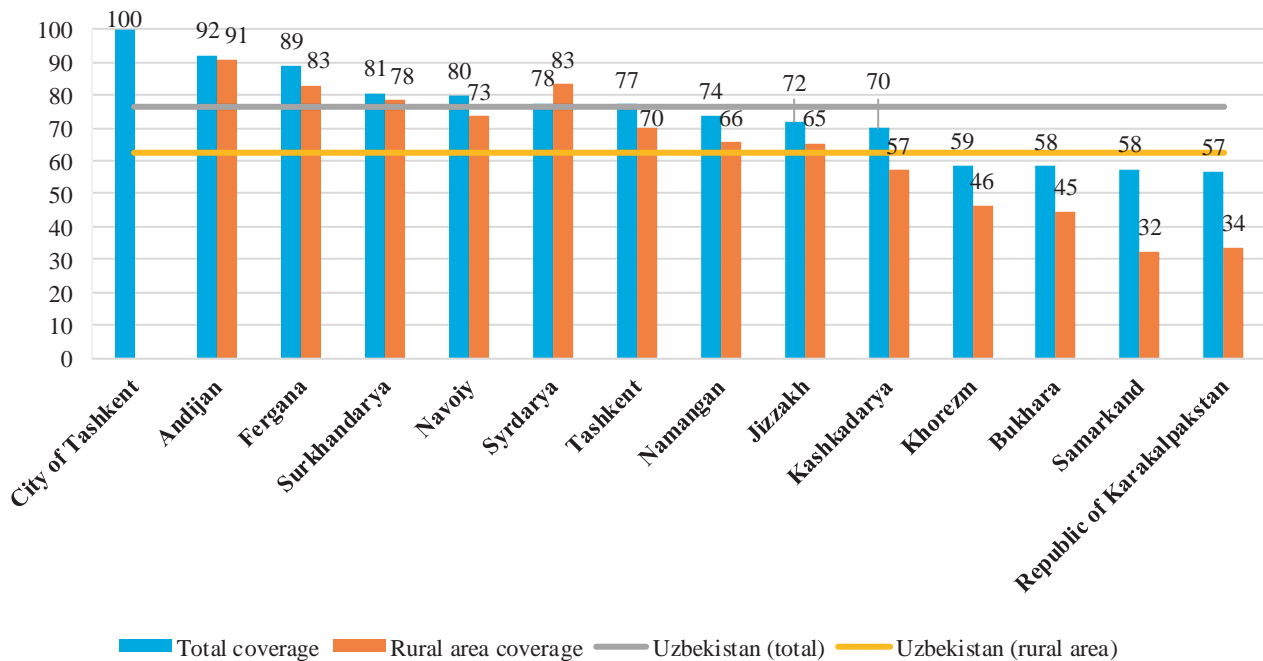
Figure 9.2: Installed water meters in apartments/households by region as at 31 December 2017, 1,000 units



Source: State Committee on Statistics, 2018.

Note: The share of apartments/households with installed meters in the total number of apartments/households is shown in figure 9.4.

Figure 9.3: Apartments/households with centralized drinking water supply by region as at 1 January 2018, per cent



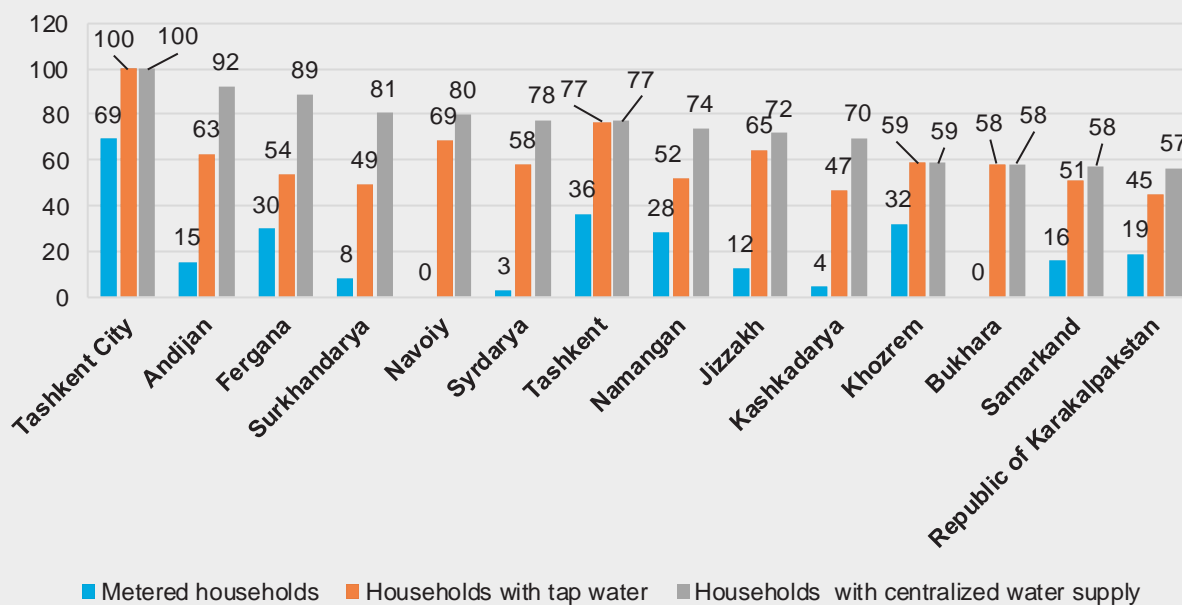
Source: State Committee on Statistics, 2018.

Box 9.2: Regional disparities in utility service provision

At the beginning of 2018, the population of Uzbekistan was 32.6 million, with 50.6 per cent located in urban areas and 49.4 per cent in rural areas.

A 2018 survey by the State Committee on Statistics shows a large range in the proportion of households connected to centralized water systems in different regions. Figure 9.4 summarizes the findings and shows that the City of Tashkent has 100 per cent coverage of apartments with centralized water supply systems and taps within the property, and approximately 70 per cent of properties are also metered. In contrast, in the Republic of Karakalpakstan, only 57 per cent of households have access to centralized water supply systems, 45 per cent have taps within the property and only 19 per cent have meters. This disparity in service provision would be expected to impact upon public health and the productivity of the local economy.

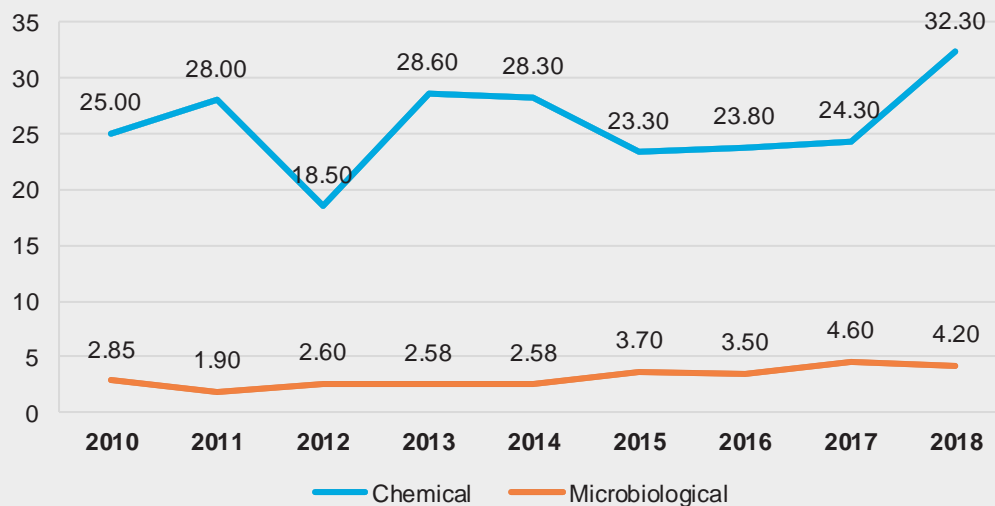
Figure 9.4: Households with access to centralized (piped) water supply systems, tap water within property and meters by region as at 1 January 2018, per cent



Source: ECE Secretariat calculations based on State Committee on Statistics Report, 2018.

While figure 9.4 shows access to water services, figure 9.5 considers the quality of those services. The Ministry of Health data for drinking water quality in the Republic of Karakalpakstan show non-compliance samples peaking at 32.3 per cent for chemical analyses and 4.6 per cent for microbiological analyses. This shows difficulties with proper management of centralized drinking water networks. Areas receiving timed supply of drinking water can often suffer from drinking water quality issues.

Figure 9.5: Average non-compliant samples from drinking water network in the Republic of Karakalpakstan, 2010–2018, per cent



Source: Ministry of Health, 2019.

In Tashkent City, there are seven water supply facilities, two of which draw on surface water and five on groundwater resources, to a total volume of 2.3 km³. The water supply network has 200 booster pumping stations. The network is undergoing substantial redevelopment, with recent investments including a significant project with support from EBRD, which has refurbished three large water supply facilities. SUE “Suvsoz”, the local water and wastewater service provider, reports that this US\$10 million project and the introduction of modern equipment has made it possible to save 1 million kW of power while delivering uninterrupted drinking water supply to Tashkent City. SUE “Suvsoz” has also focused on tackling leakage and network inefficiencies, with historic losses of 40 per cent now reduced to 20 per cent.

Wastewater treatment

Throughout Uzbekistan, 2.6 million m³/day of wastewater is collected through a sewerage network of nearly 6,000 km and more than 260 wastewater pumping stations. According to SUE “Suvsoz”, in Tashkent City, 80 per cent of wastewater is currently collected and treated. Significant investment in the asset base in Tashkent City is ongoing, including through a US\$30 million project with the EBRD to refurbish wastewater pumping stations. This project will help improve energy efficiency through modern pumping systems and aims to reduce the recent electricity consumption level of 300 million kWh/year to 100 million kWh/year.

The City of Tashkent has three large WWTPs and a sewerage network of 2,600 km. Approximately 91 per cent of the population are connected to the centralized service, with the balance served by septic tanks and mobile tankers. The three treatment plants are:

- Bozsu, a 750,000 m³/day capacity facility that discharges its effluent to the Bozsu irrigation canal;
- Salar, a 930,000 m³/day capacity facility that discharges into the Salar irrigation canal. As at early 2019, the plant operates at 89 per cent capacity with 830,000 m³/day treated;
- Bektimir treatment plant, with a capacity of 25,000 m³/day, which discharges into the Chirchik River.

All three facilities provide full biological wastewater treatment. The analysis of the effluent produced is conducted against a SCEEP-approved standard that is reviewed every five years.

Industrial discharges to the municipal wastewater network can be problematic, due to their characteristics and volume. Network operators (local water supply and wastewater service companies) have the power to set wastewater discharge limits into the network, with detailed rules specified in the legislation (2010 Resolution of the Cabinet of Ministers No. 11 and 2018 Resolution of the Cabinet of Ministers No. 820). There is also a penalty mechanism for those industrial entities that do not comply. In particular, Resolution No. 820 requires industrial facilities to have a pretreatment facility prior to discharge to a sewer. This requirement is yet to have a major impact in practice as the costs of installing a pretreatment facility are higher than the fines.

Households pay a flat rate user fee for sewerage services, while industrial sector users pay a volumetric fee based upon the water intake to the industrial facility. All customers receive one bill for wastewater and one bill for drinking water. Support schemes exist for vulnerable customers who face difficulty paying bills.

The sewerage network in Tashkent City suffers from a propensity for blockages and, due to its age and being clay pipe in certain locations, penetration by tree roots. It is a combined sewerage and storm water network, so does tend to have localized flooding issues in spring, when the rainfall is high and storm water is generated.

Sanitation access

According to the State Committee on Statistics, at the end of 2017, only 35.8 per cent of the housing stock in the country had sanitation services provided, and only 10.8 per cent in rural areas. There is a risk that drinking water and sanitation services may not keep pace with the rate of residential property development to meet the demand of the rapidly growing population of Uzbekistan. The cost of development of drinking water and sewerage networks and water and wastewater treatment plants is reported as a concern, with high costs a deterrent to investment by developers. Opportunities exist to revisit existing national design and construction standards (former SNiPs) for water supply and sanitation facilities, to lower unit capital and operation and maintenance costs without compromising service quality. This would ensure higher cost effectiveness of interventions in the sector funded from the public budget, private investors or donors, while softening the affordability constraints for consumers, households, housing developers and the public budget.

Developments in infrastructure

Since 2010, the Ministry of Water Management has invested US\$110 million for lining irrigation channels and US\$71 million for amelioration projects. An annual investment plan is developed, based upon asset quality and performance and prioritized need for investment. The plan would propose for example, the length of irrigation channels to be lined or pumping stations to be refurbished, and this would be submitted for government consideration.

Upgrading pumping stations with modern equipment or moving to gravity-fed systems where practicable has a significant impact upon power consumption. Uzbekistan will target 5 per cent power savings per year through enhanced infrastructure solutions and improved operations and maintenance (O&M) practices.

A range of IFIs and donors are involved in supporting water sector development in Uzbekistan. Recent projects have been completed with the support of the ADB, EBRD, Islamic Development Bank, Japan International Cooperation Agency and World Bank. New investments provide opportunities to increase capacity within water management and to deliver against strategic objectives. Therefore, it is important to maintain a focus on human capacity to support these investments, in addition to investment in water-saving technologies.

9.5 River basin management

In 2003, the Government initiated the transfer of water resources management from an administrative-territorial system to a basin management system (2003 Resolution of the Cabinet of Ministers No. 320, no longer in force). At that time, 10 basin irrigation system administrations (BISAs) were established, along with 50 irrigation system administrations (ISAs).

This structure was reviewed in 2017 to further move towards establishing water management on a hydrographic principle. The 2017 Decree of the President No. 5134 and 2017 Resolution of the President No. 3172 (both no longer in force) called for the reorganization of the Lower Syr Darya, Lower Amu Darya and Zarafshan BISAs. This reorganization created six BISAs: the Lower Syr Darya, Syr Darya-Zarafshan, Lower Amu Darya, Left-Bank Amu Darya, Zarafshan and Lower Zarafshan. In total, as at 2019, the Ministry of Water Management oversees the activities of 12 BISAs and the Ministry of Water Management of the Republic of Karakalpakstan. Twelve BISAs and the Ministry of Water

Management of the Republic of Karakalpakstan manage around 100 irrigation systems. Currently, all basin administrations are arranged within the borders of oblasts.

BISAs are funded directly from the state budget and employ 41,500 staff and specialists. Their main tasks are to manage the targeted and rational use of water resources, implement an integrated technical water management policy, and ensure uninterrupted and timely water supply to users, rational management of water resources within the basin, reliable measurement of water use, and water use accounting and reporting for water users and consumers.

The principal structural units of the BISAs are the main canal management organizations (MCMOs) and ISAs. Based on the approved abstractions for each river, the BISAs work with the MCMOs and ISAs to determine the water requirements and water delivery plans for each basin. The ISAs are responsible for working with individual WUAs to determine the water requirements for their members, typically, individual farms. There are approximately 1,500 WUAs providing water services to more than 80,000 water consumers.

While Uzbekistan does not have a legal requirement to develop river basin management plans (RBMPs), a number of projects have taken place to progress thinking in this area. An example is the draft Integrated Water Resource Management and Water Use Efficiency Plan for Zarafshan River Basin, developed in 2013 with the support of UNDP. The development of RBMPs in Uzbekistan would ensure the greater engagement of civil society and different categories of water users in water management.

9.6 Impact of and adaptation to climate change

The Central Asian region is threatened by the melting of mountain glaciers which are one of the main sources of formation of surface run-off.

The flood period in the region is gradually occurring earlier in the year, shifting from the traditional June–July to April–June. Flooding and mudflows occur increasingly in spring rather than summer.

A cross-governmental task force that includes the Ministry of Emergency Situations, SCEEP, Ministry of Water Management and State Committee on Geology and Mineral Resources is tasked with protecting the population from floods and mudslides and investigates mountainous areas annually, identifying areas deemed to be at risk of collapse. The

recommendations of this annual review can lead to populations being temporarily evacuated if the risk of flood in the coming season and levels of preparedness are deemed insufficient. Populations can be permanently relocated if the risk is deemed permanent and cannot be mitigated.

Another body, the State Anti-flood Commission, was established in 2017. The Ministry of Emergency Situations forms part of this Commission. The Commission submits data and recommendations to the Cabinet of Ministers for review.

Looking to the long term, Uzbekistan is concerned about diminishing freshwater reserves, particularly in the western region.

Also looking to the long term, the Tashkent Institute of Irrigation Engineers and Agricultural Mechanization and Uzhydromet are conducting hydrological studies and research on internal rivers. As glaciers retreat, it is anticipated that there will be a trend towards rainfall as the main source of water in rivers, changing the mode of formation of water resources. Irrigation periods will become shorter and crops may mature faster, and this will necessitate a review of the modes and norms of irrigation.

The ongoing research and activities in this area are led by a number of agencies. Given the importance of the issue, this area of adaptation lends itself well to a coherent strategy to align activities and prepare for future challenges.

9.7 Legal, policy and institutional framework

Legal framework

The 1993 Law on Water and Water Use targets the efficient use of water, protection of water from pollution or depletion, improving the condition of water bodies and protecting the rights of citizens and enterprises with regard to water. The Law assigns a priority to the supply of drinking and domestic water to the population over other uses. It generally prohibits the use of groundwater of drinking water quality for uses other than drinking water supply. In 2013, a draft water code was developed to replace the 1993 Law, but it was not adopted.

The 2017 Resolution of the Cabinet of Ministers No. 430 includes measures to further streamline activities that include the use of groundwater. This Resolution includes Appendix No. 1 “Regulation on the issuance of permits for drilling water wells” and Appendix No. 2 “Regulation on state monitoring of groundwaters”.

The 2013 Resolution of the Cabinet of Ministers No. 82 “On approval of the Regulation on water use and water consumption in the Republic of Uzbekistan” defines water allocation procedures among various uses of water. The limits of water intake are defined first for drinking, medicinal and municipal needs, then for industry, then for agriculture and, last, for environmental flow.

The 2010 Resolution of the Cabinet of Ministers No. 11 “On additional measures to improve environmental protection activities in the utilities system” defines the rules for acceptance of industrial wastewater discharges in municipal sewerage networks and the system of “compensation payments” (in fact, fines) for discharges in excess of allowed limits.

The 2017 Resolution of the President No. 2954 “On measures to strengthen control and accounting for the rational use of groundwater resources in the period 2017–2021” aims to preserve precious groundwater resources from overabstraction.

Several standards aim at ensuring drinking water quality:

- SanPiN No. 0200-06 “Sanitary rules and norms of hygienic assessment, definition of classes of surface water and groundwater sources, and their selection for centralized drinking water supply of the population of Uzbekistan”;
- O’zDST 951:2011 “Sources of centralized drinking water supply. Hygiene, technical requirements and selection rules”;
- O’zDST 950:2011 “Drinking water. Hygiene requirements and quality control”.

There are concerns with compliance with a number of elements of the existing legal framework. In particular, the performance of industrial enterprises with regard to water conservation and pretreatment of effluents prior to discharge is considered an issue.

The legal framework does not yet necessitate the production and implementation of RBMPs. In particular, this misses an opportunity to fully engage the range of stakeholders in line with the integrated water resources management (IWRM) approach.

Policy framework

The Programme for Integrated Development and Modernization of Drinking Water Supply and Sewerage Systems for the period 2017–2021 (2017 Resolution of the President No. 2910) provides for the construction and reconstruction of 10,200 km of water conduits and pipelines, 1,677 water wells and 1,744

water towers and reservoirs, as well as installation of 1,440 pumping facilities, with a number of projects already delivered under this programme. A Clean Water Fund (now called the Fund for Development of Water Supply and Sanitation Systems) was established as part of this programme to provide funds for improvement and modernization of the whole water supply and sewerage system and provision of the population with quality drinking water, particularly in rural areas.

The 2018 Resolution of the President No. 4040 “On additional measures for the development of drinking water supply and sewerage systems in the Republic of Uzbekistan” approved programmes for the phased reconstruction and construction of sewage treatment plants in 20 cities of the country.

The Programme of Measures for Further Development of Hydropower in the period 2017–2021 (2017 Resolution of the President No. 2947) details steps towards developing hydropower potential through construction of 42 new HPPs and refurbishment of an existing 32 HPPs. The Programme aims to increase hydropower capacity by 1.7 times by 2025. The Programme considers 18 construction projects and 14 refurbishment projects for a total of US\$2.65 billion.

The policy framework does not yet cater for the use of RBMPs. The framework does not sufficiently focus on the use of economic instruments and cost recovery with regard to the use of groundwater and surface water. Progress in this area would help support conservation objectives. Policies regarding the use of water metering, particularly at the water user level, would also support wider conservation objectives.

Linkages between land use planning and water management are not sufficiently present in the current policy framework. This is the case for agricultural, municipal and industrial projects, where opportunities exist to ensure water quantity and quality considerations in the development of new projects. Municipal projects need to consider access to good quality drinking water and sanitation and encourage consumers to use water wisely. Industrial projects need to consider the effluent produced and any pollution impacts, while also considering the opportunities for water reuse within an industrial facility and the need for on-site treatment prior to the release of any discharges. Agricultural projects need to consider the current and long-term availability of water, the impact of changes in crop type or irrigation technology, and water quality, particularly in terms of

drainage. Stronger linkages between land use and water management, as early as possible in the planning process, has potential to realize planning objectives and promote water-efficient behaviour.

Sustainable Development Goals and targets relevant to this chapter

The current status of Uzbekistan vis-à-vis selected targets under Goal 6 of the 2030 Agenda for Sustainable Development is described in box 9.3.

Institutional framework

In 2018, the Ministry of Agriculture and the Ministry of Water Management were established out of the former Ministry of Agriculture and Water Management.

The responsibilities of the Ministry of Water Management include:

- The development and implementation of a water resources management policy in conjunction with all stakeholders, which focuses on efficient water use and protection of water resources;
- Ensuring each region and sector of the economy is provided with sufficient water resources;
- Operation and maintenance of irrigation and land reclamation infrastructure, reservoirs, pumping stations and other water management and hydraulic structures;
- Increasing the awareness and engagement of water users to promote efficient water use throughout the country;
- Introducing modern water-saving technologies and best practice with regard to water management;
- The development of human capacity through the training of water sector specialists;
- Working internationally to develop interstate relations in the management of transboundary water resources, attraction of foreign investment and technical assistance and participation with international organizations in the field of water management.

In fulfilment of part of these duties, the Ministry of Water Management has already established a working group to meet donors and look at infrastructure needs and opportunities, and a cross-ministerial working group to consider roles and responsibilities and their delineation within the sector.

Box 9.3: Selected targets under Goal 6 of the 2030 Agenda for Sustainable Development**Goal 6: Ensure availability and sustainable management of water and sanitation for all**

Goal 6 has been nationalized by Uzbekistan as “Conservation and rational consumption of water and sanitation for sustainable development and their availability for all”.

Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all

Target 6.1 has been nationalized by Uzbekistan as “By 2030, achieve universal access to safe drinking water”, therefore omitting the equitability and affordability aspects of the global target. The national indicator aims to consider access of the population to drinking water as follows:

6.1.1 Proportion of population using:

- a) centralized water supply;
- b) alternative sources of water supply.

As drafted, the national indicator does not consider affordability of connection or quality of connection and these elements could be considered for future development. Furthermore, it leaves the “safety” aspect outside the indicator, somewhat presuming that “centralized” water supply is safe, whereas this is not always the case.

The data provided by the State Committee on Statistics indicate that access to centralized drinking water supply is, on average, 76 per cent nationwide and 63 per cent in rural areas (figure 9.3). An estimated 6 hours/day are spent by residents without access to centralized water supply receiving water from alternative sources (including transportation, storage and purification (<http://nsdg.stat.uz/>)). According to the Ministry of Housing and Communal Utilities, the situation is less optimistic: only about 63.5 per cent of the population are covered by centralized drinking water supply services, whereas about 25 per cent of the country population are to use wells, springs, rivers and other water sources, and about 10 per cent depend on water supplied by carriers (chapter 17).

The reporting by Uzbekistan under global indicator 6.1.1 indicates 86.5 per cent of the population using safely managed drinking water services in urban areas in 2015; there were no data for rural areas (<https://unstats.un.org>).

Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations

This target has been nationalized by Uzbekistan as “By 2030, achieve access to adequate and equitable sanitation and hygiene, paying special attention to the needs of vulnerable populations”. Open defecation is not an issue in Uzbekistan. As drafted, there is no indication of gender. Nevertheless, gender issues feature prominently with regard to access to water and sanitation in Uzbekistan (chapter 17) and this should be considered for inclusion for completion.

Two national indicators have been approved under target 6.2:

- 6.2.1.1 Proportion of population using safely managed sanitation services and a hand-washing facility with soap and water (similar to global indicator 6.2.1);
- 6.2.1.2 Proportion of population covered by centralized sewerage system.

Although the entire population in the country has access to a basic sanitation, according to the Ministry of Housing and Communal Utilities, in early 2019 only about 15.6 per cent are connected to centralized sewage.

Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

When nationalizing target 6.3, Uzbekistan omitted “halving the proportion of untreated wastewater”, part of the wording of the global target. Two national indicators were approved under target 6.3:

- 6.3.1 Proportion of wastewater safely treated (the same as global indicator 6.3.1). Uzbekistan reports to have safely treated 99.3 per cent of wastewater in 2017 (<http://nsdg.stat.uz/>);
- 6.3.2 Water pollution index (WPI). This indicator is considered well established and the country intends to use its national WPI system for tracking it.

Target 6.4: By 2030, substantially increase water-use efficiency across all sectors of economy and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

Two indicators are developed under target 6.4:

- 6.4.1 Change in water-use efficiency over time. The global indicator on water-use efficiency tracks the extent to which a country's economic growth is dependent on the use of water resources, and enables policymakers and decision-makers to target interventions at sectors with high water use and low levels of improved efficiency over time. This indicator tracks the value added (US dollars) per volume of water withdrawn (m³), by a given economic activity over time. Uzbekistan reports for 2015 US\$1.2 per m³ of water. This figure is the lowest of all countries that reported against this indicator for 2015 (<https://unstats.un.org>);
- 6.4.2 Level of water stress: Freshwater withdrawal as a proportion of available freshwater resources. The indicator tracks how much freshwater is being withdrawn by all economic activities, compared with the total renewable freshwater resources available. Building on the Millennium Development Goals indicator (Proportion of total water resources used), it also accounts for environmental water requirements. The indicator includes water withdrawals by all economic activities, with a focus on agriculture, manufacturing, electricity, and water collection, treatment and supply. Uzbekistan reports a figure of 136.9 per cent for 2015, suggesting unsustainable abstraction (<https://unstats.un.org>). This figure is the second highest of all countries that reported data for 2015, suggesting the need for action in this area.

Target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

Target 6.5 has been nationalized by Uzbekistan without changes but omitting global indicator 6.5.2 (box 6.5).

For indicator 6.5.1 (Degree of integrated water resources management implementation (0–100)), Uzbekistan scores at 45 per cent (medium-low) in 2017. The indicator relates to the degree to which IWRM is implemented, derived from responses by the country to a survey with questions relating to each of the four components of IWRM: enabling environment, institutions and participation, management instruments and financing. The survey takes into account the various users and uses of water, and has the aim of promoting positive social, economic and environmental impacts at all levels, including the transboundary level, where appropriate.

While progress can be achieved in all aspects of implementation of IWRM, the indicator highlights some key focus areas. For enabling environment, Uzbekistan scored an average of 38.3 per cent, with the lowest scores of 30 per cent for “National law(s) in the field of water resources” and “Subnational strategy in the field of water resources and management plans and so forth at the level of the basin/aquifer based on IWRM”.

The questionnaire responses against financing also scored low, securing an overall score of 34 per cent. A score of 20 per cent was achieved for “Income, received from the relevant charges from water users at the basin level, at aquifer or at the subnational level” and 30 per cent for “National budget for financing of recurrent costs of IWRM components” and “Subnational budgets or budgets at the basin level, including infrastructure of water resources”.

In contrast, Uzbekistan scored 70 per cent for “National monitoring of available water supply (includes surface and/or groundwater)” under the category on management instruments, and also for “Organizational structure of transboundary water management for the most important basins/aquifers” under the category on institutions and participation, and “The agreements on transboundary water resources management in most important basins/aquifers” under enabling environment, demonstrating areas of comparative strengths of Uzbekistan with regard to IWRM.

Target 6.b: Support and strengthen the participation of citizens' self-government bodies in improving water and sanitation management

The global target and its indicator were nationalized by Uzbekistan without changes. As at early 2019, some scoring is available for Uzbekistan in the global database (<https://unstats.un.org>), but it does not allow clear analyses to be made.

The Ministry of Agriculture now focuses on implementing the policy on agriculture and food security, aiming at modernization of the sector and introduction of resource-saving technologies and best agronomic practices. Of particular relevance to water management is the policy development around irrigation technologies and crop plantation. The policies around land allocation for cotton and other crops, as Uzbekistan considers agricultural productivity and the gradual shift to higher value crops that consume less water, will have a significant impact on long-term water management.

The Ministry of Housing and Communal Utilities is a new ministry established in April 2017 to increase

coordination, action and customer service around critical utility services, including drinking water and sewerage services. With particular regard to water management, the Ministry is responsible for the development and modernization of water supply facilities and sewerage facilities, formation of a tariff policy for water supply and sewerage services (in conjunction with the Ministry of Finance) and capacity development of staff working in the sector.

The responsibilities of the Ministry of Emergency Situations include prevention of natural and human-made emergency situations and civil protection.

The Ministry of Health oversees the work of the State Sanitary and Epidemiological Surveillance Service (SSESS). It is responsible for monitoring drinking water quality for microbiological and chemical contamination.

The responsibilities of Uzhydromet under the Cabinet of Ministers include the monitoring of the hydrological regime and quality of rivers, lakes and reservoirs. A database is maintained, with key information being routinely shared with governmental stakeholders and used to produce its annual monitoring report.

The State Committee on Geology and Mineral Resources conducts exploration and research with regard to groundwater, issues permits for groundwater abstraction and registers groundwater users.

The State Committee on Ecology and Environmental Protection (SCEEP) controls discharges of industrial wastewater by enterprises. SCEEP inspectors visit each enterprise on a quarterly basis. For persistent offenders, this inspection frequency can be increased.

In 2017, the State Inspectorate for Control over Drinking Water Use (Gosvodinspektsiya) was established under the Cabinet of Ministers. The State Inspectorate and its territorial branches control the compliance with requirements on drinking water production and transportation, provision of sanitation and wastewater treatment services. Gosvodinspektsiya verifies how water and wastewater enterprises comply with requirements of the legislation.

Since 2017, JSC Uzbekhydroenergo brings together the Uzbekenergo and Uzsuvenergo HPPs. This entity aims to increase the efficient use of hydropower, form a single water and energy resources management system and gradually increase the share of renewable hydropower resources in the energy production system.

In Tashkent City, drinking water supply and wastewater treatment is provided by the SUE “Suvsoz”. It is responsible for the operation of water and wastewater assets, developing proposals for infrastructure development or renewal and maintaining the relationship with customers, including tariff collection. In 2018, the city’s water infrastructure was separated from the Ministry of Housing and Communal Utilities, so “Suvsoz” is required to report directly to the khokimiyat (mayor)’s office. This is a one-year trial until October 2019.

In the oblasts, similar structures exist in the form of SUEs responsible for water and wastewater services

and coordinated by the Ministry of Housing and Communal Utilities.

Basin irrigation system administrations (BISAs) are responsible for the development, operation and maintenance of infrastructure and delivery of surface water within each region. Each BISA consists of a main canal management organization (MCMO) and irrigation system administrations (ISAs) and delivers water to the boundary of WUAs. WUAs provide services in water distribution and the operation and maintenance of on-farm irrigation and drainage systems. Water users pay a fee for this service rather than for the volume of water used.

The Fund for Development of Water Supply and Sanitation Systems (formerly the Clean Water Fund) is a state fund that finances investments in construction and rehabilitation of water supply and sewerage networks (chapter 3).

Coordination among various institutions in the water sector

The management of water in Uzbekistan is fragmented, with many actors involved. Each actor is responsible for developing its own strategy and policies and also for monitoring and collecting data. While significant data are collected on water quantity and quality, opportunities remain for coherent use of data and information to inform decision-making and prioritize action. Opportunities exist to coordinate the various activities, align strategic frameworks and harmonize the use of data collected to generate the information required by decision-makers. This is particularly acute for compliance and enforcement regarding discharges to the environment. A number of agencies are involved in water quality monitoring, with samples taken against a prior agreed schedule. Samples are taken by enterprises at source, and within urban areas and upstream and downstream of urban areas by different government agencies. Sharing this data promptly can lead to appropriate compliance and enforcement action, preventing immediate environmental issues and also flagging activities requiring investment and longer-term interventions, e.g. new collection or treatment infrastructure.

Given the significance of agriculture as the major water user in the country, it is vital that policy coherence is achieved and that efforts are aligned to increase agricultural productivity and conserve water. The “nexus” of water, food, energy and land use requires coordination across government to allow development of robust cross-sectoral policies and drive resource security. The ADB’s Asian Water Development Outlook 2016 ranked Uzbekistan at

“Level 2 – engaged” in a five-tier scoring system with regard to water security, illustrating that there are significant opportunities to improve coordination.

Regulatory and economic measures

With regard to management of groundwater, the abstraction of water is controlled by a regulatory framework. The hydrogeological stations of the SUE Uzbekhydrogeology at the State Committee on Geology and Mineral Resources issue permits for drilling wells for access to groundwater. The cost of drilling the well is at the expense of the applicant. Records of water use are expected to be kept in line with the requirements of the permit. Hydrogeological stations of Uzbekhydrogeology also issue permits for special water use or consumption. These permits aim to control the use of groundwater and limit overabstraction.

The Ministry of Water Management, through its 13 BISAs at oblast level and 43 ISAs at local level, issues permits for special water use for irrigation.

Drinking water and wastewater tariffs, and any proposed increases, are approved by the Ministry of Finance. The drinking water and sanitation tariffs in Tashkent City, levied by SUE “Suvsoz”, are closely linked to electricity consumption, with power costs forming 27 per cent of the tariff. Therefore, if electricity costs increase, this creates pressure to increase drinking water and sanitation tariffs. There is a tariff methodology that is periodically reviewed. SUE “Suvsoz” currently reports that approximately 15 per cent of its customer base do not pay their bills. Low bill collection rates across the country pushed the Government to introduce stringent measures: as of 1 January 2018, all water supply services are subject to receiving 100 per cent prepayment of average monthly bills from all customers.

In rural areas, 3.3 million people are reliant on mobile tankers for delivery of water. Prices for water delivered by tanker range from 10,000–25,000 sum per m³, with the fee linked to distance travelled and terrain.

The abstraction of water from natural sources is subject to payment of a water use tax. There are a number of tax exemptions, however, that weaken incentives for more rationale use of water. For example, water utilities can abstract water for production of drinking water for the population free of charge; they only have to pay for water resources used for their own needs (chapter 3). Irrigation water users do not pay for their water consumption, but only pay for the transport of water and for the maintenance of

the channels and related infrastructure (chapters 3 and 13).

Poor availability of metering to monitor water use at the “field level” has a number of ramifications; as well as preventing accurate water use measurements and demand forecasting, it precludes the development of economic instruments, such as a fee for volumetric water use. Under the present monitoring regime, irrigation norms are applied so that farmers are charged per hectare of land irrigated rather than a fee linked to the volume of water consumed or the crop grown. This means that there are no incentives for efficient water use and no robust data to manage supply and demand.

Information measures

The State Water Cadastre, maintained by Uzhydromet, contains annual and long-term data on the surface water regime and resources, as well as information on the use and quality of both surface water and groundwater resources (chapter 4).

The information portal CAWater-Info is maintained by the Scientific and Information Centre of ICWC (as of 2012, with financial support from Uzbekistan). The portal provides information on the state of water resources in Uzbekistan and Central Asia and transboundary water management in the subregion.

9.8 Assessment, conclusions and recommendations

Assessment

Since 2010, Uzbekistan has made progress in many areas of water management, in particular in the area of investment in new capital infrastructure to increase access to drinking water and sanitation and for refurbishment of irrigation infrastructure to reduce water losses. In parallel with this investment, significant reform is ongoing to improve water-use efficiency and the productivity of agriculture, with water being increasingly diverted to higher value crops, along with efforts towards the installation of efficient irrigation equipment and adoption of effective practices.

Reorganization of line ministries, including the formation of the Ministry of Water Management and the Ministry of Housing and Communal Utilities in 2017–2018, has recently been completed in an attempt to add focus to the key issues of water resources management and water supply and sanitation. The need to move towards the principles of IWRM remains, in particular towards greater stakeholder

involvement in policymaking and decision-making, despite some progress in this area.

Concerns remain about the impact of industrial discharges to the sewerage network or the environment, disparity in access to and the performance of rural water supply and sanitation systems, and general water availability and long-term sustainability. Underpinning these long-term concerns is the fact that water management remains fragmented, with many actors involved.

Access to adequate and affordable water supply and sanitation services in line with Sustainable Development Goal 6 remains a concern. While work is being done to improve access, quality of service remains an issue.

Conclusions and recommendations

Cross-sector coordination and integrated water resources management

Policy coherence, cross-ministerial dialogue and IWRM are considered key to the progression of Uzbekistan's water management ambitions. Concerns over long-term future water supply and demand, land use and the role of water in supporting policies for economic growth expose water allocation and water security issues.

A cross-ministerial policy dialogue, also involving the private sector, academia, civil society and development partners, has the potential to address some of the policy coherence concerns outlined above. ECE and the OECD have experience in facilitating these platforms in Eastern Europe, the Caucasus and Central Asia. Key outcomes of the national policy dialogues on IWRM typically take the form of evidence-based policy packages oriented towards practical implementation.

A national policy dialogue on IWRM in Uzbekistan could facilitate broad consultations and deliver analysis to support the Government's objectives and strategic direction for the water sector. It would establish the evidence base to support strategy and policy decisions and provide a platform for consultation on issues ahead of presentation to the Government. Tackling the coordination of data management would be key to supporting this overall objective.

Recommendation 9.1:

The Cabinet of Ministers should improve policy coherence, cross-sectoral cooperation and coordination with the wider water community by:

- (a) *Improving the cross-sectoral collection, sharing and use of data;*
- (b) *Developing a roadmap of key strategic objectives for the water sector as a whole, to allow focus of action;*
- (c) *Considering the establishment of a national policy dialogue on integrated water resources management.*

Capital infrastructure investments to tackle regional disparities and increase water-use efficiency

There are disparities in access to and quality of water supply and sanitation services in Uzbekistan. This is true among different oblasts and also between urban and rural areas. A range of investments has been delivered to bridge this disparity, including the recent Programme for Integrated Development and Modernization of Drinking Water Supply and Sewerage Systems for the period 2017–2021 to ensure provision of centralized drinking water to apartments and households. Investments of this type make a real difference to the day-to-day lives of citizens, improve public health and productivity and contribute directly to Uzbekistan's commitments under the Sustainable Development Goals, in particular Goal 6. However, at present, sanitation services do not keep pace with the provision of drinking water supply. Addressing provision of these vital services at the planning stage is key to preventing the deferral of problems to a future development stage, when retrofitting of utility services may be difficult. As the cost of developing drinking water and sewerage networks and water and wastewater treatment plants is reported as a concern, opportunities exist to revisit existing national design and construction standards (former SNIps) for water supply and sanitation facilities to ensure appropriate plant is developed at the appropriate time.

A range of investment opportunities also exists to increase water-use efficiency. Whether for the lining of canals, updating of irrigation infrastructure with technologies such as drip irrigation or improving of drainage facilities, these investments are to be developed in areas where the maximum impact can be realized. Monitoring impact after investments have been delivered would also help focus future plans.

Recommendation 9.2:

The Cabinet of Ministers should continue progress in infrastructure development by:

- (a) *Identifying priority communities and settlements to target for expansion of sustainable water supply and sanitation infrastructure;*

- (b) *Initiating the review of national design and construction standards for water supply and sanitation facilities in rural areas, to reduce capital and operational costs and make infrastructure more affordable;*
- (c) *Identifying priority investments that could be made to refurbish existing irrigation infrastructure and improve collector-drainage systems, with a focus on investments that would make a step change in efficient water management, reduce land salinity and increase agricultural productivity;*
- (d) *Designing appropriate financing mechanisms to support these investment programmes and human and technical capacities to support the investments.*

See Recommendations 13.2 and 17.4.

Water efficiency and conservation

A range of activities is ongoing in Uzbekistan to consider efficient irrigation practices and increase agricultural productivity. This has focused on efficient irrigation technologies, including the roll-out of drip irrigation where appropriate, moving to shorter furrows and alternate watering of furrows, and also changing crop type, to reduce the production of cotton and replace it with higher value crops, including orchards and vineyards. In urban areas, industrial water users have the opportunity to embrace efficient manufacturing and processing operations and look for

opportunities for effluent recycling and treatment before release to the environment. There are also opportunities to tackle water consumption in the growing residential population. However, the linkages between land use planning and water management are not sufficiently present in the current policy framework to ensure that water quantity and quality considerations are duly taken into account in the development of new agricultural, municipal and industrial projects.

Recommendation 9.3:

The Cabinet of Ministers should continue its efforts to drive efficient use of water in all sectors of the economy and by all water users by:

- (a) *Developing policies and strategies to support water efficiency, including metering schemes to monitor consumption and financial incentives for purchasing water-efficient technologies and investment in the human capacity and awareness campaigns to support effective roll-out;*
- (b) *Embedding water-efficient principles in land use planning to ensure that best practice in this area is adopted from the start of new municipal, industrial or agricultural developments;*
- (c) *Ensuring that agricultural policies and strategies are coordinated with water management objectives so that the necessary crop mix, irrigation technology and practice and required water volume are aligned.*

Chapter 10

WASTE AND CHEMICALS MANAGEMENT

10.1 Practices and trends in municipal waste management

Generation and collection

Generation of municipal solid waste (MSW) is estimated from norms on waste generation. These norms are defined in kilograms or in cubic meters of waste per person per day, differ from oblast to oblast and are approved by the local administration. Due to the lack of reliable data, the generation of MSW was estimated by the State Committee on Ecology and Environmental Protection (SCEEP) based on the value of 219 kg/person/year, which it considered to be a typical MSW generation value for Uzbekistan (table 10.1).

In 2018, information on the composition of MSW was published by SCEEP (table 10.2). Prior to that, as part of the Asian Development Bank (ADB)'s Uzbekistan Solid Waste Management Investment Project 2, an

analysis of MSW was done at high-rise and low-rise residential areas in Mirzo Ulugbek District, Tashkent City, from October to November 2012. As each waste analysis was based on a different methodology, the results are not directly comparable.

The population covered by waste collection services numbered more than 15.7 million (53 per cent of the country's population) in 2018. Of that number, SUE "Makhsustrans" in Tashkent City served 1.2 million, Toza Khudud enterprises served 9.7 million and private companies served 3.7 million people.

Waste is disposed of in three types of sites (table 10.3). Official dumpsites include those that are recognized by local administrations as areas designated for waste disposal; unofficial dumpsites are sites that are regularly used but were not designated for disposal; and other dumpsites are those that are used irregularly and only limited or unverified information on them is available.

Table 10.1: MSW generation, 2010–2017, 1,000 t

	2010	2011	2012	2013	2014	2015	2016	2017
MSW	6 132.3	6 378.0	6 472.6	6 568.6	6 677.9	6 793.9	6 914.9	7 034.3

Source: State Committee on Ecology and Environmental Protection, 2018.

Table 10.2: MSW composition

	SCEEP (2018)	ADB (2012)	SanPiN (2011)
Food waste	27.53	64.06	38.4
Garden waste	12.91	..	..
Paper and cardboard	3.22	6.84	18.9
Mercury lamps, medical and wireless powered devices	0.29	0.71	0.0
Glass	4.62	6.56	3.7
Plastics	7.91	11.31	..
Metals	1.38	1.75	3.4
Construction waste	3.32	0.71	8.9
Textiles	3.28	1.81	3.9
Leather, rubber, bones	2.29	1.29	0.8
Wood	1.42	..	4.9
Other	31.83	4.96	17.1

Source: State Committee on Ecology and Environmental Protection, 2018; ADB Waste Characterization Study, 2012; 2011 SanPiN No. 0297-11.

Note: ADB data reflect the situation in Tashkent City only. Garden waste is included in food waste in the analyses of the ADB and SanPiN. In the analysis provided in the SanPiN, plastics were included in Other waste.

Table 10.3: MSW dumpsites, 2017, number

	Official	Unofficial	Other*
Republic of Karakalpakstan	17	12	804
Andijan	15	29	1 865
Bukhara	15	26	1 137
Jizzakh	10	250	..
Kashkadarya	16	141	1 384
Navoiy	9	10	695
Namangan	12	96	1 786
Samarkand	15	86	2 502
Surkhandarya	18	12	1 613
Syrdarya	12	83	498
Tashkent	23	96	2 358
Fergana	15	15	2 091
Khorezm	9	75	1 217
Total	186	931	17 950

Source: State Committee on Ecology and Environmental Protection, 2018.

Note: * not confirmed.

Tashkent City

The system of MSW management for Tashkent City was introduced by the Tashkent Solid Waste Management Project (1999–2006) financed by the World Bank and EBRD.

Waste collection

Collection of MSW in Tashkent City is undertaken by the specialized company SUE “Makhsustrans”. Secured MSW points are used for collection of MSW in densely populated areas and in low-density areas waste is brought to collection vehicles by residents. Secured MSW collection points were originally introduced under the project with the idea of preventing damage to containers and maintaining cleanliness around containers, but the operators of MSW collection points started to sort waste brought by residents. In 2018, about 700 manned MSW collection points and 12,000 containers were available in densely populated areas of Tashkent. MSW is delivered to three transfer stations.

The fleet of waste collection vehicles acquired under the project was not properly maintained, due to a shortage of financing, and the need for additional waste services was satisfied by allowing private companies to serve Tashkent. As of 2018, 55 per cent of MSW in Tashkent is collected by “Makhsustrans” and 45 per cent by private companies. Selection of private operators is conducted through electronic auctions.

The transfer stations compact received waste into dedicated cylindrical containers with a capacity of 20 tons. MSW is weighed at the entrance. The amount of

MSW delivered to transfer stations is 1,400 tons per day or 650,000 tons per year. However, after 15 years of operation and minimal maintenance, a lack of financing and no regular investments to renew the vehicle fleet or make general repairs to equipment, transfer stations and long-haul vehicles are in need of repair or replacement.

Waste disposal

Waste generated in Tashkent is disposed of at the landfill at Akhangaran, located 22 km south-east from the centre of Tashkent. The landfill, which started operation in 1967 as an uncontrolled dumpsite, was upgraded during the period 2000–2005. A weighbridge, garages and a personnel building were built and the covering of waste with inert material was introduced. The landfill was equipped with a compactor and other vehicles needed for landfill operation and access to the site was guarded by police. As at March 2019, vehicles are not operational, except for one bulldozer; therefore, waste is not compacted and fires caused by self-ignition are occurring. The protection of the site was transferred to a private security company, which is not sufficiently deterring people who enter the site at night and scavenge scrap metals. In addition, the capacity of the site will be exhausted within several years.

This landfill will be closed and “Makhsustrans” has contracted a South Korean company, Sejin, to perform the closure and rehabilitation works on the landfill in exchange for the right to collect and burn landfill gas under the carbon credit scheme. It is expected that electricity generation from the landfill gas will achieve a capacity of 16 MW.

Photo 10: MSW collection point in Tashkent City

Photo credit: State Committee on Ecology and Environmental Protection

Ongoing projects

To remediate the situation in MSW management in Tashkent, a loan of US\$69 million from the ADB was agreed and the Solid Waste Management Improvement Project 2 started in December 2014 and is planned to end in 2021. By June 2018, 13,500 new containers had been purchased. Then an additional 4,050 containers were purchased under a separate contract. The network of waste collection points was extended by 150 units. A US\$13 million contract for delivery of 182 collection vehicles and special vehicles was signed and these vehicles were delivered.

A new sanitary landfill will be developed in the area neighbouring the existing Akhangaran landfill. This new landfill will have capacity for the next seven years, with the possibility of extension for the following 50 years.

Other cities

Waste collection

Collection of MSW in other cities is carried out by municipal and private companies. MSW is typically accumulated in MSW collection points fenced off with

brick walls, usually without containers, or is accumulated at the curbside or delivered to a passing collection vehicle. Collected waste is transported out of the city to the municipal dump.

Although responsibility for waste management was assigned to local administrations (khokimiyats), in practice, the main responsibility falls to makhallas (traditional self-governing communities) and shirkats (apartment block owners' associations). Shirkats are subordinated to makhallas. The population of a makhalla may be about 2,000–3,000 people, while that of a shirkat is typically 200–500 people. Leaders of makhallas and shirkats decide where waste collection points are established, assign persons responsible for their maintenance, often collect additional money to ensure that waste is collected (besides regular waste fees paid by the population), agree collection schedules and, in the event a regular collection vehicle fails to collect waste, hire a private truck and driver to transport waste.

All makhallas have their own street sweeping staff and streets are cleaned on a daily basis; thus, littering is not considered a problem. If a waste bag is dropped on the way to a waste collection point, the street sweeping staff must carry it to a waste point.

Daily collection is a standard requirement, defined by the legislation and requested by the population. But this creates a pressure on collection companies as they usually do not have enough vehicles to meet this requirement. This situation is caused by the lack of containers, irregular or no cleaning of them and bad experience with using old types of containers, which are rectangular, leave waste remains in the corners and generate odours.

The problem of ensuring regular and reliable collection of MSW is considered by central and local administrations, who are searching for optimal service arrangements. Municipal companies are gradually being replaced by private companies, but the private sector is still too weak to meet the challenge. Regular waste collection is a new market for private companies, which lack experience in this type of service, as, traditionally, private companies were providing waste collection for individual or small businesses on an irregular basis. Also, specialized collection vehicles are owned by the municipality, which does not allow a private company to introduce its own operational standards, but it must improvise with the equipment available to provide a waste collection service. The latest government initiative started in 2017 with the creation of Toza Khudud (Clean Zone) enterprises on a regional basis, which should develop a countrywide infrastructure for integrated waste management.

Waste disposal

The number of dumpsites used in Uzbekistan is known (table 10.3) but details of their operation are not yet collected and summarized. Typically, cities other than Tashkent dispose of their waste on allocated sites, usually on the city outskirts. Such sites do not include barriers controlling pollution or surface water control. Access control is limited to recording vehicles entering the site. Dumpsites are often scavenged for plastics and metal by local people. Sites are regularly set on fire to make space for additional waste.

The unsatisfactory situation in waste disposal was recognized by the Government and one of the responsibilities of Toza Khudud enterprises is to replace existing dumpsites by controlled landfills.

Toza Khudud enterprises

Activities of Toza Khudud enterprises are focused on increasing the population coverage of waste services. Coverage was estimated at 22 per cent in 2016,

increased to 53 per cent in 2018 and is projected to reach 83 per cent in 2021. This was achieved by the purchase of 210 new collection vehicles in 2018 and it is planned to purchase 510 additional vehicles in the period 2019–2021.

Toza Khudud enterprises are also implementing new systems on waste collection and disposal. Regional plans were developed to support the switch from direct transportation to uncontrolled dumpsites, towards the introduction of transfer stations and managed landfills. This would reduce the number of active disposal sites and decrease environmental risks of waste disposal.

Vehicles used in waste management

Changes in vehicles used for street cleaning and waste collection between 2011 and 2017 are shown in table 10.4. The number of specialized waste collection vehicles doubled in this period. This has improved the situation mainly in cities other than Tashkent, where “Makhsustrans” operates a fleet of 540 waste collection vehicles.

Table 10.4: Vehicles used in waste management and street cleaning, 2011, 2017, number

	2011	2017
Street washing vehicles	244	247
Waste collection vehicles	1 077	2 079
Snow removal vehicles	19	21
Sewage trucks	166	205
Other trucks	264	432

Source: State Committee on Statistics, 2017.

Sorting waste

Sorting of MSW waste is not yet formally introduced as a national policy, but the informal sector and private companies are active in recovering recyclables from waste. The recycling rate was estimated to be 5–10 per cent²³ in 2017. The actual recycling rate could be higher considering that the separation is done on several levels. First, the operators of manned waste collection points are sorting out recyclables. Then, the personnel on collection vehicles are also separating out recyclables, which are stored in large plastic bags hanging from the collection vehicle. Finally, separation is being done on disposal sites, which are visited by large groups of scavengers. Separated recyclables, mainly plastics, paper and metal scrap, are purchased by “middlemen” or agents who sell recyclables to processing companies.

²³ Central Asia Waste Management Outlook, Zoi Environment Network, UNEP, ISWA, 2017.

The first waste sorting plant with a capacity of 180,000 tons/year was put into operation in Angor District of Surkhandarya Oblast in January 2018.

10.2 Practices and trends in the management of other waste

Waste generation is regulated by defining waste generation norms for each type of waste. These norms define how much waste a company is generating as a percentage of raw material or per unit of production. This approach is used because the practice of weighing waste has not been introduced in Uzbekistan. Based on the waste generation norm, a limit on temporary waste storage is established.

Manufacturing waste

Manufacturing includes the textile, automotive, food processing, machinery and construction industries (chapter 15). Typically, large companies may operate several factories with the same or a similar type of production. This allows straightforward introduction of waste management rules specific for a manufacturing sector and supports knowledge transfer between factories controlled by one company.

Companies manage their waste in-house, using their own transportation and own disposal sites, located close to factory premises. Private sector provision of specialized waste management services is not yet sufficiently developed.

Statistics on waste are categorized by hazard and toxicity classes. Categorization of waste by industrial sector is not available. The increase of industrial waste generation in the period 2010–2013 was caused by improvements in waste reporting, rather than by an actual increase in the amount of generated waste (table 10.5).

Mining and quarrying waste

Uzbekistan is rich in mineral resources, the most important being gold, uranium, copper, coal, oil and gas (chapter 15). Mining companies are organized as combines, in which one company exploits several mines, processes extracted ore and also produces equipment needed for mining (drills, pipes, machinery) and, in the case of gold, may also produce jewellery.

This set-up of mining companies has a positive impact on waste management since all waste generated from several mine operations is the responsibility of one legal body. Being aware of that responsibility, mining

companies are operating adequate tailing and dumping facilities for mining waste. Also, possibilities for recycling are often found in-house, and thus the need for transferring waste to another legal body is limited.

The Navoiy Mining and Metallurgical Combine (NMMC) is mining uranium and gold. Uranium is extracted by in-situ leaching, which minimizes waste (chapter 12). Gold mining is conducted in open pit mines, which are 3–5 km wide and about 500 m deep.

The Almalyk Mining and Metallurgical Combine (AMMC) is mining copper, silver, gold, molybdenum, tungsten, zinc, cadmium and selenium. As at January 2019, it operates the following waste facilities:

- Tailing pond No. 1 contains 546 million tons of enrichment tailings, with annual input of 6.7 million tons and its operation is planned until 2025;
- Tailing pond No. 2 contains 775 million tons of enrichment tailings, with annual input of 27.8 million tons;
- Kalmakir mine dumpsites A-7 and A-8 accumulated 74.5 million ton of sulphide ores;
- Kalmakir deposit dumpsites No. 39, 9, 10, 8a and A-4 accumulated 63.8 million tons of oxidized ores;
- Chadak gold recovery plant, Shinavazsai tailing pond contains 1.8 million tons of concentrate tailings and was operated from 1970 to 1979;
- Chadak gold recovery plant, Rezsaksai tailing pond contains 6.9 million tons of concentrate tailings, with annual input of 185,000 tons; it was operated from 1979 and plans to close in 2019;
- Angren mine tailing pond accumulated 16.4 million tons of enrichment tailings, with annual input of 642,000 tons and its operation is planned until 2020;
- The copper enrichment facility (CCF) has disposed of slag from its operation onto a dumpsite since 1964. As at March 2019, the dumpsite contained 7.6 million tons of slag. Since 1998 this slag is sent for reprocessing to CCF-2, which produces concentrates of copper (68 per cent), gold (50 per cent) and silver (53 per cent). Approximately the same amount of slag sent from CCF to the dump is extracted for reprocessing to CCF-2.

The average annual production of coal in Uzbekistan is about 4 million tons. JSC Uzbekcoal is mining lignite through open pit mining; 85 per cent of coal mined in the country is used in Angrenskaya and Novo-Angrenskaya TPPs.

Table 10.5: Industrial, including mining, waste, 2010–2017, million tons

	2010	2011	2012	2013	2014	2015	2016	2017
Industrial waste	41.3	78.2	87.0	107.0	98.0	101.0	104.0	114.7

Source: State Committee on Ecology and Environmental Protection, 2018.

Oil and gas mining is managed by the company Uzbekneftegaz, in cooperation with foreign companies. This leads to implementation of modern waste management systems for drill cuttings and similar waste generated in the oil and gas sector. For example, Lukoil Uzbekistan Operating Company has constructed and operates waste management facilities for drilling cuttings on the Khauzak, Southwest Gissar, Kandym and Shady oilfields.

Information on waste generated by the mining sector is limited. The system of collection of waste management data based on four hazard classes does not allow the clear identification of types and amounts of mining waste.

Waste from the energy sector

Uzbekistan's 10 thermal power plants (TPPs) use natural gas as their main fuel. About 4 per cent of electricity in the country is generated from burning coal in the Angrenskaya and Novo-Angrenskaya TPPs (table 12.5(a)). Angren coal is of poor quality and has high ash content. Ash and slag are stored on four dumpsites, amounting to a total of 15 million tons.

Ash and slag are generated in the range of 600,000–700,000 tons per year. There is an increasing trend to recycling this waste: in 2015, the recycled share was 12 per cent, and this had increased to 30 per cent in 2017. The main use for waste from the energy sector is in the production of cement and construction materials.

Construction and demolition waste

Tashkent City is implementing large infrastructure and housing projects. Information on construction and demolition waste is not available. Transportation and disposal of construction and demolition waste is not controlled. Strict control of the transportation of construction and demolition waste is planned – vehicles will be GPS tracked and marked with a Quick Response (QR) code to allow fast identification of a vehicle's route and destination.

Construction and demolition waste is often used as filling material.

It is accepted practice that residents scavenge demolition waste and reuse windows, doors, beams or bricks.

Agricultural waste

Livestock husbandry occurs mainly on grazing pastures on smaller plots of dekhan farms and homestead land, and manure is traditionally used as natural fertilizer. GEF and UNDP are financing the introduction of anaerobic digestors to farming communities where larger amounts of manure are generated, as a source of renewable energy from generated biogas. About 45 anaerobic digestors were in operation in 2017 and the Government has plans to increase their number to more than 700 by 2020. Implementation of this programme would reduce the negative impact of manure waste on the environment.

The main crops in Uzbekistan are cotton and wheat. Traditionally, waste from cotton is used as fuel or is burned in the field. Cotton seeds are used for production of oil, which is used as an addition to animal fodder.

Consumption of fertilizers has increased continually, from 193 kg/ha in 2009 to 233 kg/ha in 2016 (figure 13.5). According to the 2017 data, the volume of pesticides applied to arable land was 0.4 kg/ha. The area of pesticide application to cotton and wheat increased to almost 5 million ha in 2018 (table 13.3).

Hazardous waste

Uzbekistan classifies hazardous waste based on four hazard classes that cover 134 types of waste. These classes are based on toxicity and do not reflect all hazardous properties as defined in the Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention). The Uzbek system of classification considers only health aspects and not complex environmental protection aspects. Published data on hazardous and non-hazardous waste from manufacturing are presented separately for large companies and for small companies and distinguish between waste suitable or not suitable for recycling (table 10.6).

Table 10.6: Manufacturing waste, 2017, tons/year

	Total	1 class	2 class	3 class	4 class	5 class
Large companies						
Toxic waste, of which:						
Not suitable for recycling	41 584 845	2 113	525	464	41 581 742	..
Suitable for recycling	42 830 703	1 047	7 911	7 064	42 814 681	..
Non-toxic waste, of which:						
Not suitable for recycling	21 031 320	6	2 600	27 562	3 652	20 997 500
Suitable for recycling	9 081 449	25	967 762	6 844 071	320 950	948 641
Small companies						
Toxic waste, of which:						
Not suitable for recycling	3 257	86	56	37	3 078	..
Suitable for recycling	4 178	66	106	2 391	1 616	..
Non-toxic waste, of which:						
Not suitable for recycling	100 538	1 104	23	1 178	1 509	96 724
Suitable for recycling	73 142	6	7 543	9 517	8 550	47 527

Source: Statistical bulletin “Main indicators of nature protection and rational use of natural resources, forestry and hunting for 2017”, 2018.

Note: The table presents annual reported generation of manufacturing waste. Although a fifth class is not formally defined, all waste with properties below the fourth hazard class is categorized as being in a fifth class.

Medical waste

The generation of medical waste in health-care facilities in Uzbekistan is estimated at 20,000 tons per year. Medical waste is divided into five groups:

- A: non-hazardous waste, similar to municipal waste;
- B: hazardous waste;
- V: highly hazardous waste (infectious);
- G: waste similar to industrial waste;
- D: radioactive waste.

Single-use containers are used for needles and sharp items and transported to disposal sites. The use of containers for other types of medical waste is not common practice, as hospitals do not have budget allocated for this type of consumable.

In Tashkent City, non-hazardous waste (groups A and G) is transported directly to a disposal site. Hazardous waste (group B) is first sterilized in a 0.5 per cent chloride solution for 10 minutes and then sent to landfill. Liquid waste of group B (blood, vomited matter, urine and fecal matter) and similar biological liquids are allowed to be disposed to a centralized sewerage system. Where a centralized sewerage system is not available, this category of waste is disinfected using chemical and physical methods.

In medical institutions in district centres, syringes and similar waste are collected into cardboard boxes and then burned in simple muffle furnaces that do not meet the modern requirements, including for environmental safety.

Highly hazardous waste of group B undergoes autoclave treatment at 132°C for 20 minutes in those places where it is generated.

A specialized service for collection and treatment of medical waste is not available in Uzbekistan, although there is demand for such a service, mainly from private health-care facilities.

Public hospitals face challenges to comply with rules and requirements on safe handling and treatment of medical waste, due to limited funds being allocated in hospital budgets for medical waste management.

Radioactive waste

Radioactive waste is generated from the operation of nuclear fuel cycle facilities, research reactors and radiation sources used in research, medicine and industry. Large amounts of radioactive waste are accumulated in the uranium mining process.

The Institute of Nuclear Physics of the Academy of Sciences has operated a WWR-SM reactor since 1959 and the SUE Republican Burial Site for Radioactive Waste has operated since mid-1970. There is also an older radioactive waste storage facility at the Institute, which was operated from 1950 to 1970. The Institute is located near the village of Ulugbek, in Mirzo-Ulugbek District of Tashkent City.

The WWR-SM research reactor in the Institute is water cooled, has a capacity of 10 MW and is expected to continue operation until 2022. The plan for its decommissioning is already prepared. A temporary

storage facility for spent fuel is located near the reactor.

The Republican Burial Site for Radioactive Waste includes storage for high-level, low-level and liquid radioactive waste. The site is located 60 km north-east of Tashkent and 10 km south-east of the town of Chirchik, at an altitude of 800 m.

A subsidiary of the Institute, the SUE “Radiopreparat”, has used a storage facility for filters, containers and other contaminated equipment since 1976.

A significant proportion of the radioactive waste was formed during the development of the Soviet Union’s nuclear industry and accumulated on the mined-out uranium deposits in the Chatkalo-Kuramin region and Kyzylkum region excavated by NMMC.

There are 16 radioactive storage facilities in Uzbekistan, for all types of radioactive waste, with a total capacity of more than 5,000 m³. Three of them are full and sealed and five are empty and ready to receive waste.

Mining of uranium by NMMC resulted in the accumulation of 1.4 million m³ of ore in Uchkuduk. NMMC is performing rehabilitation works to minimize environmental impact in the central Kyzylkum region, which includes Uchkuduk, Zarafshan and Zafarabad.

NMMC operates a disposal site for solid radioactive waste in cell 6A of the tailing pond RU MMP-1. The area of the tailing pond is 630 ha and contains 57 million tons of radioactive waste. NMMC performs rehabilitation works on the tailing pond; already, 18 million tons of processed gold-bearing ore has been deposited over the radioactive waste on an area of 290 ha.

Accumulation of radioactive waste and radioactive contamination from uranium mining was identified in the past in Charkesar mine, where there is 482,000 m³ of waste on an area of 20.6 ha, and in Yangiabad uranium ore field, where there is about 500,000 m³ of waste and an area of 50 km² is contaminated by radioactivity. These areas were partially decontaminated and fenced off to minimize risk to the local population. Rehabilitation works in Yangiabad were carried out from 2006 to 2015. In Charkesar, works started in 2002. Assistance from international donors for cleaning up these legacy sites is provided through the multilateral fund Environmental Remediation Account for Central Asia, managed by the EBRD (chapter 6). The costs of remediation are

assessed at US\$85 million and the remediation is expected to be finished in 2027.

Persistent organic pollutants waste

Uzbekistan is not a party to the 1998 Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention). In 2019, it became a party to the 2001 Convention on Persistent Organic Pollutants (Stockholm Convention). Information on POPs is not openly available.

Large amounts of pesticides have been used, especially in cotton farming. Unused and obsolete pesticides have accumulated in many places in the past, and present environmental and health risks. Many of the polluted sites have been excavated and pesticides and contaminated soil were disposed of in centralized sites and storage facilities. There are 14 burial sites where at least 18,375 tons of obsolete pesticides are buried or otherwise disposed of. There are also five central storage facilities holding a total of 1,350 tons of obsolete pesticides. This information is based on the national inventory of POPs conducted in 2001 and 2009 with support of the UNEP project “Inventory of Obsolete, Unwanted and Banned Pesticides in the Republic of Uzbekistan” and the World Bank-funded pilot project “Technical Study of Obsolete Pesticides in Uzbekistan”. Newer data are not available.

Uzbekistan does not have a facility for safe destruction of pesticides, but the Navoiy Electrochemical Factory receives metallic containers, previously used for pesticides, for shredding and disposal.

Specific waste streams

Uzbekistan has not yet introduced a specific waste streams approach by formulating strategies and targets for these streams, but the private sector is already active in processing recyclables. SCEEP is preparing a new reporting system for recyclables based on reporting from companies processing recyclables. An overview of identified waste processing companies is presented in table 10.7.

The capacity of waste processing companies exceeds supply from agents buying recyclables; therefore, waste for recycling is imported from neighbouring countries. This is a good position before implementation of recycling programmes as there will be enough processing capacity for separated waste from the domestic sources.

Table 10.7: Recycling companies and amount of processed waste

	Companies (number)	Processed waste (tons)
Total	183	631 360
Polyethylene	72	34 391
Paper	65	90 990
Tyres and rubber	16	35 549
Textiles	1	7 000
Glass	7	11 137
Oils	1	35 000
Metals	10	215 897
Other	11	201 396

Source: State Committee on Ecology and Environmental Protection, 2018.

10.3 Transboundary movement of waste

Uzbekistan has been a party to the Basel Convention since 1996. Transboundary movement of waste in the period 2015–2017 is shown in table 10.8. Earlier data are not available.

Table 10.8: Transboundary movement of waste, 2015–2017

	2015	2016	2017
Imports			
Number	3 342	3 428	3 307
Amount (t)	581 889	427 599	165 484
Exports			
Number	266	301	379
Amount (t)	4 318	3 092	23 409
Transit			
Number	142	147	119
Amount (t)	7 924	7 932	5 909

Source: State Committee on Ecology and Environmental Protection, 2018.

Uzbekistan imports waste from Kazakhstan, Kyrgyzstan, the Russian Federation and Tajikistan. Exports are weighted towards the People's Republic of China and the Russian Federation. Imported waste, mainly metal, plastics and paper, is used as input for waste recycling companies. Exported waste is metal slag and metal scrap.

10.4 Practices and trends in chemicals management

The National Profile on Management of Chemical Substances was prepared in 2012 by the State Committee for Nature Protection and the United Nations Institute for Training and Research (UNITAR) with support under the Strategic Approach to International Chemicals Management (SAICM). This

report contains data from 2008, 2009 and 2010. The National Profile does not provide enough information on chemicals management.

Production

According to the National Profile, the main chemicals in the country are mineral fertilizers (1.1 million tons in active substances per year), crude oil (4 million tons/y), primary processing of crude oil (4.3 million tons/y), ammonia (1.3 million tons/y) and sulphuric acid (1.1 million tons/y).

The main producer of chemicals is the company Uzkhimsanoat, which includes 12 industrial facilities producing nitrogen, phosphorus and potash fertilizers.

Imports and exports

According to the National Profile, about one third of produced mineral fertilizers was exported. Exports also included calcinated soda (30,000 tons/y), nitric acid (14,600 tons/y), ammonia (14,500 tons/y), nearly all cotton cellulose (3,700 tons/y) and sodium chlorate (5,700 tons/y).

Imports reported by Uzkhimsanoat in the National Profile were relatively small. The main imported substances were unprocessed phosphate (39,600 tons), magnesium chloride (5,600 tons), granulated polypropylene (1,040 tons) and barium carbonate (less than 600 tons).

The National Profile does not provide information on storage and transportation of chemicals. This report states that there is very limited information on the use and disposal of chemicals covered by SAICM.

Chemicals emergency preparedness, response and follow-up

Uzbekistan does not have specific legislation on chemical emergency preparedness and response. Chemical emergencies are included in the general framework of technogenic emergencies. The Ministry of Emergencies plans and performs training and operates local bases where personnel and equipment are located. Depending on the extent of emergency situations, Civil Defence can be involved by a decision of the Prime Minister.

Factories or parts of a factory are classified as hazardous production facilities if they have on their territory flammable, explosive, toxic or other material endangering human health or environment. Facilities performing mining or smelting activities or where equipment is operated under pressure are also

hazardous. These facilities classified as hazardous are required to develop emergency response infrastructure (e.g. firefighting systems), develop emergency response plans and ensure that employees are regularly trained.

A national system of early warning and response in emergency defines that the head of a region (khokim) is responsible for applying one of the three emergency regimes.

10.5 Pressures from waste and chemicals on the environment

Air

Fires on municipal dumpsites are frequent, releasing pollution into the atmosphere. Setting waste on fire is used as a method of reducing the amount of waste dumped and gaining access to previously dumped metal scrap. On the Akhangaran landfill, which receives the large amount of waste from Tashkent City, self-ignition of waste also occurs due to inadequate landfill gas venting. Fires on dumpsites can be minimized by introducing controlled waste disposal and improved access control. SCEEP has started a programme for planning and development of a nationwide network of transfer stations and modern landfills in 2018.

Dust containing radioactive matter or metals from tailing ponds and waste ore heaps created from mining and processing of ore can spread to surrounding areas. The spreading of dust has an impact on soils, land and water, and potentially also on biodiversity, ecosystems and human health. The spreading of dust can be minimized by maintaining an appropriate water level in tailing ponds and rehabilitation of unused tailing ponds and ore heaps. Uzbekistan is implementing rehabilitation measures on several historical hotspots and large tailing ponds operated by mining companies.

Water

MSW illegally dumped into rivers or in water protection areas affects water quality, especially in the event of flooding. This risk can be minimized by improved waste collection and its transportation to controlled landfills. SCEEP has been investing in collection equipment since 2017 to increase the coverage of the population by waste collection services.

Soil and land

Pollution to soil and land is a secondary result of the transportation of waste or its components by air or water. Because production and disposal facilities are located close to each other, it is difficult to distinguish whether results of soil monitoring show increased values of heavy metals and radiation originating from mining and processing activities or from waste disposal.

Landscape

Accumulation of waste in disposal sites or tailing ponds is a visual disturbance to the landscape. This can be observed in areas of mining and ore processing activities. Uncontrolled disposal and illegal dumping are common practice in Uzbekistan and also result in landscape damage.

The negative impact of waste on the landscape can be minimized by remediation of dumpsites, but such projects have not yet started in Uzbekistan.

Biodiversity and ecosystems

Waste dumpsites have localized impact and usually do not represent a threat to biodiversity and ecosystems. Information on the direct impact of waste management activities on biodiversity and ecosystems is not available.

Health of selected population groups

Scavengers are exposed to fumes from burning disposal sites or to injury from disposed waste. Data on the number of scavengers in Uzbekistan or number of accidents on disposal sites are not available.

Specific impacts on human health have occurred in areas where the mining of radioactive material formerly took place. Uzbekistan has already implemented measures (land reclamation, fencing, rainwater run-off control, dismantling of abandoned facilities, blocking of access to mines) to minimize the impact of these sites on the local population.

Development and well-being of local communities

Well planned, reliable and efficient waste management is one of conditions for the sound development and well-being of local communities. Uzbekistan started to implement a nationwide waste collection and disposal system, but it is too early to assess the impact of these changes.

10.6 Legal, policy and institutional framework

Legal framework

The 2002 Law on Waste describes the responsibilities of authorities on the state, regional and local levels and the rights and duties of companies and citizens in the sphere of waste management. Further, it introduces waste norms, environmental certification of waste, and the requirement to keep national records of imported, exported and generated waste, national list of sites where waste is treated or disposed of and waste passports. The Law defines compensation payments for disposal of waste, which are similar to a landfill tax.

The Law was amended in October 2018 to introduce new definitions of waste management and treatment, and of sites where waste is managed, and also the responsibility of waste producers to finance waste recycling and minimization. These amendments are in line with international practice in waste management.

The Law on Waste defines only general responsibilities and rights, while details are formulated in subsidiary legislation introduced by national, regional and local authorities. Traditionally, waste was regulated by hygiene/sanitary authorities in the form of sanitary rules and norms (SanPiNs) and waste legislation issued by the national authority responsible for the environment was added later.

Classification, inventory, storage and treatment of industrial waste are defined in the 2002 SanPiN No. 0127-02. These rules introduce four classes of hazard/toxicity and the method of calculation of hazard class, which is based on the toxicity (Lethal Dose, 50 per cent (LD50)) of individual waste components. They also introduce the form for keeping records of industrial waste within an enterprise and the form for a waste passport. These forms are used by waste generators but a national summary is not available.

The 2011 SanPiN No. 0300-11 provides additional rules for non-hazardous/non-toxic waste and introduces division of industrial waste by disposal or recycling. This SanPiN requires monitoring of the environmental impact of disposed waste.

A system for classification of wastes is presented in the 2002 SanPiN No. 0128-02, which provides a list of 134 waste types according to their hazard or toxicity class. The list includes only selected toxic waste types and cannot be used as a general system, as non-hazardous wastes are not included. For comparison, the EU system lists more than 600 waste types.

The 2004 SanPiN No. 0157-04 defines rules for disposal of municipal waste and includes morphology and physical-chemical characteristics of municipal waste and default generation norms. These rules also include requirements on site selection and development and operation of a disposal site, but they do not meet internationally recognized standards for landfills. These rules were not enforced due to underfinanced waste services: operators did not have funds to develop disposal sites to these standards.

The 2011 SanPiN No. 0297-11 defines rules for sanitary cleaning of residential areas and standards for waste collection and rules for inspections of residential areas.

The 2004 SanPiN No. 0158-04 regulates asbestos waste management. Asbestos waste is considered to be moderately or low-level hazardous/toxic and it is permitted to dispose of asbestos waste together with municipal waste. This approach is not in line with international practice, which considers asbestos waste as hazardous and requires its disposal in a dedicated landfill.

The 2011 Resolution of the Cabinet of Ministers No. 266 regulates the collection of mercury-containing lamps. Sellers of these lamps shall collect old lamps and send them for mercury removal to lamp producers or importers. The system of financing the collection of mercury-containing lamps is based on the extended producer responsibility principle, as the producer of these lamps shall cover the cost of collection and mercury removal.

The 2013 Resolution No. 2438, jointly adopted by the then State Committee for Nature Protection, the Ministry of Finances, Ministry of Emergencies and Ministry of Health, concerns the transportation and disposal of toxic chemicals and other toxic substances and operation of special disposal sites. Toxic chemicals regulated by this legislation are obsolete pesticides. This act defines the conditions under which pesticides become obsolete and requires that obsolete pesticides are transferred to the company “Qishloqhojalikkimyo” for disposal.

The 2014 Resolution of the Cabinet of Ministers No. 295 requires waste generators to keep records of toxic and non-toxic waste and report this information to the State Committee on Statistics in order to improve information on waste. Enterprises submit data on waste (in fact, waste is a section of the statistical form “1-ECO: report on nature protection”) to the territorial bodies of SCEEP, which verify it and forward to the territorial bodies of the State Committee on Statistics. The Resolution also formulates the rights and duties of

SCEEP when performing inspection of waste-related activities.

The 2018 Resolution of the Cabinet of Ministers No. 765 “On measures to improve the system of allocation of territories for provision of waste collection services” has enabled private companies to provide waste collection services to regional authorities. This decision introduced a system for selection of waste services providers by electronic auction. The regional authority (i.e. the Council of Ministers of the Republic of Karakalpakstan, oblast khokimiyats or Tashkent City Khokimiyat) is responsible for presentation of the territory that will be serviced by a private company. Private companies participating in a tender prepare documentation proving their capacity to provide the requested services. The selected company concludes a contract on provision of waste services with the regional authority.

The entry of private companies into provision of waste services, which were traditionally provided by municipal companies, required regulation of their activities. The 2019 Resolution of the Cabinet of Ministers No. 95 established rules for the provision of waste collection and removal services and defined the rights and duties of private companies and their clients. These rules shall be further specified in the contract on provision of waste services. In addition to technical requirements, which include types of waste to be collected and transported, these rules also present financial requirements, which include methods of waste fees collection and recovery of debts from unpaid waste fees.

The 2018 Resolution of the Cabinet of Ministers No. 787 defines rules for the siting and operation of waste infrastructure and MSW management. This document provides guidance on placement of public dustbins and development of container stands and stipulates that apartment block areas shall be equipped with containers and for private houses areas the “bring” system shall be used. It defines rules for the collection of bulky waste, construction waste, waste from the operation of vehicles, including end-of-life vehicles, green waste from parks, liquid municipal waste and hazardous municipal waste. It also introduces the requirement to provide containers for separate collection, transportation and disposal of municipal waste. The disposal of recyclables is banned by this decision. Street cleaning requirements by season (summer/winter) are also defined and responsibility for inspection and control is assigned to the local administration.

The 2017 Order of the President No. 5057 approved the lists of special equipment and components not

produced in Uzbekistan, and therefore imported, to facilitate the creation of a system for the collection, transportation, recycling and disposal of municipal waste in cities. Such equipment and components were exempted from import duties.

The 2000 Resolution of the Cabinet of Ministers No. 151 regulates transboundary movement of waste, requires that waste that will be imported or exported must pass “ecological certification” and defines a list of wastes that are subject to this certification.

The 2018 Resolution of the President No. 3730 defines the collection vehicles and containers needed for Toza Khudud enterprises, indicates the number of dumpsites that need improvement and the type of improvement required. It also exempted Toza Khudud and “Makhsustrans” from the road tax and import tax on waste collection vehicles and equipment, as well as the land tax. This Resolution also banned the use of plastic bags thinner than 40 microns and the distribution of plastic bags free of charge.

The 2017 Resolution of the President No. 2916 “On measures for drastic improvement and development of waste management system for 2017–2021” introduced the system of Toza Khudud enterprises as a new system for providing waste collection and disposal services. This Order includes a list of actions aimed at improvement of municipal waste management, targeting collection and transportation of municipal waste, development of dumpsites and closure of illegal sites and development of recycling, and also education, training and awareness in waste management. Actions planned for the first phase until 2017–2018 included strengthening of the collection fleet with new vehicles, establishment of Toza Khudud enterprises and legislative changes, and have already been implemented.

The 1999 Law on Protection of the Population and Territory from Natural and Man-made Disasters defines the rights and responsibilities of state authorities and of the population on preparedness and response and aims to prevent the occurrence and expansion of emergency situations, reduce losses from emergency situations and provide adequate response.

The 2006 Law on Industrial Safety of Hazardous Production Facilities defines criteria for classifying a production facility as hazardous. It also defines requirements on the design, construction and operation of hazardous production facilities, and requirements on the training of employees and planning and preparation for emergency situations. According to this Law, technical equipment used in a hazardous production facility must be certified and

individual activities/processes must be licensed. Hazardous production facilities are subject to industrial safety expertise and must have insurance to cover expenses in the event of an accident causing damage to health, property or the environment. An industrial accident must be investigated by a governmental commission.

Policy framework

Strategy on Municipal Solid Waste Management for the period 2019–2028

The 2019 Strategy on Municipal Solid Waste Management for the period 2019–2028 (2019 Resolution of the President No. 4291) is a follow-up to two previous acts of the President (2017 Decree of the President No. 5024 and 2018 Resolution of the President No. 3730) that started the process of modernization of municipal waste management.

The Strategy is focused on development of a countrywide system of collection and disposal of municipal waste and allocation of the financing needed for its completion. The Strategy expresses support for actions on waste minimization and recycling. Its implementation necessitates the involvement of the private sector and private investments. The Strategy defines a set of progressive targets for waste management (table 10.9), which the existing Law on Waste is unable to support.

An important component of the Strategy is the introduction of centralized and controlled landfilling. Disposal sites shall be monitored, and existing sites will be prioritized by risk assessment, to identify where urgent action is needed. The Strategy contains an annex that defines for each oblast where landfills and transfer stations have to be developed.

The Strategy stipulates that financing of the municipal waste management system should be strengthened by the introduction of the “polluter pays” principle, the allocation of governmental funds and an increase in user fees, while recognizing social impacts. Financing should cover not only the transportation of MSW but also the cost of recycling and disposal and investment costs of required infrastructure. The Strategy suggests combined financing from waste fees and governmental subsidies.

Concept on Environmental Protection until 2030

The 2019 Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863) goes beyond MSW to also cover other types of waste. With regard to industrial waste, the Concept provides for: the introduction of a waste classification system based on industrial sectors and/or chemical-physical characteristics; economic incentives for the introduction of no-waste and low-waste production technologies; incentives for the introduction of technologies for processing and disposal of mining and quarrying waste; and ensuring the organization of environmentally safe storage of hazardous waste at industrial sites.

The Concept also refers to the need for a system for handling the specific waste streams (mercury-containing lamps and devices, batteries, etc.) and for medical waste management.

Sustainable Development Goals and targets relevant to this chapter

The current stand of Uzbekistan vis-à-vis targets 3.9, 11.6, 12.4 and 12.5 of the 2030 Agenda for Sustainable Development is described in box 10.1.

Table 10.9: Targets of the Strategy on Municipal Solid Waste Management for the period 2019–2028, per cent

	2021	2025	2028
Population covered by waste collection services	85	100	..
Recycling of MSW	25	45	60
Specific waste streams recycling	10	15	25
Diversion from disposal	25	45	60
Upgrading of disposal sites to comply with legislation	25	65	100
Remediation of closed disposal sites	20	65	100
Use of alternative sources of energy on MSW treatment facilities	15	25	35
Monitoring of disposal sites	20	75	100

Source: 2019 Resolution of the President No. 4291.

Box 10.1: Targets 3.9 (chemicals management aspects), 11.6 (waste management aspects), 12.4 and 12.5 of the 2030 Agenda for Sustainable Development



Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

Pesticides, kerosene, household chemicals and carbon monoxide are common causes of unintentional poisoning. Uzbekistan has established a legal framework regulating imports and use of chemicals.

With regard to global/national indicator 3.9.3 (Mortality rate attributed to unintentional poisoning), the trend of the mortality rate from unintentional poisoning in Uzbekistan has remained stable since 2000. According to WHO data, the mortality rate from unintentional poisoning in Uzbekistan was 1.0 person per 100,000 population in 2016; in 2000, it was 1.2 persons per 100,000 population. Unintentional poisoning occurs more often in the male population (1.5 per 100,000 population) than in the female population (0.5 per 100,000 population). The national data match the WHO estimates: according to the State Committee on Statistics, the mortality rate attributed to unintentional poisoning was 1.0 person per 100,000 in 2016 and 1.3 persons per 100,000 in 2017 (<http://nsdg.stat.uz>). The global average mortality rate from unintentional poisoning was 1.4 persons per 100,000 population, and for Europe it was 0.7 person per 100,000 population, in 2016.

Uzbekistan's national indicator 3.9.1 (Mortality rate attributed to toxic impact of chemicals per 100,000) is different from the global indicator 3.9.1 (box 8.3). The State Committee on Statistics provides no data on this indicator.



Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

With regard to the global/national indicator 11.6.1 (Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities), the coverage by regular collection is about 53 per cent of the total population in 2018, but reliable data on collected waste are not available. Dumpsites that comply with modern landfilling standards are not existent in Uzbekistan.

The country started a reform of its municipal waste collection and disposal system in 2016. If the reform of municipal waste management remains a priority, this target can be achieved by 2030 with respect to its waste management aspects.



Goal 12: Ensure sustainable consumption and production patterns

Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

The global indicator 12.4.1 refers to the number of parties to international MEAs on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement. For this indicator, countries are rated based on their participation in five agreements: the Basel Convention, Rotterdam Convention, Stockholm Convention, Montreal Protocol and Minamata Convention. Of these, Uzbekistan participates in the Basel Convention and Montreal Protocol, and since 2019 – in the Stockholm Convention. Implementation of the Basel Convention is limited and, since 2014, there has been no communication with the Convention Secretariat.

With regard to indicator 12.4.2 (Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment), Uzbekistan does not have reliable data on hazardous waste. Moreover, the definition of hazardous waste differs from practice in EU and OECD countries. The average annual amount of hazardous waste per capita in OECD countries is 150 kg per capita for the period 2006–2011, while Uzbekistan reports in average tons per capita as the sum of waste belonging to hazard classes 1, 2 and 3. The national value is 0.7 tons per capita in 2017 (<http://nsdg.stat.uz/>).

Due to inconsistency of the country's waste data classification system with international practice, it is not possible to assess the country's progress towards achieving target 12.4.

Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

Uzbekistan's national indicator 12.5.1 (Processing level of municipal solid waste, percentage) is narrower than the global indicator 12.5.1 (National recycling rate, tons of material recycled). The State Committee on Statistics provides no data on the national indicator. Material recycling of MSW in Uzbekistan is estimated at 9 per cent while the OECD average is 34 per cent. The ongoing reform of the municipal waste system is aimed, in its second phase, at achieving target 12.5.

With regard to the global indicator 12.5.1, the structure of data on industrial waste does not allow assessment of the overall recycling rate in Uzbekistan.

Institutional framework

Responsibility for waste management is divided among a number of institutions at the national, oblast and local levels.

The State Committee on Ecology and Environmental Protection (SCEEP) was restructured in 2017–2018, its responsibilities in waste management were strengthened and the institutional arrangements were restructured. The Department of Coordination and Organization of Waste Management is led by the Deputy Chairperson of SCEEP and employs 13 people. The Department is divided into: the Unit for Methodology and Regulation Development on Waste Management; Unit for Organization of Waste Management; Unit for Waste Disposal, Recycling, Burial and Processing and Introduction of Innovation; and Unit for Economic Analysis and Tariffs in Waste Management (figure 1.2).

Organizations directly subordinated to SCEEP include the Republican Association of Specialized Sanitary Cleaning Enterprises, SUEs “Toza Khudud” and SUE “Makhsustrans” (figure 1.1). The Republican Association of Specialized Sanitary Cleaning Enterprises acts as a coordinating body for investments, financing, purchasing, construction and development of infrastructure and equipment for municipal waste management.

The agency under the Ministry of Housing and Communal Utilities, Kommunkhizmat, prepares investment programmes on waste management for approval by the Cabinet of Ministers and monitors municipal waste management. These responsibilities overlap with those of the Republican Association. The Law on Waste mentions Kommunkhizmat among institutions with waste management responsibilities, but waste-related responsibilities are not specified in the Regulation on Kommunkhizmat (2017 Resolution of the Cabinet of Ministers No. 340).

The Ministry of Health ensures compliance with sanitary standards in waste management and defines sanitary norms for products made from waste. The Ministry prepares sanitary and epidemiological expertise for waste management facilities and methodology for classification of waste by hazard/toxicity classes.

The State Inspectorate for Supervision of Geological Exploration and Work Safety in Industry, Mining and the Household Sector under the Cabinet of Ministers (Sanoatgeokontekhnazorat) was responsible for the control and supervision of mining and processing waste from industries. It was also responsible for the

proper management of radioactive waste materials. In December 2018, the State Inspectorate was transformed into the State Committee on Industrial Safety (Goskomprombez). The State Committee is responsible for implementing state policies and exercising control of radiation and nuclear safety at nuclear power facilities and over nuclear technology, as well as of industrial safety at hazardous production facilities.

The SUE “Sanoat Xavfsizligi” (Industrial Safety) provides services to industries in equipment testing and certification and provides industrial safety expertise

The territorial bodies of SCEEP are responsible for implementing national waste management programmes and approval of local waste management programmes. Their responsibility is also to decide about the siting of waste management facilities and enforcing waste management legislation. Local waste management programmes, if formulated at all, were not yet implemented.

Local authorities (khokimiyats) participate in the process of siting waste management facilities, promote sanitary cleaning of residential areas and timely payment of waste fees and perform state control of waste management facilities.

Coordination on waste management at national, regional and local levels

The waste management system is in the process of transformation, which is also changing the modalities of cooperation among institutions controlling the waste management system. The old system was not functioning. Cities were practically left alone to deal with MSW collection and disposal. Only the capital was under close control and municipal and national administrations there were cooperating well.

The system of cooperation among national, regional and local administrations was weak, due also to the lack of funds for financing waste management. Legislative requirements defined at the national level could not be implemented at the local level, because these requirements were not supported by allocation of the requisite funding.

Another limiting factor for effective cooperation in waste management is that the same body is assigned both implementation and inspection responsibilities. Therefore, it checks its own activities so might not wish to reveal its own shortcomings or failures. This situation is observed on several levels. For example, SCEEP is responsible for regulating, inspecting and

monitoring waste management and its structure includes “Makhsustrans” and Toza Khudud enterprises – companies that provide waste collection and disposal services. The territorial bodies of SCEEP are responsible for implementation of waste management programmes and support of waste management services in their respective administrative entities, as well as, simultaneously, for inspections of waste management. On the local level, most local administrations (khokimiyats) are operating local disposal sites and are simultaneously responsible for inspection of waste facilities. However, this situation is not specific to waste management and it is how the system of government in general works in Uzbekistan, in all sectors (i.e. there is no division of regulation from the provision of services).

Regulatory, fiscal and information measures

Permits

Permits regulating waste management, as is known in international practice, are not used in Uzbekistan. No waste-related activities require a licence according to the 2000 Law on Licensing of Certain Activities. Instead, indirect or partial measures are used for limiting or regulating waste management. For this reason, no centralized register of issued permits is used in Uzbekistan. The legislative system assumes that a waste generator, transporter and operator of a recycling or disposal facility must comply with all legislation and, therefore, a site-specific permit is not needed. For example, the 2011 Resolution of the Cabinet of Ministers No. 35 on transportation of hazardous goods by road vehicles includes a list of hazardous goods that are permitted for transportation. Using this approach, a transport-specific permit is replaced by general legislation.

Environmental certification is used for regulating the transportation of waste and development of waste facilities and operations. Such certification is conducted by a company, albeit state-owned, and the legal status of such certification is different from a permit issued by a governmental body.

Also, setting norms for waste generation does not have the character of a permit. The norms related to waste generation are prepared by applicants. Local administrations only approve the proposals.

A system of integrated permits is not introduced in Uzbekistan.

Taxes and fees

The abolition of road tax (3 per cent of vehicle value) and import tax (10–30 per cent of vehicle value, depending on engine volume) for waste collection vehicles and equipment in 2018 (2018 Resolution of the President No. 3730) should help attract local companies to provide waste management services. Such fiscal instruments are used by countries that are improving their waste management systems.

Payment for waste services has been a topic of discussion between foreign donors and the Government since the Tashkent Solid Waste Management Project (1999–2006). Despite the need to ensure sustainability of waste services, the Government gave priority to socially acceptable prices. Waste fees for the population are based on monthly per capita payments. The level of waste fee is set by the collection company and approved by the local administration (khokimiyat).

Waste fees of “Makhsustrans” in Tashkent rose from 2,600 sum per person per month in 2014 to 4,500 sum per person per month in 2019, an increase by 73 per cent. But in real terms, taking consumer price inflation into account, there was an increase of only 15 per cent. In United States dollar terms, the waste fee dropped from US\$1.1 in 2014 to US\$0.5 in 2019, which reflects the sizeable depreciation of the national currency in the wake of the exchange rate liberalization in 2017. Private waste companies in Tashkent charge waste fees in the range of 3,300–3,500 sum (some US\$0.4) per person per month. Legal entities (companies) are paying 41,900 sum (US\$5.0) per m³ per year. One person generates approximately 1.1 m³ per year according to the waste generation norm and pays 54,000 sum per year. This corresponds to 49,090 sum per m³, some 17 per cent more than legal entities have to pay.

The deterioration of MSW infrastructure and reduction in availability of waste services is the result of insufficient financing. User fees are low, beneath the level needed for “Makhsustrans” to achieve sustainable operation. The World Bank and EBRD Tashkent Solid Waste Management Project (1999–2006) stressed the need to set user fees to cost-effective levels, but its proposals were not accepted by the Uzbek authorities.

The Akhangaran landfill collects a gate fee of 13,000 sum (US\$1.6) per ton of waste delivered to the landfill by private vehicles; “Makhsustrans” vehicles do not pay this gate fee.

Outside Tashkent, regional waste fees, established in 2016 by oblast heads (khokims), ranged from 1,200–2,000 sum per person per month and 20,000–32,000 sum per m³ of waste per year for companies. The collection rate is below 50 per cent. Detailed information on taxes and fees in the regions of Uzbekistan is not available.

Starting from 2019, waste fees are collected by the General Prosecutor's Office. This should improve the collection rate and control of waste fee.

Information

Information on waste is still limited. Reporting waste by classes of toxicity does not help to identify major waste generators and waste types to be targeted as a priority.

SCEEP maintains the State Cadastre of Waste Disposal Sites. The database contains information on municipal and industrial waste disposal sites since 2014 and waste recycling companies were included in 2017. The database also contains information on generated waste, but these data are based on calculation and not on weighing.

Training for sound management of chemicals

Hazardous industrial facilities prepare a response plan to potential emergencies that defines possible occurrence and development of emergencies and resources needed to provide an adequate response. This plan also prescribes theoretical and practical training on response to emergency situations.

10.7 Assessment, conclusions and recommendations

Assessment

Municipal waste management is undergoing a transformation aimed at expanding collection service to the whole population of Uzbekistan and ensuring an increase in recycled and safely disposed of waste. Recent positive developments include the increase in coverage of the population by waste services and operationalizing of the first waste sorting plant in the country. The transformation is supported by the Strategy on Municipal Solid Waste Management for the period 2019–2028, which sets well-defined goals until 2029. However, it will be difficult to assess whether the goals will be achieved, as data on waste are estimated and incomplete.

Information on waste types and amounts is not detailed and structured and does not support current

reforms. Waste management is based on calculated and administratively agreed waste norms and not actual data obtained from weighing waste at disposal or recycling sites.

The Law on Waste and implementing legislation is complex and represents a mix of the old approach, when waste management was regulated by the Ministry of Health, and the new approach, with waste management regulated by SCEEP. The implementation (provision of waste services) and enforcement (monitoring and inspection) functions are often assigned to the same public authority.

Industrial waste management is on a higher level than municipal waste management, although much less waste is monitored, due to the outdated system of four toxicity classes of waste. This system does not allow identification of the nature of industrial waste and resulting environmental impact (beyond health impacts). Although waste management plans are required by the legislation, they do not seem to have an impact on improvement of waste management.

Financing of waste management is not incorporated to a full extent in the budgets of state-owned services (health care) and state-owned enterprises. Also, in the municipal waste management sector, waste fees are insufficient for sustainable provision of waste collection and disposal. Such a situation leads to underestimation of waste management costs.

Uzbekistan does not possess the expertise and financial resources to deal with the impacts of waste generated in the past. While the country cooperates well with international organizations in managing the legacy of radioactive waste, such cooperation for the management of obsolete pesticides and other POPs is not sufficient. Greater involvement of foreign donors in municipal and industrial waste management could lead to faster and more effective transformation of waste management to international standards.

Conclusions and recommendations

Waste legislation

The waste legislation is undergoing a change from the traditional approach led by the Ministry of Health, which emphasized hygiene aspects, towards a modern approach oriented towards broader environmental aspects of waste management. The adoption of the 2019 Strategy on Municipal Solid Waste Management for the period 2019–2028 and including private companies as providers of waste services creates new challenges in the legislative area. The 2002 Law on Waste, although recently amended, does not comply

with the needs of the new system of waste management. As at 2019, the Law on Waste is weak in defining permits for the operation of waste facilities, providing waste services and transboundary movement of waste. Inspection of waste management is limited if these permits are absent as such.

Recommendation 10.1:

The State Committee on Ecology and Environmental Protection should develop a new law on waste in accordance with the best international practice and in line with the Strategy on Municipal Solid Waste Management for the period 2019–2028 and ensure that the law includes well-defined site-specific permits regulating waste management activities.

Waste management reform

Municipal waste management in Uzbekistan is starting a transformation, moving towards a modern, centralized system based on nationwide planning. The emphasis is on controlled disposal, recycling and monitoring of the impact of waste. The implementation of actions defined in the Strategy on Municipal Solid Waste Management for the period 2019–2028 would support the achievement of target 12.5 of the 2030 Agenda for Sustainable Development, achieve financial sustainability of the waste sector and encourage the industrial sector to strengthen its efforts on industrial waste recycling.

Recommendation 10.2:

The State Committee on Ecology and Environmental Protection should:

- (a) *Establish a nationwide system of municipal waste collection and disposal in line with the Strategy on Municipal Solid Waste Management for the period 2019–2028;*
- (b) *Elaborate a priority list for the modernization of controlled landfills.*

Waste classification

Industrial waste management is not yet fully regulated at the national level, except for radioactive waste hotspots. The main drawback is the use of waste classification based on four hazard classes, which is not compatible with international practice, therefore hindering the assessment of progress towards achieving target 12.4 of the 2030 Agenda for Sustainable Development. Uzbekistan does not have comparable data to produce the global indicator 12.4.2 (Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment). The use of waste classification based on hazard/toxicity classes does not conform with international practice

and does not support waste recycling and proper disposal.

Recommendation 10.3:

The State Committee on Ecology and Environmental Protection, in cooperation with the State Committee on Statistics, should consider introducing a waste classification system based on chemical-physical characteristics and abandon the system of four hazard classes, so that to ensure compatibility of data to produce the global Sustainable Development Goals indicator 12.4.2 and support waste recycling and proper disposal.

Waste data

Waste data in Uzbekistan are based on calculation using per capita or per ton of product values. This approach rarely results in reliable data. The development of new transfer stations and disposal sites is an excellent opportunity to start using data from weighbridges for national waste reports.

Recommendation 10.4:

The State Committee on Ecology and Environmental Protection should start the transition from calculated waste data to waste data from weighbridges in the preparation of national statistics and reports.

Landfills

All disposal sites used in Uzbekistan are in urgent need of modernization and they are not achieving standards of controlled waste disposal. Although the investments in municipal waste infrastructure planned under the Strategy on Municipal Solid Waste Management for the period 2019–2028 include the development of controlled landfills, the standards for development and operation of disposal sites are outdated or lacking.

Recommendation 10.5:

The State Committee on Ecology and Environmental Protection should continue to prepare the standards for siting, construction, operation, closure and monitoring of waste disposal sites in line with international practice.

Obsolete pesticides

Information on the situation in management of obsolete pesticides is not openly available. This does not allow access to international expertise and funding to eliminate risks of obsolete pesticides to the environment and people. Also, information on the use of PCBs and PCB-containing equipment is non-existent and thus it is not possible to assess the impact of these POPs on the environment.

Recommendation 10.6:

The Cabinet of Ministers should reconsider its position on obsolete pesticides and task the State Committee on Ecology and Environmental Protection to engage in international cooperation in POPs management.

Recommendation 10.7:

The State Committee on Ecology and Environmental Protection should investigate the use of PCBs and PCB-containing equipment in the industrial sectors and prepare a plan for the elimination of PCBs and their safe disposal.

Medical waste

The management of medical waste is underdeveloped, and hospitals and other health-care facilities are managing waste on their own. There is no regional approach to the provision of specialized waste service for health-care facilities.

Recommendation 10.8:

The State Committee on Ecology and Environmental Protection, in cooperation with the Ministry of Health, should:

- (a) Prepare a national strategy for management of medical waste that would focus on the regional approach to treatment and disposal of medical waste;
- (b) Consider establishing a state-owned enterprise specialized in medical waste management.

Chemicals management

Chemicals management is not included as part of environmental policy. The last chemical profile of Uzbekistan was prepared in 2012 and the information presented therein may be outdated. Emergencies and accidents involving chemicals are managed together with all technogenic emergencies and accidents.

Recommendation 10.9:

The State Committee on Industrial Safety should:

- (a) Consider preparing a Chemical Profile of Uzbekistan, using the latest data;
- (b) Include chemical management as a separate category of risk management in industry;
- (c) Provide training focused on safe management of chemicals.

Chapter 11

BIODIVERSITY AND PROTECTED AREAS

11.1 Trends in species and ecosystems

Species diversity

According to the Institute of Botany of the Academy of Sciences, as at 2018, the flora of Uzbekistan included 4,383 vascular plant species (4,155 native and 228 naturalized alien species) belonging to 115 families and 650 genera, including a large number of endemic, threatened and globally important species. However, the knowledge of flora composition differs for particular biogeographic regions and administrative regions of the country. In 2018, the most complete information was available for some mountain ranges (Western Tien-Shan and Nurata Mountains, jointly accounting for some 8 per cent of the country's territory) and the Aral Sea region. Floristic field research and inventory works were carried out in the Kyzylkum Desert, Fergana Valley, Baisyn Mountains and Ustyurt Plateau, while credible and updated information for many other regions was either deficient or unavailable. The 2006 Third National Report to the CBD indicated the occurrence of 2,548 algae (compared with 4,146 in the 1998 NBSAP), some 500 lichen and 2,102 fungi species; no information on recent changes in the above numbers is available.

According to the Institute of Zoology of the Academy of Sciences, the fauna included some 14,846 invertebrate (1,179 roundworm, 850 protozoa, 533 flatworm, 223 mollusc, 61 annelid and some 12,000 arthropod species), and 715 vertebrate species (467 bird, 107 mammal, 77 fish, 61 reptile and 3 amphibian species). The current number of fish species (77) was lower by some 9 per cent than indicated in the 2015 Fifth National Report to the CBD (which mentioned 84 species).

Globally threatened species

The global IUCN Red List (version 2019-1) contains records on 209 plant and 556 animal species occurring in Uzbekistan. According to the IUCN assessments, 16 plant species are globally threatened by extinction, including 4 species categorized as Critically Endangered (CR), 8 as Endangered (EN) and 4 as Vulnerable (VU). So far, only five of these globally threatened plant species have been included in the national Red Book. Further, 1 plant species was

categorized by IUCN as Near Threatened (NT), 15 as Data Deficient (DD) and 177 as Least Concern (LC). As for fauna, according to IUCN assessments, 46 animal species (19 bird, 10 mammal, 7 reptile, 7 fish, 1 mollusc and 2 other invertebrate species) are globally threatened by extinction, including 9 species categorized as CR, 8 as EN and 29 as VU. A further 27 fauna species are categorized as NT, 19 as DD and 464 as LC.

Not all plant, fish, mollusc and other invertebrate species have so far been assessed for the IUCN Red List. Therefore, the flora, fungi and fauna could include more species globally threatened by extinction, that have not yet been assigned relevant IUCN Red List categories. Similarly, due to missing or incomplete data from recent field research and inventory works, numerous species were temporarily categorized as DD, despite their confirmed rarity status.

Globally threatened fauna species still present in the country include: the critically endangered (CR) saiga antelope (*Saiga tatarica*) of the Ustyurt population migrating into Uzbekistan in the winter season, sociable lapwing (*Vanellus gregarius*) and slender-billed curlew (*Numenius tenuirostris*); endangered (EN) Saker falcon (*Falco cherrug*), Egyptian vulture (*Neophron percnopterus*), steppe eagle (*Aquila nipalensis*), Pallas's Fish-eagle (*Haliaeetus leucorhynchus*) and white-headed duck (*Oxyura leucocephala*); vulnerable (VU) Tien-Shan brown bear (*Ursus arctos ssp. isabellinus*), snow leopard (*Panthera uncia*), Bukhara urial (*Ovis vignei ssp. bochariensis*), Ustyurt urial (*Ovis vignei ssp. arkal*), goitered gazelle (*Gazella subgutturosa*), Menzbier's marmot (*Marmota menzbieri*), marbled polecat (*Vormela peregusna*), European turtle-dove (*Streptopelia turtur*), red-breasted goose (*Branta ruficollis*), lesser white-fronted goose (*Anser erythropus*) and marbled teal (*Marmaronetta angustirostris*); near threatened (NT) Asiatic wild ass (*Equus hemionus ssp. kulan*), which was considered to be locally extinct in Uzbekistan until the confirmation of its reoccurrence in 2012, Bukharan markhor (*Capra falconeri ssp. heptneri*), Vinogradov's jerboa (*Allactaga vinogradovi*), a local subspecies of the argali sheep (*Ovis ammon ssp. severtzovi*) and Dalmatian pelican (*Pelecanus crispus*); and least

concern (LC) Bukhara deer (*Cervus elaphus ssp. bactrianus*).

As many as 92 animal species or subspecies occurring in Uzbekistan are included in Appendices to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), while 176 bird and 10 mammal species are listed in Appendices to the Convention on the Conservation of Migratory Species of Wild Animals (CMS).

Regionally rare and endangered species

Information on the conservation status, level of threat (risk of extinction in the wild) and trends in populations of regionally rare and endangered flora and fauna species was available in subsequent editions (1983 Fauna, 1984 Flora, 1998, 2006, 2009) of the Red Book. All Red Book editions published to date used the national system of extinction threat level categorization, which is different from the IUCN Red List categorization system (the national category “0 – apparently extinct” roughly corresponds to IUCN categories EX and EW, “1 – disappearing” to CR and EN, “2 – rare” to VU, “3 – declining” to NT and “4 – data deficient” to DD). Most recently, the fifth Red Book edition was prepared for adoption and publication. Pursuant to the 2018 Resolution of the Cabinet of Ministers No. 1034 “On measures to organize the preparation, publication and maintenance of the Red Book”, a new system of threat level categorization is to be used in the fifth Red Book edition, identical to the system used in the Red Book of the Russian Federation (0 – probably extinct, 1 – threatened by extinction, 2 – population diminishing in size and/or distribution, 3 – rare, 4 – indefinite status and 5 – recoverable and recovering).

As for flora, the increasing number of listed species (163 in 1984, 301 in 1998, 302 in 2006 and 321 in 2009) resulted not only from the worsening conservation status, but also from the identification of new, not previously assessed species.

As for fauna, the 2009 Red Book Vol. II (Animals) included 189 species and subspecies: 60 arthropod (61 with subspecies), 48 bird (51 w. ssp.), 24 mammal (25 w. ssp.), 17 fish (18 w. ssp.), 16 reptile, 14 mollusc (15 with subspecies) and 3 annelid species. Hence, the species listed in the 2009 Red Book accounted for some 26.2 per cent of the total number of reptile species occurring in the country, 23.4 per cent of the mammal species, 23.3 per cent of the fish species, 10.9 per cent of the bird species, 6.7 per cent of the mollusc species, 4.9 per cent of the annelid species and 0.5 per cent of the arthropod species. The fifth Red Book edition is expected to list 206 animal species and

subspecies. According to recent research results and assessments, the level of threat should be changed in comparison with the previous Red Book edition in the case of 12 species (8 bird, 2 mammal, 1 fish and 1 reptile species).

Trends in threatened wild species populations

Statistical data on the population numbers of rare and endangered flora and fauna species are collected on a regular basis (mainly inside protected areas (PAs) or waterfowl concentration areas), but officially published statistical data sources generally do not contain information on biodiversity. Hence, the proper assessment of recent trends in threatened wild species populations since 2010 is not possible.

However, the 2019 Sixth National Report to the CBD informed of decreasing trends in populations of numerous threatened wild species, including the CR saiga antelope, of which the Ustyurt population has decreased by 99.5 per cent since 1990. The current size of the saiga population inside Uzbekistan was estimated at some 200 individuals. However, the occurrence of saiga in the country resulted mainly from the Ustyurt herd migration to the south in the winter season, which was at first impeded by the construction of the state border fence in 2012 (modified in 2016 to allow wildlife migrations). Since 2017, due to the construction and operation of the Beyneu–Shalkar section of the Trans-Kazakhstan Railway, saiga migrations to the south of the railway line are no longer recorded.

According to the 2019 Sixth National Report to the CBD, a decrease in population numbers had also been confirmed for other mammal species, including the VU marbled polecat, NT Vinogradov’s jerboa and Pallas’s cat (*Otocolobus manul*), and the LC Turkestan steppe polecat, corsac fox (*Vulpes corsac*) and sand cat (*Felis margarita*). Negative trends were also observed in populations of the VU Central Asian tortoise (*Testudo horsfieldii*), sand boa (*Eryx miliaris*) and Tartar sand boa (*Eryx tataricus ssp. tataricus*), and the endemic Szczerbak’s even-fingered gecko (*Alsophylax szczerbaki*), agama (*Phrynocephalus moltschanovi*) and Trans-Caspian toad-headed agama (*Phrynocephalus raddei Boettger*). The decrease in population of the EN Saker falcon was estimated at some 90 per cent (down to 120–150 individuals in 2018), and negative trends also affected the populations of other bird species, e.g. the CR sociable lapwing, EN Egyptian vulture (a decrease from some 200 pairs in the period 1990–2000 to 130–140 pairs in 2018) and steppe eagle, the VU European turtle-dove and red-breasted goose, the NT Dalmatian pelican, Eurasian curlew (*Numenius arquata*), ferruginous

duck (*Aythya nyroca*) and black-tailed godwit (*Limosa limosa*), and the LC griffon vulture (*Gyps fulvus*), squacco heron (*Ardeola ralloides*) and Turkestan white stork (*Ciconia ciconia asiatica*).

However, the most striking example was the environmental disaster in the Aral Sea region, formerly abundant in flora and fauna species. The still ongoing processes of the Aral Sea shallowing and dessication, shrinkage or disappearance of lakes in the Amu Darya River delta, discontinuation of seasonal floodplain inundation, drop in the ground water level, deterioration of habitats (e.g. wetlands and floodplain “tugai” forests) and degradation of native plant communities, which turned the region into the sandy-salty Aralkum Desert with a surface exceeding 5.5 million ha, resulted in a sharp decrease in the biological diversity of the region. The whole ichthyofauna of the Aral Sea (originally including 34 fish species) disappeared as a result of the increasing water salinization. Some 26 bird, 12 mammal, 11 plant and 11 fish species became regionally extinct, while some mollusc and arthropod (in particular crustacean) species are close to extinction in the region. Nesting habitats of numerous aquatic bird species either vanished or declined significantly.

In order to protect threatened fauna species and prepare for the reintroduction of locally extinct ones, more than 40 years ago the specialized Species Breeding Centre (SBC) “Jeyran” (currently, a PA encompassing 16,522 ha in Bukhara Oblast) was established in Uzbekistan. According to the 2019 Sixth National Report to the CBD, in 2017, this nursery harboured 23 individuals of the EN Przewalski’s horse (*Equus ferus ssp. przewalskii*), 985 of the VU goitered gazelle (*Gazella subgutturosa*) and 125 of the NT Asiatic wild ass (*Equus hemionus ssp. kulan*). Information on other herbivorous species protected in this nursery, i.e. the VU Bukhara urial (*Ovis vignei ssp. bochariensis*) and the NT Bukharan markhor (*Capra falconeri ssp. heptneri*), and data on population numbers recorded in other years, are not available. Two small (300–400 ha) nurseries for breeding the VU Asian houbara bustard (*Chlamydotis macqueenii*) were established with the financial assistance of the United Arab Emirates (in 2007 in Peshkunsy district of Bukhara Oblast, and in 2008 in Karmana district of Navoiy Oblast), which allowed the release of 16,320 houbara bustard individuals into the wild, while Zarafshan State Strict Nature Reserve (SSNR) operated the facility for breeding Bukhara deer.

Endemic species

The new edition of “Flora of Uzbekistan” (Vol. I published in 2017) contained the first lists of endemic species identified in each botanical-geographical region (eight regions divided into 23 units in the mountainous areas and a further eight regions divided into 15 units in the lowland part of the country). According to the Institute of Botany, the flora included 350 country endemic species (approximately 8 per cent of the total), 137 of which were listed in the Red Book. Some 10–12 per cent of endemic species are considered to be relict endemics, preserved after the drying of the Tethys Sea and development of the arid climate in Central Asia. The 2015 Fifth National Report to the CBD mentioned several examples of relict endemics, preserved mainly in the mountainous regions of Pamir-Alay (e.g. *Otostegia buharica*, *Allium verticellatum*, *Astragalus thlaspi*, *Zygophyllum bucharicum*, *Cleome gordjaginii*, *Fumariola turkestanica*, *Dionysia hissarica*, *Cephalorhizum oopodum* and *Ostrovskia magnifica*) and Western Tien-Shan (e.g. *Thesium minkwitzianum*, *Kamelinia tianschanica*, *Nanophyton botschantzevii* and *Kuramosciadum corydaliifolium*). The low mountains of the Kyzylkum Desert constitute another important botanical region, rich in rare, threatened, endemic and relict species.

The global IUCN Red List data on endemic species (version 2019-1) includes three endemic fish (sturgeon) species. According to the 2019 Sixth National Report to the CBD, the fauna includes 53 species and subspecies of terraneous animals of local (Turanian or Turkestan) origin, endemic to Central Asia: 30 reptile, 16 mammal and 8 bird species and subspecies. The highest level of endemism is among fish (50 per cent) and reptiles (49.2); it is much lower among mammals (14.95) and birds (1.7 per cent).

Widespread species

Although collected on a regular basis (e.g. in state forestry units, hunting or fishing grounds), statistical data on the population numbers of widespread wild animals (including game species) is absent in publicly accessible official statistics, which makes proper assessment of recent trends in their populations since 2010 not possible.

The recent National Reports to the CBD contain some fragmented data on the populations of several game species, the annual hunting quotas and the number of hunted animals. In general, populations of most game species showed an increasing trend, followed by an increase in use of their annual hunting quota. For instance, the population of the LC wild boar (*Sus*

scrofa) increased from some 1,700 individuals in 2010 to 5,210 in 2016 and 5,917 in 2017, and the use of its annual hunting quota (180 for 2016 and 2017) increased from 59 hunted specimens (32.7 per cent of the quota) in 2016 to 125 (69.4 per cent) in 2017. Between 2016 and 2017, the population of the LC Eurasian badger (*Meles meles*) increased from 5,067 to 8,639 individuals; however, despite the above increase, the annual quota was lowered from 450 to 400, while the number of hunted badgers increased from 134 to 213 (29.7 and 52.2 per cent of the quota respectively). In 2016–2017, the population of the LC Tolai hare (*Lepus tolai*) increased from 158,800 to 186,000, the annual hunting quota was raised from 12,000 to 15,000, and both the number of hunted hares and the use of quotas were higher in 2017 than in 2016 (12,784 vs. 6,588 and 85.2 per cent vs. 54.9 per cent respectively). The above numbers prove that, in the case of game mammals, the annual hunting quotas allowed not only for their regeneration but also for the continuous increase in their population numbers (regardless of poaching of several mammal species). No data is available on the status of and trends for other widespread mammal species, e.g. the grey wolf (*Canis lupus*) or red fox (*Vulpes vulpes*).

As for the game bird species, the LC chukar partridge (*Alectoris chukar*) population numbers varied from some 316,000 in 2010 to 354,100 in 2011, 226,500 in 2016 and 251,500 in 2017 (hence, they decreased by some 20 per cent in the period 2010–2017). Despite this decrease in population, in 2016–2017, the number of hunted partridges and the use of its annual hunting quota (51,000 in 2016 and 2017) more than doubled, increasing from 11,980 (23.5 per cent) to 26,879 (52.7 per cent). The LC common pheasant (*Phasianus colchicus*) population size varied from 150,000 in 2010 to 196,700 in 2016 and 171,700 in 2017; however, despite the recent decrease in numbers, the annual quota for 2017 (9,770) was higher than for 2016 (6,000), as were the number of hunted pheasants (7,462 in 2017 vs. 3,297 in 2016) and the use of annual quota (76.4 per cent in 2017 vs. 54.9 per cent in 2016).

Alien species

In October 2018, under the Global Register of Introduced and Invasive Species, Uzbekistan compiled its first list of non-indigenous (alien) introduced or invasive plant species naturalized in the country, which contained 228 species. As for fauna, the majority of alien species had been introduced intentionally for commercial purposes, in particular the non-native fish species (which constituted some 50

per cent of the ichthyofauna). Alien fauna included two synanthropic bird species: the common myna (*Acridotheres tristis*) and Eurasian collared turtle-dove (*Streptopelia decaocto*). Although both species are known carriers of parasites and viruses harmful to other birds (including poultry) and, due to its aggressive behaviour, the common myna threatens the populations of native bird species occurring in urban and suburban environments, their influence on the native species is still considered insignificant in Uzbekistan. The five alien mammal species include the American mink (*Neovison vison*), Eurasian red squirrel (*Sciurus vulgaris*), brown rat (*Rattus norvegicus*), muskrat (*Ondatra zibethicus*) and coypu/nutria (*Myocastor coypus*); the latter two were intentionally introduced game species and, thus, hunting helped to control the spread of their populations.

Ecosystems

General description

According to the 2019 Sixth National Report to the CBD, natural and semi-natural landscapes and ecosystems extend over some 82 per cent of the territory of Uzbekistan. In the remaining 18 per cent of the country, natural landscapes, ecosystems and habitats have largely been transformed into anthropogenic ones, mainly as a result of agricultural practices, settlement and infrastructure development.

Mountain ecosystems cover some 13 per cent of the country and alluvial river valleys some 2 per cent, while desert and steppe ecosystems (e.g. the Kyzylkum Desert, Ustyurt Plateau and Karshi Steppe) stretch over the remaining 85 per cent of the territory, which determines the country's vulnerability to the effects of climatic changes, in particular, desertification. The plains of the north-western, northern and central parts of the country are predominantly covered by deserts, semi-deserts and steppes. The smaller, south-eastern part of the country, apart from having heavily transformed agricultural and urban areas, harbours piedmont semi-desert, piedmont steppe and mountain ecosystems of the Western Tien-Shan and Pamir-Alay ranges, with the distinct altitudinal zonation of vegetation belts, including mountain steppes, subalpine mountain forests, sub-alpine and alpine meadows, and nival zone ecosystems (Khazret Sultan in the Gissar range reaches the elevation of 4,643 m) (map 11.1).

Photo 11.1: Chukar partridge (*Alectoris chukar*), Kyzylkum Desert, Bukantau Butte



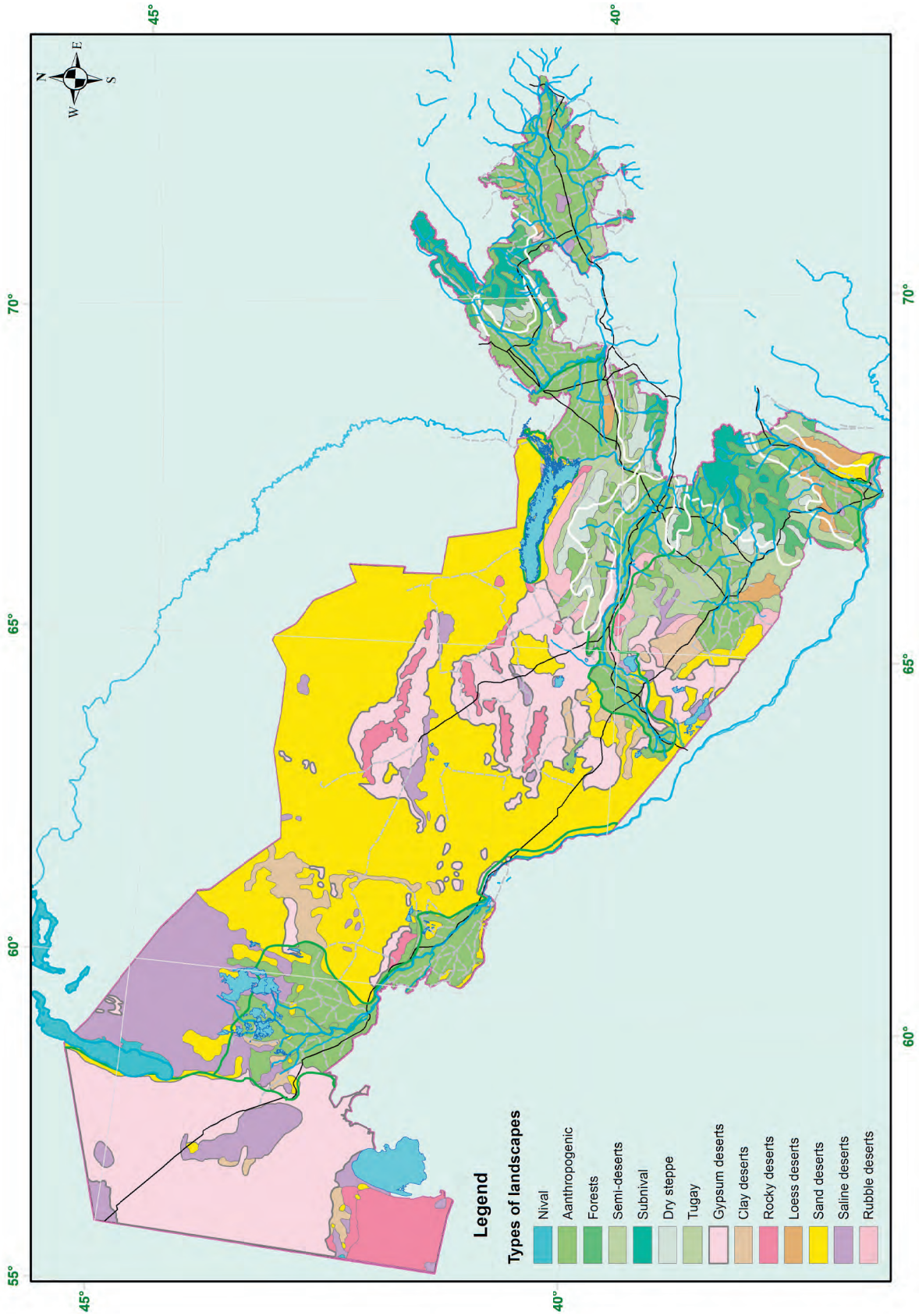
Photo credit: Ms. Mariya Gritsina

Photo 11.2: Goitered gazelle (*Gazella subgutturosa*) in the Species Breeding Centre “Jeyran”



Photo credit: Ms. Mariya Gritsina

Map 11.1: Landscapes



Source: 2019 Sixth National Report to the CBD.
 Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

The country harbours some 525 lakes, most of which have an area of less than 100 ha; only 32 lakes exceed 1,000 ha in area. The human-made Aydar-Arnasay Lake System (which emerged in 1969–1970 as a result of excess Syr Darya floodwater flow into the saline depression of the south-eastern Kyzylkum) stretches over some 340,000 ha. Another specific phenomenon of anthropogenic origin is the irrigation-wastewater lakes, which are fed with agricultural drainage waters (collector discharge and drainage run-off). Many larger irrigation-wastewater lakes (e.g. Sudochye, Dengizkul and Sarygamysh) and the Aydar-Arnasay Lake System became important concentration areas for nesting, transient and wintering bird species. Riverine and riparian ecosystems are best preserved in river corridors (e.g. of the Amu Darya, Syr Darya, Surkhan Darya and Zarafshan Rivers), and in the extensive delta of the Amu Darya River.

As a result of past hydrotechnical works (including regulation of rivers during the Soviet era), irrigation network development, current anthropogenic pressures and ongoing climatic changes, and due to changing environmental conditions, most aquatic, coastal, wetland and riparian ecosystems are in decline, largely affected by periodic fluctuations in water level and salinity. However, most dramatic are the transformations and disappearance of natural ecosystems in the Aral Sea basin. In the dried-up part of the Aral Sea, another new ecosystem spontaneously emerged, the sandy-salty Aralkum Desert (with an area exceeding 5.5 million ha, of which more than 3.3 million ha are on the territory of Uzbekistan). Nowadays, this is intentionally transformed through the planting of saxaul and desert plant species, in order to stabilize the moving sands and mitigate the adverse effects of frequent storms carrying salt, sand and dust.

According to the 2015 Fifth National Report to the CBD, the priority ecosystems and habitats for biodiversity conservation in Uzbekistan are: forest ecosystems; tugai and floodplain ecosystems stretching along the Amu Darya, Syr Darya, Zarafshan, Chirchik and Akhangaran Rivers; low mountains and escarpments of the Ustyurt Plateau; piedmont steppes and adyrs (belts of low, barren hills) in the foothills of the Western Tien-Shan and Pamir-Alay mountain ranges; alpine meadows; and wetland ecosystems threatened by climatic changes, resulting in water scarcity.

Forest ecosystems

Uzbekistan is always described as a forest-poor country, but, even so, many spatially limited forest areas are of significant importance for the conservation of wild species diversity, ecosystems and

habitats and also provide important ecosystem services (e.g. soil formation and protection, water provision, retention and purification, slope stabilization, prevention of wind and water erosion, flood and climate regulation). According to the legislation, forests constitute the national wealth, subject to rational use and protection by the State. This is why all forest fund lands are owned by the State and indicated in official statistics as protected areas. According to the 2015 FAO Global Forest Resources Assessment, some 83 per cent of forests in Uzbekistan are designated as protective forests serving as desertification control, while a further 12 per cent are conserved for the protection of biodiversity.

A proper assessment of the current state, trends in forestry over time and progress made by the country since 2010 is not possible, due to the unavailability of comprehensive, complete, reliable and publicly accessible statistical data on forest resources. The national inventory of forests and state forest fund land was last carried out in 1987. As at 2019, the State Committee on Forestry plans to prepare the new national forest resources inventory.

Three main types of forests can be distinguished in Uzbekistan: drought- and soil-salinity-resistant forests in desert regions, mountain forests, and tugai or riverine forests. The first two types are forests with sparse tree cover. According to the 2019 Sixth National Report to the CBD, as at January 2018, the vast majority of the state forest fund land (9.53 million ha, 84.6 per cent of the total) was located in sandy deserts, and much less in the mountain regions (1.12 million ha, 9.95 per cent), valleys (0.26 million ha, 2.31 per cent) and floodplains (0.11 million ha, 0.98 per cent).

The species composition of forests in Uzbekistan includes some 200 species of trees and shrubs, either native or deliberately introduced. The main forest-forming species in sandy deserts are the white saxaul (*Haloxylon persicum*) and black saxaul (*Haloxylon ammodendron*); the desert forest vegetation also includes *Tamarix* and kandy *Calligonum* shrubs and annual plants such as prickly saltwort species (*Salsola paletziana* and cherkez *Salsola richteri*). Mountain forests are either deciduous (e.g. growing at altitudes between 800 m and 2,000 m in the Western Tien-Shan range) or coniferous (e.g. juniper “archa” forests of the Pamir-Alay range, growing above 2,000 m). Deciduous mountain forest trees include pistachio (*Pistacia vera*), almond (*Amygdalus bucharica*, *A. spinosissima*), walnut (*Juglans regia*), common sea buckthorn (*Hippophae rhamnoides*), barberry (*Berberis vulgaris*), hawthorn (*Crataegus turkestanica*) and apple tree species.

Photo 11.3: Western Tien-Shan, Pskem Mountain Range

Photo credit: Ms. Mariya Gritsina

Photo 11.4: Ustyurt Plateau, Eastern Cliff

Photo credit: Ms. Mariya Gritsina

Valley forest species composition includes poplar, ash, maple, plane and elm species. The floodplain tugai forests are formed by the desert poplar (*Populus pruinosa*), LC Euphrates poplar (*Populus euphratica*), LC Persian olive (*Elaeagnus angustifolia*) and various *Tamarix* and willow species.

The largest complexes of natural riparian tugai forests survived in the Amu Darya River delta (in the Republic of Karakalpakstan) on an area of some 30,000 ha (approximately 10 per cent of their original extent, but as much as 75 per cent of tugai forests in the country and 20 per cent of tugai forests left in Central Asia). Some remnant narrow strips of natural tugai forests were also preserved in river corridors of the Amu Darya, Syr Darya, Zarafshan, Chirchik and Akhangaran Rivers.

Even though larger areas are officially classified as forest land (i.e. state forest fund land, which includes not only forests per se but also areas potentially suitable for afforestation, currently open areas or pastures), the share of actually afforested areas (in particular of closed-canopy forests) is much lower.

In 2010, the total area of state forest fund land accounted for 9.4627 million ha (21.08 per cent of the country's territory), of which the forested areas occupied 2.9753 million ha (6.63 per cent of the country's territory), including 2.3482 million ha of natural forests and 0.6271 million ha of planted forests (78.92 per cent and 21.08 per cent of forested areas respectively). Since 2010, the area of state forest fund land increased constantly, to 9.6 million ha (21.39 per cent of the country) as at 1 January 2013 and 11.26 million ha (25.09 per cent of the country) as at 1 January 2018. Over the same period, the forested area increased to 3.26 million ha (7.26 per cent of the country) as at 1 January 2018, as a result of reforestation works. As a result, the share of forested areas decreased from 31.44 per cent to 28.95 per cent of the total state forest fund land area. According to FAO estimates, as at 2018, the total growing stock of timber was 26 million m³ (19 million m³ deciduous, 7 million m³ coniferous); however, these data could not be verified in the absence of an updated national forest inventory. Data on trends in the available timber stock (in total and per ha), the mean annual timber/biomass increment or the tree-stand age structure are not available.

The spatial distribution of forests throughout the country is uneven and both the share of the state forest fund land and actual forest cover in the total area of the 12 oblasts and the Republic of Karakalpakstan vary. According to the 2019 Sixth National Report to the CBD, the largest areas of the state forest fund land

(as at January 2018) were located in the Republic of Karakalpakstan (5.75 million ha, which accounts for 51.1 per cent of the total) and Navoiy Oblast (almost 3.1 million ha, 27.5 per cent), the smallest were in Andijan (0.008 million ha, 0.07 per cent), Syrdarya (less than 0.009 million ha, 0.08 per cent) and Fergana (less than 0.016 million ha, 0.14 per cent) Oblasts. However, actually afforested areas were most extensive in Navoiy Oblast (1.293 million ha, 39.6 per cent of the total) and the Republic of Karakalpakstan (almost 1.101 million ha, 33.69 per cent). Taking into account the different size of the oblasts, the area forest cover index was the highest for Navoiy (11.7 per cent) and Bukhara (8.3 per cent) Oblasts and the lowest for Syrdarya (0.07 per cent) and Andijan (0.3 per cent) Oblasts.

Due to the scarcity of forest resources and the importance of the multiple ecosystem services provided by forests, the commercial use of forests was prohibited – since the 1960s, only sanitary fellings were allowed. The majority of timber used in the country (as at 2016, approximately 98 per cent of forest raw materials) is imported, while the potential for meeting the demand for wood raw materials through establishing commercial industrial forest plantations of poplar and other fast-growing tree species (e.g. on “reserve lands”) is largely limited by the poor availability of water resources and the soil salinity. State forestry units (“leskhozets”) acquire a limited amount of timber, fuelwood and brushwood in the course of forest management works, including sanitary felling. In 2010, a total amount of 20,315 m³ was harvested (including 5,450 m³ from sanitary felling); a smaller amount was harvested in 2011 (16,850 m³ with 3,662 m³ from sanitary felling). The complete statistical data on annual timber and firewood is absent in publicly accessible official statistics. According to the State Committee on Forestry, in recent years, the mean annual harvest accounted for 25,278 m³ (including 3,654 m³ from sanitary felling). No data on the volume of illegal logging and fuelwood harvesting are available.

Forest ecosystem services also include the provision of valuable non-timber forest products (NTFPs), e.g. game animals, medicinal, decorative and aromatic plants, nuts (pistachio, almonds, walnuts), mushrooms, berries, honey, hay and fodder plants for livestock husbandry. Specialized state forestry enterprises conduct the harvesting of wild medicinal and fodder plants in the lands of the state forest fund, while concessionary private companies operate in the lands leased from either the forestry enterprises or agricultural farms. Annual quotas for NTFPs harvesting are determined by a special interdepartmental commission set up at the Academy

of Sciences, and usually are not fully used (e.g. in 2018, the quota amounted to 859 tons of wild medicinal plants raw material, while only 617 tons, some 71.8 per cent, were actually harvested). More detailed statistical data on particular NTFP species collection are absent from publicly accessible official statistics. Furthermore, the harvesting and use of wild plants, for example for consumption or sale by the local population, is in practice neither regulated nor controlled; hence, the volume of raw NTFP materials collected by individuals is not known.

According to the 2019 Sixth National Report to the CBD, deforestation processes are most intensive in sub-montane and mountain districts of Tashkent, Surkhandarya, Samarkand and Fergana Oblasts. Forest ecosystems are most threatened by the excessive and uncontrolled livestock grazing and illegal logging and fuelwood harvesting, as well as wrongly planned agricultural and infrastructural developments (e.g. slope ploughing, road construction), which have increased soil erosion and the probability of landslides and mudflows. The degradation of tugai forest ecosystems, caused by unsustainable resource uses (in particular, overgrazing), is further aggravated by adverse changes in hydrological regimes, resulting from water drainage for agricultural purposes and climatic changes.

Uzbekistan undertook various activities aimed at the preservation of tugai forest ecosystems, mainly focused on the conservation of those still present in the Amu Darya River delta, for example by establishing protected areas (PAs). As at March 2019, the State Committee on Forestry is implementing two projects, one aimed at enhancing the natural reproduction of tugai forests in the Amu Darya River delta (supported by the Turkish International Cooperation Agency) and another focused on the preservation of ecosystems in the lower reaches of this river. In 2018, a project on restoration of the tugai forest ecosystem in the designated important bird area IBA UZ036 in the Syr Darya River corridor was completed by the Uzbekistan Society for the Protection of Birds (UzSPB), with the support of local communities and the Van Tienhoven Foundation for International Nature Protection.

Uzbekistan implemented intensive ecosystem restoration and rehabilitation works in forest ecosystems. The size of areas where artificial (e.g. planting and sowing) reforestation and afforestation works were carried out, and where forest management measures enhanced the natural regeneration of tree stands, was constantly increasing, from 42,400 ha in 2010 to 43,200 ha in 2015, 46,900 ha in 2017 and 52,600 ha in 2018, while the scope of afforestation

works planned for 2019 was incomparably higher. Similarly, an increasing trend could be noted in the production of planting stock (tree seedlings) and collection of forest tree seeds, which would allow the intensification of afforestation works.

Available statistical data indicate that, between 2014 and 2018, the share of areas where new forest sowing was undertaken was increasing, from 6,400 ha in 2014 (14.55 per cent of areas under reforestation works) to 20,800 ha in 2018 (44.25 per cent) and the scope of forest planting works was stable (20,000 ha in 2014 and 19,750 ha in 2018), while the size of areas where the natural regeneration of already existing forests was enhanced declined, from 17,600 ha (40.0 per cent) in 2014 to only 6,250 ha in 2018 (13.3 per cent). Species used for forest planting (and sowing) in desert ecosystems include saxaul, kandym and saltwort; those planted in the mountains are juniper, pistachio, almond, walnut and hawthorn seedlings. Planting material for valley areas included poplar, maple, plane, elm and the Caspian locust (*Gleditsia caspica*), as well as some fast-growing (including alien) or fruit tree species, while poplar, willow and Persian olive tree seedlings were planted in tugai floodplain areas. Statistical data on, for example, seed germination success rate, tree seedlings survival rate or the use of wildlife repellents to protect planted seedlings are not available.

11.2 Performance of biodiversity monitoring networks and gaps in biodiversity monitoring and research

According to the Law on the Protection and Use of Flora and the Law on the Protection and Use of Fauna (both issued in new editions in 2016), monitoring of the animal and plant world shall be an integral part of state environmental monitoring.

In 2016, the Government approved the Programme of Environmental Monitoring for the period 2016–2020, containing provisions on the monitoring of biological diversity. The geographical scope of biodiversity monitoring in the period 2016–2020 is limited solely to eight state strict nature reserves (SSNRs or “zapovedniks”), two national nature parks (NNPs), one state biosphere reserve (SBR), the Species Breeding Centre (SBC) “Jeyran” and 20 other selected locations (including PAs) in the Republic of Karakalpakstan.

According to 2019 Sixth National Report to the CBD, in late 2018, the methodology for biodiversity data collection and analysis for the integrated monitoring system was in the development and testing phase, the final selection of subjects (species and ecosystems)

was still pending and the integrated system that could link and combine different databases was under development. The work on the procedures for ecosystem monitoring inside SSNRs was most advanced.

Consequently, as at March 2019, an integrated biodiversity monitoring system, which could provide comprehensive and regularly updated information on the current state of ecosystems and habitats and trends in populations of flora and fauna species, was still not operational in Uzbekistan.

As at March 2019, the monitoring of selected key Red Book-listed fauna species was carried out on a regular basis only in some PAs, in particular those of legal entity status that employed research staff and field inspectors (rangers), with the support of the Academy of Sciences. The local populations of the Tien-Shan brown bear were regularly monitored in Ugam-Chatkal SBR, Gissar SSNR and Kitab SSNR; of the Turkestan lynx in Ugam-Chatkal SBR, Chatkal state biosphere strict nature reserve (SBSNR) and Gissar SSNR; of the Przewalski's horse, goitered gazelle and Asiatic wild ass in the SBC "Jeyran"; of the snow leopard, Turkestan white stork and Central Asian cobra (*Naja oxiana*) in Gissar SSNR; of the Bukhara urial and Bukharan markhor in Surkhan SSNR; of the argali sheep (*Ovis ammon ssp. severtzovi*) in Nurata SSNR; of the Bukhara deer in the Lower Amu Darya SBR and Kyzylkum SSNR; and of the cinereous vulture (*Aegypius monachus*) and black stork in Kitab SSNR. Gissar SSNR also carried out the monitoring of plant species.

According to the Academy of Sciences, beginning from 2018, the populations of some rare and threatened Red Book species were also monitored outside PAs.

Furthermore, since 2005, Uzbekistan has been involved in the long-term International Waterbird Census (IWC), collecting data on waterfowl populations and the state of their habitats in wintering grounds. Uzbekistan contributed to the IWC by carrying out a regular annual census of waterfowl in nine of the 52 IBAs identified in the country, on Lakes Chimkurgan, Dengizkul, Hadicha, Kattakurgan, Kuymazar, Talimardzhan, Tudakul, Tuyabuguz and Zekra.

As for flora, the Institute of Botany carried out the long-term (10-year) regular monitoring of 19 populations of four *Lagochilus* species (included in the Red Book) in the lowland areas of the Kyzylkum Region and on the Nurata Ridge. A four-year programme of biodiversity monitoring on the Ustyurt

Plateau was conducted under the UNDP/GEF/SCEEP project "Integrating biodiversity conservation principles into the oil and gas sector of Uzbekistan" (2010–2014).

State forestry units carry out regular (annual) biodiversity monitoring covering, for example, selected species of mammals, birds (including geese, ducks, partridges and sandpipers), reptiles (including lizards and non-venomous snakes), amphibians and invertebrates (scorpions, spiders, scolopendra and wasps). However, in 2018, the area of the state forest fund accounted for only some 24–25 per cent of the country, which means that similar data are not available for the remaining part of the territory.

Hunters' and fishers' societies report annually on the size of populations of game species of mammals, birds and fish. For obvious reasons, the game species census is focused on potential targets of hunting or fishing activities, and hence provides little information on the populations of protected rare and threatened animal species. The annual census of game species is rarely performed outside the officially designated hunting grounds and is effectively carried out only in a certain part of the hunting grounds. According to official statistics for 2017, the area of hunting grounds in Uzbekistan accounted for 4.7971 million ha (including 4.0691 million ha in the Republic of Karakalpakstan, over 84.8 per cent of the total), while the wildlife census was performed on an area of 2.0528 million ha (i.e. in only some 42.8 per cent of the hunting grounds' total area). Hence, the game species populations occurring outside the PAs, state forest fund lands or hunting grounds are not monitored.

Moreover, the quality of data acquired through wildlife censuses carried out in hunting grounds may also be impaired by the small number of employees involved. In 2017, there were 298 persons employed in hunting grounds (including only 16 hunting specialists), which translated statistically into one hunting ground employee for more than 16,000 ha or one hunting specialist for almost 300,000 ha of the area included in the census.

The UNDP/GEF/SCEEP project "Sustainable natural resource and forest management in key mountainous areas important for globally significant biodiversity" (2017–2022) implemented in the highland ecosystems of the Western Tien-Shan and Pamir-Alay Mountains aims at the development and launching of the Biodiversity Conservation Information Management System (BCIMS), for the collection, processing and storage of biodiversity data.

State Cadastres of Flora and Fauna

Works on the census and the maintenance of state cadastres of flora and fauna should be funded from the state budget. The Government funds the research on biodiversity on the basis of research grants, disbursed on a competitive basis.

Due to there being only limited resources, cadastral studies have so far been conducted in only some administrative regions of the country. The Academy of Sciences carried out cadastral projects concerning both vascular plant and vertebrate animal species (most often with a focus on Red Book-listed species) in Tashkent and Surkhandarya Oblasts (2012–2013), Jizzakh Oblast (2013–2014), the Republic of Karakalpakstan and Khorezm Oblast (2014–2015), Samarkand Oblast (2015–2016) and Kashkadarya Oblast (2016–2017). Resulting data include the number and status of populations (at the time of inventory) and their spatial distribution (including GIS maps). In the course of the above projects, the first complete lists of flora species for Jizzakh, Kashkadarya and Samarkand Oblasts were elaborated. Moreover, cadastral works on rare and endangered vascular plant species were carried out in the Kyzylkum Mountains (2015–2017). Outcomes of research by the Academy of Sciences are provided to SCEEP for inclusion in the national cadastral database. Other important sources of biodiversity data are the outcomes of monitoring conducted (mostly on a project basis) by environmental NGOs, in particular UzSPB. In 2018, a bird (in particular, waterfowl) species census was carried out three times (during the spring migration, summer nesting and autumn migration periods) on the coast of Lake Dengizkul, in its north-western bay and in adjacent areas.

In 2018, cadastral works on flora were launched for Navoiy and Bukhara Oblasts, as well as a project on mapping the occurrence of flora species of the western spurs of the Zarafshan range, and identification of key botanical territories. According to the 2019 Sixth National Report to the CBD, as at 2018, the research on flora was carried out in the Kyzylkum Desert, Fergana Valley, Baisyn Mountains and Ustyurt Plateau. However, a large part of the country had not yet been sufficiently studied; for example, updated information on the flora of Sangardak and Tupalang River basins, the middle part of the Syr Darya River corridor, and the Gissar, Babatag and Zirabulak-Ziadin mountain ranges is largely unavailable. Also in 2018, the Institute of Zoology launched a three-year project titled “Inventory and assessment of the current state of the fauna of vertebrate animals of the Tashkent Oblast as the basis for creating a bioresources monitoring system”.

According to the 2019 Sixth National Report to the CBD, the existing cadastres are updated on a regular basis; however, this information could not be verified.

Cadastral works on flora and fauna carried out to date are mainly limited to field inventory works (often “one-off surveys”) undertaken in sequence in selected administrative regions (usually over a period of two years in each region). Hence, once the data acquired from the research ongoing in 2019 (e.g. recently undertaken in Navoiy and Bukhara Oblasts) becomes available, the similar data previously acquired from cadastral works completed for other administrative regions (e.g. in 2012–2013 for Tashkent and Surkhandarya Oblasts) would already be outdated.

Moreover, the findings acquired in a particular region are not verified in the following years, while the monitoring itself means a systematic review, requiring continuous collection and updating of information. Although inventory works undertaken provide a valuable reference point and the basis for the establishment of the cadastral database, the proper maintenance of cadastres (and the planned development of an integrated biodiversity monitoring system) requires undertaking similar efforts, regularly repeated in the subsequent periods.

The continuity of long-term research on wild species of flora and fauna (in particular, rare and threatened species) is the prerequisite for the successful implementation of CBD Article 7, requiring the monitoring of the components of biological diversity by the parties, with particular attention being paid to those requiring urgent conservation measures.

State Cadastre of Protected Natural Territories

No information is available on the full thematic scope of data currently stored in the State Cadastre of Protected Natural Territories.

11.3 Trends in development and management of protected areas

The 2004 Law on Protected Natural Territories (amended in 2014 and 2017) constitutes the legal basis for the designation of PAs. The Law defines seven national PA categories and mentions several other PA types that do not fall under those categories. Some of the national categories are not harmonized with the IUCN PA management categorization system. According to SCEEP (2019), the introduction of a new, revised PA categorization system is planned. The Law provides also for the establishment of PA external buffer zones. The designation of ecological corridors, which could link existing PAs and ensure the

ecological continuity and connectivity of their network, is not mentioned in the Law.

Protected areas

National category I protected areas:

State strict nature reserves

The national category I PAs are state reserves of national importance (also called “zapovedniks”, following the former USSR categorization system), established in order to preserve and facilitate research on ecosystems, flora and fauna, and each designated for an indefinite period as a “state nature conservation and research institution” by the Cabinet of Ministers. The entire area of state reserve is assigned the highest, strictly protective regime, limiting human interference and excluding economic uses of the area. Only scientific research, monitoring (obligatory in state reserves) and fire protection activities are allowed, while tourist visitation of the area requires special permits issued by the PA administration. Therefore, the national category I is equivalent to the IUCN PA management category Ia (Strict Nature Reserve), assigned to wilderness areas in which natural conditions and ecological processes are exceptionally well preserved, and where human interference or use is seriously restricted. Due to the above, state reserves designated in Uzbekistan can better be described as state strict nature reserves, which term better reflects their highest protective regime.

As at March 2019, there are seven SSNRs in Uzbekistan, together encompassing a total area of 188,335 ha, which accounts for only 0.42 per cent of the country’s territory. Most SSNRs stretch over an area of 10,000–27,000 ha, with the exception of the smallest (Kitab, 3,938 ha) and the largest (Gissar, 80,986 ha) (table 11.1).

National category II protected areas:

Complex landscape reserves

The national category II includes complex (landscape) reserves (CLRs), defined as “complex (landscape) zakazniks” (another term of the USSR categorization system, although its use for category II might be misleading). CLRs are established (simultaneously with their external buffer zones) in order to preserve natural objects and complexes of particular ecological values in their natural state. CLRs are each designated as a “state nature conservation institution” by the Cabinet of Ministers. Neither the Law on Protected Natural Territories nor the 2016 Resolution of the Cabinet of Ministers No. 238 indicates the validity period of CLRs’ designation.

The CLR protective regime prohibits activities other than scientific research, monitoring and recreation. However, haymaking, livestock grazing and collection of NTFPs by the CLR personnel and area residents for their own needs are allowed in specially appointed areas extending along a CLR’s border and not exceeding 0.001 per cent of its total area. Hence, national category II corresponds to IUCN category Ib (Wilderness Area) for areas protected and managed in order to preserve their natural condition, which allows local communities to use the available resources in ways compatible with the conservation objectives.

As at March 2019, Uzbekistan has one CLR, Saygachiy, designated in the Republic of Karakalpakstan on the Ustyurt Plateau, adjacent to the state border with Kazakhstan. It encompasses 628,300 ha (1.4 per cent of the country’s territory), with an external buffer zone of 219,800 ha. CLR Saygachiy (which name derives from the CE saiga antelope, the “flagship” species of this region), designated in 2016 and the largest PA in Uzbekistan, replaced the former Saygachiy “zakaznik” (of lower national category V), established in 1991 on an area of 1,000,000 ha.

National category III protected areas:

National nature parks

The national category III PAs are defined as nature parks, established to protect natural objects and complexes of particular ecological, cultural and aesthetic values and used for nature conservation, recreational, scientific and cultural purposes. Nature parks can be of either national or local importance and are designated as a “state nature conservation institution” by either the Cabinet of Ministers or local government authorities accordingly. The nature park designation validity period is not determined by the 2004 Law on Protected Natural Territories.

Once designated, a nature park area should be divided into different functional zones: the strictly protected zone (with the same management regime as an SSNR), and zones of recreational, economic and other uses (the latter could include the designation of a health spa zone, with the same management regime as in such zones of national category VI). The management regime of a nature park recreational zone depends on the state of preservation of its natural objects and complexes. The management regime of a nature park economic and other uses zone allows for permanent human habitation. In general, all activities that could threaten the natural values of the nature park area (e.g. logging, activities that could cause the degradation of flora and fauna) are either restricted or prohibited. Hence, the national category III corresponds to IUCN

category II (National Park), and thus, nature parks are further referred to as national nature parks (NNPs).

As at March 2019, there are three NNPs of different sizes, encompassing a total area of 558,173.6 ha (1.243 per cent of the country's territory), including the vast Ugam-Chatkal NNP (531,637 ha, the second largest PA in Uzbekistan), medium-sized Zaamin NNP (24,110 ha) and small Zarafshan NNP (2,426 ha). The latter replaced the former Zarafshan SSNR ("zapovednik"), of the highest national category I, which was established in 1979 on an area of 2,352 ha.

National category IV protected areas:

Nature monuments

PAs of the national category IV are state nature monuments, protecting natural objects of unique ecological, scientific, cultural, and aesthetic values, designated by state authorities at the local level. Depending on the kind of natural object subject to conservation, state nature monuments are further divided into hydrological (protecting wetlands, lakes, rivers or other water bodies), botanical (protecting flora species), geomorphological (protecting natural relief forms), palaeontological (preserving fossil objects), as well as geological and mineralogical (protecting geological and mineralogical formations). All activities that could threaten the values of the preserved natural object are prohibited. As the national category IV corresponds to IUCN category III (Natural Monument or Feature), state nature monuments are further referred to as nature monuments (NMs). The responsibility for ensuring the protective regime and undertaking conservation measures is delegated to the legal entities or individuals owning the land protected as the NM or renting and using it for religious purposes.

As at March 2019, Uzbekistan has 10 NMs, jointly encompassing a total area of 3,760.1 ha (0.008 per cent of the country's territory). Six NMs cover less than 100 ha each, the smallest being Varahsha (7 ha), while the largest are Mingbulak (1,000 ha) and Yaz'yavan Steppe (1,962.9 ha).

National category V protected areas:

State reserves, nature nurseries and fishery zones

According to the Law on Protected Natural Territories, the national category V includes several types of PAs designated for the conservation, reproduction and recovery of individual natural objects and complexes: state reserves (called "zakazniks", as in the USSR categorization system), nature nurseries and fishery zones. Therefore, the conservation objective of the

national category V is similar to IUCN category IV (Habitat/Species Management Area).

National category V state "zakaznik" reserves (further referred to as state reserves, SRs) are designated for the conservation, reproduction and restoration of individual natural objects and complexes. Four types of SRs are defined by the Law on Protected Natural Territories: biological (botanical, zoological), protecting rare and endangered flora and/or fauna species, as well as their migration routes, palaeontological, hydrological, and geological and mineralogical. SRs of national importance are designated by the Cabinet of Ministers and SRs of local importance by the state authorities at the local level, for either an indefinite period or a period not shorter than 10 years. SRs can be established as a legal entity (which would then imply the presence of an own management body and personnel) or without such legal status, and be either publicly or privately owned. In general, all activities that could threaten the values of natural objects and complexes protected in SRs are either prohibited or restricted (on either a permanent or temporary basis); however, the territories of SRs without legal entity status are not withdrawn from their economic use. As the "zakaznik" term was also used for CLRs, the Law emphasizes the difference in protective regimes of "complex (landscape) zakazniks" (CLRs) and "zakazniks" (SRs).

As at March 2019, there are 12 SRs, with a total area of 572,404 ha (1.275 per cent of the country's territory). Two SRs are of less than 5,000 ha each (including the smallest, Omonkuton, at 1,515 ha), nine SRs are between 11,300 ha and 63,300 ha, while Mubarek (the third-largest PA in Uzbekistan) encompasses 264,469 ha (46.2 per cent of the SRs' total area).

National category V nature nurseries (further referred to as species breeding centres, SBCs) are designated by the state authorities at the local level, with the purpose of facilitating the preservation, reproduction and restoration of particular wild flora or fauna species. SBCs can be established as a legal entity or without such legal status and be either publicly or privately owned. The protective regime prohibits activities that could threaten the species subject to conservation in a particular SBC. As at March 2019, three SBCs are in operation in Uzbekistan, encompassing a total area of 17,222 ha (0.038 per cent of the country's territory). The biggest, the SBC "Jeyran" (16,522 ha) in Bukhara Oblast, is protecting large herbivorous mammals (Przewalski's horse, goitered gazelle, Asiatic wild ass, Bukhara urial and Bukharan markhor). The other two, much smaller

SBCs (300 ha and 400 ha), are established in Bukhara and Navoiy Oblasts for breeding the houbara bustard.

National category V fishery zones are designated on water bodies by the Cabinet of Ministers as protected natural areas with the objective to preserve, reproduce and restore rare and endangered species of fish and other aquatic organisms. Moreover, besides the conservation functions, fishery zones are also used for fishery activities. No data on the total number and area of fishery zones are available.

National category VI protected areas:

Protected landscapes

The national category VI of PAs is defined as protected landscapes, and again includes several types of PAs: natural health spa zones (NHSZs), recreational zones, water protective zones, coastline belts, sanitary protection zones of water bodies, and surface and groundwater formation zones. Protected landscapes of the national category VI, the main objective of which is the protection of natural resources (e.g. ensuring water quality) should not be confused with the IUCN PA management category V (Protected Landscape/Seascape), assigned to areas of high or distinct scenic quality, with significant associated habitats, flora and fauna, and associated cultural features.

National category VI NHSZs are areas protected for their therapeutic and curative properties (e.g. areas harbouring mineral water springs, rich in therapeutic mud deposits and being of favourable climatic conditions). NHSZs of national importance are designated by the Cabinet of Ministers, and those of local importance by the state authorities at the local level. NHSZs are further divided into three functional zones, each having its special protective regime: the first zone consisting of therapeutic resources, the second zone including territories of sanatoria, etc., and the adjacent third zone serving as a buffer zone, where some activities (e.g. the use of pesticides, waste storage and several industries) are forbidden. No data on the total number and area of NHSZs are available. NHSZs cannot be perceived as typical PAs in the common understanding of the term, as the purpose for the designation of an NHSZ is different from the preservation of biological and landscape diversity.

Another PA type of the national category VI are recreational zones, designated by the state authorities at the local level, for tourist and recreational purposes. Recreational zones can be divided into areas of different protective regimes (e.g. similar to the third zone of an NHSZ). No data on the total number and area of recreational zones are available. Again, due to

the purpose of designation, recreational zones cannot be perceived as typical PAs.

Similarly to NHSZs, national category VI water protective zones, coastline belts, sanitary protection zones of water bodies, and surface and groundwater formation zones are designated (either by the Cabinet of Ministers or state authorities at the local level) with the primary purpose to protect natural resources (e.g. ensure water quality, maintain a favourable water regime), and, to a much lesser extent, biological and landscape diversity. However, the protection of such areas (adjacent to river corridors, lake and water reservoir coastlines, canals or water collectors) from pollution, the use of pesticides and the felling trees and shrubs, for example, is of vital importance for the maintenance of wildlife habitats and migration routes. As at March 2019, water protective zones, coastline belts and sanitary protection zones of water bodies encompassed a total area of 155,416 ha (0.346 per cent of the country's territory) and the surface and groundwater formation zones a further 269,949 ha (0.601 per cent).

National category VII protected areas:

Territories for the management of individual natural resources

The Law on Protected Natural Territories defined the national category VII of PAs as territories for the management of individual natural resources, namely, the state forest fund lands (including forests of high conservation values) and the lands used for hunting farms, intended for the rational use of flora and fauna. The Law does not determine the body authorized to designate territories for the management of individual natural resources. The protective regime prohibits the intentional introduction of non-native species, and any other activities that could threaten the flora and fauna in such territories, while the use of flora and fauna species (including hunting, which could directly threaten the fauna) is regulated by other laws. Therefore, the national category VII could correspond to IUCN management category IV (Habitat/Species Management Area), assigned to protected areas designated to maintain, conserve and restore species and habitats (also semi-natural ones, like the vast majority of forests in Uzbekistan), which might require undertaking regular and active management interventions.

As at March 2019, territories for the management of individual natural resources encompassed as much as 11,121,567.2 ha (24.776 per cent of the country's territory) – an area almost equal to the whole territory of the state forest fund (11.26 million ha, as at 1 January 2018), which implies that almost all state

forest fund lands and lands of hunting farms are classified as PAs of the national category VII. It should be remembered that, as at 1 January 2018, the share of forested areas accounted for only 28.95 per cent of the total state forest fund land area, while the share of natural forests (in particular, high conservation value forests) was much lower. Hence, the majority of PAs of the national category VII are in fact other state forest fund lands (e.g. forestry plantations, areas under afforestation and open areas potentially suitable for afforestation) and lands of hunting farms, which can hardly be perceived as typical PAs, even of the IUCN category IV.

Non-categorized protected areas:

State biosphere reserves, national parks and inter-State protected natural territories

State biosphere reserves (SBRs) are designated by the Cabinet of Ministers with the purpose of fostering sustainable economic and social development aimed at the preservation of biological diversity and rational use of natural objects and complexes. SBRs can be nominated as biosphere reserves under the UNESCO Man and the Biosphere (MAB) Programme. SBRs are divided into the strictly protected zone (of the same protective regime as in SSNRs), the buffer zone serving for the preservation but also reproduction and restoration of natural objects and complexes (where activities that could threaten the protected zone are prohibited) and the transitional zone (the management regime of which allows activities that do not harm natural objects and complexes of the SBR).

As at March 2019, there are two SBRs in Uzbekistan, encompassing a total area of 111,670.6 ha (0.249 per cent of the country's territory): Lower Amu Darya (68,717.8 ha), encompassing complexes of tugai forests and floodplain ecosystems, and Ugam-Chatkal (42,952.8 ha), including mountain forests and highland ecosystems. Ugam-Chatkal SBR, in particular the core zone Bashkyzylsay, also bears two international designations, as the UNESCO MAB Biosphere Reserve "Mount Chatkal" (since 1978)²⁴ and as part of the Western Tien-Shan transnational World Heritage property (2016). Although the Law on Protected Natural Territories does not determine the SBR legal entity status, both these SBRs have their own management bodies and personnel.

According to the Law on Protected Natural Territories, national parks (NPs) are designated by the Cabinet of Ministers as protected areas aimed at the preservation, reproduction and sustainable use of unique and

valuable plant species (including decorative ones) for conservation, recreational, scientific and cultural purposes. Even though the legal entity status is not mentioned, the Law determines that NPs are to be managed by their own directorates, established by the Cabinet of Ministers. The protective regime of NPs prohibits activities that could harm the flora (the Law also mentions the fauna inhabiting the NP territory, but only as an integral part of the ecosystem), while external buffer zones can be designated in adjacent areas, to protect both the flora and fauna of the NP. The NP inner territory can be divided into functional zones, not further detailed by the Law.

As at March 2019, the only NP in the country is Durmen (32.4 ha), designated in 2014 in Tashkent Oblast, established on the basis of a village park zone. NPs do not belong to any national PA category. Despite the similarity of the term, NPs in Uzbekistan should not be confused with IUCN category II areas (National Parks), as the latter are designated with the purpose of protecting the whole complexity of native species and ecosystems and ensuring the continuity of ecological processes, usually encompass large-scale natural areas of sufficient size and ecological quality to maintain ecological functions and processes, and rarely require intensive management interventions.

In contrast to the above, according to the Law on Protected Natural Territories, NPs in Uzbekistan have a clear focus solely on the protection of flora species, and can be "created through the restoration and reproduction of flora", including the application of complex agrotechnical measures (hence, their establishment does not necessarily require the presence of natural areas of high ecological qualities and conservation values). The 2014 Resolution of the Cabinet of Ministers No. 144 on the designation of Durmen NP, among the tasks set for its Directorate, explicitly mentions carrying out complex agrotechnical measures, the maintenance of artificial irrigation systems and "measures to further green the territory with valuable plant species". Last, but not least, the size of Durmen NP (less than 33 ha, and thus smaller than most NMs in the country) is definitely not sufficient to protect an ecosystem, or viable fauna populations. However, it can serve as a nursery area for rare plant species, function as a local botanical garden and be used for scientific and educational purposes.

The Law on Protected Natural Territories also mentions the possibility of designation of inter-State protected natural territories, encompassing PAs of two

²⁴ Only Bashkyzylsay – the core zone of Ugam-Chatkal SBR – has World Heritage status.

or more neighbouring countries, established on the basis of international agreements. As at March 2019, no inter-State protected natural territories are designated in Uzbekistan; however, a Memorandum of Cooperation between SCEEP and relevant authorities of the Republic of Kazakhstan and the Kyrgyz Republic on the management and protection of the Western Tien-Shan transnational World Heritage property was signed in 2019. This trilateral transnational World Heritage site encompasses seven PAs with a total area of 528,177.6 ha (including 35,724 ha in Chatkal SBSNR and the core zone Bashkyzylsay of Ugam–Chatkal SBR in Uzbekistan), with a buffer zone of 102,915.8 ha.

Buffer zones

The Law on Protected Natural Territories provides for the designation of external buffer zones, adjacent to the territories of several types of PAs (SSNRs, CLRs, SRs, NMs and NPs) and determines that part of the SSNR buffer zone may be transferred to the SSNR managing body for the organization of ecological tourism activities, establishing nurseries for breeding rare and threatened native flora and fauna species and other SSNR needs. This Law does not provide for the designation of NNP buffer zones, probably due to the fact that, in addition to the strictly protected zone, their territories obligatorily include zones of recreational, economic and other uses. In general, the protective regime of a buffer zone either prohibits or restricts activities that could adversely influence related PAs.

According to the Law, the protective regime and size of a buffer zone are to be determined simultaneously with the designation of the PA concerned. However, this general rule was not always applied, as the designation of Durmen NP was not accompanied by the establishment of its external buffer zone, for example. Furthermore, according to SCEEP (2019), buffer zones are not yet established for several SSNRs (Chatkal, Gissar, Kyzylkum, Nurata and Zaamin). The designation of buffer zones for Chatkal and Gissar SSNRs is planned under the UNDP/GEF/SCEEP project “Sustainable natural resource and forest management in key mountainous areas important for globally significant biodiversity” (2017–2022). Information on external PA buffer zones is generally not available.

Trends in development of protected area system

Between 2010 and 2018, a few new PAs were established in Uzbekistan, most often on the basis of previously existing ones:

- Lower Amu Darya SBR in the Republic of Karakalpakstan (2011 Resolution of the Cabinet of Ministers No. 242) with an area of 68,717.8 ha (which included the former Badai-Tugai SSNR, established in 1971 on 6,400 ha);
- Durmen NP covering 32.4 ha in Tashkent Oblast (2014 Resolution of the Cabinet of Ministers No. 144);
- Saygachiy CLR in the Republic of Karakalpakstan (2016 Resolution of the Cabinet of Ministers No. 238), as at March 2019 the largest PA in the country, encompassing an area of 628,300 ha, with an external buffer zone of 219,800 ha (replacing the former Saygachiy SR of national category V, established in 1991 on 1,000,000 ha);
- Zarafshan NNP in Samarkand Oblast covering 2,426 ha, established in 2018 (2018 Resolution of the Cabinet of Ministers No. 82) on the basis on the former Zarafshan SSNR;
- Ugam-Chatkal SBR on 42,952.8 ha in Tashkent Oblast (2018 Resolution of the Cabinet of Ministers No. 367), which replaced the former Ugam-Chatkal SR (established in 2016).

As at March 2019, works on the designation of Saykhun SR in Syrdarya Oblast are ongoing.

According to official statistics, the national PA system of Uzbekistan (even without taking into account PAs of the national category VI) on 1 January 2019 encompassed 13.2 million ha, 29.4 per cent of the country’s territory. This is above the minimum threshold set by the CBD Aichi Target 11, which stipulates that, by 2020, at least 17 per cent of terrestrial and inland water areas shall be included in effectively and equitably managed, ecologically representative and well-connected systems of protected areas.

However, the predominant part of the above total area (84.24 per cent, over 11.1 million ha) comprises PAs of the national category VII: state forest fund lands (of which only 28.95 per cent were actual forests, while the remaining 71.05 per cent were, for example, forestry plantations and areas under afforestation works, as well as pastures and open areas potentially suitable for afforestation) and the lands of hunting farms. Hence, PAs, in the common understanding of the term, together cover less than 2.1 million ha (some 15 per cent of the national protected area system), which accounted for only 4.63 per cent of the country’s territory (map 11.2).

Table 11.1: Protected areas as at 1 January 2019

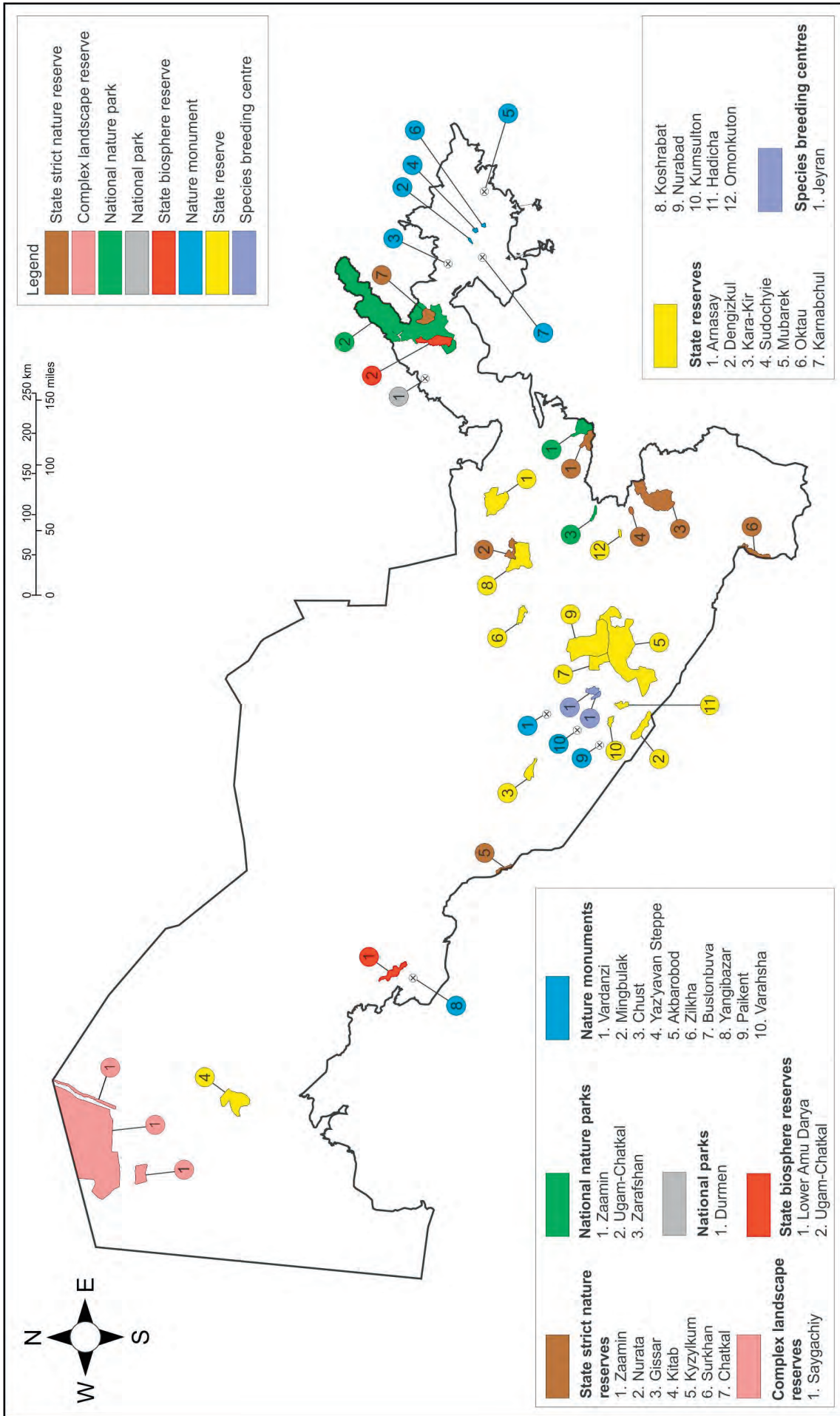
Protected area type	PA category	IUCN correspondence	PA name	Year of designation	Area (ha)	Approx. % of country's territory*	Remarks		
State strict nature reserve	I	Ia	Zaamin	1960	188 335.0	0.42	“zapovednik” Originally established in 1926. Mountain forest/highland ecosystems. Pamir-Alay, Turkestan Ridge		
			Chatkal	1947	24 706.0		Mountain forest/highland ecosystems. West Tien-Shan, Chatkal Ridge		
			Kyzylkum	1971	10 311.0		Tugai forest, desert ecosystems, Amu Darya floodplain		
			Nurata	1975	17 752.0		Arid lowland, low mountain ecosystems. Pamir-Alay, Nurata Ridge		
			Kitab	1979	3 938.0		Geological/paleological monument, low mountain forest ecosystem. Pamir-Alay, Zarafshan Ridge		
			Gissar	1983	80 986.0		Mountain forest/highland ecosystems. Pamir-Alay, Gissar Ridge		
			Surkhan	1987	23 802.0		Low mountain, mountain forest/highland ecosystems. Pamir-Alay, Kugitang Range		
							628 300.0	1.40	“complex landscape zakaznik”
							628 300.0		State Reserve 1991–2016. Desert ecosystems. Ustyurt Plateau
Complex landscape reserve	II	Ib	Saygachiy	2016	558 173.6	1.24			
	III	II	Zaamin	1976	24 110.0		Mountain forest/highland ecosystems. Pamir-Alay, Turkestan Ridge		
National nature park			Ugam-Chatkal	1990	531 637.2		Mountain forest/highland ecosystems. West Tien-Shan, Chatkal Ridge		
			Zarafshan	2018	2 426.4		Tugai forest/wetland ecosystems. Zarafshan floodplain. Incl. former SSNR (zapovednik) established in 1979		
National park	none	none			32.4	0.00	Flora species. Tashkent Oblast.		
State biosphere reserve	none	none	Durmen	2014	32.4				
	none	none	Lower Amu Darya	2011	111 670.6	0.25	Tugai/floodplain ecosystems. Amu Darya River basin. Incl. former Badai-Tugai SSNR (zapovednik)		
			Ugam-Chatkal	2018	42 952.8		Mountain forest/highland ecosystems. West Tien-Shan, Chatkal Ridge. World Heritage/UNESCO MAB Biosphere Reserve		

Protected area type	PA category	IUCN correspondence	PA name	Year of designation	Area (ha)	Approx. % of country's territory*	Remarks					
Nature monument	IV	III	Chust	1990	96.0	3 760.1	0.01					
			Mingbulak	1991	1 000.0							
			Yaz'yavan Steppe	1994	1 962.9							
			Vardanzi	1997	124.0							
			Akbarobod		39.5							
			Zilkha		22.2							
			Bustonbuva		8.5							
			Yangbazar	2003	470.0							
			Paikent	2010	30.0							
			Varahsha	2010	7.0							
			Total							572 404.0	1.28	“zakaznik” Ramsar site (2001) Ramsar site (2008)
			State reserve	V	IV			Dengizkul	1973	50 000.0	17 222.0	0.04
								Arnasay	1983	63 300.0		
Sudochyie	1991	50 000.0										
Kara-Kir	1992	30 000.0										
Nurabad	1992	40 000.0										
Oktau	1997	15 420.0										
Karnabchul	1998	25 000.0										
Koshrabat	1998	16 500.0										
Mubarek	1998	264 469.0										
Kumsulton	2010	4 900.0										
Hadicha	2010	11 300.0										
Omonkuton		1 515.0										
Total					17 222.0	0.04						
Species breeding centre	V	IV	Jeyran	1976	16 522.0	11 121 567.2	24.78					
			Bukhara houbara	2007	400.0							
			Navoiy houbara	2008	300.0							
Total					155 416.0	0.35	In Peshkunsky district/Bukhara Oblast In Karmana district/Navoiy Oblast					
Forest management area	VII	IV				269 949.0	0.60					
Water protection zone	VI	none				13 626 829.9	30.36					
Water source protection zone	VI	none				13 626 829.9	30.36					
Total					155 416.0	0.35	Zones along rivers, irrigation channels and collectors Surface/groundwater source protective zones					

Source: State Committee on Ecology and Environmental Protection (2019); 2019 Sixth National Report to the CBD; 2015 Fifth National Report to the CBD; ECE Secretariat calculations.

Note: * 44,889,240 ha.

Map 11.2: Protected areas



Source: Prepared by ECE based on the maps provided by the State Committee on Ecology and Environmental Protection, 2019.
 Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

In 2016–2017, the Government increased the share of PAs of the highest protective regime through the redesignation of the former Saygachiy SR and the former Zarafshan SSNR. However, in the case of the former Saygachiy SR, the redesignation resulted in a decrease in the area of the protected territory by almost 37.2 per cent. In the case of the former Zarafshan SSNR, a strictly protected zone of the Zarafshan NNP (1,777 ha) was made almost one quarter (24.4 per cent) smaller than that in the SSNR.

Protected area management

The development of PA management plans, mentioned in the 2004 Law on Protected Natural Territories, is further regulated by the 2012 Order of the Chairperson of the State Committee for Nature Protection No. 3. The Order served as the basis for the preparation of management plans for the period 2014–2018 for eight SSNRs, two NNPs, the Lower Amu Darya SBR and the SBC “Jeyran”. As at March 2019, management plans for the period 2019–2023 are still in preparation.

In general, provisions of PA management plans concerning the application of prescribed nature conservation measures, conducting scientific research and carrying out environmental education and awareness-raising activities are successfully implemented, while the originally planned capacity-building measures (e.g. concerning the construction of facilities, visitor centres, purchase of equipment, etc.) are either abandoned or progressing much more slowly, due to the limited available funding.

As for human resources, which are indispensable for the implementation of adopted management plans, the increase in the total area placed under legal protection in Uzbekistan was not accompanied by an increase in the number of PA personnel. Even though the publicly available statistical data on employment in PAs is incomplete, a negative trend is observed. The total number of employees in SSNRs and NNPs initially increased from 550 in 2011 to 557 in 2012 and 567 in 2015, but later decreased to 526 in 2017. Similarly, the number of SSNR and NNP scientific employees increased from 65 in 2011 to 73 in 2012, then stabilized at 70 in the period 2013–2015, but later decreased to only 49 in 2017. The latter negative trend is most alerting, as the decreasing number of scientific personnel might further limit the capacities for carrying out regular biodiversity monitoring in PAs. Statistical data that could demonstrate employment trends in institutions managing types of PAs other than SSNRs and NNPs are not available.

The most effective protection of biological and landscape diversity is ensured only in PAs granted

legal entity status, which have their own managing body and field personnel (including rangers), that is, PAs of national categories I (SSNRs) and II (CLRs), and also in strictly protected zones of NNPs (national category III) and of non-categorized SBRs. As at March 2019, the total area encompassed by the above PA types (given the unavailability of data on the exact functional zonation of NNPs and SBRs, including NNP zones of recreational, economic and other uses, as well as SBR buffer and transitional zones), accounted for only 1,486,479.2 ha, or 10.9 per cent of the total area of the national PA system (including PAs of the national category VI) and only 3.31 per cent of the country’s territory.

The extensive Saygachiy CLR constitutes over 42 per cent of the area of the most effective PAs (628,300 ha, 4.61 per cent of the whole PA system and 1.4 per cent of the country’s territory). However, the full achievement of the main conservation objective for its designation is largely dependent on progress in transboundary cooperation with Kazakhstan, which could reopen the southward cross-border winter migrations of saiga antelope of the Ustyurt herd into Saygachiy CLR. Furthermore, seven SSNRs, designated to preserve natural ecosystems, habitats and species diversity, and therefore PAs that best serve as reference areas for scientific research and monitoring and ensure the highest legal protective regime, jointly encompassed 188,335 ha (1.38 per cent of the PA system and 0.42 per cent of the country’s territory).

Other “typical” PAs are either established with management objectives that differ from the conservation of the whole complexity of native species and ecosystems and of the continuity of natural ecological processes, or have much less effective management. For instance, SBCs, which jointly occupy a small area (17,222 ha, 0.038 per cent of the country’s territory), mainly serve for the preservation and reproduction of selected “flagship” rare mammal and bird species. The twelve “zakaznik” SRs (572,404 ha in total, 1.275 per cent of the country’s territory) are supervised and patrolled rather than actively managed by the regional SCEEP branches, while eight of the 10 NMs (3,760.1 ha in total, 0.008 per cent of the country’s territory), managed by local authorities, are too small to protect much more than a single natural phenomenon.

Gaps in the protected area system in terms of ecosystem coverage and species conservation

As at March 2019, a striking disparity in the PA geographical distribution among particular regions of Uzbekistan is visible (map 11.2). For instance, very

few PAs are designated in western (Republic of Karakalpakstan) and central (e.g. Navoiy Oblast) parts of the country, and the PA system is also underdeveloped in the most southern (e.g. Khorezm, Surkhandarya) and eastern (Syrdarya, Andijan, Fergana, Namangan) oblasts. Furthermore, almost all PAs of the highest protective regime (SSNRs and NNPs) are concentrated in the south-eastern part of the country, with the exception of the only CLR recently established in the Republic of Karakalpakstan, in the northernmost corner of the country.

According to CBD Aichi Target 11, the PA network should be ecologically representative, including all main representative landscapes and ecosystems, as well as protecting the diversity of flora and fauna species, in particular endemic, rare and threatened species. As at 2019, this was not yet the case in Uzbekistan.

As at 2016, only 3.5 per cent of desert landscapes and ecosystems (including desert and foothill habitats), which encompass a large part of the country and are therefore highly representative of Uzbekistan, and only 3 per cent of floodplain forests were included in the PA system. On the contrary, 14 per cent of mountain landscapes and ecosystems (which cover some 13 per cent of the country) were best preserved by the PA system, as the majority of SSNRs and all three NNPs had been designated with the objective to protect high mountain and montane forest ecosystems with their unique flora and fauna. However, the valuable ecosystems of the mountain massifs located in the central part of the Kyzylkum Desert are not yet protected.

Furthermore, PAs are not only unevenly distributed among the geographical regions, landscape and ecosystem types and administrative regions of the country but also among botanical and zoological regions, and therefore the PA system does not encompass the full geographical ranges of occurrence and habitats of several rare, endemic and threatened species; consequently, it preserves neither the whole phytocenotic and floristic nor zoological diversity.

According to the Institute of Botany, as at 2019, only 157 (48.9 per cent) of 321 higher plant species listed in the 2009 Red Book of Uzbekistan (RB), and only 131 of 350 national endemics are protected in SSNRs and NNPs, providing for effective flora species protection. According to estimates presented in the 2019 Sixth National Report to the CBD, some 180 RB plant species (56 per cent) occur in PAs of national categories I–IV (SSNRs, CLR, NNPs, NMs), and in SBRs. However, the coverage of the above rare plant species by the whole PA network cannot be properly

assessed, as no field inventory works on flora had been conducted to date in PAs of management categories other than SSNRs and NNPs. As for geographical gaps concerning the protection of RB plant species, most noticeable is the absence of PAs in other important areas of their concentration, e.g. in the Baysun Mountains (76 RB plant species), Tupalang River basin (40), western spurs of the Gissar Range (32), Babatag Ridge (22), Sangardak River basin (20) and Shakhimardan enclave (15 species), and in the residual lowlands of Kuldzhuktau, Tamdytau and Bukantau (respectively, 16, 10 and 8 RB plant species).

As for fauna species conservation within the PA system, the 2019 Sixth National Report to the CBD estimates that 88–90 per cent of bird species, 68–75 per cent of mammal species, 72.2 per cent of RB fish species and 63–71.4 per cent of reptile species occurred in SSNRs, CLR, NNPs, NMs and SBRs. SSNRs, which provide the most strict and effective species protection, are reported as harbouring some 50 per cent of all vertebrate animal species, and 43 per cent of those listed as rare and threatened (including 56 per cent of RB mammal and 38.5 per cent of RB bird species). However, the existing PAs cover only parts of their habitats and do not provide protection for several migrating fauna species during their full life cycle. The majority of SSNRs (except for Gissar) are too small to provide for adequate protection for target ecosystems, or the individual fauna species whose presence justified their designation. Furthermore, a proportion of rare and threatened species, in particular reptile and bird species, occurs only inside NMs and “zakaznik” SRs, which provide a lower protective regime. SRs are estimated to protect some 40 per cent of rare and threatened vertebrate species (in particular, waterfowl).

Planned extension of the protected area system

In 2012, the UNDP/GEF/SCEEP project “Strengthening sustainability of the national system of protected areas by focusing on strictly protected areas” developed the Recommendations for expansion of the system of protected areas in Uzbekistan. PA network gap assessment was conducted, with the use of landscape, botanical and zoological criteria and GIS techniques. As a result, 29 sites suitable for the extension of existing PAs or designation of new ones were recommended, including seven that simultaneously meet all three types of criteria. The recommendations were the basis for the elaboration of the draft programme for the expansion of the network of protected natural territories for 2014–2023, which was not officially adopted.

In early 2019, the President approved the Roadmap for the development of the protected area system for the period 2019–2022 (2019 Resolution of the President No. 4247), based on the proposal jointly submitted by SCEEP, the State Committee on Forestry and the Academy of Sciences. According to the Roadmap, five PAs with a total area of some 2.3–3 million ha are to be designated in the Republic of Karakalpakstan in 2019–2022: the new Southern Ustyurt SSNR with its own administrative body and personnel and four new SRs, each with a legal entity status. Two of four new SRs are planned to be designated for the purpose of landscape conservation.

In terms of area, Southern Ustyurt SSNR is expected to extend over some 1.4 million ha (which would make it the largest PA in the country) of territories adjacent to the existing Gaplangyr SSNR in Turkmenistan and planned Mangystau State Preserved Zone in Kazakhstan, which could then provide for the emergence of a coherent trilateral transboundary protected area.

Furthermore, Resolution No. 4247 provides for the establishment of buffer zones for six SSNRs (Chatkal, Gissar, Kyzylkum, Nurata, Surkhan and Zaamin) and Lower Amu Darya SBR.

11.4 Ecological networks

National ecological network

The CBD Aichi Target 11 emphasizes that the national PA system should be well connected, which requires the presence of ecological corridors linking PAs (serving either as core biodiversity conservation areas or species migration stepping stones) to ensure the integrity, ecological continuity and connectivity of the ecological network, both in-country and with neighbouring States. However, the concepts of the ecological network and of ecological corridors are, in practice, absent from the Law on Protected Natural Territories. No information on field research activities aiming at inventorying and mapping of the mainstays, priority connecting corridors and migratory routes of rare and endangered fauna species protected by the national legislation of Uzbekistan is available. Hence, the possible designation of ecological corridors would require prior scientific research.

The national PA system of Uzbekistan is still not a “network” in the common meaning of the term, mostly due to the scattered spatial pattern of PA distribution. Despite this, some positive examples of ecological connectivity on a local scale can be mentioned, including:

- Three SRs (Karnabchul, Nurabad and Mubarek) adjacent to each other, located at the conjunction of administrative boundaries of Navoiy, Kashkadarya and Samarkand Oblasts;
- The linkage between Koshrabad SR (Jizzakh Oblast) and Nurata SSNR (Samarkand Oblast);
- The ecological continuity of the two well-protected PAs situated in the Turkestan Ridge (Zaamin SSNR and Zaamin NNP);
- The connectivity of several PAs of different management categories at both in-country and transboundary levels within the Western Tien-Shan transnational World Heritage property.

Nevertheless, in-country ecological corridors are lacking, despite the fact that around one quarter (24.16 per cent, as at 2018) of the country’s territory is classified as “reserve land” (table 16.4).

Ramsar network

Two sites are designated as wetlands of international importance (Ramsar sites), together encompassing an area of 558,400 ha.

“Lake Dengizkul” Ramsar site (31,300 ha), designated in 2001, is located in Bukhara Oblast, entirely protected in Dengizkul SR (50,000 ha); it encompasses the large saline water body, fed by irrigation run-off. It is situated in the Kyzylkum Desert, on the route of bird migrations from Western Siberia and Kazakhstan to Indo-Pakistani wintering grounds. It is also a crucially important habitat for several threatened waterfowl species, e.g. a mainstay of over 1 per cent of the world population of the EN white-headed duck (*Oxyura leucocephala*).

The “Aydar-Arnasay Lakes system” Ramsar site (527,100 ha), designated in 2008, is located in Jizzakh and Navoiy Oblasts, and partly protected in Arnasay SR (63,300 ha). It extends over the largest freshwater reservoirs of Uzbekistan, located in the Kyzylkum Desert and Golodnaya Steppe at the crossroads of the Afro-Eurasian and Central Asian flyways. The site provides wintering and nesting habitats for more than 100 bird species, including the CR sociable lapwing (*Vanellus gregarius*), EN Pallas’s Fish-eagle (*Haliaeetus leucoryphus*) and white-headed duck, VU red-breasted goose (*Branta ruficollis*) and lesser white-fronted goose (*Anser erythropus*) and NT Dalmatian pelican (*Pelecanus crispus*).

In 2013, SCEEP, with the financial support of the Government of Sweden, prepared the nomination dossier of “Tudakul and Kuymazar Water Reservoirs” (the latter is a natural wetland) to be designated as a new Ramsar site, located in the south-western part of

the Kyzylkum Desert in Navoiy Oblast. These two wetlands are fed with waters of the tributary of the Amu Darya River and provide a refuge for numerous nesting and wintering water bird species, including the EN white-headed duck, VU lesser white-fronted goose and NT Dalmatian pelican. The Government submitted the Information Sheets on Ramsar Wetlands (RIS) to the Ramsar Convention Secretariat with a designation letter for “Tudakul and Kuymazar Water Reservoirs” in 2016 and was then asked to revise the RIS with additional information for designation. As at mid-2019, no revised RIS had been submitted.

Neither the two existing Ramsar sites, nor Dengizkul and Arnasay SRs (overlapping with the territories of the above Ramsar sites), have management plans.

Important bird area network

Until 2018, Uzbekistan implemented the Important Bird Areas of Uzbekistan (IBAUz) Programme, which allowed the identification and description of 52 IBAs with a total area of 2,230,186 ha (4.97 per cent of the country’s territory) as globally important for the conservation of threatened bird species, confirmed by the BirdLife International and included in the IBA network. Termez IBA was considered the most important site from the international perspective, and was included in the Network of areas for the Siberian crane and other semiaquatic birds of West and Central Asia. The IBA network in Uzbekistan includes all landscape types representative of the country: 9 IBAs (1,133,365 ha) identified in desert ecosystems, 15 IBAs (373,910 ha) in wetland areas, 9 IBAs (371,631 ha) in desert-lake complexes, 12 IBAs (315,826 ha) in mountain areas, 3 IBAs (19,002 ha) in desert lowlands and 4 IBAs (16,452 ha) ranging over tugai forests.

However, only 17 of the 52 IBAs either partially or entirely overlap existing PAs, while the remaining 35 IBAs are not under any legal protection. Moreover, only nine IBAs are regularly monitored.

Key biodiversity areas network

The identification of key areas for the preservation of biological diversity in Uzbekistan began in 2012 under the UNDP/GEF/SCEEP project “Strengthening sustainability of the national system of protected areas by focusing on strictly protected areas”, and was continued in 2016–2017 in the framework of the joint initiative of the Critical Ecosystem Partnership Fund (CEPF) and Zoï Environment Network, “The Mountains of Central Asia Biodiversity Hotspot”, with the involvement of UzSPB, the Academy of Sciences (Institute of Botany and Institute of Zoology) and the

NGO Union for the Defence of the Aral Sea and Amu Darya.

As a result of the latter initiative, 36 key biodiversity areas (KBAs) with a total area of 2,683,000 ha (5.98 per cent of the country’s territory) were identified within the Uzbek part of the mountainous area defined as the Biodiversity Hotspot. Thirteen KBAs were considered important for the conservation of faunal diversity, including five defined by the CEPF as priority areas in need of basic scientific research. Two KBAs, UZB04 Akbulak River Basin and UZB05 Bashkyzylsay River Basin, are key for the preservation of the globally threatened VU snow leopard (*Panthera uncia*) and Menzbier’s marmot (*Marmota menzbieri*), UZB24 Nuratau Ridge is a refuge for more than 90 per cent of the world population of the NT local subspecies of the argali sheep (*Ovis ammon ssp. severtzovi*), while, during the autumn migration season, the transborder Uzbek–Turkmen KBA (UZB30 Talimarjan Reservoir/TKM2 Tallymerjen) harbours more than 30 per cent of the world population of the CR sociable lapwing (*Vanellus gregarius*).

However, only 12 of the 36 KBAs either partially or entirely overlap existing PAs. Moreover, the CEPF–Zoï initiative, implemented solely in the Pamir and Tien-Shan Mountains, did not cover the predominant non-mountainous part of the territory of Uzbekistan. Hence, other potential KBAs remain to be identified in the remaining 87 per cent of the country’s territory.

World Heritage sites

The only “natural” World Heritage site of Uzbekistan is Western Tien-Shan (designated in 2016), a trilateral transnational property with a total area of 528,177.6 ha and a buffer zone of 102,915.8 ha; it is shared by Uzbekistan, Kazakhstan and Kyrgyzstan, encompassing seven PAs in the three countries, including 35,724 ha in Chatkal SBSNR and the core zone Bashkyzylsay in Ugam–Chatkal SBR in Uzbekistan.

Between 1996 and 2008, Uzbekistan considered a further 30 areas for nomination to the World Heritage List, including six properties inscribed on the Tentative List by Uzbekistan in 2008: three under the “mixed” (cultural and natural) criterion (Ancient Termiz, Boysun and Sarmishsay) and three under the “natural” criterion (Gissar, Shokhimardon and Zaamin Mountains).

In July 2018, the National Commission for UNESCO started the updating and revision process concerning the Tentative List of Uzbekistan. Some sites inscribed

under the “natural” criterion could be proposed as new transnational properties: Gissar Mountains (including Gissar SSSR in Kashkadarya Oblast, and geological Kitab SSSR as its cluster) could become a joint nomination with Tajikistan, and Shokhimardon (located in Fergana Oblast) could become a joint nomination with Kyrgyzstan (which would then require including both sites in the Tentative Lists of the respective countries). Work on the preparation of a nomination dossier for Gissar Mountains had been scheduled for 2019–2020.

World Network of Biosphere Reserves

As at March 2019, Uzbekistan had one area included in the UNESCO World Network of Biosphere Reserves under the UNESCO Man and the Biosphere (MAB) Programme – Chatkal Biosphere Reserve (BR), which includes Chatkal SSSR and Ugam-Chatkal SBR, with a total area of 35,724 ha in the core zone, 5,197.6 ha in the buffer zone and 27,920.8 ha in transition area in Ugam-Chatkal SBR, encompassing part of the Chatkal Ridge of the western Tien-Shan Mountains, which was nominated in 1978 on the basis of the Chatkal SSSR.

It should be noted that the BR concept has evolved, and, since 1995, BRs (originally designated for strict nature conservation and scientific research purposes) aim at reconciling biodiversity conservation in core and buffer zones with sustainable development and use of natural resources in the surrounding transition area (which is not required to have a legal protective status). The designation of Ugam-Chatkal SBR in 2018 allowed for the establishment of the buffer zone and transition area for the Bashkizylsai section, while, in 2019, work is ongoing to establish the buffer zone for the Maydantal section, which would also connect parts of the core zone.

As at March 2019, work was also ongoing on preparation of the nomination of the Lower Amu Darya SBR for inclusion in the UNESCO World Network of Biosphere Reserves.

11.5 Pressures on species and ecosystems

Land uptake

According to the 2019 Sixth National Report to the CBD, natural landscapes, ecosystems and habitats had largely been transformed into anthropogenic zones in some 18 per cent of the country’s territory, mainly as a result of land uptake for agricultural purposes, but also due to urban development, mineral resources mining and infrastructure development. Regions where natural ecosystems were heavily degraded as a

result of land uptake for agriculture are, for example, the Fergana Valley, Zaravshan, Kashkadarya and Surkhandarya River valleys, Khorezm and Tashkent oases and Golodnaya Steppe. One of the main factors was the growing demand for pastures (due to the increasing livestock populations and ongoing degradation of current, overgrazed pastures), which caused degradation of natural ecosystems, decline of biological diversity and loss of wildlife habitats. Land uptake for the construction of industrial facilities, mining and corresponding technical infrastructure, hydro construction works and transport infrastructure accounts for only some 2 per cent of the country’s territory. However, the ongoing development of the mineral resource extraction sector has adverse effects on ecosystems, causing irreversible landscape transformations, water pollution and soil contamination, which all threaten the stability of ecosystems and survival of wild species populations on a much broader spatial scale.

Development of energy infrastructure

As at early 2019, the development of energy installations and infrastructure did not pose major threats to biodiversity (except for accidental bird mortality on high voltage power lines), with the exception of hydroelectric power plant construction and operation, which could further alter the conditions for the water-dependent riverine and wetland ecosystems and species.

However, the recent developments proposing Lake Tuzkan, part of the Aydar-Arnasay Lake System, as a site for location of the planned nuclear power plant may well result in significant risks and pressures from the energy sector on biodiversity (chapter 12).

Habitat fragmentation and human-made barriers for migratory species

As the density of transport (railway and road) networks is rather low (at least for a country the size of Uzbekistan) and fenced highways are practically non-existent, these cannot seriously impede in-country wildlife migrations. Habitats are not highly fragmented in the predominant part of the territory, with the exception for the easternmost oblasts (which are densely populated, and intensively used for agricultural purposes), as the concrete barriers set along roads (and separating lanes), coupled with linear agricultural technical infrastructure (e.g. elevated half-pipelines distributing water for irrigation purposes), may impede migrations of larger wild mammal species. However, the presence of anthropogenic barriers on transboundary wildlife migration routes is a major problem in border areas (as a result of state

border fencing). Another example is the rapid decline of the CR saiga antelope population in Uzbekistan caused by the construction and operation of the Beyneu–Shalkar railway on the Kazakhstan side, which has prevented the winter migration of the Ustyurt herd since 2017.

Logging and deforestation

Deforestation processes are ongoing in sub-montane and mountainous regions of the country, predominantly caused by the excessive and uncontrolled livestock grazing, which destroys the forest undergrowth and prevents the natural forest regeneration (in particular, in the case of slow-growing archa/juniper mountain forests). Another factor causing deforestation is the illegal felling of trees and bushes for firewood and construction timber, resulting from the increasing demand for wood, which could not be met by sanitation fellings. No data on the volume of illegal logging and fuelwood harvesting is available to allow proper assessment of the intensity of this pressure.

Furthermore, sub-montane and montane forests are affected by wrongly planned agricultural and infrastructural developments (e.g. slope ploughing, road construction), while tugai forests are also threatened by adversely changing hydrological regimes, resulting from water drainage for agricultural purposes and water salinization. Another threat to forest ecosystems is forest fires, the occurrence of which would be further aggravated by ongoing climatic changes and desertification processes.

The ongoing deforestation automatically translates into the degradation and vanishing of forest plant communities and wildlife populations. However, the scale of deforestation, anthropogenic impact and pressures on forests, and their influence on biodiversity, cannot properly be determined in the absence of the national forest inventory and of an integrated biodiversity monitoring system.

Pressures on aquatic ecosystems

Aquatic ecosystems are highly threatened due to the general scarcity of water resources, which is further aggravated by unsustainable methods of agricultural land irrigation and excessive surface water intake for irrigation purposes, resulting in increasing salinization and declining water quantity in rivers, lakes and wetlands, contamination by pesticides, eutrophication as a result of livestock husbandry waste discharges, and cumulation of pollutants in water bodies and wetlands, threatening the viability of fish, amphibian

and reptile populations (which further affects the viability of predatory bird and mammal populations).

Desertification

The ongoing desertification process is one of the major threats to biodiversity in Uzbekistan. As at 2019, desert and steppe ecosystems encompass as much as 85 per cent of the country's territory. The most striking example is the Aral Sea region, where almost the entire marine ecosystem and a large part of coastal and wetland ecosystems were gradually replaced by the sandy-salty desert ecosystem (the so-called Aralkum Desert, of more than 5.5 million ha, including over 3.3 million ha in Uzbekistan). However, all other regions of the country are also threatened by desertification (in particular the Ustyurt Plateau, Kyzylkum Desert and mountainous and sub-montane regions), partly due to climatic changes but also due to unsustainable surface water withdrawal for agricultural irrigation purposes. Tugai floodplain forests are among the most affected ecosystems, as the discontinuity of annual flooding prevents their natural regeneration. Water and wind erosion and the increasing salinization of soils reduce the productivity of ecosystems, which limits the nutrition base for both livestock and wild ungulates (prey for wild carnivorous mammal and bird species populations). Adverse effects of desertification were further enhanced by unsustainable agricultural practices, in particular livestock husbandry, as the transhumance and seasonal pasture rotation practices had been mostly abandoned, which resulted in overgrazing and degradation of pastures. Furthermore, desertification increases the threat of steppe and forest fires, with immediate effects on overall biodiversity.

Intensified agriculture

Unsustainable farming and animal husbandry practices had the strongest impact on the natural ecosystems, habitats and wild flora and fauna species of Uzbekistan, mainly as a result of water withdrawal for agricultural irrigation causing changes in the water regime, excessive land uptake for agricultural purposes, contamination of water bodies by pesticides, eutrophication of aquatic ecosystems due to uncontrolled animal husbandry waste discharges, damage to forest ecosystems resulting in deforestation and pasture land degradation caused by overgrazing. One of the factors is the growing share of cattle in the livestock composition. Between 2010 and 2018, cattle numbers increased by 45 per cent (figure 13.3).

According to the 2019 Sixth National Report to the CBD, the vast majority (almost 92.5 per cent, 19 million ha) of all pastures are concentrated in four administrative regions: Navoiy Oblast (8,759,900 ha),

the Republic of Karakalpakstan (4,780.7 ha), Bukhara Oblast (2,576.2 ha) and Kashkadarya Oblast (1,455.6 ha). However, the predominant desert pastures (which account for more than 80 per cent) are, by regulation, designed only for sheep grazing, while pastures suitable for cattle grazing are located in semi-deserts (12 per cent), mountain steppes (5 per cent) and high mountains (2 per cent). Nevertheless, in 2017, some 52.2 per cent of cattle were grazing in unsuitable desert pastures, which illustrates the pressure of cattle husbandry on desert ecosystems. Simultaneously, the remaining 47.8 per cent of cattle were using the remaining 19 per cent of available pastures. This resulted in the disappearance of several rare and endemic plant species, the transformation of grassland communities species composition, competition for forage with wildlife and the infection of wildlife species with ecto- and endoparasites, which had adverse effects on the populations of globally threatened animal species populations, including the VU snow leopard, Bukhara urial, goitered gazelle and Menzbier's marmot, and NT Bukharan markhor and Severtsov argali sheep.

Hunting and fishing

Despite the fact that complete statistical data are not available on trends in population numbers of game species, annual quotas set for hunting and fishing and the use of quotas, some game mammal populations (boar, badger, hare) have tended to increase in numbers, which means that their annual hunting quotas were kept at sustainable levels. This was not the case for some game bird species (the LC chukar partridge and common pheasant). No data is available on hunting on other game mammals and birds.

Reportedly, uncontrolled hunting of the grey wolf (the status of which is not regulated, allowing for hunting without any limits or permits) led this "outlaw" species to the risk of extinction in Uzbekistan, despite its regulatory functions in the ecosystem, which are also favourable for the natural regeneration of the forest.

According to the 2019 Sixth National Report to the CBD, the fish resources in natural water bodies are overused and declining. Furthermore, poaching was determined to be one of the reasons for the decline in populations of some 69 per cent of game mammal species, as well as 56 per cent of rare and threatened protected mammal species, which were killed either for subsistence purposes or for the highly profitable illegal trade in wild animals, their parts and derivatives (e.g. for traditional medicine).

No data on poaching and illegal procurement are available, but different sources indicate that the target species include the CR Tien-Shan brown bear, VU Bukhara urial, Menzbier's marmot and goitered gazelle, NT Bukharan markhor, as well as boar, stone marten, porcupine, cobra and different lizard and turtle species; at the same time, catching birds of prey and singing birds is traditional in mountain regions of Uzbekistan. Furthermore, some predatory mammal species (e.g. snow leopard, lynx, bear, wolf, fox) are subject to retaliatory killing by livestock herders.

Collection of non-timber forest products

Statistical data on the collection of wild medicinal plants, and other non-timber forest products (NTFPs) are not available. Specialized state forestry enterprises and concessionary private companies obey the annual quotas set for NTFPs harvesting, but intensive harvesting of NTFPs by local communities (e.g. picking of medicinal herbs, flowers, wild onions and garlic, rhubarb, rosehip, pistachio, walnut, almonds) for subsistence purposes and trade is common and practically uncontrolled.

Tourism

Tourist visitation pressure is still relatively low in most natural areas of Uzbekistan, due in part to the fact that the majority of foreign tourists are more tempted to visit destinations famous for unique historical and cultural monuments or the Aral Sea environmental disaster area than much less accessible countryside. However, the growing trend in domestic tourism can be noted, including visits to more accessible natural areas (in particular the Chatkal and Nurata Mountains) for outdoor recreation purposes, automatically resulting in the growing demand for the development of recreational and tourist facilities and infrastructure, as well as the increasing number of misdemeanours against nature conservation laws and PA visitation rules, and growing anthropogenic pressure on natural ecosystems and wildlife habitats. The 2019 Sixth National Report to the CBD mentions the decrease in the EN Egyptian vulture population in Chatkal Ridge as the result of uncontrolled visitation of its nesting sites.

Climate change

Global climate changes pose a major threat to all natural ecosystems and the overall biodiversity of Uzbekistan. Most noticeable are the adverse effects of desertification, coupled by water shortages, increasing water and soil salinity, wind erosion and exposure to extreme temperatures during prolonged drought seasons. Decreased precipitation has an adverse

impact on environmental conditions in plant communities, including habitats of rare and endangered plant species, and limits the potential for the regeneration of the vegetation and the productivity of ecosystems, both natural and semi-natural (e.g. pastures). Periodic fluctuations in water level and salinity affect all aquatic, coastal (e.g. tugai forests) and wetland ecosystems, while the increasing scarcity of water resources threatens the survival of both resident and migratory wildlife populations, leading to competition for water between wildlife populations and local people and livestock. Last, but not least, not all flora and fauna species are resilient to rapid climatic changes.

Use of genetically modified organisms

The influence of genetically modified organisms (GMOs) on biodiversity could not be determined due to the general absence of data on the use of GMOs.

11.6 Biodiversity-related measures in the Aral Sea area

The Aral Sea environmental disaster resulted in the shrinkage or partial disappearance of both the sea itself and lakes in the Amu Darya delta, vanishing of marine habitats as a result of still-increasing water salinization, deterioration of habitats (in particular tugai forests and wetlands, which were nesting sites for many aquatic bird species) and degradation of native plant communities, as well as a rapid decline in biodiversity of the Aral Sea region, including the disappearance of the whole marine ichthyofauna (34 fish species) and regional extinction of numerous plant and animal species.

Uzbekistan implements numerous measures and activities to improve the environmental, social and economic situation in the Aral Sea basin. Biodiversity-related measures can be divided into three areas:

- Protection of biodiversity that survived the disaster;
- Rehabilitation of aquatic and wetland ecosystems in the Amu Darya River delta;
- Prevention and mitigation of effects of the resulting “secondary disaster” of salinization of adjacent regions.

The implementation of various conservation measures was preceded by scientific field research and mapping works, resulting in, for example, the development of the “Map of vegetation of the southern dried part of the Aral Sea” (scale 1:500,000), followed by scientific recommendations on the selection of the proper, most promising species for the stabilization of the shifting

sands on a dried sea bottom. According to the 2019 Sixth National Report to the CBD, such species include *Salsola richterii*, *Ammodendron conollyi*, *Calligonum setosum*, *Astragalus villosissimus*, *Krascheninnikovi aeversmanniana* and *Artemisia ferganensis*.

In 2011, the Cabinet of Ministers (2011 Resolution No. 242) designated the Lower Amu Darya SBR in the Republic of Karakalpakstan (encompassing 68,717.8 ha, but located further upstream from the former coast of the Aral Sea), and, in 2016 (2016 Resolution No. 238), designated the large-scale Saygachiy CLR (628,300 ha, with an external buffer zone of 219,800 ha). The Roadmap for the development of the protected area system for the period 2019–2022 (2019 Resolution of the President No. 4247) provides for the designation of five new PAs in the Republic of Karakalpakstan, including four new SRs situated in the Aral Sea basin: Sudochyie Lake System (designation planned in 2019), Beltau (2020), Akpetki (2021) and Akdariya-Kazakhdariya Mezhdureche (2022). Establishment of the new PAs will largely enhance the conservation of biological and landscape diversity of the Aral Sea region.

However, the scarcity of water resources is still the major challenge, not only for the survival and recovery of flora and fauna species populations but also for the survival and economic activities of the human inhabitants of the Aral Sea basin. As the water inflow into the region is limited, and humidity evaporation is intensified as a result of ongoing global climate changes, the requirement to store water in reservoirs along the former sea coastline and in the Amu Darya River delta is an immediate task, in order to improve the overall ecological situation in the region.

This is why the measures carried out by the Agency of the International Fund for Saving the Aral Sea (IFAS) in Uzbekistan were of crucial importance for the provision of water into the ecosystems and stabilizing the water regime in the region. IFAS activities included engineering works aimed at landscaping the Amu Darya River delta for the restoration of aquatic and wetland ecosystems, which includes works on numerous natural water bodies and artificial water reservoirs (Dzhiltyrbas, Mezhdurechensk, Muinak and Rybachye reservoirs and Lakes Dumalak, Ilenkul, Makpalkol and Mashankul). These works were funded by the Government of Uzbekistan. The next phase of the proposed IFAS project “Creation of the system of local water lakes, reservoirs and wetlands in the Amu Darya River delta and dried part of the Aral Sea” provides for the establishment of polders in the dried bed of the Aral Sea, capable of harbouring the potential future inflow of waters exceeding the

capacity of reservoirs in the Amu Darya River delta. The expected results include not only the restoration of nesting habitats of numerous aquatic bird species but also the accommodation of some 3.3 km³ of water

resources (for which the annual inflow of at least 5 km³ per year is required), which would then allow the recovery of vegetation and fish stock.

Photo 11.5: Water outlet, Rybachye Reservoir



Photo credit: Agency of IFAS in Uzbekistan

Photo 11.6: Muynak Canal Head at Mezhdurechensk Reservoir



Photo credit: Agency of IFAS in Uzbekistan

Last, but not least, Uzbekistan undertook costly large-scale measures aimed at land reclamation and stabilization of soils of the dried bottom of the Aral Sea, in order to prevent and mitigate the adverse effects of frequently occurring storms, carrying salt, sand and dust, which also enhanced desertification processes in other regions. Land reclamation works include afforestation and planting desert vegetation, fixing moving sand of the seabed and absorbing salt. Since 2000, these efforts received external financial support provided by Germany (GIZ), IFAS, the Japan Fund for Global Environment (JFGE) and France. In recent decades, afforestation works were carried out on a total area of 740,000 ha of the Aral Sea region (including 310,000 ha of the dried Aral Sea bottom).

According to the State Committee on Forestry, between 2010 and 2018, forest plantations were established on 144,691 ha of the exposed seabed. The annual scope of afforestation works on the dried sea bottom was initially slow (between 15,000 and 16,000 ha per year), then increased constantly in the period 2014–2018. The statistical data indicate 16,800 ha of seabed afforested in 2014, 18,000 ha in 2015, 18,200 ha in 2016, 18,800 ha in 2017 and 19,040 ha in early 2018 (as afforestation in this region can be successful only in the early spring months, ensuring the optimal soil humidity). However, the tree seedlings' survival rate varied over time from 44 per cent in 2013, 2015 and 2016 to 41 per cent in 2014 and only 37 per cent in 2017.

According to expert estimates, some 1 million ha of the Southern Aral Sea region is suitable for afforestation works. Following the initiative of the President of Uzbekistan voiced at the IFAS Summit of August 2018 to plant 1 million ha of forest vegetation, the Government decided to plant over 500,000 ha of forest vegetation in the period 2019–2021. In December 2018, preparatory field works for massive afforestation works of the seabed were launched, with the use of heavy machinery. By the end of March 2019, an area of 720,000 ha had been prepared for planting, and some 400,000 ha of forest plantations had been established. Uzbekneftegaz allocated 100 billion sum for seabed afforestation works in 2019 in line with the 2019 Resolution of the Cabinet of Ministers No. 132.

11.7 Legal, policy and institutional framework

Legal framework

The 1992 Law on Nature Protection mentions the preservation of diversity of species, ecosystems and landscapes among the main objectives of nature conservation. The obvious shortcoming of the Law is

that Article 28, concerning the state environmental monitoring system, does not explicitly mention the need for monitoring biodiversity. Furthermore, this Law is very general; it neither introduces nor regulates the basic conservation concepts (e.g. the differentiation between passive conservation and active nature protection) that could serve the implementation of its provisions.

The 2004 Law on Protected Natural Territories provides the legal basis and general legislative framework for the planning, designation and management of PAs in Uzbekistan. It lists different PA categories and determines their management objectives and related protective regimes, legal status, ownership and, in some cases, also their functional zonation, and the period of their designation. It contains provisions for the establishment of external buffer zones for some PA categories, the development of the PA cadastre, PA management plans and on sources for financing PA operations. The innovative aspect is that the Law provides for the establishment of privately managed PAs and, in general, for more active involvement of local communities and private entrepreneurs in the designation and management of PAs and PA external buffer zones. No privately managed PAs exist as at March 2019.

However, the Law on Protected Natural Territories does not sufficiently regulate PA governance, which would require the determination of a specialized *central* governmental administrative body, other than the Cabinet of Ministers, with responsibility for the supervision of PA management. It states that the state administration of PAs shall be carried out by the Cabinet of Ministers, local government bodies and specially authorized state bodies, but such authorized state bodies are not defined and neither is the division of duties, rights and responsibilities among the three levels of governance mentioned above.

Furthermore, even though the Law on Protected Natural Territories determined that PAs could be designated by either the Cabinet of Ministers or local government bodies, such designation procedure was not further explained. Similarly, neither the procedures for the “reorganization” (change in protective category) and termination (degazetting) of PAs nor the bodies authorized to conduct such procedures are determined. The validity period of designation is not determined for some PA categories (CLRs, NNPs). The categorization of fishery zones is misleading, defining them as PAs of the national category V instead of placing them in the national category VII. The relevant Article 34 contains an internal contradiction, by prohibiting all activities that could threaten the conservation, reproduction and

restoration of fish and other aquatic organisms, simultaneously stating that fishery zones could also be used for fishery needs, while further provisions that could regulate the economic use of a fishery zone to make it sustainable are lacking.

Moreover, the Law on Protected Natural Territories also determines categories of PAs (e.g. NHSZs) for which the original purpose for designation is either different from the preservation of biological and landscape diversity or contradictory to biodiversity conservation objectives, namely, hunting farms under PA national category VII. Furthermore, PAs categorized by this Law include territories planned for the management of a still-absent individual natural resource (the case of extensive open areas potentially suitable for afforestation, but not yet afforested, included in the state forest fund land area, categorized as PAs of the national category VII). Last, but not least, the concepts of the ecological network and ecological corridors are absent from the Law.

Two other legal acts constitute the basis for flora and fauna species conservation: the 1997 Law on the Protection and Use of Flora and the 1997 Law on the Protection and Use of Fauna, both issued in new editions in 2016. The new editions of both Laws define a much more detailed division of duties, rights and responsibilities between the central state administration bodies (Cabinet of Ministers, SCEEP, State Committee on Forestry and, in the case of flora, the State Plant Quarantine Inspectorate under the Cabinet of Ministers) and local government bodies. Both Laws contain detailed provisions for the involvement of the Academy of Sciences, local self-governments, NGOs and citizens in measures for the conservation and sustainable use of flora or fauna. Both Laws define the protective measures, grant legal protective status for the rare species threatened by extinction that are included in the relevant Red Books, and determine the manner of sustainable use of flora and fauna. However, none of these Laws determines methods and procedures for flora and fauna species monitoring, which task is delegated to the Cabinet of Ministers. The Law on the Protection and Use of Fauna regulates the determination of annual hunting quotas and also contains the basic provisions concerning hunting and fishing. These activities are further regulated by the Rules of hunting and fishing, approved by the 2006 Order of the Chairperson of the State Committee for Nature Protection No. 27.

Another legal act relevant to biodiversity conservation is the 1999 Law on Forests, issued in a new edition in 2018, which regulates the protection, sustainable use and restoration of forests. It determines 19 protective categories of forests. The Law in practice prohibits

timber harvesting in areas other than commercial plantations, except for the thinning of forests and sanitary cuttings. The 2019 Resolution of the Cabinet of Ministers No. 132 envisaged the creation in 2019 of protective forests on the dry bottom of the Aral Sea on an area of 500,000 ha at the expense of local budgets, charity funds and Uzbekneftegaz funds.

The 2019 Law on Pastures imposes the general obligation on pasture users to obey the seasonal pasture rotation principle, and observe rules, norms and standards (including the maximum permissible load on the pasture) aimed at pasture conservation, determined on the basis of the inventory of pastures and the geobotanical survey of pastures. These measures could largely enhance the natural regeneration of natural ecosystems degraded by overgrazing.

Due to the general and framework character of the national legislation related to biodiversity conservation issues, a large number of more detailed by-laws and secondary legislative acts is required and has been adopted for implementation of the laws.

Policy framework

First NBSAP

The First National Biodiversity Strategy and Action Plan (NBSAP) (1998 Resolution of the Cabinet of Ministers No. 139, no longer in force), adopted for the 10-year period 1998–2007/2008, determined five priority strategic national targets (STs), which included the improvement and further development of the representative PA network, expected to encompass at least 10 per cent of the country's territory by 2002 (ST1), as well as the development and implementation of regional (for the Republic of Karakalpakstan) and local (oblast or district level) action plans, in order to address specific regional and local circumstances, requirements, demands and challenges (ST4). These two STs have not yet been met, since, as at March 2019, the system of PAs (excluding protected landscapes of the national category VI and state forest fund lands of the national category VII) encompassed only 4.63 per cent of the territory of Uzbekistan. Furthermore, no regional or local action plans on biodiversity were developed.

NBSAP for the period 2019–2028

Since 2008, with the expiration of the validity of the First NBSAP, Uzbekistan had no national biodiversity strategy and action plan in force for a decade, despite this being a requirement under the CBD. A new NBSAP of Uzbekistan was adopted only in June 2019

(2019 Resolution of the Cabinet of Ministers No. 484) as the Strategy for the Conservation of Biological Diversity for the period 2019–2028.

The new NBSAP does not define general national targets, which could directly correspond to the CBD Strategic Plan for Biodiversity 2011–2020, including the Aichi Biodiversity Targets (adopted in 2010 for the 2011–2020 period), but sets more detailed national priorities, as follows:

- Expansion of the area of protected natural territories to 12 per cent of the country's territory by 2028;
- Afforestation of the dried bottom of the Aral Sea to increase the afforested area up to 1.2 million ha by 2028;
- Breeding gazelles in the Bukhara specialized SBC "Jeyran", with the objective to increase its population numbers to 1,000 individuals;
- Creation of a unified system for monitoring the components of biodiversity with the central component – the reference ecosystems of SSNRs;
- Creation of a unified information database of state monitoring and state cadastre on biodiversity based on modern geo-information technologies (GIS technology);
- Annual geobotanical survey of vegetation in natural pastures and hayfields in the amount of 2 million ha;
- Integrating biodiversity conservation issues into all sectors of the economy.

The above priorities are explicitly listed in Resolution No. 484, while the Strategy itself also lists some additional targets and indicators, e.g. breeding and release into the wild of 1,000 individuals of houbara bustard per year, conducting annual censuses of game waterfowl species, and the submission of nomination dossiers for two new Ramsar sites.

Furthermore, the 2019 Strategy defines the four strategic objectives, to be achieved by 2029, as follows:

- Integration of biodiversity issues in the activities of state authorities and administration, and of the whole society;
- Reduction of direct pressures on biological diversity, and sustainable use of its components in productive landscapes;
- Development of the protected area system, increasing the volume of benefits provided by ecosystem services;
- Improvement of the conservation and sustainable use of biological diversity through planning,

capacity-building and the development of financing mechanisms.

The main shortcoming of the 2019 NBSAP is its incoherence, as the two components (Strategy and Action Plan) are not fully harmonized. As a result, not all national priorities and objectives defined in the Strategy are followed by corresponding provisions in the Action Plan. Furthermore, the 2019 NBSAP determines that its implementation will be divided into two phases – in the first phase (2019–2023), only the work on the improvement of the legislative framework and the establishment of five new PAs in the Republic of Karakalpakstan are planned (both mentioned solely in the Strategy, but absent in the Action Plan), while the achievement of all other indicators is planned in the next phase of implementation (2024–2028).

The achievement of some indicators might not be feasible; for example, the national strategic priority concerning the extension of the PA system to cover 12 per cent of the country's territory by 2029 is not included in the Action Plan, which provides solely for drafting a Resolution of the Cabinet of Ministers on the approval of a new state programme on the creation and expansion of the system of protected natural territories for the period up to 2028, while no measures on the actual extension of the PA system are included in the Action Plan. No additional funding necessary for the establishment of new PAs (including those planned in the Republic of Karakalpakstan in the first phase of NBSAP implementation) and ensuring their operability is provided for in the document.

Other policy documents

The 2019 Concept on Environmental Protection until 2030 includes the target to increase PAs of national categories I–V to 12 per cent by 2030. It also provides for an increase in the state forest fund lands covered by forests to 4.5 million ha.

As for the PA network, in March 2019, the President adopted the Roadmap for the development of the protected area system for 2019–2022 (2019 Resolution of the President No. 4247). According to the 2019 NBSAP, the state programme on the creation and expansion of the system of protected natural territories for the period up to 2028 is planned to be drafted by August 2020.

Few rare and threatened species are currently covered by single species conservation plans, which are most often developed and implemented on an international scale under the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and its Central Asian Mammals Initiative (CAMI), for the

conservation of, for example, the saiga antelope, Bukhara deer, Asiatic wild ass, Severtsov argali sheep, goitered gazelle and snow leopard. Some other single species conservation programmes and plans were developed on a national scale, including the Programme and Action Plan for the Conservation of the Snow Leopard in the Republic of Uzbekistan for 2019–2029 (prepared under the UNDP/GEF/SCEEP project “Sustainable natural resource and forest management in key mountainous areas important for globally significant biodiversity”), and the 2014 National Action Plan on conservation of stiff tail in Uzbekistan, concerning protection of the white-headed duck (*Oxyura leucocephala*).

As at March 2019, two other policy instruments are under development: the concept of a state programme for forestry development until 2030 (as the validity period of the State Programme for Forestry Development in 2015–2018 has already expired), and the new national action plan on combating desertification and droughts.

The country does not have a national wetland policy or programme for wetland conservation.

Sustainable Development Goals and targets relevant to this chapter

When developing the national Sustainable Development Goals and targets (2018 Resolution of the Cabinet of Ministers No. 841), Uzbekistan changed the wording of the globally adopted indicators under targets 15.4, 15.7 and 15.8, and interpreted targets 15.8 and 15.9 differently.

In some cases, such modifications could well be justified; for example, adding another national indicator 15.5.2 “The number of species listed in the national Red Book” under target 15.5 was necessary,

as the global indicator 15.5.1 “Red List Index” was inappropriate for Uzbekistan (box 11.1).

However, some other modifications brought counter-productive results, incompatible with the original intention for adopting an indicator on a global scale. For example, Uzbekistan changed the global indicator 15.4.1 “Coverage by protected areas of important sites for mountain biodiversity” to national indicator 15.4.1 “Proportion of protected mountain ecosystems in their total area”, which changed its original meaning and objectives. The original wording could require undertaking scientific research aimed at the identification of all areas important for the conservation of mountain biodiversity, including those not yet protected (e.g. non-protected parts of KBAs, IBAs or migratory routes of rare and endangered fauna species). Results of the above could then justify and guide the necessary extension of the PA system. Contrary to this, the modified indicator requires a simple comparison of the total area of mountain ecosystems with the total area of existing PAs located in mountain ecosystems, without the exact determination of mountain areas that should become legally protected.

The absence of the global indicator 15.1.2 (Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type) among the national indicators of Uzbekistan cannot be explained or justified.

While one can understand that, not being a party to the Nagoya Protocol, Uzbekistan has not nationalized target 15.6 (on benefits sharing), it is not possible to explain why target 15.b (on resources to finance sustainable forest management) was not nationalized, except for the reason that its global indicator 15.b.1 repeats the global indicator 15.a.1.

Box 11.1: Target 6.6. and selected targets under Goal 15 of the 2030 Agenda for Sustainable Development



Goal 6: Ensure availability and sustainable management of water and sanitation for all
Target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

Global target 6.6 was nationalized by Uzbekistan with the change of the time horizon to 2030 instead of 2020.

Not enough data are available to properly assess the value of indicator 6.6.1 (Change in the extent of water-related ecosystems over time), also due to the fact that target 6.6 refers not only to typical aquatic, riverine or riparian ecosystems, but also to mountains and forests. The ongoing processes of shallowing and dessication of the remains of the Aral Sea, shrinkage or disappearance of lakes in the Amu Darya delta, and the still-increasing water salinization, further enhanced by the global climatic changes, caused the vanishing of marine habitats and deterioration of water-related ecosystems on an unprecedented scale. Hence, the achievement of target 6.6 is well beyond the capacity of Uzbekistan, in particular if acting alone. However, the above could not explain the absence of a national wetland policy and of the corresponding programme for wetlands conservation.



Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements

The value of indicator 15.1.1 (Forest area as a proportion of total land area) increased from 6.63 (2010) to 7.26 (as at 1 January 2018), mostly as a result of intensive reforestation works, while the share of the total area of the state forest fund land increased from 21.08 per cent to 25.09 per cent of the country's territory. The proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type (indicator 15.1.2) cannot be properly assessed, due to the lack of data. The coverage of different natural ecosystem types by PAs is uneven, and several key ecosystems are considerably underrepresented in the PA system. The "Aydar-Arnasay Lakes system" Ramsar site is only partly protected in Arnasay SR, while the planned "Tudakul and Kuymazar Water Reservoirs" Ramsar site would also require territorial protection granted by national legislation. Furthermore, only 17 of the 52 IBAs, and 12 of the 36 KBAs (the latter so far identified solely in the mountain regions) partially or entirely overlap existing PAs. The achievement of target 15.1 would require the further extension of the PA system in order to sufficiently include all natural ecosystems representative of Uzbekistan, in particular, desert and floodplain forest ecosystems.

Target 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

All forests in Uzbekistan are perceived as providing important ecosystem services and classified as protective; hence, they are well protected and sustainably managed. No commercial timber harvesting is allowed, except for sanitary fellings. Furthermore, Uzbekistan successfully halts the deforestation process and conducts intensive works on afforestation, in particular, in the dried bottom of the Aral Sea. However, progress towards sustainable forest management (indicator 15.2.1) cannot precisely be assessed due to the general lack of data on forest resources, in the absence of the national inventory of forests (last carried out in 1987).

Target 15.4: By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development

Compared with other main ecosystem types, as at 2019, mountain ecosystems are the best conserved, with 14 per cent included in PAs of national categories I and III (SSNRs, NNPs), except for the mountain massifs of the Kyzylkum Desert. However, existing PAs encompass only 12 of the 36 KBAs identified in the Western Tien-Shan Mountains. As no scientific assessments indicating areas most important for mountain diversity in the whole of Uzbekistan are available, the value of indicator 15.4.1 (Coverage by protected areas of important sites for mountain biodiversity) cannot be calculated. Nevertheless, the need for the further extension of the PA system in mountain regions is well justified by the outcomes of the two projects (carried out jointly by UNDP and SCEEP, and by Critical Ecosystem Partnership Fund and Zoï Environment Network in 2012–2017) aimed at the identification of key areas for the preservation of biological diversity in Uzbekistan.

The value of indicator 15.4.2 (Mountain Green Cover Index) for 2017 amounted to 54.81 per cent (below the average value of 64 per cent for Central Asia and Southern Asia). It should also be noted that many of the mountain forests of Uzbekistan are not close canopy forests (particularly not the coniferous archa/juniper forests), which might not have been taken into account during the calculation of the Mountain Green Cover Index.

Target 15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species

The value of the IUCN Red List Index (indicator 15.5.1), aggregating change in extinction risk across groups of species, cannot be calculated, as it would require the elaboration of at least two editions of national Red Lists with the use of IUCN criteria, while the national Red Books of Uzbekistan continue to use a different threat categorization system.

This is why Uzbekistan introduced a national indicator 15.5.2, "The number of species listed in the national Red Book", which, according to the 2009 fourth edition of the Red Book, were 321 vascular plants, 60 arthropod, 48 bird, 24 mammal, 17 fish, 16 reptile, 14 mollusc, 3 fungi and 3 annelid species. The planned fifth edition of the Red Book is expected to include only 313 vascular plants and the same number of fungi, annelid, mollusc and fish species, but already recorded are 66 arthropod, 52 bird, 30 mammal and 21 reptile species. According to IUCN global assessments, as many as 46 animal species and 16 plant species occurring in Uzbekistan are globally threatened by extinction, which clearly indicates priorities for conservation. The adoption of special national conservation programmes for these species would largely facilitate the achievement of target 15.5 by Uzbekistan.

Target 15.8: By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species

Uzbekistan's national indicator 15.8.1 encompasses the adoption of the relevant national legislation but omits the national allocation of resources towards the prevention or control of invasive alien species, when compared to the global indicator 15.8.1.

In 2018, Uzbekistan compiled the first list of non-indigenous (alien), introduced or invasive plant species naturalized in the country. However, as Uzbekistan has not yet adopted relevant national legislation, indicator 15.8.1 has not yet been achieved. The implementation of state monitoring and research programmes on invasive alien species is an indispensable next step towards the achievement of target 15.8.

Target 15.9: By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

Uzbekistan interpreted Sustainable Development Goals target 15.9 differently and replaced the original indicator 15.9.1 with a nationally elaborated one, "Number of national, sectoral and regional strategies and programmes that take into account the value and safety of biodiversity and ecosystems". Nevertheless, as at 2019, no positive examples of such integration of ecosystem and biodiversity values can be quoted. Relevant measures are planned in the 2019 NBSAP.

Institutional framework

The State Committee on Ecology and Environmental Protection (SCEEP) is the central state administrative body responsible for the development, coordination and implementation of national policies and state programmes for biodiversity conservation and sustainable use of natural resources. Additionally, SCEEP performs control (environmental inspection) and supervisory functions, which include supervision of the PA management carried out by other state agencies, regional and local state administrations. SCEEP is also the CBD National Focal Point for Uzbekistan. In October 2018, the former Inspectorate for Control in the field of Protection and Use of Biodiversity and Protected Areas was included in SCEEP's Inspectorate for Control in the field of Ecology and Environmental Protection.

The State Committee on Forestry, established in May 2017, on the basis of the Main Department of Forestry of the Ministry of Agriculture and Water Management, is the central state administrative body responsible for the implementation of the national forest policy, forestry operations (including afforestation), sustainable use of forest resources and management of the state forest fund land. The State Committee is also responsible for the management of PAs located on the state forest fund land, and the supervision of NTFPs collection and hunting activities carried out on the state forest fund land.

As at 2019, there is still not a single central administrative body responsible for the planning and management of all PAs of different national categories (as recommended by the First EPR), which is an impediment for the implementation of a coordinated policy for biodiversity conservation in PAs, and for the effective management of the national PA system. Moreover, the responsibility for the management of particular PAs often shifted according to the current circumstances, on the basis of resolutions of the Cabinet of Ministers or decrees of the President, mainly between the former State Committee for

Nature Protection (or SCEEP since April 2017) and the State Committee on Forestry.

The most recent change took place in late March 2019, when the President decided (2019 Resolution of the President No. 4247 on measures to improve the state administration system in the sphere of protected natural territories) on the establishment of the Chief Department of Biodiversity and Protected Areas within the organizational structure of SCEEP Central Office. The Resolution transferred to SCEEP the responsibilities for the management of four SSNRs (Kyzylkum, Nurata, Surkhan and Zaamin), the Lower Amu Darya SBR and Chatkal SBSNR, previously managed by the State Committee on Forestry. Furthermore, the five new PAs planned for designation in the Republic of Karakalpakstan in the period 2019–2022 will also be managed by SCEEP.

Another example of such frequent reorganizations and shifting responsibilities is the current Ugam-Chatkal SBR. Simultaneously with the designation of the Ugam-Chatkal SR and the inclusion into this SR of the former part of Chatkal SBSNR, Bashkizylsay in Tashkent Oblast (with preservation of the protection regime), and of some lands of forestry enterprises Parkent, Buchmulla and Shovozsoy, in December 2016, this territory was transferred for "permanent use" to JSC "O'zbekiston temir yo'llari" (Uzbekistan Railways). This was done mainly because of better funding opportunities, which created favourable conditions for undertaking biodiversity conservation measures and also resulted in higher remuneration of the SR personnel. Sixteen months later (in May 2018) the area was redesignated as a state biosphere reserve (SBR), which remained under the management of the JSC Uzbekistan Railways, but the SBR staff were granted the status, rights and benefits of state inspectors for ecology and environmental protection in accordance with the legislation.

Taking into account that SCEEP was already responsible for the management of the Gissar SSNR, Saygachiy CLR, all three SBCs and all 12 SRs (the latter supervised by local SCEEP branches), as a result

of the 2019 Resolution of the President No. 4247, the majority of the large-scale PAs in Uzbekistan are now managed (or supervised, in the case of SRs) by the Chief Department of Biodiversity and Protected Areas, recently established within the SCEEP organizational structure (figure 1.2). However, the Resolution left the management responsibilities for all three NNPs (Ugam-Chatkal, Zaamin and Zarafshan) with the State Committee on Forestry (until 2017, Ugam-Chatkal NNP was managed by the Tashkent Oblast Khokimiyat).

The management of Kitab SSNR remains under the responsibilities of the State Committee on Geology and Mineral Resources. All 10 NMs are managed by oblast administrations (khokimiyats).

Other central state administrative bodies relevant for biodiversity conservation and PA management issues are the State Committee on Land Resources, Geodesy, Cartography and State Cadastre (responsible for coordinating the implementation of land use and land management legislation and programmes, as well as maintenance of the national land cadastre) and the National Security Service's Committee for State Border Protection, responsible for border security (which includes patrolling the border areas; hence, it is important for the control of illegal activities, such as poaching and smuggling of wild flora and fauna species, their parts and derivatives across the state border).

The Academy of Sciences, and its Institute of Botany and Institute of Zoology, are the key scientific institutions for biodiversity research, monitoring and conservation planning activities. The Academy of Sciences, based in Tashkent, also has two regional branches (Karakalpak Department of the Academy of Sciences and Khorezm Mamun Academy). Within the reporting period, the Institute of the Gene Pool of Plants and Animals of the Academy of Sciences, which previously carried out scientific research on plant and animal genetics, species populations, habitats and ecosystems, and invasive alien species, was reorganized and ceased to exist.

Other important academic and research institutions include the five main universities of Uzbekistan: the National University named after Mirzo Ulugbek, located in Tashkent, as well as Karakalpak, Bukhara, Samarkand and Namangan Universities.

Other important stakeholders directly involved in biodiversity monitoring (e.g. wildlife census) and conservation activities are environmental NGOs, e.g. the Ecological Movement of Uzbekistan, UzSPB, Uzbek Zoological Society, Union for the Defence of

the Aral Sea and Amu Darya, NGO Zarafshan and "Ekomaktab".

Regulatory, economic and information measures

Regulatory measures

Quotas for hunting game mammal and bird species, fishing and collecting wild plants are determined by SCEEP, based on the opinion of the Academy of Sciences, approved by a specially authorized Interdepartmental Commission. Permits for the "special use" of fauna are issued by SCEEP, within the limits of approved annual quotas. However, hunting of some species (e.g. the wolf) is not regulated. Permits for the collection of wild plants (e.g. medicinal and food plant species) are issued either by SCEEP (for the collection of plants in areas beyond the state forest fund land) or by the State Committee on Forestry (for the collection of plants in areas of the state forest fund land) (chapter 2).

The State Committee on Forestry regulates the use of forest resources, and also determines limits concerning the use of pastures within the state forest fund land. Forestry authorities at oblast level issue permits (forestry tickets) and collect fees for the use of forest resources (including NTFPs).

Financing

According to the 2004 Law on Protected Natural Territories, SSNRs, CLRs, NNPs and SBRs are to be financed by the state budget, by the Fund for Ecology, Environmental Protection and Waste Management, from the revenues from research and educational activities, revenues from compensation payments and fines, and charitable donations. Moreover, CLRs, NNPs and SBRs can collect entrance fees and fees for the use of natural resources. NPs are to be financed by the state budget and charitable donations. Activities in SRs and NMs are to be financed by the relevant local government authorities.

In practice, the administration and management (including monitoring and implementation of protective measures) of PAs is predominantly financed from state budget allocations. However, state budget funding is insufficient to implement effective nature conservation. Furthermore, the level of available funding to some extent depends on the subordination of a particular PA to a particular state administrative body. Reportedly, PAs subordinate to the State Committee on Geology and Mineral Resources (Kitab SSNR) and the Tashkent Oblast Khokimiyat (until 2017, Chatkal SBSNR and also Ugam-Chatkal NNP),

were better resourced than PAs subordinate to SCEEP or the State Committee on Forestry. Furthermore, according to the assessment undertaken by UNDP, the state budget allocations to PAs were determined regardless of the size of their territories, presence or absence of management challenges and level of threat to biodiversity, and not always in relation to the scope of activities required for their effective management. In the common opinion, PAs are generally perceived as draining the scarce financial resources of national, regional and district government budgets and, hence, it is not worth investing significant funds in their management.

As a result, the needs for the development, maintenance or simple replacement of ageing infrastructure, provision of contemporary outdoor equipment, off-road vehicles, etc. accumulated over time. Furthermore, the remuneration of PA staff (both for highly qualified scientific employees and field rangers/inspectors) is still comparatively low (despite the significant salary level increase in 2018). However, the situation in PAs that receive no direct state budget funding is even worse.

According to UNDP, the state budget allocation for all SSNRs in 2015 was estimated at approximately US\$1.2 million, of which some 71.5 per cent comprised staff costs (salaries and associated taxes), 27 per cent recurrent operational costs, and infrastructure, equipment and capital costs the remaining 1.5 per cent. In the same year, the state budget allocation for the administration and management of the state forest fund was estimated at approximately US\$6 million, of which about 82 per cent comprised staff costs, 16 per cent recurrent operational costs and 2 per cent infrastructure, equipment and capital costs. Several legal acts related to biodiversity (the 1997 Law on the Protection and Use of Flora, 1997 Law on the Protection and Use of Fauna, 1999 Law on Forests, 2004 Law on Protected Natural Territories) provide the legal basis for the collection of various fees for the use of natural resources, e.g. forest resources (forestry tickets), PAs (entrance fees) and flora and fauna species (fees for collection of plants, procurement of NTFPs, hunting and fishing). However, additional self-generated revenues of SSNRs, derived from collected fines and penalties, were estimated at only some US\$21,000 per year.

Contrary to PAs, the forestry sector (managing some 25.09 per cent of the country's territory) can substantially supplement the state budget allocation with additional self-generated revenues (e.g. income from forest land lease fees, sales of timber and firewood, services and fines). Payments made by users

of forest resources are income of the State Committee on Forestry. The revenues are an important supplement to the limited state budget allocations for financing the sustainable management of forest ecosystems. In 2015, the own income of the State Committee from use of forest resources amounted to some 25 per cent of its total budget. The fact that, in general, the state budget allocations for forest management are insufficient to finance expenditures on the maintenance and renewal of equipment and alleviate infrastructure constraints puts pressure on forest enterprises to raise their own incomes in order to strengthen the financial resources of the State Committee. These revenue-raising activities include leasing of land for pastures, sale of food plants and fruits, medicinal plants and self-harvested timber, which may divert human resources from activities related to forest conservation, preventing illegal cuttings of plants and preventing and/or detecting poaching.

Information measures

As at March 2019, an integrated biodiversity information system is not operational in Uzbekistan. According to the 2019 Sixth National Report to the CBD, the integrated biodiversity data management system (the national Clearing House Mechanism, CHM) had already been prepared in the period 2013–2015, under the UNDP/GEF/RUZ project “National biodiversity planning to support the implementation of the CBD 2011–2020 Strategic Plan in Uzbekistan”. The CHM was expected to include available thematic databases and integrate these into a national biodiversity information system, accessible online. But the internet portal (publicly accessible at cbd.uz) developed under the above project, which was initially fed with basic information on the biodiversity of Uzbekistan and relevant international agreements and maintained and kept operational at the expense of SCEEP for some period after the project completion, was later abandoned, due to the ongoing reforms in the country, including the reorganization of SCEEP.

The development and launch of the Biodiversity Conservation Information Management System (BCIMS) for the collection, processing and storage of biodiversity data is one of the objectives of the ongoing (2017–2022) UNDP/GEF/SCEEP project “Sustainable natural resource and forest management in key mountainous areas important for globally significant biodiversity”.

As at March 2019, information on biodiversity, PAs and forestry management is practically absent in the publicly available statistics. The State Committee on Statistics issues an annual bulletin on the main

indicators of environmental protection, rational use of natural resources, forestry and hunting but solely for distribution among selected public authorities. Information on forestry and hunting in this publication is very limited. Furthermore, the publicly available information on biodiversity and protected areas is not always up to date and comprehensive. In the past, the former State Committee for Nature Protection periodically published the national report on the state of natural environment and use of natural resources, but the 2008-2011 edition was the last available (chapter 4). In this situation, the official website of SCEEP remains one of the few available information sources on biodiversity.

Red Books

Four subsequent Red Book editions (1983 Fauna, 1984 Flora, 1998, 2006, 2009) were published. In 2016–2017, following the results of scientific research, the updated list of animals and plants was prepared for inclusion in the next Red Book. According to the 2018 Resolution of the Cabinet of Ministers No. 1034, the Red Book system of categories (threat status) will be changed to make the categories identical with those of the Red Book of the Russian Federation. Hence, the Red Book of Uzbekistan would continue to be incompatible with the IUCN standards.

11.8 Assessment, conclusions and recommendations

Assessment

Uzbekistan successfully preserved the abundance of wild native species of flora and fauna, including 16 plant and 46 fauna species categorized by the IUCN as globally threatened by extinction, as well as numerous regionally rare and endangered species, inscribed in the national Red Book. The populations of widespread wild animal species are either stable or growing in numbers, as hunting for the majority of game species is kept at a sustainable level. However, decreasing trends in populations of several globally threatened or locally endemic fauna species are observed.

All natural ecosystems in Uzbekistan (where deserts and steppe ecosystems encompass 85 per cent of the country's territory) are exposed to, and seriously threatened by, the global climate changes, further exacerbating desertification, habitat degradation, increased threat of steppe and forest fires, increasing salinization of water and scarcity of water resources. The most striking example of the degradation of natural ecosystems, habitats and species diversity is the environmental disaster in the Aral Sea region.

However, numerous other pressures continue to threaten the viability of ecosystems and species populations, in particular the land uptake for mining and agricultural purposes and the unsustainable use of pastures (also in mountain forest ecosystems).

In order to mitigate the adverse effects of such pressures and prevent further biodiversity loss and land degradation, Uzbekistan implements extensive and costly protective and restorative measures, in particular the afforestation of the dried bed of the Aral Sea, restoration of aquatic and wetland ecosystems in the Amu Darya River delta, establishment of rare and threatened species breeding centres and designation of new PAs.

However, the development and implementation of state policies on biodiversity conservation is seriously hampered by the unavailability of reliable data. An integrated biodiversity monitoring system is not in place. The monitoring of key Red Book species is carried out only in some PAs, while sporadic field inventories of flora and fauna species populations have so far been conducted only in some administrative regions of the country.

As at 1 January 2019, the PA system (excepting areas of the national category VI) encompassed 13.2 million ha, which equals 29.4 per cent of the country's territory. However, the state forest fund lands (less than 29 per cent of which are covered by actual forests) constituted the predominant part (over 84 per cent) of the above. Typical PAs together covered less than 2.1 million ha, only 4.63 per cent of the country's territory, while the most effective protection of biological and landscape diversity was ensured only in PAs granted legal entity status, the total area of which accounted for less than 1.5 million ha – less than 11 per cent of the total PA system or only 3.31 per cent of the country's territory.

Conclusions and recommendations

Biodiversity monitoring and research

The availability of reliable, comprehensive and up-to-date information on biodiversity is a prerequisite for the proper formulation of national policies, ecosystem and species conservation action plans and PA management plans, as well as for the proper setting of hunting quotas. As at 2019, an integrated biodiversity monitoring system is not operational in Uzbekistan and no forest inventory has been conducted since 1987, while the 2009 national Red Book, which should indicate the most urgent priorities for species conservation, is outdated and incompatible with the IUCN global assessment methodology and criteria.

Moreover, the integrated biodiversity monitoring system, once in operation, will not be able to perform its planned policy support tool functions unless it is continuously provided with good quality and continuously updated information derived from biodiversity monitoring, field inventory works and scientific research. The lack of access to reliable and updated information on biodiversity is an impediment for progress in achieving the Sustainable Development Goals targets 15.1, 15.2 and 15.5. The continuity of long-term research on wild species of flora and fauna (in particular rare and threatened species) is the prerequisite for the successful implementation by the parties of CBD Article 7.

Recommendation 11.1:

The Cabinet of Ministers should:

- (a) *Based on a proposal from the State Committee on Ecology and Environmental Protection, adopt the revised and updated Red List of rare and endangered flora, fungi and fauna species, paying due account to the globally applied IUCN methodology and criteria, and ensure the publication of the next edition of the Red Book;*
- (b) *Based on a proposal from the State Committee on Ecology and Environmental Protection, adopt the list of priority biodiversity monitoring and research programme topics, with a special focus on both rare and threatened, and locally endemic flora, fungi and fauna species, plant communities and ecosystems, game species and invasive alien species;*
- (c) *Adopt and ensure the implementation of a long-term state biodiversity monitoring and research programme, as part of the integrated system of state environmental monitoring, in cooperation with the Academy of Sciences, other relevant public academic and scientific research institutions and environmental NGOs;*
- (d) *Mobilize adequate resources to ensure the continuation of state support for biodiversity monitoring and research in the long run;*
- (e) *Support the State Committee on Forestry and mobilize adequate resources for carrying out the national forest inventory and long-term systematic research on forest ecosystems and habitats;*
- (f) *Ensure the establishment and operation of an efficient biodiversity information system, utilizing contemporary techniques for digitalized data acquisition, storage, retrieval, processing and dataset harmonization, with the objective to gather,*

store and share results of biodiversity monitoring, research programmes and projects carried out with the support of public funding, and provide access to this system (with differentiated access and data administration levels) for all stakeholders involved in biodiversity conservation initiatives.

Biodiversity policy instruments

In 2019, the United Nations General Assembly declared 2021–2030 the United Nations Decade on Ecosystem Restoration. The integrity of almost all natural ecosystems in Uzbekistan is currently threatened, due partly to ongoing climatic changes but also to growing anthropogenic pressures. The biodiversity loss continues, and populations of several rare species continue to decline in size. This means that management approaches applied to date have not provided for effective biodiversity conservation. The recent adoption of the 2019 National Biodiversity Strategy and Action Plan (NBSAP) is a step forward. However, only a few rare and threatened fauna species, and no flora species, are currently covered by single species conservation plans. The same applies to the most vulnerable ecosystems, rare plant communities and habitats. No national wetland policy is in place.

Therefore, undertaking additional efforts aimed at the achievement of the globally adopted biodiversity-related Sustainable Development Goals, and Aichi Target 12 (“By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained”) is urgently required, for example, through the development, adoption and implementation of new national policies, strategies and action plans, in particular concerning ecosystems, habitats and species not yet adequately covered.

Recommendation 11.2:

The Cabinet of Ministers should:

- (a) *Ensure implementation of the 2019 National Biodiversity Strategy and Action Plan;*
- (b) *Adopt and ensure implementation of the national wetland policy and corresponding programme for wetlands conservation;*
- (c) *Adopt and ensure implementation of ecosystem and species action plans and programmes;*
- (d) *Mobilize adequate resources for the implementation of all biodiversity-related policy documents in the long run.*

Establishment of the national ecological network

The current PA system does not yet adequately safeguard the biodiversity values, as some main natural ecosystems are underrepresented, while some rare and threatened species do not occur inside current PAs. Furthermore, the national PA system of Uzbekistan is still not a “network” in the common meaning of the term, as the concepts of the ecological network and ecological corridors are absent from the national legislation, policy framework and conservation practice.

The achievement of globally adopted Aichi Target 11, and relevant targets under the Sustainable Development Goals (15.1, 15.4 and 15.5) requires the further extension of the PA system and redesigning it into a functional network.

Recommendation 11.3:

The Cabinet of Ministers should:

- (a) *Adopt amendments to the 2004 Law on Protected Natural Territories, incorporating the concepts of the ecological network and ecological corridors;*
- (b) *Designate external buffer zones surrounding or adjacent to the territories of relevant categories of protected areas;*
- (c) *Extend the territories of existing protected areas and designate new protected areas, paying due account to the need to provide adequate coverage of all main ecosystem types representative of Uzbekistan and the sufficient inclusion of mainstays and habitats of rare and threatened species, and to ensure the ecological connectivity and continuity of the protected area network by linking core areas with ecological corridors, covering migration routes of rare and threatened terrestrial and aquatic wildlife species;*
- (d) *Mobilize adequate resources in order to ensure the proper functioning of the national ecological network in the long run.*

***PART III: INTEGRATION OF ENVIRONMENT INTO
SELECTED SECTORS AND ISSUES***

Chapter 12

ENERGY AND THE ENVIRONMENT

12.1 Overview of the energy sector

Coal

Uzbekcoal, the major coal company, quotes Uzbekistan's explored reserves as 1.8 billion tons of brown coal and 47 million tons of black coal. Coal resources are estimated at over 5 billion tons, of which 3 billion tons are classified as reserves. Reserves at Angren alone are estimated at over 2 billion tons, of which most is classified as lignite. Coal mining is carried out at three deposits: the open-pit Angren mine (brown/lignite coal) and underground mines Baisun and Shargun (both hard coal).

There are fluctuations in total coal production, with a peak in 2014, a decline in 2015 and some increase since then (table 12.1). Brown coal production has increased in recent years to around 4 million t/y, reflecting a modernization programme at Angren mine and power plant.

Oil

According to the State Committee on Geology and Mineral Resources, the country has about 177 million tons of oil reserves as at 1 January 2019, including crude oil and gas condensate, which are located in 188 oil and gas fields. Currently, crude oil is produced at 55 fields and condensate at 22 fields. Over 60 per cent of them, which accounts for about 70 per cent of oil production, are situated in the Bukhara-Kiva region. Some 20 per cent of oil fields are developed in the Fergana region. There are also oil deposits in the

south-west part of the country at Kokdumalak, Northern Urtabulak, Kruk and Umid. Currently, there are oil explorations on the Ustyurt Plateau and in the Aral Sea.

In 2018, total annual petroleum and other liquids production was 2,891 million tons.

The decline of oil output, which started in 2004, continued during the period 2013–2018 (table 12.2). The decrease in production was caused by the depletion of oilfields. In 2017–2018, gas condensate production increased in comparison with 2015–2016. The prospects of oil and gas content are related to the Ustyurt Plateau and the Aral Sea. Although the volume of oil produced in the country does not cover its demands, conversion of transport to gas (liquefied natural gas (LNG)) reduces the need for liquid fuels.

Also, the decrease in oil production had a positive effect. The Government was motivated to largely abolish an inward-focused energy policy that stimulated self-sufficiency and subsidized domestic prices. Current objectives are to attract foreign investment to increase oil production and explore new reserves. The state oil and gas company Uzbekneftegaz pursues production-sharing agreements and joint ventures with foreign companies.

Natural gas

According to the State Committee on Geology and Mineral Resources, the country has about 2.2 trillion m³ of proven natural gas reserves as at 1 January 2019.

Table 12.1: Coal production, 2013–2018, 1,000 tons

	2013	2014	2015	2016	2017	2018
Hard coal	20	107	127	160	124	..
Brown coal	4 070	4 290	3 361	3 707	3 915	..
Total	4 090	4 397	3 488	3 867	4 039	4 174

Source: State Committee on Statistics, 2019.

Table 12.2: Crude oil production, 2013–2018, 1,000 toe

	2013	2014	2015	2016	2017	2018
Crude oil	1 280	1 031	1 000	868	814	746
Gas condensate	1 887	1 836	1 728	1 748	1 953	2 145

Source: State Committee on Statistics, 2019.

Uzbekistan is the third largest natural gas producer in Eurasia, after the Russian Federation and Turkmenistan, and ranks among the top 20 gas producers globally. There are 240 natural gas fields in the country. The country produces close to 60 billion m³ (bcm) of natural gas annually and consumes roughly 54 bcm of natural gas. Thus, around 10 per cent is currently exported due to market constraints and high domestic consumption.

The development of national natural gas reserves faces several challenges, such as deep deposition and high sulfur content in some gas fields, and conversion of natural gas from the fields to marketable gas. There are several processing facilities, such as Mubarek Gas Processing Factory, Kandym Gas Processing Factory, Shurtan Gas Processing and Chemicals Complex and Ustyurt Gas Processing and Chemicals Complex, to remove impurities such as sulfur and separate heavy components. The output of these facilities is pure hydrocarbons, such as:

- Methane (CH₄), which is exported by transnational pipelines as well as being used by the local population;
- Ethane (C₂H₆) and heavier components, which are used as a feed stock for refineries; for supply to the population; in production of LNG, which is used as a transport fuel; and in production of some chemicals, such as ethylene as feedstock for low-density polyethylene.

These facilities also produce granulated sulfur.

In 2017, Uzbekistan produced around 52 billion toe of natural gas (table 12.3). Natural gas output does not fluctuate strongly, but is showing some tendency to increase.

Uzbekistan is an exporter of natural gas: around 50 per cent of exported gas flows to the People's Republic of China and the remainder to the Russian Federation, Kazakhstan, Tajikistan and Kyrgyzstan.

Hydropower

The technically feasible hydropower potential of Uzbekistan exceeds 35 billion kWh/y, and the potential economically viable for development is

estimated at around 27 billion kWh/y. As at January 2019, the state-owned company Uzbekhydroenergo operated 37 HPPs with installed capacity of 1,914 MW.

Uranium

According to the IAEA, Uzbekistan ranks seventh globally in terms of uranium reserves (4 per cent of world reserves) and fifth in terms of its production. About 40 deposits have been explored, of which 27 are the main source of production. According to the State Committee on Geology and Mineral Resources, the explored and estimated reserves of uranium amount to 185,800 tons, of which 138,800 tons are of infiltration type.

As at early 2019, Uzbekistan does not yet have a nuclear industry and nationally produced low-enriched uranium is exported.

Transmission of fossil fuels

Uzbekistan's sole domestic crude oil pipeline links the Fergana and Alty-Aryk refineries. The only international crude oil pipeline runs through Uzbekistan, linking the Shymkent refinery in Kazakhstan to the Chardzhou refinery in Turkmenistan.

The natural gas pipeline system in Uzbekistan includes 122,000 km of high-pressure pipeline and 14,000 km of medium- and low-pressure pipelines. Uzbekistan plays a role as a transit country for natural gas supply from Turkmenistan.

With the development in the 1960s of a unique Gazli gas field, the main gas pipelines Bukhara–Urals and Central Asia–Centre were commissioned. The Bukhara–Urals pipeline runs from Turkmenistan through the Bukhara gas region in Uzbekistan, via Kazakhstan to the Russian Federation. The capacity of this pipeline is 55 bcm/y; however, it does not operate at full capacity. Sections of this pipeline have been rehabilitated in the past few years.

The Central Asia–Centre is a system of natural gas pipelines that runs from Turkmenistan via Uzbekistan and Kazakhstan to the Russian Federation.

Table 12.3: Natural gas production, 2010–2017, 1,000 toe

	2010	2011	2012	2013	2014	2015	2016	2017
Production	48 944	51 329	51 224	48 553	50 271	50 642	51 503	51 962

Source: ESCAP Asia-Pacific Energy Portal, <https://asiapacificenergy.org/>.

The Central Asia–China pipeline, which was commissioned in the 2010s, starts in Saman-Depe to supply natural gas from the Bagtyyarlyk gas fields on the right bank of the Amu Darya River in Turkmenistan. This pipeline enters Uzbekistan in Olot and runs across Uzbekistan to the southern part of Kazakhstan, parallel to the long-standing Bukhara–Tashkent–Bishkek–Almaty pipeline. Then the exported gas flows from Kazakhstan to China through the Horgos cross-border point. The pipeline has three parallel lines of 1,833 km and a total capacity of 55 bcm/y. In 2013, China signed agreements with Uzbekistan and other Central Asian countries to construct a fourth line of the Central Asia–China pipeline. However, the project has been delayed, and the pipeline is not expected to begin operations until around 2020. The system is expected to have a total capacity of 85 bcm on the completion of Line D.

For the last few years, Uzbekistan has been developing its gas transportation system to heighten the country's level of gasification and to create a unified national network of gas transportation. It has been a part of the Government's plan to increase the energy security and environmental friendliness of the economy. Thus, two new natural gas pipelines, Gazli–Kagan and Gazli–Nukus, were built to connect the Ustyurt Plateau and Bukhara-Khiva region with the existing pipeline system.

The Bukhara–Tashkent–Bishkek–Almaty natural gas pipeline, with a capacity of 3.2 bcm/y, is the main Uzbek owned and operated pipeline. It supplies natural gas for Kyrgyzstan and southern Kazakhstan.

The Mubarek–Shurabad–Dushanbe natural gas pipeline connects Uzbekistan and Tajikistan.

Electricity and heat production

At the present stage of economic development, the main goals of the electric power industry are to meet the growing needs of consumers in electricity, modernize and reconstruct existing power plants and grids and build new generating capacities based on

efficient power production technologies. The development of the power sector up to 2021 envisages implementation of 62 investment projects, which aim at:

- Further upgrading power generation technologies, increasing the efficiency of natural gas usage and reducing the energy intensity of the industry;
- Accelerated development of the hydropower resources;
- Further diversification of the fuel and energy balance using RES (wind and solar);
- Development of the optimal configuration of backbone power grids to increase the sustainability of the electricity system, meeting the growing electricity needs of industries and the population and for export;
- Improving the sustainability of the unified power system and the reliability of electricity supply to consumers, and strengthening the country's energy security.

The main power fleet of Uzbekistan belongs to JSC Uzbekenergo²⁵ and consists of TPPs and CHPPs (table 12.4). There is also some 300 MW installed capacity, which belongs to industrial enterprises. Total installed capacity in the country, including HPPs, is around 14,000 MW. Thirty-seven HPPs with installed capacity of 1,914 MW generate around 6 billion kWh/y. However, all HPPs were erected as component elements of irrigation systems. Power production is their secondary purpose and correlates with the release of water for irrigation. There are several cascades of HPPs: at Urta-Chirchik, Chirchik, Nizhne-Bozsuisk, Kadyrinsk, Tashkent and Farhad.

Modernization and new capacities

Electricity transmission assets have not been properly maintained and upgraded, affecting the delivery of reliable power supply to domestic customers, especially in the southern regions. There is a high level of electricity losses. According to Uzbekenergo, transmission system losses are 18 per cent and distribution losses are 14 per cent.

²⁵ Following the reorganization of JSC Uzbekenergo, TPPs and CHPPs will be under the JSC Thermal Power Plants.

Table 12.4: Main thermal power plants and combined heat and power plants, 2010–2017, MW

	2010	2011	2012	2013	2014	2015	2016	2017
Syrdarinskaya TPP	3 000	3 000	3 000	3 000	3 000	3 015	3 065	3 065
Novo-Angrenskaya TPP	2 100	2 100	2 100	2 100	2 100	2 100	2 100	2 100
Tashkentskaya TPP	1 860	1 860	1 860	1 860	1 860	1 860	1 860	1 860
Navoiskaya TPP	1 250	1 250	1 250	1 728	1 618	1 618	1 618	1 618
Talimarjanskaya TPP	800	800	800	800	800	800	800	1 700
Tahiatashskaya TPP	730	730	730	730	730	730	730	730
Angrenskaya TPP	484	484	484	484	484	484	484	393
Ferganskaya CHPP	305	305	305	305	305	305	305	305
Muborekskaya CHPP	60	60	60	60	60	60	60	60
Tashkentskaya CHPP	30	30	30	30	30	57	57	57
Total	10 619	10 619	10 619	11 097	10 987	11 029	11 079	11 888

Source: Ministry of Energy, 2019.

Photo 12: Tashkentskaya CHPP

Photo credit: Mr. Vadim Ni

From 2012, JSC Uzbekenergo increased installed power capacity. This was done by modernization of existing facilities as well as installation of new ones:

- At Navoiskaya TPP, a new combined cycle unit with 478 MW capacity was installed in 2012;
- At Tashkentskaya CHPP, a new gas turbine unit with 27 MW capacity was installed in 2013;
- At Syrdarinskaya TPP, modernization of existing units 1 and 2 (+50 MBt) was undertaken in 2015;
- At Angrenskaya TPP, a new fluidized bed combustion unit with 130–150 MW capacity for coal with high ash content was installed in 2016;
- At Talimarjanskaya TPP, two combined cycle units with 450 MW capacity each were installed in 2016;
- At Tashkentskaya TPP, a combined cycle unit with 370 MW capacity was installed in 2018.

Several ongoing projects are aimed at construction of additional generation capacities. These include:

- Construction of a new combined cycle TPP with two units with 450 MW capacity each in Turakurgansk District;
- Extension of Navoiskaya TPP with a second combined cycle unit with 450 MW capacity;
- Construction of two combined cycle units with 230 MW and 280 MW capacity at Tahiatashskaya TPP.

Efficiency of combined cycle units is around 55 per cent with consumption of 225 g of fuel for generation of 1 kWh. Ongoing projects are expected to increase power generation but also reduce consumption of natural gas.

According to ESCAP, in 2016, natural gas was responsible for 75 per cent of produced electricity, hydro for 20 per cent, coal for 4 per cent and fuel oil for 1 per cent (table 12.5(a)). According to national data, hydropower accounted, on average, for 11.17 per cent of power generation in 2013–2018 (table 12.5(b)). Steady growth of power generation was observed in the period 2010–2018.

Nuclear energy

Since 2017–2018, Uzbekistan has been firmly stating its intention to construct a nuclear power plant (NPP) in order to meet the growing demands of the economy for energy resources and to diversify energy supply.

Oil refining

Uzbekistan has two oil refineries located in Fergana (annual crude oil distillation capacity 5.5 million tons) and Bukhara (annual capacity 2.5 million tons). The refineries' actual operation is below capacity because of insufficient domestic oil production. They produced some 60 different products (table 12.6). There is also a small-scale refinery to process heavy oil in Surhandariya Oblast. About 52 per cent of nationally consumed oil products are used in transport, 16 per cent in agriculture, 13 per cent in the power sector and 5 per cent in industry.

Table 12.5(a): Power generation by source, 2010–2016, GWh

	2010	2011	2012	2013	2014	2015	2016	2016 (%)
Natural gas	37 992	39 478	38 763	40 148	41 106	42 963	43 742	75
Hydro	10 846	10 240	11 210	11 560	11 830	11 830	11 830	20
Coal	2 112	2 140	2 145	2 214	2 263	2 340	2 382	4
Oil and other	750	542	382	278	201	147	365	1
Total	51 700	52 400	52 500	54 200	55 400	57 280	58 319	100

Source: ESCAP Asia-Pacific Energy Portal: <https://asiapacificenergy.org>

Table 12.5(b): Power generation by producer, 2013–2018, GWh

	2013	2014	2015	2016	2017	2018	Average 2013–2018 (%)
Combined heat and power plants (CHPPs)	1 090.6	1 230.9	1 239.2	1 237.0	1 250.9	1 039.7	2.02
Thermal power plants (other than CHPPs)	47 823.8	48 459.9	49 349.9	50 536.4	51 141.8	55 470.6	86.09
Hydropower plants	5 704.2	6 075.0	6 824.7	6 859.8	7 929.6	5 897.3	11.17
Other sources (except electricity produced by waste incineration)	-	-	244.2	467.3	497.9	488.9	0.72
Total	54 618.6	55 765.6	57 658.1	59 100.1	60 820.1	62 896.6	

Source: State Committee on Statistics, 2019.

Table 12.6: Selected product output of Fergana and Bukhara refineries, 2013–2016, million tons

	2013	2014	2015	2016
Benzene	1.80	1.07	1.07	1.13
Kerosene	0.25	0.16	0.16	0.18
Diesel	1.12	0.99	1.09	0.98
Mazut	0.19	0.12	0.07	0.10

Source: State Committee on Statistics, 2019.

12.2 Trends in energy balance

In 2016, the diversity of primary energy supply was concentrated in fossil fuels, mainly natural gas, with some hydropower (table 12.7). The total primary energy supply began to decrease in 2012. The development of local fuels such as natural gas and coal is a goal of national energy policies. Therefore, fossil fuels continue to play a dominant role, although their supply has declined. The share of natural gas is about 87–89 per cent of total supply; the next largest share is oil (6 per cent).

According to the International Energy Agency, final energy consumption by the industrial sector at the end of 2016 made up half the total final energy consumption. The transport sector accounted for 2.33 per cent and other sectors of the economy for 18.18 per cent of total final consumption.

12.3 Environmental pressures

Extraction of energy sources

Open-pit mining

Angren brown coal deposit is developed by surface mining. Extraction of coal by open-pit mining requires the removal of vegetation, soil and rock (overburden) from above the coal. Removal of overburden and coal mining requires drilling and blasting as well as the operation of different types of equipment/machines, which cause dust. For surface mines, the main environmental problems are large-scale land use, overburden removal and disposal, disturbance of hydrology, acid mine drainage and fugitive dust. The overburden has traditionally been dumped in piles around the mines, which can be exposed to weather conditions that lead to environmental hazards. This refuse can contain enough coal to burn after piling up and will often internally combust and burn slowly for

years. Since these mounds of overburden are quite dense, the interior may burn, while the top and outer levels are exposed to rain. Rains could leach toxins into water bodies. Toxins that are released through fires are major contributors to air contamination and are returned to the ground by rains to contaminate crops consumed by forage animals, which are eventually consumed by humans. In addition, during the summer, which is typically hot and dry, the outer layer of these mounds dries out and the wind spreads the dust throughout nearby areas, where the dust and its toxins are inhaled by people.

Underground mining

For underground mines in the Shargun and Baisun deposits, the problems related to environmental impact are mine water drainage, methane emissions and fugitive dust. If not managed correctly, any of these could adversely affect the health and livelihood of the poor and vulnerable groups living near mining operations. Underground coal mining may cause emissions of coal-bed methane. There are no data on methane content and emissions in the coal seams of these mines.

Oil and gas transportation and production

The construction of pipelines always raises issues around the protection of the land and water basins in the areas through which the pipelines will pass. In general, pipelines are the safest and most efficient method of moving fossil fuels, and Uzbekistan has a good safety record in this area. However, even properly maintained and modern pipelines can have oil spills and gas leakage. The pipeline system is very important for the national economy since it also delivers gas to many TPPs and customers, as well as delivering oil to refineries.

Table 12.7: Total primary energy supply, 2010–2016, 1,000 toe

	2010	2011	2012	2013	2014	2015	2016
Natural gas	37 229.00	41 570.00	42 931.00	37 571.00	38 313.00	33 895.00	32 752.00
Hydro	933.00	880.00	964.00	994.00	1 017.00	1 017.00	1 017.00
Coal	1 306.00	1 372.00	1 386.00	1 443.00	1 570.00	1 552.00	1 549.00
Oil	3 741.00	3 525.00	3 133.00	2 955.00	2 783.00	2 587.00	2 391.00
Electricity	7.57	7.65	7.65	7.91	8.08	- 90.10	- 127.00
Renewables	3.77	3.77	3.82	3.89	3.96	4.04	4.11
Total	43 200.00	47 400.00	48 400.00	43 000.00	43 700.00	39 000.00	37 600.00

Source: ESCAP Asia-Pacific Energy Portal: <https://asiapacificenergy.org>

Pipelines are often slated to go through rural parts of the country; one of the concerns of residents is that the pipeline and noisy compressor stations that can accompany it would disrupt their way of life and disturb the environment. Transportation of gas and, especially, oil, raises the possibility of loss of biodiversity and habitats. Uzbekistan follows international guidelines and practice on the management of risk of spills from pipelines. The greatest possible threats of oil discharge in operations are posed by pipeline leaks and release of bunker oil.

The main pollutants released by the oil industry are carbon monoxide, carbon dioxide, nitrogen oxides, sulfur compounds, methane, methanol and volatile organic compounds (VOCs).

During oil production, the associated natural gas is flared when barriers to the development of gas markets and gas infrastructure prevent it from being used. Flaring (the burning of associated petroleum gas in an open flame at production sites) has long been part of the process of hydrocarbon extraction worldwide, including in Uzbekistan. Flaring gas wastes a valuable energy resource that could be used to support economic growth. It also contributes to climate change by releasing millions of tons of CO₂ into the atmosphere. It used to be one of the main sources of oil industry pollution.

In Uzbekistan, the volume of gas flaring has declined. While in 2013 the volume of gas flared was around 1.494 bcm, this had decreased to 0.788 bcm in 2018 (table 12.8). The decrease was caused not only by reduction of oil production but also by some measures implemented by oil production companies. Thus, flaring intensity (volume of gas flared per produced amount of oil – cm/barrel) was also in decline. While some associated petroleum gas is consumed for own use, such as reinjection to maintain reservoir pressure, the limited market and low prices for commercial gas, especially in remote areas, result in some gas still being flared.

Waste is also generated in oil production and processing. There is no information on the land and soil polluted by oil products in Uzbekistan. According to SCEEP, there were no registered oil

leakages/contaminations in the period 2010–2018.

However, accidents do occur in the natural gas industry. In 2015, the rupture of the main gas pipeline Yangier–Tashkent, 157 km from Yangier, caused the loss of 1,758,684 m³ of natural gas and emission of air pollution products. Also in 2015, the rupture of the Bukhara–Tashkent–Bishkek–Almaty gas pipeline in Jizzakh Oblast, 34 km from Bukhara, caused the loss of 4,545,495 m³ of natural gas.

Gas leakage due to the rupture of gas pipelines subordinated to the Mubarek Gas Pipeline System during the period 2010–2017 amounted to more than 5,000 m³.

Available information on gas leakages focuses on economic aspects (losses of natural gas) rather than environmental impact. Nevertheless, such accidents cause the release of carbon monoxide, carbon dioxide, nitrogen oxides, sulfur compounds, methane, methanol and other pollutants.

With potential natural gas production expected to increase in the coming years, the risk of gas leakages would increase.

In the past few years, natural gas processing facilities, which aim to remove impurities, introduced new technologies/techniques to improve environmental protection. For example, in 2016–2017 the Mubarek Gas Processing Factory commissioned new units for the most complete extraction of gas fractions. It enables a significant decrease of emissions of air pollutants. The Kandym Gas Processing Factory, commissioned in April 2018 in Bukhara region, focuses on treatment of sulfurous gases, which had previously been flared.

Detailed data on sources, types and volumes of pollution and waste discharges during oil and gas activities, which would allow the Government to develop the necessary preventive measures, are lacking. The collection of detailed information from all enterprises is not carried out and hinders a comprehensive assessment of the oil and gas industry's impact on the environment.

Table 12.8: Gas flaring, 2013–2018

	2013	2014	2015	2016	2017	2018
Annual volume of gas flared (million m ³)	1 494.0	1 301.0	1 115.0	1 043.0	849.0	788.0
Oil production (kilobarrel/d)	63.0	61.0	54.0	58.0	54.0	54.0
Intensity (m ³ /barrel)	58.5	55.4	50.8	54.0	50.5	39.7

Source: www.worldbank.org/en/programs/gasflaringreduction#7

Uranium extraction

Uranium mining was carried out in Uzbekistan during the Soviet period. For more than 50 years, a large amount of radioactive materials had been disposed of in the dumpsites and tailing sites of mines, without almost any remediation work. The main amount of radioactive waste was accumulated on the mined-out uranium deposits of the Chatkalo-Kuramin region and in the Kyzylkum region at the facilities of the SUE Navoiy Mining and Metallurgical Combine (NMMC). The accumulated radioactivity-contaminated materials are a threat to the environment and human health. Many of these deposits are situated along tributaries of the Syr Darya River, which flows through the densely populated Fergana Valley.

Rehabilitation work to overcome the legacy of uranium mining in Uzbekistan is expected to start in 2019. This work would be done in accordance with a plan developed by a group of experts established by IAEA. The work will be through the Environmental Remediation Account for Central Asia established at the EBRD in 2015 at the initiative of the European Commission (chapter 6).

At present, radioactive waste is formed as a result of uranium mining for the production of low-enriched uranium. According to the Ministry of Energy, current mining of uranium ore is carried out by the in-situ leaching (ISL) mining process. The ISL method has a clear advantage over traditional ore mining methods (mining and quarrying). Since the reserves are extracted without eliminating the surrounding rock (cap rock), expenditures on ore extraction (excavation) and mining are significantly reduced or even eliminated altogether, while operating costs are minimal.

Although some environmental impacts are minimized, such as there being no need for large uranium tailings, the productive solution (containing the leaching agent and wastewater) has to be disposed of after the initial treatment. One of the challenges in terms of environmental protection in the application of ISL is to prevent contamination of groundwater.

Electricity and heat production

Each enterprise or power plant under JSC Uzbekenergo must operate an environmental control system. Environmental protection measures at various enterprises under JSC Uzbekenergo are coordinated by the Environmental Protection Service of JSC Uzbekenergo. Also, environmental protection measures are reflected in the annually developed plan “Basic Measures for Environmental Protection” and in

the annually updated order of JSC Uzbekenergo No. 21 “Main directions of socio-economic development of JSC Uzbekenergo”.

Power plants

Approximately 75–80 per cent of the electricity in Uzbekistan is produced using natural gas produced in Uzbekistan. Natural gas is considered to be the cleanest of all the fossil fuels as combustion by-products are primarily carbon dioxide and water vapour, with low levels of nitrogen oxides and hardly any particulate matter. In generating a given quantity of energy through combustion, natural gas produces approximately 30 per cent less carbon dioxide than oil and 45 per cent less carbon dioxide than coal. However, even gas TPPs might use mazut (heavy oil) as a reserve fuel. However, Angrenskaya and Novo-Angrenskaya TPPs, which use coal and gas, emit larger amounts of emissions. Table 12.9 shows selected air emissions from the main TPPs and CHPPs.

Coal combustion causes emissions of SO₂, NO_x, CO, PM₁₀, CO₂ and VOCs. Angren coal is of poor quality and has high ash content (up to 48 per cent) and the specific structural properties of the coal have rendered its enrichment uneconomic to date. Its combustion is associated with substantial emissions of particulate matter.

The amount of fly ash, SO₂, NO_x and CO emitted from boilers depends on equipment design, combustion modus operandi and the quality of the fuel. For example, the high ash content of Angren coal, consumed by the two power plants, causes challenges for fly ash capture. The average fly ash removal rate is rather low, at about 96 per cent.

Oil refineries

Refineries could be sources of air, water and soil pollution. According to data from JSC Uzbekneftegaz, concentrations of air pollutants do not exceed the limit around the existing refineries. Generated waste from the plants undergoes a full cycle of deep cleaning at the cleaning facilities, including the units of mechanical, physical and chemical, and biological purification. Refineries carry out self-monitoring to ensure control over emissions into the air and discharges to surface waters.

Recently, the Fergana refinery introduced additional measures aimed at environmental protection:

- Reconstruction of treatment facilities: In 2019, the installation of equipment and its preparation for commissioning works are carried out. As a result

of modernization, the amount of pollutants in wastewater should be reduced;

- A hydrodesulfurization unit for diesel fuel was put into operation, which allows the sulfur content in diesel fuel to meet the requirements of the world standard – 0.05 per cent (previously, the sulfur content was 1.2 per cent). Burning diesel fuels reduces sulfur dioxide emissions;
- The first stage of the gas fractionation unit was commissioned to produce light petroleum products whose quality meets the world standards. It reduces emissions of pollutants into the atmosphere.

Prospective development of nuclear energy

The prospective development of a nuclear power industry in Uzbekistan has important environmental dimensions. There are several advantages in any NPP project: nuclear fuel is produced nationally, there are no emissions of GHGs or other harmful substances,

advanced nuclear power production has a tiny radiation impact (less than coal combustion), and only a small volume of radioactive waste is generated during operation. As with all energy sources, pollution is associated with supporting activities, such as mining, manufacturing and transportation, in addition to storing radioactive waste.

On the other hand, there is a risk of releasing large quantities of fission products into the environment in the event of an accident. It is important to ensure compliance with the international standards of NPP construction and operation and make the compliance strategy known to all stakeholders. The application of internationally adopted standards, taking into consideration recommendations of IAEA in respect of design, siting, operational safety, radiation safety and safe management of radioactive waste, is indispensable, to provide necessary safeguards to reduce environmental and health risks.

Table 12.9: Emissions from TPPs, 2010–2018, 1,000 tons

	2010	2011	2012	2013	2014	2015	2016	2017	2018 (11 months)
SO₂ emissions									
Total	44.8	49.9	48.2	69.6	59.4	49.8	50.7	54.5	41.4
Angrenskaya TPP (coal/gas)	9.1	10.0	9.6	9.9	8.6	11.4	12.3	19.1	14.0
Novo-Angrenskaya TPP (coal/gas)	20.0	22.1	28.4	52.2	43.5	32.8	32.4	27.4	22.0
Tashkentkaya TPP	7.6	8.2	4.1	4.7	4.2	2.7	4.0	5.0	2.5
Navoiskaya TPP	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0
Syrdarinskaya TPP	6.5	7.2	3.7	0.8	1.7	0.4	0.9	1.9	2.4
Talimarjanskaya TPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tahiatashskaya TPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Muborekskaya CHPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ferganskaya CHPP	1.6	2.5	2.4	1.9	1.3	0.5	1.0	0.9	0.5
Tashkentkaya CHPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NO_x emissions									
Total	31.2	41.8	53.8	57.4	61.8	63.8	65.2	55.7	53.3
Angrenskaya TPP (coal/gas)	1.0	0.9	0.8	2.5	0.7	0.9	0.8	1.7	2.4
Novo-Angrenskaya TPP (coal/gas)	5.4	5.4	7.5	6.7	6.1	5.3	4.9	4.4	3.7
Tashkentkaya TPP	3.9	5.3	5.1	4.8	4.4	5.0	5.1	3.7	3.7
Navoiskaya TPP	2.5	3.6	3.7	3.7	3.4	4.4	3.7	2.3	2.1
Syrdarinskaya TPP	11.9	19.4	29.8	32.9	39.7	41.3	43.4	36.3	33.9
Talimarjanskaya TPP	3.2	3.5	3.3	3.4	3.8	3.6	3.5	3.9	4.4
Tahiatashskaya TPP	2.3	2.5	2.4	2.6	2.7	2.4	2.7	2.5	2.1
Muborekskaya CHPP	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ferganskaya CHPP	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2
Tashkentkaya CHPP	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3
Particulate matter									
Total	37.8	43.3	63.7	120.2	107.6	85.9	78.2	94.1	57.8
Angrenskaya TPP (coal/gas)	11.1	14.3	11.6	11.6	10.1	13.2	18.9	33.9	8.5
Novo-Angrenskaya TPP (coal/gas)	26.4	29.0	52.2	108.6	97.5	72.7	59.3	60.1	49.3
Tashkentkaya TPP	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navoiskaya TPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Syrdarinskaya TPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Talimarjanskaya TPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tahiatashskaya TPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Muborekskaya CHPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ferganskaya CHPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tashkentkaya CHPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: State Committee on Ecology and Environmental Protection, 2019.

In May 2019, Uzatom announced that a priority site location for the future NPP has been identified. The site is close to Lake Tuzkan of the Aydar-Arnasay Lakes System in Jizzakh Oblast. The Aydar-Arnasay Lakes System is a Ramsar site. It is located at the crossroads of the Afro-Eurasian and Central Asian flyways and is a centre for migrating and wintering waterfowl. The “Aydar-Arnasay Lakes system” Ramsar Site is partly covered by the Arnasay State Reserve (“zakaznik”) (chapter 11).

The obligations of Uzbekistan as a party to the Ramsar Convention are to promote the conservation of its Ramsar sites and to maintain their ecological character (Article 3). This means that the possible effects of planned projects such as an NPP on the ecological character of the wetland ecosystem concerned need to be evaluated before the development takes place. Additionally, the Convention requires that if the ecological character of wetlands has changed or is likely to change, the party has to inform the Secretariat without delay.

Key instruments for implementation of the Convention’s obligations to promote the conservation and to maintain ecological character of Ramsar sites are the management plans for the Ramsar sites. Other instruments are SEAs and EIAs (2008 Resolution X.17). If negative effects are foreseen and when the development cannot be stopped or placed somewhere else, the Party can delete or restrict – in its urgent national interest – the boundaries of a wetland included in the Ramsar List, but has an obligation to compensate the loss of ecosystem services in the same area or elsewhere with an adequate portion of original habitat (Article 4).

As of May 2019, no management plan exists either for the “Aydar-Arnasay Lakes System” Ramsar Site or for the Arnasay State Reserve, and no EIA or SEA has been conducted for the NPP project. While the decision on the location of the NPP has not yet been made, the choice of the Lake Tuzkan for the location of the NPP would need to be reconsidered vis-à-vis the implementation of international obligations, in particular the Ramsar Convention, by Uzbekistan. If not, Uzbekistan would need to prove that the NPP cannot be placed somewhere else and that the project takes place as “in its urgent national interest”. Furthermore, the country would likely need to delete or restrict the boundaries of the wetland already included in the Ramsar List, and fulfil the obligation to compensate for any loss of wetland resources, with

all these decisions potentially damaging the image of the country on the international arena.

As at October 2019 the Cabinet of Ministers has not yet taken a decision on site selection for the NPP.

12.4 Energy efficiency and renewable energy development

Energy efficiency

Uzbekistan has a high level of primary energy intensity (amount of consumed energy per unit of GDP). According to the State Committee on Statistics, in 2016, it was 203.9 kg of oil equivalent (kgoe) per US\$1,000 GDP (2011 PPP). According to ESCAP, in 2016 it was 195 kgoe per US\$1,000 GDP (2011 PPP). For comparison, in Azerbaijan, which has a similarly structured energy sector, it was 91 kgoe, while the average energy intensity in Asia and the Pacific in 2016 was 129 kgoe per US\$1,000 GDP. Energy intensity is high in Uzbekistan due to own hydrocarbon production and inefficient consumption.

The country’s energy efficiency potential is high due to inefficient infrastructure and the absence of incentives to introduce energy efficiency measures. A 2013 World Bank report²⁶ noted major energy efficiency challenges, which are still valid:

- Demand-side energy efficiency, particularly in industry and agriculture, the most inefficient sectors of the economy. Industry uses outdated technologies while the irrigation system used in agriculture is inefficient;
- Efficiency of gas-fired power plants, which are 40 per cent less efficient than modern thermal plants;
- Efficiency of electricity networks, with losses of up to 20 per cent.

In recent years, a wide range of measures has been implemented to ensure energy efficiency and energy savings in sectors of the economy and the social sphere.

Standards for energy management of industrial production and energy labelling of household equipment have been introduced. The introduction of energy-efficient technologies in the system of street lighting and energy-saving lamps for residential and public buildings is being carried out. The sale of incandescent lamps with a capacity of over 40W has been halted.

²⁶ Artur Kochnakyan and others, “Uzbekistan: Energy/Power Sector Issues Note”, Report No. ACS4146 (Washington, D.C., World Bank, 2013).

At the same time, despite these measures, the energy intensity of the domestic economy remains high, and the level of diversification of the fuel and energy balance due to the involvement in industrial production of RES does not meet world trends. The structure of the primary fuel for the production of electrical and thermal energy is dominated by natural gas and other traditional types of hydrocarbon fuels.

Currently, the basic sectors of the economy, through a set of measures to save energy, undertake measures for saving more than 1 billion kWh of electricity and almost 1 billion m³ of natural gas, or around 5 per cent and 3.6 per cent, respectively, of the total annual consumption of these energy resources. According to the State Committee on Statistics, this has contributed to the decrease in the primary energy intensity of GDP from 425.6 kgoe per US\$1,000 GDP (2011 PPP) in 2010 to 203.9 kgoe per US\$1,000 GDP (2011 PPP) in 2016. While this is still very high, the trend is promising.

JSC Uzbekenergo implements energy-efficiency measures on the generation side through modernization, rehabilitation and use of new technologies. However, demand-side management is lacking and there is no understanding of energy savings potential and its benefits. New building standards are under development and new tariffs aimed at reducing energy consumption by households and businesses were introduced in November 2018.

The phase-out of tariff subsidies, which started in November 2018, is expected to reduce consumption. No measure to increase energy efficiency in buildings and transport has been introduced.

The JSC National Energy Saving Company was established in Uzbekistan in mid-2017 as the sole supplier of goods, works and services for implementation of energy-efficient and energy-saving technologies in government agencies and organizations; however, the company was abolished in February 2019.

Tariffs

The Cabinet of Ministers, by its Resolution No. 897 of 2018, approved a gradual increase in prices and tariffs for fuel and energy resources. The first to raise tariffs was JSC Uzbekenergo. From 16 November 2018, the tariff for 1 kWh for residential consumers (without electric stoves) increased from 228.6 sum to 250 sum (by 9.3 per cent), and from 15 August 2019, to 295 sum.

For household consumers living in apartment buildings centrally equipped with electric stoves for food preparation, the tariff for 1 kWh from 16 November 2018 was set at 125 sum (previously 114.3 sum) and from 15 August 2019 at 147.5 sum.

Public buildings

The current budget regulations do not allow khokimiyats and other state-funded organizations to keep savings resulting from energy efficiency improvements in their budgets. This creates a barrier for implementation of energy efficiency improvements, including through the use of new institutional and financial mechanisms and structures, e.g. energy service companies (ESCOs) and public-private partnerships, for developing, financing and implementing energy efficiency investments.

In public sector buildings, the problem is caused by the budgeting process undertaken by the governmental authorities: public buildings receive an annual budget allocation for running expenditures. Should the building administration implement energy efficiency improvements, it is not allowed to keep the resulting savings from its administrative budget; these have to revert to the Government. The budget allocation for the following year will even then be reduced by the amount saved through the implementation of energy-efficiency measures. Therefore, the public sector building administrations are not interested in energy efficiency improvement since the implementation of energy efficiency improvements in fact results in a decreased budget allocation.

Industrial sector

Since 2010, the World Bank's Energy Efficiency Facility for Industrial Enterprises Project has greatly contributed to raising the energy efficiency of industrial enterprises through financing energy-saving investments in both large industrial enterprises and industrial SMEs (chapter 15). Nevertheless, much more remains to be done to modernize industry and reduce energy losses in the industrial sector.

Renewable energy

In 2019, there is no renewable energy (other than hydro) generation in Uzbekistan, except some off-grid and/or small-scale units. The country's enormous technical potential for the use of solar energy is not used (table 12.10). With a target of 19.7 per cent of total energy production being produced by RES by 2025 (2017 Resolution of the President No. 3012), Uzbekistan plans to further develop hydropower and start developing solar and wind energy. Most of the

targeted 19.7 per cent is to come from hydropower (15.8 per cent), while solar and wind energy are expected to provide 2.3 per cent and 1.6 per cent respectively.

Table 12.10: Estimated technical potential for renewable energy resources, GWh/y

	Technical	Used
Solar	2 058 000	0
Large and medium hydro	20 934	1 650
Small hydro	5 931	200
Wind	4 652	0
Biomass	1 496	0

Source: Artur Kochnakyan and others, "Uzbekistan: Energy/Power Sector Issues Note", Report No. ACS4146 (Washington, D.C., World Bank, 2013).

In Namangan Oblast, with the assistance of the Ministry of Trade, Industry and Energy of the Republic of Korea, a solar PV station with a capacity of 130 kW based on Korean technologies was commissioned in December 2014 and connected to a power grid that can produce 234,300 kWh annually. Projects are being prepared for the construction of large solar PV stations in the Surkhandarya, Namangan and Navoiy Oblasts. An investment project for the construction of a pilot wind power plant with a capacity of 750 kW in the Bostanlyk District of Tashkent Oblast is at the final stage.

Four investment projects for the construction of solar and wind power plants, including three solar stations with a capacity of 100 MW each in Samarkand, Surkhandarya and Navoiy Oblasts and one wind station with a capacity of 102 MW in Navoiy Oblast, are under consideration by investors.

Support measures

Renewable energy units are prioritized over generating capacity using fossil fuels in the dispatching schedule of the operator of the unified power system for the purchase of energy.

Calculations of the electricity generated by renewable sources, except for the power plants of JSC Uzbekhydroenergo, and supplied to the unified power system are made according to the current tariff for consumers (excluding VAT) but reduced by the cost of transmission of a unit of electric power in a unified electric power system, as well as by the cost of the distribution and sale of a unit of electricity charged by utilities companies.

Equipment, raw materials and components, devices, spare parts, and technological documentation that are

not produced in the country and imported for the implementation of renewable energy projects are exempted from customs duties until 1 January 2022. Feed-in tariffs and competitive bidding/auction support schemes have so far not been envisaged.

Several unresolved issues hinder the accelerated development of the use of RES, such as the absence of experience with application of incentives for renewable energy projects development and lack of experience of joint operation of TPPs and RES.

Energy audits

Enterprises are subject to mandatory energy audits when their total annual energy consumption exceeds 2,000 tons of reference fuel. Information on practical implementation of energy audits is not available.

12.5 Legal, policy and institutional framework

Legal framework

National primary legislation on energy comprises the 1997 Law on Rational Use of Energy, 1994 Law on Subsoil, 2001 Law on Production Sharing Agreements and 2009 Law on Electricity. Although some amendments were introduced into these laws, they are rather outdated and new laws on these issues are under development. The draft law on gas supply has been discussed for years but is not adopted.

The 2019 Law on the Use of Renewable Energy Sources envisages tax and customs preferences for the import of RES installations. Those who produce energy from RES are exempted from the property tax and land tax for RES installations for 10 years. Producers of RES installations are exempted from all taxes for five years. Tariffs for electricity produced by RES will be determined through auctions.

The 2019 Law on the Use of Nuclear Energy for Peaceful Purposes regulates the procedures of establishment and operation of nuclear installations and storage facilities for nuclear materials and radioactive waste. The Law names the principles of the use of nuclear energy for peaceful purposes, in particular the priority of protecting the life and health of citizens, property of individuals and legal entities, as well as environmental protection. It regulates the powers of various authorities in the process of decision-making on various aspects of the establishment and operation of nuclear installations. The President has the power to decide on the construction of a nuclear installation upon the proposal by the Cabinet of Ministers. The Cabinet of Ministers is empowered to take a decision on site

selection for a nuclear installation. Detailed rules for site selection are not part of the Law.

The operation of the energy sector is mainly regulated by decrees and resolutions of the President and resolutions of the Cabinet of Ministers.

The 2013 Decree of the President on Measures of Further Development of Alternative Energy No. 4512 outlines measures aimed at facilitating the development of primarily solar energy in the country.

The 2014 Resolution of the Cabinet of Ministers No. 164 on the use of petroleum products sets the general rules of delivery of petroleum products, storage conditions and transportation rules and specifies environmental and safety requirements.

The 2014 Resolution of the Cabinet of Ministers No. 230 approved a regulation on the development of state exploration programmes of the national holding Uzbekneftegaz. Such programmes determine the main directions of development for the oil and gas sector.

The 2017 Resolution of the Cabinet of Ministers No. 338 on measures to further promote production and instalment of biogas plants in the period 2017–2019 envisaged installation of up to 726 biogas plants in large-scale livestock and poultry farms by 2018. By June 2019, 13 biogas plants were put in operation by Uzbekneftegaz.

The 2018 Resolution of the President No. 3687 approved the power-purchasing agreement with SkyPower Global. The Resolution also sets a package of incentives that are likely to be expanded to all other successful bidders for solar power projects in Uzbekistan, so as to avoid creating a disadvantageous environment for competitive independent power producers. It establishes that: (i) the investor company, its project companies and subcontractors are exempt from customs duties, corporate income tax, VAT and mandatory payments to the Republican Road Fund and Education and Medicine Development Fund, property tax on specific equipment and pertaining land use tax; and (ii) if JSC Uzbekenergo fails to purchase power, the state budget will take responsibility; and (iii) the Ministry of Finance will issue the guarantee for JSC Uzbekenergo.

The 2018 Resolution of the President No. 3981 on the Accelerated Development and Provision of Financial Stability of the Electricity Sector aims at creating a modern scheme for the production, transportation, distribution and sale of electricity. In particular, it aims at attracting private investment, including FDI, to the entities that produce and distribute electricity,

including based on PPPs, while maintaining full control of electricity transportation, and the gradual creation of a modern electricity market based on competitive purchase of electricity directly from the producers. It mandates the work to prepare and approve the methodologies for calculating electricity tariffs, based on coverage of current and capital expenses. Furthermore, it envisages creating an interdepartmental tariffs commission under the Cabinet of Ministers.

The 2018 Decree of the President No. 5484 “On measures to develop nuclear energy in the Republic of Uzbekistan” established the Agency for the Development of Nuclear Energy (Uzatom) and firmly stated the intention of the Government to develop nuclear energy.

Policy framework

Oil and gas

According to the Programme to Increase the Extraction of Hydrocarbons in the period 2017–2021 (2017 Resolution of the President No. 2822), the Government plans to significantly increase the production of oil and gas condensate to keep the country’s economy independent of oil imports. The Government is looking to improve the rate of oil recovery, conversion and gas processing efficiency to raise product quality to world standards, and to increase the area of the hydrocarbon resource base, primarily of liquids, through new discoveries.

Energy efficiency and renewable energy

The Programme of Measures for Further Development of Renewable Energy, Increase of Energy Efficiency in Economic Sectors and the Social Sector for the period 2017–2021 (2017 Resolution of the President No. 3012) replaced the 2015 Programme of Measures to Reduce Energy Intensity and Introduce Energy Efficient Technologies in Economic Sectors and the Social Sector for the period 2015–2019 (2015 Resolution of the President No. 2343). The new Programme targets the promotion of private sector investments in renewable energy development and reducing energy intensity and implementing energy-saving technologies and systems. Specific privileges and preferences are granted to enterprises and organizations that use energy from renewable sources in their production. The Programme outlines key directions for the implementation of energy-saving technologies and energy-reduction programmes, while also promising tax benefits to entities producing energy from alternative sources. The Programme also aims at reducing energy intensity by 8–10 per cent

annually in key economic development sectors. At the same time, it also set targets to rehabilitate central and district heat power plants by the substitution of 17,251 obsolete heat boilers, 879 water pumps and 1523 electric motor parts with energy-efficient technologies and devices by 2020.

The Programme of Measures to Secure Structural Reforms, Modernization and Diversification of Production for the period 2015–2019 (2015 Decree of the President No. 4707) covers 846 investment projects worth US\$40.8 billion. Consistent modernization of existing facilities and the creation of new power-generating facilities is expected on the basis of the introduction of resource-saving and modern combined-cycle plants and solar technologies.

In accordance with the 2015 Resolution of the Cabinet of Ministers No. 86 “On measures of obligatory energy-efficient labelling and certification of domestic electrical appliances and newly constructed buildings and infrastructures”, all household electrical appliances not corresponding to energy efficiency standards cannot be imported to Uzbekistan and should be gradually phased out. The targets envisage the importation of appliances that have a category label of A, A+ or A++ and phasing out of those that fall under category label “G” by 1 January 2017, “F” by 1 January 2018 and “E” by 1 January 2019. At the same time, in 2015, the Government issued a prohibition on the use, production and importation of incandescent lamps with a capacity of more than 40W.

Nuclear energy

The Concept for the Development of Nuclear Energy for the period 2019–2029 (2019 Resolution of the President No. 4165) and its roadmap for implementation envisage the construction of an NPP in Uzbekistan. The Concept is a follow-up to the 2018 Agreement between the Government of Uzbekistan and the Government of the Russian Federation on Cooperation in Construction on the Territory of the Republic of Uzbekistan of a Nuclear Power Plant. The NPP project would be implemented in three stages. The first stage (2019–2020) is intended for carrying out site selection and licensing. In the second stage (2020–2022), it is planned to design the NPP and its external infrastructure. The construction and commissioning of the NPP will be carried out in the period 2022–2030. Two units with an installed capacity of 1.2 GW each are envisaged. The construction is to be financed through a credit from the Russian Federation.

The Concept envisages the organization of an EIA during the first stage of project development. It provides for a dialogue in the form of negotiations with neighbouring countries but does not envisage organization of a transboundary EIA. In fact, the legislation of Uzbekistan does not provide for transboundary consultations as part of an EIA and Uzbekistan has no practical experience with transboundary EIA (chapter 2). The Concept envisages that a safe and cost-effective nuclear fuel cycle would be organized; however, it gives no detail in this respect.

A state programme on development of nuclear energy for the period 2019–2029 is under development.

Draft sectoral policy document

As at mid-2019, a concept of the country’s fuel and energy supply for 2020–2030 is under development.

Sustainable Development Goals and targets relevant to this chapter

The current stand of Uzbekistan vis-à-vis most targets of Sustainable Development Goal 7 is described in box 12.1.

Institutional framework

The institutional framework of the energy sector in Uzbekistan was restructured in late 2018–early 2019.

The Ministry of Energy was established in February 2019 (2019 Decree of the President No. 5646) and entrusted with functions and powers in energy resources and power production. The Ministry is responsible for creating a modern scheme of organization of the production, transportation, distribution and sale of electricity, with the aim of attracting private investment, including FDI, to the entities that produce and distribute electricity, including based on PPPs, while maintaining full control of the transportation of electricity, and the gradual creation of a modern electricity market based on the competitive purchase of electricity directly from the producers. The Agency for the Development of Atomic Energy (Uzatom), previously under the Cabinet of Ministers, and the State Inspectorate for Control over the Use of Oil Products and Gas were reassigned to the new Ministry. The Ministry of Energy will also include the Inspectorate for Supervision in the Electric Power Industry.

Box 12.1: Goal 7 of the 2030 Agenda for Sustainable Development**Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all**

Uzbekistan has adopted all global targets under Goal 7 except target 7.a (related to international cooperation on clean energy research) as national targets. Uzbekistan is drafting an action plan to meet Goal 7. The action plan would identify best practices, measures and procedures relevant to preparing a transition to sustainable energy, with a particular focus on the cross-cutting nature of energy efficiency, renewable energy and energy access.

Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services

This target is measured by indicator 7.1.1 (Proportion of population with access to electricity), nationalized by Uzbekistan without changes. The State Committee on Statistics reports to have already achieved 100 per cent electrification of both urban and rural areas in 2012 (<http://nsdg.stat.uz/>). Nevertheless, it is difficult to assess reliability and affordability due to the lack of reliable data, especially on rural electrification. Reportedly, rural areas experience regular and long electricity shortages and interruptions. In the cities, even in Tashkent, the power can be off for several hours a day during winter.

Unreliable power supply has a clear gender dimension in Uzbekistan, since women typically perform most household and family obligations and are key consumers of electricity. According to a 2018 report by the Asian Development Bank (ADB), unsustainable supply of energy means that women cannot take advantage of labour-saving appliances such as washing machines and electric cooking stoves, which affects women's efficiency while performing traditional social roles and creates barriers for working women.

The nationalized indicator 7.1.2 (Proportion of population using clean fuels (gas and electricity) technologies for cooking) differs slightly from global indicator 7.1.2 (Proportion of population with primary reliance on clean fuels and technology). No data are available on indicator 7.1.2 in Uzbekistan.

Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix

Progress towards target 7.2 is measured by global indicator 7.2.1 (Renewable energy share in the total final energy consumption), nationalized by Uzbekistan as indicator 7.2.1 (Proportion of electricity generated from renewable energy sources in total electricity generation). The State Committee on Statistics reports that the values for the national indicator are 15.8 per cent in 2010, 10.8 per cent in 2011, 12.6 per cent in 2012, 10.5 per cent in 2013, 10.9 per cent in 2014, 11.8 per cent in 2015, 11.6 per cent in 2016 and 13.0 per cent in 2017 (<http://nsdg.stat.uz/>). However, these numbers account only for hydropower. Other RES (wind and solar) cannot be accounted for in total electricity production due to their insignificant capacity. It is important that Uzbekistan has set targets on renewable energy up to 2025 and 2030; however, effective support measures are not yet in place to achieve the targets.

Target 7.3: By 2030, double the global rate of improvement in energy efficiency

With regard to indicator 7.3.1 (Energy intensity measured in terms of primary energy and GDP), according to the ESCAP Asia-Pacific Energy Portal, energy intensity in Uzbekistan decreased from 357 kgoe per US\$1,000 GDP (2011 PPP) in 2010 to 195 kgoe per US\$1,000 GDP (2011 PPP) in 2016. While this is still very high, the trend is promising. For comparison, the average energy intensity in Asia and the Pacific in 2016 was 129 kgoe per US\$1,000 GDP (2011 PPP).

According to the State Committee on Statistics, the primary energy intensity of GDP decreased from 425.6 kgoe per US\$1,000 GDP (2011 PPP) in 2010 to 203.9 kgoe per US\$1,000 GDP (2011 PPP) in 2016.

Target 7.b: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support

Uzbekistan puts a lot of effort into developing its energy infrastructure, mostly focusing on new generation capacity based on clean gas combustion technologies, electrification and gas transportation.

Global indicator 7.b.1 (Investments in energy efficiency as a proportion of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services) has been nationalized by Uzbekistan differently, as "Share of capital investments in the energy sector in the total capital investments). The values for national indicator 7.b.1 are 5.8 per cent in 2010, 5.1 per cent in 2011, 4.3 per cent in 2012, 4.6 per cent in 2013, 4.8 per cent in 2014, 5.4 per cent in 2015, 5.7 per cent in 2016 and 8.0 per cent in 2017 (<http://nsdg.stat.uz/>).

The Commission for the Reform of the Electric Power Industry was established in late 2018 (2018 Resolution of the President No. 3981). A project office is being created in the Ministry of Energy, which is the

working body of the Commission for the reform of the electric power industry. The project office will be headed by the Deputy Minister of Energy, who oversees the electricity industry. In March 2019, the

President took a decision on the reorganization of JSC Uzbekenergo as part of the transition to modern methods of organizing the production, transportation, distribution and marketing of electric energy (2019 Resolution of the President No. 4249). Three independent companies are created on the basis of JSC Uzbekenergo – JSC Thermal Power Plants, JSC National Electric Networks of Uzbekistan and JSC Regional Electric Networks. Following the completion of the reorganization process, JSC Uzbekenergo will be liquidated.

Following the reorganization, JSC Thermal Power Plants will manage the TPPs and CHPPs.

JSC National Electric Networks of Uzbekistan, created on the basis of UE Uzelektroset and Energosotish branch of Uzbekenergo, will operate and develop the country's trunk grids, transport electricity via trunk grids, be in charge of the export and importation of electricity, function as a single electricity purchaser and sell electricity to enterprises in charge of regional power grids.

Another new entity, JSC Regional Power Grids, will manage the enterprises of the regional power grids that distribute and sell electricity to end users.

Coal mining in Uzbekistan is undertaken by Uzbekcoal. Uzbekcoal has nine subsidiaries in exploration, mining, operations and repair and maintenance, among other functions.

Uzbekneftegaz owns and operates the entire oil and gas sector in Uzbekistan. Uzbekneftegaz has six subsidiaries: Uzgeoburneftegaz (oil and gas exploration); Uzneftegazdobycha (production of oil and gas); Uztransgaz (gas transportation and storage); Uznefteproduct (refining, processing); Uzneftegazmash (production of technological equipment for the industry); and Uzneftegazstroyinvest (capital investment projects). Uzbekneftegaz is majority state owned, with parts of each subsidiary privatized. Gas transmission and distribution are operated by Uztransgaz, with six regional enterprises that are legally and financially unbundled. Uztransgaz sells directly to large industrial consumers.

The Ministry of Finance is in charge of tariff-setting for electricity, heat and gas, among other functions. Tariffs are drafted by Uzbekenergo and Uzbekneftegaz and approved by the Ministry of Finance.

The State Committee on Ecology and Environmental Protection (SCEEP) is responsible for SEE, state

environmental control and interagency coordination on environmental issues.

The Republican Commission on Energy Efficiency and Development of Renewable Energy Sources (created in 2015) was abolished in 2018 and reestablished in 2019. It is chaired by the Prime Minister.

Data collection

As at September 2019, the raw data collected by the State Committee on Statistics in the energy sector are intended mainly as information for governmental bodies. Data and information in the energy sector are poorly disclosed outside the government. Furthermore, the data and data collection practices are not harmonized with international standards. The knowledge of national experts on relevant best practices on collection and monitoring of national data on sustainable energy in compliance with international standards is insufficient. Data collection is not organized in accordance with International Recommendations for Energy Statistics (IRES), adopted by the United Nations Statistical Commission in 2011 as a statistical standard, and the Energy Statistics Compilers Manual, which provides additional practical guidelines on the collection and compilation of energy statistics.

In September 2019, the country's leadership took a political decision to open all information on energy balance. It is expected that in the future information of energy balance and other energy statistics will be prepared in line with international recommendations and will be published on the website of the State Committee on Statistics.

Participation in international agreements and processes

In 2015, Uzbekistan joined the “Zero Routine Flaring by 2030” Initiative, introduced by the World Bank, which brings together governments, oil companies and development institutions that agree to eliminate routine flaring no later than 2030.

Uzbekistan is a member of the Energy Charter Conference. Since 1998, it is a party to the 1994 Energy Charter Treaty and the 1994 Protocol on Energy Efficiency and Related Environmental Aspects. No In-Depth Energy Efficiency Review has ever been prepared for Uzbekistan.

Uzbekistan joined the International Renewable Energy Agency (IRENA) in 2009.

Uzbekistan participates in the work of the Commonwealth of Independent States (CIS) Electric Power Council, the Interstate Environmental Council of the CIS Member States, and the Commission of the CIS Member States on the Use of Nuclear Energy for Peaceful Purposes.

Uzbekistan is a member of IAEA. Uzbekistan acceded to the 1997 Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management in 2009. As at early 2019, Uzbekistan is not a party to the 1986 Convention on Early Notification of a Nuclear Accident, 1994 Convention on Nuclear Safety or 1986 Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. The recently approved Concept for the Development of Nuclear Energy for the period 2019–2029 (2019 Resolution of the President No. 4165) states the intention of Uzbekistan to join and ensure the implementation of the provisions of the international nuclear safety conventions, with national legislation in the field of the use of atomic energy for peaceful purposes to be developed and adopted.

12.6 Assessment, conclusions and recommendations

Assessment

The national energy mix is represented mainly by natural gas use. However, coal combustion remains present in the country's power production. The construction and commissioning of an NPP is planned to be carried out in the period 2022–2030. The growth of renewable energies (apart from hydropower) has not yet begun. An important aspect is that the country has set targets for the development of renewable energy. The recent developments show Uzbekistan's good intention to develop wind and solar sources.

Uzbekistan has a high level of energy supply per unit of GDP. Energy intensity is high due to own hydrocarbon production and inefficient energy consumption. The energy efficiency potential is high. Energy efficiency has become one of the national policy priorities. The introduction of energy-efficient technologies in the system of street lighting and energy-saving lamps for residential and public buildings is being carried out, and the sale of incandescent lamps with a capacity of over 40W has been halted. However, energy-saving measures and energy-efficiency technologies in industrial enterprises and the residential sector, which could potentially improve energy efficiency in the country, are not sufficiently applied because they require

investments and their implementation is much more difficult than lighting upgrades.

The oil and gas industry continues to have environmental and health impacts. Uzbekistan managed to achieve a significant reduction in the volume of gas flaring, from around 1.494 bcm in 2013 to 0.788 bcm in 2018. Flaring intensity was also in decline. However, the waste generated in oil production and processing remains an issue of great concern. Detailed data on sources, types and volumes of pollution and waste discharges during oil and gas activities, which would allow the Government to develop the necessary preventive measures, are lacking.

At present, the raw energy data collected by the State Committee on Statistics are mainly intended as information for governmental institutions and are not harmonized with international standards.

Conclusions and recommendations

Data collection

The energy statistics are poorly available outside the governmental bodies and even basic energy data are not publicly available. The internal procedures for statistical data disclosure outside government structures require improvement. The knowledge of national experts on best practices on collection and monitoring of national data on sustainable energy in compliance with international standards is insufficient. Data collection on the energy sector at present does not follow the International Recommendations for Energy Statistics (IRES), adopted by the United Nations Statistical Commission in 2011. Some data that are necessary for monitoring Uzbekistan's progress with the achievement of Sustainable Development Goal 7 are not collected. A political decision to open all information on energy balance was taken in September 2019 but it still needs to be implemented.

Measures to expand statistics collection processes, increase regional and global cooperation on statistics and improve the availability of data on energy, including the energy sector's impact on the environment, are indispensable to gaining greater investor confidence and stronger business interest in the sector.

Recommendation 12.1:

The State Committee on Statistics, in cooperation with the Ministry of Energy, should continue its efforts to:

- (a) *Develop an integrated system of multipurpose*

energy statistics based on the United Nations Fundamental Principles of Official Statistics and the International Recommendations for Energy Statistics;

- (b) *Publish energy statistics, including national energy balances;*
- (c) *Ensure data collection for monitoring progress with the achievement of Sustainable Development Goal 7 in line with the internationally accepted methodologies.*

Energy performance of public buildings

The budget regulations do not allow public sector buildings to keep the savings resulting from energy efficiency improvements in their budgets. Expenditures are determined by the Government and do not allow local authorities to retain or reallocate any savings they make for long-term investments in energy efficiency. In these circumstances, incentives for implementation of energy efficiency improvements are lacking.

Recommendation 12.2:

The Cabinet of Ministers should introduce regulations that will allow the financial resources saved through energy-efficiency measures in public buildings to be accumulated in the budgets of organizations undertaking such measures.

Fossil fuels

National policy documents envisage that fossil fuels will continue to be a major energy source in Uzbekistan over the medium term and, potentially, the long term. At the same time, the country has underlined the importance of moving towards sustainable energy. Clean fossil fuels technologies can contribute to increasing sustainability.

There are a number of modern clean fossil fuels technologies that could be implemented in Uzbekistan, which would enhance the country's transition to a low-carbon economy. Increased efficiency, flexible operation to support renewables and carbon capture and storage are key technologies that could deliver such a transition.

There is no information on the land and soil polluted by oil products in Uzbekistan. Soils are severely degraded by mining activities, in particular for the extraction of energy sources, since large amounts of soil and vegetation are removed for open pit mining. This also affects local habitats and causes loss of biodiversity and arable lands.

Recommendation 12.3:

The Ministry of Energy should:

- (a) *Gradually reduce the share of fossil fuels in the energy production and consumption, while continuing to explore ways to use them, especially coal, in a more efficient and environmentally friendly manner;*
- (b) *Facilitate the use of less polluting energy sources as a valid alternative to fossil fuels;*
- (c) *Take measures to increase the efficiency of coal utilization with gradual modernization and technology upgrades at existing coal-fired power plants;*
- (d) *While developing its national policy documents to meet Sustainable Development Goal 7, undertake a comprehensive study on the development of advanced fossil fuel technologies that will include their status, trends, economic analysis, environmental and health impacts, and institutional and legislative barriers;*
- (e) *Develop economically and environmentally sound policies that also address health impacts in support of Sustainable Development Goal 7, ensuring that such policies are supported by appropriate legal frameworks and economic incentives;*
- (f) *Collect information about land and soil polluted by oil products and analyse the environmental impacts of gas leakages in Uzbekistan;*
- (g) *Properly address the environmental hazards of open pit mining.*

Electricity

Electricity transmission assets have not been properly maintained and upgraded, affecting the delivery of reliable power supply to domestic customers. There is a high level of electricity losses: transmission system losses are 18 per cent and distribution losses are 14 per cent.

Recommendation 12.4:

The Ministry of Energy should promote the regular maintenance and upgrade of the electricity transmission assets to provide reliable power supply to domestic consumers, especially in southern regions.

Renewable energy sources

The changes in the energy sector are expected to be introduced by development of RES. The 2017 Resolution of the President No. 3012 on the Programme of Measures for Further Development of Renewable Energy, Increase of Energy Efficiency in

Economic Sectors and the Social Sector for the period 2017–2021 anticipates that the share of RES in the national power mix will increase to 19.7 per cent by 2025. Most of the increase is to be achieved through the expansion of hydropower, but the development of solar and wind energy is also firmly on the agenda.

However, at this stage, substantial expansion of electricity generation based on renewable sources faces some resource and technological limitations. The development of renewable energy requires a significant level of state support for a long period of time. At present, Uzbekistan does not apply the traditional support schemes for renewable energy such as feed-in tariffs and competitive bidding/auctions. Support schemes to date have been limited to investment tax credits and reduction in import taxes for renewable energy technologies.

Recommendation 12.5:

The Cabinet of Ministers should:

- (a) *While developing its national policy documents to meet Sustainable Development Goal 7, undertake a comprehensive study on the development of renewable energy technologies that will include their status, trends, economic analysis, and institutional and legislative barriers in renewable energy technology issues in the country;*
- (b) *Take appropriate steps to meet the targets of raising the share of renewable energy sources in total power production;*
- (c) *Further develop support schemes for renewable energy.*

Nuclear energy

Uzbekistan intends to build an NPP in order to meet the growing needs of the economy for energy resources. Design, construction and commissioning of an NPP of two units with an installed capacity of 1.2 GW each are planned for the period 2019–2029. The Government plans to organize a national EIA and conduct a dialogue with neighbouring countries during the first stage of project development (2019–2020). The organization of a transboundary EIA is not planned. The Concept for the Development of Nuclear Energy for the period 2019–2029 envisages that a safe and cost-effective nuclear fuel cycle would be organized at the NPP but it gives no detail in this respect.

Uzbekistan is not a party to several key conventions on nuclear safety.

The construction and operation of an NPP can potentially have environmental impacts associated with this type of development. The application of internationally adopted standards, taking into consideration recommendations of the IAEA in respect of design, siting, operational safety, radiation safety and safe management of radioactive waste, could provide necessary safeguards to reduce environmental and health risks. An EIA procedure, conducted in line with international standards, is an important mechanism to ensure that environmental, including health, considerations, as well as public opinion, are thoroughly taken into account. Conducting transboundary consultations as part of an EIA is a tool for enhancing the quality of decision-making.

In May 2019, Uzbekistan announced that a priority site location for the future NPP has been identified. The site is close to Lake Tuzkan in the Aydar-Arnasay Lake System, which was declared as a Ramsar site in 2008. Construction of an NPP in the Ramsar site would require sound justification, may result in the need to delete or restrict the boundaries of wetlands already included in the Ramsar List, with these decisions potentially damaging the image of the country on the international arena.

The 2019 Law on the Use of Nuclear Energy for Peaceful Purposes names protection of life and health of citizens and environmental protection among its principles but does not include detailed rules for NPP site selection.

Recommendation 12.6:

The Cabinet of Ministers should:

- (a) *Consider accession to the 1986 Convention on Early Notification of a Nuclear Accident, 1994 Convention on Nuclear Safety and the 1986 Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency;*
- (b) *Carry out an EIA for the proposed NPP in line with international standards and ensure transboundary consultations as part of the EIA procedure;*
- (c) *Ensure application of recommendations of the International Atomic Energy Agency²⁷ to provide necessary safeguards to reduce environmental and health risks associated with*

²⁷ Safety Standards for protecting people and the environment, available at IAEA website (www.iaea.org/resources/safety-standards).

- construction and operation of an NPP;*
- (d) *Ensure compliance with the country's international obligations under the Ramsar Convention by refraining from the construction of an NPP in the territory of a Ramsar site.*

Chapter 13

AGRICULTURE AND THE ENVIRONMENT

13.1 Conditions and activities in agriculture

In 2018, the agriculture, forestry and fisheries sector accounted for 32.4 per cent of GDP in Uzbekistan (table 13.1). Agriculture is one of the biggest income sources for the rural population, which accounts for about 60 per cent of the total population. The share of agriculture (including forestry and fisheries) in employment remained stable between 2010 and 2017, at around 27 per cent each year, which demonstrates its outstanding role in the labour market.

Agriculture not only ensures food security in the country. Due to the favourable agroclimatic conditions, Uzbekistan is among the top 10 producers in the world of the following fruit products: apricots and dried apricots, persimmons, cherries, grapes and raisins. The Government has recognized the importance of the sector and, due to government measures, investment in agriculture is constantly growing: between 2014 and 2017, total agricultural investment has grown by 64 per cent, from 1,447 billion sum to 2,379 billion sum, mostly through increased funding from enterprises and (loans) from commercial banks.

Annual agricultural output has grown steadily in recent years, by 7 per cent in 2014, 6.8 per cent in both 2015 and 2016 and 2 per cent in 2017. This mostly resulted from gains in productivity growth, due to the stability of the arable land area (around 4 million ha out of 20 million ha total agricultural area) in recent years, even while sown areas decreased from 2010 to 2018 (table 13.2), with major decreases in sown areas observed in Fergana and Tashkent Oblasts and the Republic of Karakalpakstan.

The increase in productivity can be explained by the Government's commitment to crop diversification (from cotton and wheat towards more profitable, so-called higher value crops) and subsequent measures to implement it. The 2015 Resolution of the President No. 2460 "On measures to further reform and develop agriculture in the period 2016–2020" sets the legal base for crop diversification policy by reallocating 170,000 ha of cotton and 50,000 ha of wheat land for the growing of higher value crops in the period 2016–2020. Since then, there were a few subsequent land releases and reallocations for higher value crops, but on a smaller scale.

Table 13.1: Share of agriculture, forestry and fisheries sector in GDP, 2010–2018, per cent

2010	2011	2012	2013	2014	2015	2016	2017	2018
32.9	35.9	34.9	33.1	33.8	34.1	34.0	34.0	32.4

Source: State Committee on Statistics, 2019.

Table 13.2: Sown area of all crops, 2010–2018, 1,000 ha

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Uzbekistan	3 708	3 602	3 628	3 659	3 678	3 694	3 707	3 475	3 396
Republic of Karakalpakstan	266	224	255	233	230	252	256	264	232
Andijan	230	230	230	230	230	230	230	219	219
Bukhara	242	240	240	240	241	241	241	240	238
Jizzakh	391	390	390	395	396	398	401	356	367
Kashkadarya	493	479	478	494	499	494	494	473	463
Navoiy	106	103	100	102	103	103	104	97	95
Namangan	224	221	221	222	224	225	225	202	193
Samarkand	373	353	331	360	364	360	359	351	352
Surkhandarya	272	280	280	283	283	284	285	267	260
Syrdarya	236	223	227	230	233	233	233	215	207
Tashkent	357	358	360	356	355	353	353	300	305
Fergana	291	290	290	290	290	290	289	271	256
Khorezm	229	210	225	223	232	232	237	219	210

Source: State Committee on Statistics, 2019.

Photo 13.1: Tashkent bazaar

Photo credit: Ms. Angela Sochirca

Agriculture is still significantly regulated by the Government, especially wheat and cotton production. In parallel with crop diversification, the growing of other crops became more flexible (e.g. before 2017, all exports were channelled through the State; now only wheat and cotton exports remain under strict state control).

Agricultural activities

Crops

Cotton and wheat production is of outstanding importance to the agricultural sector – they are recognized by the Government as priority crops for ensuring the country's food security (wheat) and foreign currency supply through export revenues (cotton). Together, they still occupy over 80 per cent of irrigated land, despite the Government's long-term programme of crop diversification and subsequent measures in support of it, encouraging farmers to diversify from cotton production towards higher value crops (horticulture and vegetables).

Traditionally, cotton and wheat have been grown on the whole territory of Uzbekistan, while vegetables and fruit were grown on a large scale in areas where cotton is not specified as a priority crop and where the geographical conditions allow it (i.e. soil is less saline and the summers are not extremely dry and hot), on smaller plots of dekhkan farms and homestead landowners, which are usually close to larger settlements (particularly around Tashkent City, in Samarkand Oblast and the Fergana Valley). Surkhandarya Oblast is specialized in out-of-season vegetables and fruit production, thanks to its mild winter climate, the steppe lands of the Republic of Karakalpakstan and Jizzakh, Syrdarya, Khorezm and Kashkadarya Oblasts are the primary growing areas for melon and watermelon, while oilseeds are typically grown in the less fertile and saline lands of the Republic of Karakalpakstan and Jizzakh Oblast.

The share of crop production within total agricultural output has increased between 2010 and 2017 by approximately 10 percentage points, but decreased in 2018 by 17 percentage points. The share of animal husbandry decreased between 2010 and 2017 by

approximately 9 percentage points, but increased by 17 percentage points in 2018. In 2018, the share of crop production dropped to only 53.2 per cent, despite the Government's effort to promote it (figure 13.1).

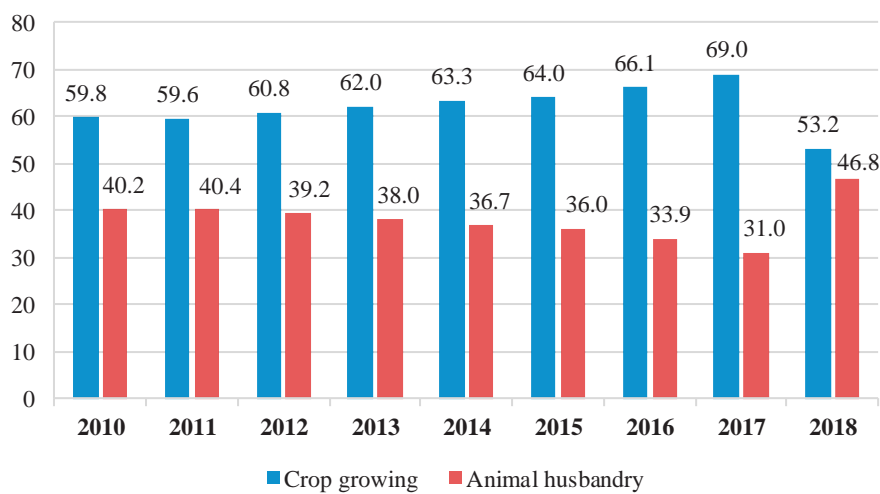
Animal husbandry

The share of livestock breeding within total agricultural production was decreasing in the period 2010–2017, even though meat output (figure 13.2) and the number of bred animals (figure 13.3) have grown steadily. This is explained by the greater increase in

crop production. Between 2010 and 2018, poultry numbers more than doubled, while cattle numbers increased by 45 per cent and the numbers of horses, goats and sheep have also been increasing (figure 13.3).

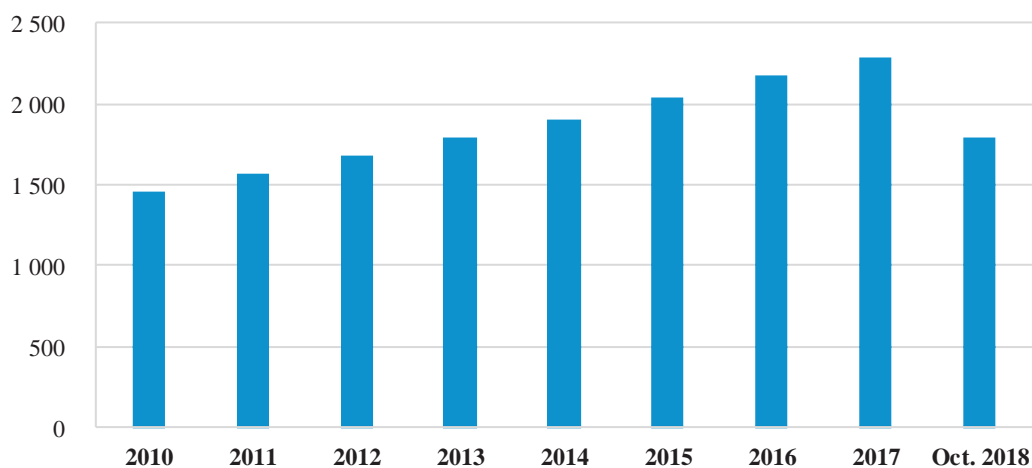
Grazing is still the predominant method for the feeding of animals, although fodder crops are also among the types of crop production the Government is seeking to boost. There are no significant territorial differences in animal husbandry as it is nearly equally present in all the oblasts.

Figure 13.1: Share of crop production and animal husbandry in total agricultural output, 2010–2018, per cent

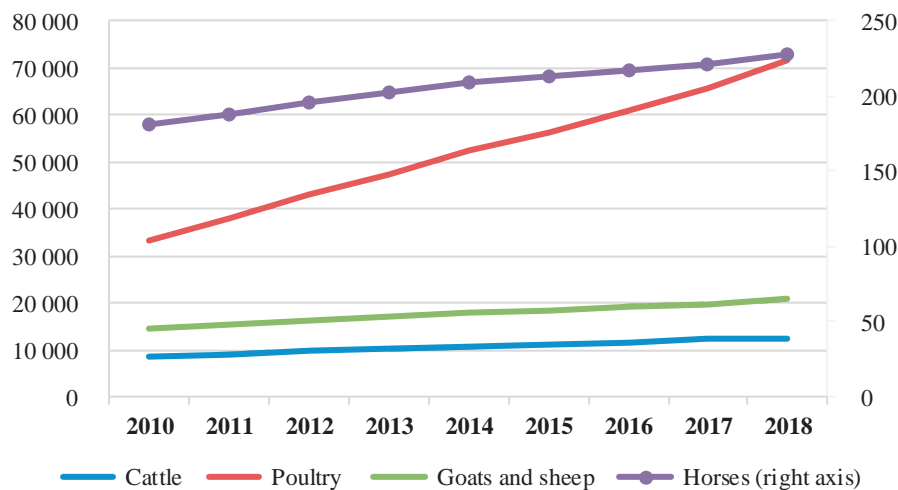


Source: Ministry of Agriculture, 2019.

Figure 13.2: Livestock and poultry production, 2010–2018, 1,000 tons



Source: Ministry of Agriculture, 2019.

Figure 13.3: Structure of livestock, 2010–2018, 1,000 head

Source: Ministry of Agriculture, 2019.

Fisheries

Fish farming is growing in Uzbekistan, partly as a result of the Government's efforts to enhance it and ensure food security and quality food for domestic needs and export. Although large-scale fishing has been discontinued in the Aral Sea for decades (since 2010, fish have not been found in the waters of the Uzbekistani part of the Aral Sea), the total fish catch in the country has almost doubled between 2014 and 2017, from 46,391.6 tons to 83,900.4 tons.

Fishing is mostly practised in natural water bodies (in theory, 570,000 ha are available for fishing), but it is also increasing in artificial water reservoirs (38,000 ha). In 2017, the Government established Uzbalkisanoat, the association for the promotion of fishing that already incorporates around 30 per cent of the 3,582 fish farms in the country. The Government foresees the establishment of clusters in fishing.

Organizational types of agricultural production units

In Uzbekistan, three major organizational types of agricultural production are differentiated according to the 1998 Law on Dekhan Farms and 2004 Law on Farms: homestead landowners (producing on household plots), dekhans farms and private farms. In statistics on agriculture, homestead landowners and dekhans farms are presented as one category, with an additional category called organizations conducting agricultural activities.

Homestead landowners' agricultural activity is limited to the plots directly attached to their houses; thus, their production remains smallscale. Homestead

landowners almost exclusively distribute their products in their local or the next bigger settlement's market.

Dekhan farms are the main agricultural producers in the country, even though private farms are the largest entities. In Uzbekistan, land is owned by the State and the agricultural land is leased to farmers, predominantly on a permanent basis (if they fulfil the basic conditions). Land can be inherited, but without the right to sell or transfer it to other farmers or entities.

According to the legislation, a dekhans farm is a family-owned small-scale farm engaged in the production and sale of agricultural products on the basis of the personal labour of family members on a land plot provided to the head of the family for life as an inherited (land) property. Land for dekhans farms (up to 0.35 ha on irrigated and 0.5 ha on rain-fed lands, and up to 1 ha of rain-fed pastures in the steppe and desert zone) can also be granted by the State to young citizens who fulfil several criteria prescribed in the legislation.

Private farms are independent economic entities, performing commercial agricultural production using leased land plots.

While the activities of dekhans farms are less regulated by the State (e.g. they are free to choose what they produce, though, on the other hand, they do not receive subsidies for crop production from the State), the establishment of and production on the private farms is more strictly regulated by the State. The size of the private farms is also regulated according to their specialization. For example, for livestock breeding

farms, the minimum land size is 0.3 ha per conventional head of livestock on irrigated lands in Andijan, Namangan, Samarkand, Tashkent, Fergana and Khorezm Oblasts, 0.45 ha of irrigated land in other oblasts and in the Republic of Karakalpakstan, and 2 ha on non-irrigated (rain-fed) lands where the minimum number of livestock is at least 30 conventional heads. The minimum size of land plots rented to private farms for crop production is at least 10 ha for farms specialized in cotton and grain growing, and not less than 1 ha for horticulture, viticulture and vegetable growing and for the cultivation of other crops.

Dekhan farms used to be more traditional in terms of organization of production processes and the varieties of (local) crops grown; however, in the past decade, they could benefit much more from the Government's agricultural diversification policy and measures by intensifying their production, applying new agricultural techniques (e.g. introducing greenhouse production), introducing new crops (e.g. dwarf and semi-dwarf varieties suitable for intensive cultivation) and thus increasing their productivity. They became the front-runners in Uzbekistan's agriculture.

After the land reform following the independence of Uzbekistan, there were several changes affecting farm types and sizes, mostly due to the changes (increase) in obligatory minimum land sizes. In the past decade, there were also a few, but slighter, corrections affecting land sizes and the farm sector.

The latest change affecting the typology and sizes of farms was prescribed by the 2019 Resolution of the Cabinet of Ministers No. 14 "On additional measures to optimize the land plots of farms and other agricultural enterprises and effective use of cultivated areas in agriculture". It redefined (in fact, increased) the minimum area for different farm types, based on their crop specialization. For cereal and cotton farms, the minimum land size is at least 100 ha; for farms growing cereals and vegetables, 20 ha; for orchards and vineyards, 10 ha; and for farms growing vegetables and gourds, 5 ha. Dekhan farms must be between 0.3 ha and 1 ha, regardless of the type of their (main) crops. The expected result of this regulation is to restructure and increase average farm sizes by prescribing greater land sizes for different types of farms, to promote the active use of land for homestead landowners, promote rural job creation, increase rural income levels and ensure raw material for the meat and dairy sector, i.e. to support agricultural diversification.

Due to the Government measures aimed at increasing the effectiveness of agriculture (among other matters)

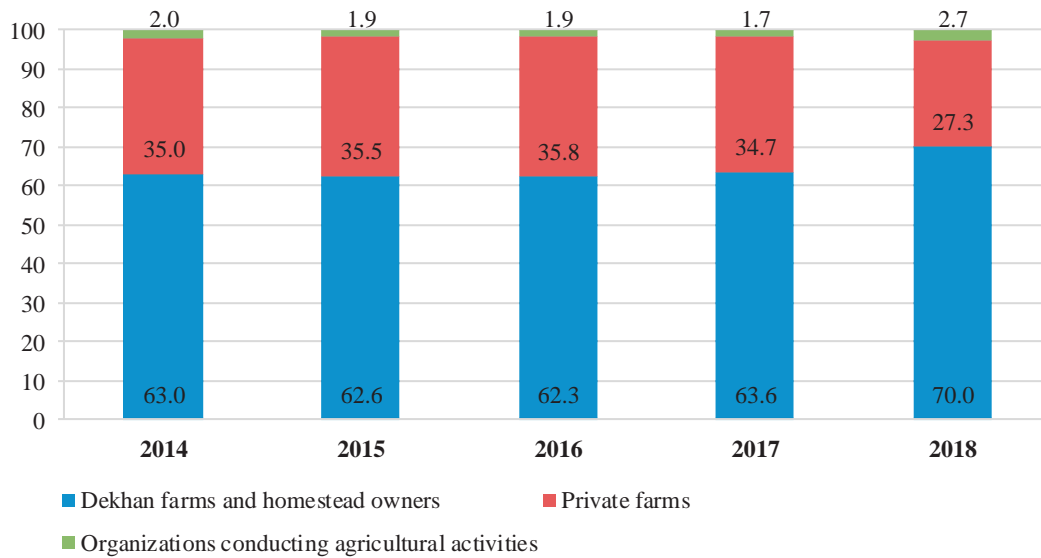
through increasing the size of farms, there was a steady rise in the number of private farms after 2010; their number more than doubled, from 66,134 in 2010 to 151,123 as at 1 December 2018. In the same period, the number of dekhan farms and homestead landowners increased only moderately, from 4,773,013 to 4,952,035. On the other hand, in the period 2014–2017, despite the doubling in number of private farms, their share in the structure of agricultural production remained stable, varying between 34.7 per cent and 35.8 per cent, while the share of dekhan farms (together with homestead landowners) varied between 62.6 per cent and 63.6 per cent (figure 13.4). From 2017 to 2018, the structure of production by farm type changed: the share of dekhan farms has reached 70 per cent, while the share of private farms in production has decreased from 34.7 per cent to 27.3 per cent. According to the estimation of the Council of Farmers, Dekhan Farms and Owners of Household Lands of Uzbekistan, there were approximately 4.7 million homestead landowners, 500,000 dekhan farms and 160,000 private farms before the newly introduced changes affecting the typology of farms in January 2019.

The Government has recognized the possible gains in agricultural production by cooperatives, and so has started to introduce clusters as forms of cooperative production (2018 Resolution of the Cabinet of Ministers No. 53). Despite this currently being clearly a top-down initiative of the Government applied in some pilot areas in cotton production, the Government has ambitious plans to involve all the cotton fields in clusters and also expand clusters to other agricultural subsectors by 2020.

Prevailing agricultural practices

Use of fertilizers and pesticides

The use of mineral fertilizers is very high in Uzbekistan. The high consumption is a basic precondition for agricultural production on irrigated lands in Uzbekistan because of the problem caused by poor irrigation techniques, which causes the loss of nutrients (mostly nitrogen and phosphorus) from the soil; thus, the soil fertility would be very low without the use of fertilizers. For international comparison, Uzbekistan used much more fertilizer (233 kg/ha) than the world average (141 kg/ha) in 2016 (figure 13.5). In the period 2009–2016, fertilizer use in Uzbekistan was 60–70 per cent higher than the world average and more than five times higher than the average in Europe and Central Asia (excluding the high-income countries). Fertilizers are mainly applied before the autumn sowing and in the early spring sowing.

Figure 13.4: Structure of agricultural production by farm type, 2014–2018, per cent

Source: State Committee on Statistics, 2019.

Photo 13.2: Bukhara street market

Photo credit: Ms. Alessandra Fidanza

Organic fertilizers are widely used in the country, the volume (weight) of their consumption being 20 times higher than that of mineral fertilizers (figure 13.6). Manure makes up a significant proportion of the organic fertilizers in use and it is an essential input for maintaining the soil fertility of irrigated lands. Organic fertilizers are applied before the autumn sowing (20–30 tons per 0.5 ha) and, in addition to the sowing period, they are also mixed with mineral fertilizers and applied. Compost is produced along with cattle and poultry manure, tree leaves, rhizomes and phosphate fertilizers. Such compost is ready in 120–130 days.

About 12–15 tons per ha are applied as finished compost.

Pesticides are mainly used to protect sowing seeds from pests and diseases, as well as for spraying crops for protection from pests, diseases and weeds during the growing season. As a measure to prevent negative impacts of plant protection products on human health and the environment, SCEEP conducts EIA/SEE procedures for new plant protection products prior to their registration.

Over the past 10 years, the use of chemical plant protection products has decreased more than fourfold. This is mainly due to the government policy that promotes biological plant protection. More than 1,500 biological laboratories for processing crops by biological methods have been created in the country. According to the 2017 data, the volume of pesticides applied to arable land was 0.4 kg/ha, whereas, in the past (in the final years of the Soviet Union), it was 15–19 kg/ha, although the area where pesticides were applied to cotton and wheat increased between 2016 and 2018, from 3.4 million ha to almost 5.0 million ha nationwide, primarily through increases in such areas in Andijan, Bukhara, Namangan, Tashkent and Fergana Oblasts (table 13.3).

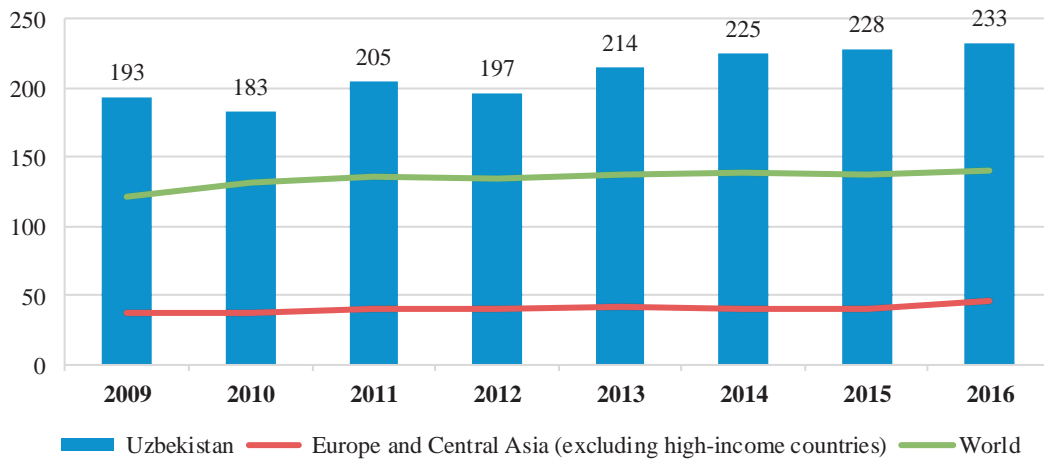
Use of genetically modified organisms

In Uzbekistan, the use of GMOs is not regulated by the law or controlled by any state body, although the Ministry of Health adopted SanPiN No. 0366-19, which covers food safety, including GMOs.

Water use for irrigation

In Uzbekistan, roughly 90 per cent of the surface water is allocated for agricultural use (officially, to ensure food security, i.e. sufficient food to cover domestic consumption) each year.

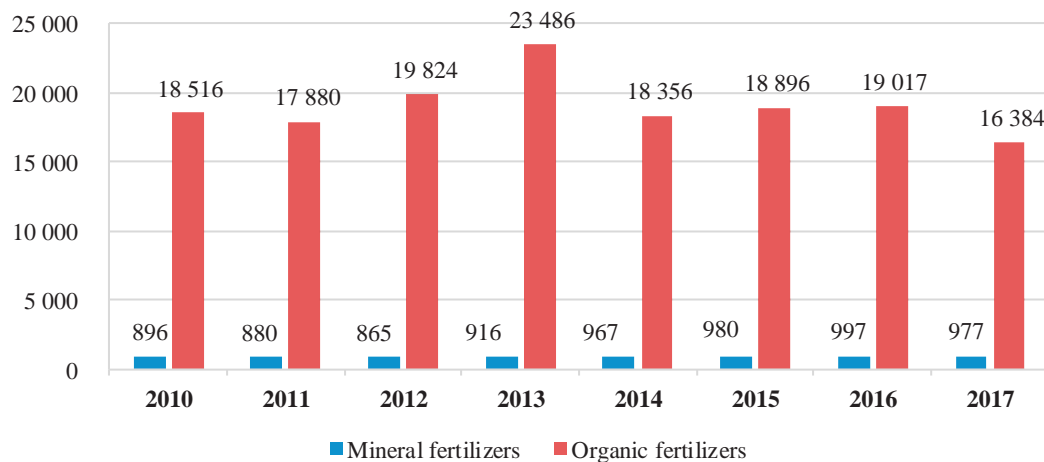
Figure 13.5: Fertilizer use, 2009–2016, kg/ha



Source: World Bank, World Development Indicators

(<https://databank.worldbank.org/data/reports.aspx?source=2&series=AG.CON.FERT.ZS&country=#>).

Figure 13.6: Mineral and organic fertilizer use, 2010–2017, million tons



Source: Ministry of Agriculture, 2019.

In accordance with the 2013 Resolution of the Cabinet of Ministers No. 82, the Department for Definition and Planning of Water Consumption in Agriculture of the Ministry of Agriculture determines the water demand by agricultural crop type and submits it to the Ministry of Water Management to set the water limits. The territorial (oblast) departments of the Ministry of Agriculture define the water resource needs for agricultural water users on the basis of information provided by specialists of district departments of agriculture. Specialists determine water resource needs jointly with water user associations (WUAs), which conclude contracts for water supply with basin irrigation system administrations (BISAs). Agricultural water users (private and dekhans farms) sign water supply agreements with their respective WUA and the concluded agreements are registered with the district departments of agriculture. WUAs are expected to incorporate different water users and uses beyond farmers and farming. Most decision-making in irrigation management and WUAs is male dominated (box 13.1).

Due to the hot and dry climate, almost 95 per cent of the cultivated area must use irrigation for crop growing. The average rainfall in most areas is 400–800 mm annually and temperatures in the main growing season often exceed 45°C, resulting in severe soil salinization. Most of the irrigation water demand must be met from rivers and connected channels. Around 44 per cent of the total irrigated area is in the Syr Darya River basin and 56 per cent in the Amu Darya River basin.

In the period 2009–2017, total water use in agriculture varied between 43 km³ and 54 km³, depending on the available water sources in a given year, but its share of the total water use remained stable at around 89–92 per cent (table 13.4). Between 14.6 km³ and 17.7 km³ of water is lost annually by agricultural activities, meaning that around one third of the total water use in this sector is lost. By reducing or eliminating water losses, the country would be able to solve the problem of a forecast water deficit and save enough water to make reservoirs to mitigate the fluctuations in annual available water quantity caused by the variability of precipitation.

Table 13.3: Use of pesticides on cotton and wheat, 2016–2018, 1,000 ha

	2016	2017	2018
Uzbekistan	3 374.3	3 625.1	4 993.0
Republic of Karakalpakstan	60.5	65.5	52.6
Andijan	294.3	338.9	499.6
Bukhara	65.0	162.3	194.6
Jizzakh	349.7	386.9	420.9
Kashkadarya	308.8	310.0	400.5
Navoiy	99.1	119.0	154.3
Namangan	282.7	334.8	514.1
Samarkand	304.7	242.1	405.5
Surkhandarya	738.9	436.7	485.2
Syrdarya	321.8	339.3	373.3
Tashkent	328.0	378.3	541.0
Fergana	185.7	456.9	895.0
Khorezm	35.3	54.5	56.4

Source: Ministry of Agriculture, 2019.

Box 13.1: Gender aspects of irrigation management

Most decision-making in irrigation systems on water allocation and irrigation management remains male dominated. Nevertheless, changes in these patterns have taken place in recent years. Due to the annual departure of male seasonal labourers, but possibly also because of the culturally protected role of women in Uzbek society, women have become more active in irrigation and water management within the village boundaries.

Women's new roles in this domain are often defined according to age groups. While young women irrigate, elder women negotiate with men, including mahalla mirabs (community water masters), WUA mirabs and local authorities.

The increased involvement of female small-scale water users challenged traditional irrigation-specific gender roles. However, these new roles for women have not been institutionalized so far within the village setting (mahalla staff) or within WUAs.

Source: Nozilakhon Mukhamedova and Kai Wegerich, "Integration of villages into WUAs: The rising challenge for local water management in Uzbekistan", *International Journal of Water Governance*, No. 2 (March 2014).

Table 13.4: Water use in agriculture, 2009–2017, km³

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total water use	50.2	57.2	48.8	56.1	54.0	51.8	55.1	54.6	58.9
of which:									
Agriculture	44.7	51.6	43.4	50.9	48.9	46.9	50.0	49.4	53.7
of which:									
Water losses	15.1	17.2	14.6	16.8	16.2	15.5	16.5	16.4	17.7

Source: Ministry of Water Management, 2019.

In theory, the Government's crop diversification policy should decrease water consumption because water demand for cotton growing is higher than water demand for irrigation of most other crops (including the majority of fruits and vegetables). According to the study "Water footprint of cotton, wheat, and rice production in Central Asia",²⁸ in Uzbekistan, an estimated 4,426 m³ of water is required to grow 1 ton of cotton and 2,068 m³ to grow 1 ton of wheat, while horticultural crops, for example, require much less water. According to the Ministry of Water Management, an estimated 2,234 m³ of water is required to grow 1 ton of cotton, while 1,066 m³ water is required to grow 1 ton of wheat in Uzbekistan. These data suggest that water requirement for growing cotton is more than double than that for wheat in Uzbekistan. International methodologies suggest that apples require about 820 m³ of water per ton of yield. Considering that new orchards in Uzbekistan generally apply new technologies and drip irrigation, they would most likely require even less water than international average values suggest.

13.2 Pressures from agriculture

Greenhouse gas emissions

The agricultural sector is the second biggest emitter of GHGs in Uzbekistan. The GHG emissions in this sector increased by 27.1 per cent in the period 1990–2012, amounting to 21.65 million tons of CO₂-eq. in 2012 (table 7.1), while the sector's share of total emissions in this period also increased slightly, from 9.4 per cent to 10.5 per cent, as a result of the development of livestock breeding. Methane emissions in the sector increased by 98.2 per cent, due to an increase in the number of cattle and sheep. Nitrous oxide emissions decreased by 17.3 per cent as a result of a reduction in the amount of nitrogen fertilizers applied to agricultural soils.

According to the Food and Agricultural Organization of the United Nations (FAO), enteric fermentation has accounted for the major part (50.86 per cent, on average, in the period 2010–2017) of the agricultural GHG emissions (figure 13.7), while synthetic fertilizers were the second largest source of GHG emissions (15.78 per cent).

Soil

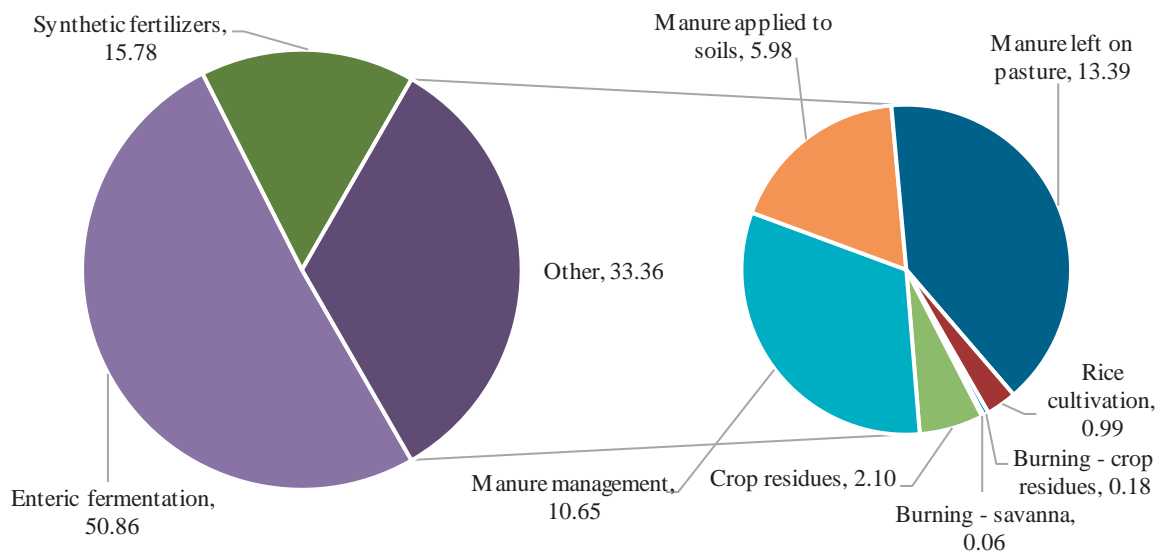
According to some estimates, more than 60 per cent of the total irrigated agricultural land in Uzbekistan (3,702,400 ha in 2018)²⁹ is classified as affected by salinity and around half of this is moderately or highly saline. The situation with soil salinization is getting worse due to the poor maintenance of the irrigation and drainage infrastructure.

Due to large-scale cotton monoculture, the lands used for such purposes without applying adequate crop rotation measures or cultivation techniques are degraded and often affected by low soil fertility caused by poor soil structure and low organic content.

According to the analysis made for the preparation of the 2019 Law on Pastures, 78 per cent of the pasture lands are degraded, which primarily means that the soil is degraded. The status of the remaining pastures is also not satisfactory; their productivity has decreased by half, demonstrated by the fact that the yield of fodder crops has decreased by an average of 2 per cent per ha. In most of the pasture lands, farmers need to buy fodder even during the grazing season, due to the declining soil productivity. As at 2019, there has been no systematic practical work carried out to identify, restore and increase the yield of degraded pastures.

²⁸ M. M. Aldaya, G. Muñoz and A. Y. Hoekstra, "Water footprint of cotton, wheat, and rice production in Central Asia", Value of Water Research Report Series, No. 41 (Delft, the Netherlands, UNESCO-IHE Institute of Water Education, 2010).

²⁹ According to the Ministry of Agriculture, total irrigated land was 4,198,900 ha at the beginning of 2018, while total irrigated agricultural area was 3,702,400 ha.

Figure 13.7: GHG emissions from agricultural activities, 2010–2017, per cent

Source: FAOSTAT, 2019.

Water

Agriculture is by far the biggest water user. There is pressure from agriculture not only on water quantity but also on water quality. Because of the widespread practice of “washing” the fields with water to decrease soil salinization, water quality is also affected. Farmers usually wash their fields twice every year (first after the harvest and then before sowing) and the water used for washing is directed back to the irrigation channels and rivers, and it might contain pesticides and other pollutants. It is the source of secondary salinization and contributes to the toxic sandstorms in the Aral Sea area. Unofficial sources also claim that there are POPs and heavy metals present in the watercourses, especially in the western part of the country where these substances might already reach critical levels, but there are no measurements to prove or reject these suspicions.

Aral Sea region

The Aral Sea disaster was caused by the overuse of the water of the Amu Darya and Syr Darya Rivers, almost exclusively for irrigation. Agriculture is also responsible for residues of pesticides in the Aral Sea and its former basin.

Biodiversity

More than 20 per cent of pastures and hayfields in Uzbekistan have been facing serious loss of biodiversity. The number of plant species that grow on the pastures fell from more than 270 species in the 1990s to only 42 in 2019.

13.3 Organic agriculture

Government officials working in agriculture in Uzbekistan have already recognized the importance of organic farming and its possible role in further improving the exports balance. Some activities were undertaken in recent years to promote organic production, but the legal framework is still lacking, so the country does not issue certifications for organic agricultural products.

Despite the lack of a related legal framework, organic production is already ongoing in the country. According to the Ministry of Agriculture, 5,645.4 ha are certified for organic products (by foreign certification organizations), including 5,000 ha of wild plants (capers) and 645.4 ha of fruit, which are mostly exported as dried products (apricots, mulberries, almonds); in addition, 1,000 ha (pulses) are in a transitional stage to organic certification.

The Centre for Standardization of Agriculture under the Ministry of Agriculture carried out research related to organic agriculture for the period 2015–2018. As a result of the study, the Plan of practical measures for the integrated development of organic agriculture, the production of organic agricultural and food products in the Republic of Uzbekistan for the period 2019–2022 was adopted by the Prime Minister (19 January 2019, No. 03/1-4665) and is under implementation. Also, a draft law on organic agriculture and the production system has been developed and, as at March 2019, the draft was under consultation with the concerned ministries. The state standards on organic production have already been adopted: O’z DSt 3084:2016 “Organic agricultural and food products.

Terms and definitions” and O’z DSt 3290:2018 “Organic agricultural and food products. Rules of production, storage and transportation”. A draft procedure for conducting voluntary certification has been developed and it is also under consultation within the Government. A national label (logo) for organic products is under development, as are the concept of the certification system and certification bodies in the field of organic production. The Centre for Standardization of Agriculture periodically organizes training and seminars for farmers, dekhkan farmers and other agricultural enterprises on organic farming.

A significant contribution to the design of the national framework of organic agriculture in Uzbekistan was made by the FAO project “Institutional capacity building for the development of organic agriculture and the promotion of good agricultural practice in Uzbekistan”, which was implemented in the period 2015–2018.

13.4 Impact from and adaptation to climate change

The results of observations of agroclimatic indicators prepared for the Ministry of Agriculture show a shift in the dates of steady transition of average daily air temperature over 5°C, 10°C and 15°C thresholds during spring or autumn towards winter, therefore indicating an increase in the length of the growing season throughout Uzbekistan. On average, the rate of such an increase is three days over 10 years across the country.

A statistically significant increase in effective temperatures has been revealed, which, by the 2030s, may already exceed the current variability by 1.5–2 times. Such changes will inevitably affect the yields of currently cultivated crop varieties.

Increasing moisture deficit is also expected, according to all GHG emission scenarios, throughout the country, and generally mirrors the rate of increase in effective air temperatures. According to the scenarios, in the period 2021–2040, on average, an increase of 11–14 per cent in moisture deficit is expected in Uzbekistan. According to estimates based on the CropWat model, in the desert and steppe zones, moisture evaporation from cotton, vegetable, melon and gourd crops, alfalfa and tree plantations is expected to increase by 5–7 per cent by the 2030s and 8–15 per cent by the 2050s, relative to climatic norms. In the foothill zone, the rate of increase in evaporation is lower. Calculations show that for most crops (cotton, alfalfa, vegetables, fruit) concentrated on arable land in the desert and foothill zones, as a result of increased evaporation, irrigation will increase by

5.8–7.3 per cent up to 2030 and 9.7–15.0 per cent up to 2050.

Due to climate change, an increase in the number of days with abnormally high air temperatures may lead to a decrease in cotton yields in some areas of the Bukhara, Kashkadarya, Tashkent and other oblasts. Yield losses due to the effect of ballast temperatures (above biological minimum) can reach 10–12 per cent in the southern cotton-growing areas. Due to the poor precipitation, the yield of grains in dryland farming areas may decrease by 15–20 per cent.

In the pastures, the expected increase in air temperature by 2050 will lead to the formation of vegetative winters, which will contribute to better growth of vegetation in spring, but the yield of ephemeral pastures may decrease. Increasing temperature in the warm season, with reduced water availability, will worsen the conditions for the formation of feed stocks and create difficulties in the livestock sector. The growing number of hot days will increase the heat pressure on grazing animals in the pasture in the summer, which can cause a decrease in weight gain or even weight loss.

Climate change projections for Uzbekistan by the World Bank estimate that, between 2005 and 2050, the country’s water demand will increase from 59 km³ to 62–63 km³ and the available water resources will decrease from 57 km³ to 52–54 km³, resulting in a fivefold increase in the present water deficit (from about 2 km³ to 11–13 km³).

13.5 Legal, policy and institutional framework

Legal framework

Although there is a proper legal framework in the form of laws for most of the agriculture-related activities and issues, the legal environment has been changing rapidly over the past decade, due to the Government’s efforts to modernize agriculture. These changes were introduced predominantly in the form of presidential decrees and governmental resolutions, which, in some cases, changed several times over the past few years and sometimes had implications that necessitated implementation in a very short time frame. These changes were hard to follow for the stakeholders, especially those outside the governmental structures, such as dekhkan farmers.

The 1998 Law on Dekhan Farms sets the definition of dekhkan farms, as well as the basic terms and conditions for their operation.

The 2004 Law on Farms defines the basic rules and conditions for establishing and operating the private farms as the biggest agricultural units.

The 2019 Resolution of the Cabinet of Ministers No. 14 “On additional measures to optimize the land plots of farms and other agricultural enterprises and effective use of cultivated areas in agriculture” modified the terms and conditions for the different types of agricultural organizational units with the objective to further enhance the effectiveness of land use.

The 1998 Land Code regulates land-related activities in order to ensure rational use and protection of lands, the reproduction of and increase in soil fertility, and preservation and improvement of the natural environment.

The 2000 Law on Protection of Agricultural Plants from Pests, Diseases and Weeds regulates protection of agricultural plants and prevention of harmful influence of the plant protection products on human health and the environment.

The 2015 Law on Veterinary Medicine regulates veterinary medicine and veterinary welfare, the veterinary system and management, and the rights and obligations of owners of animals, products and raw materials of animal origin.

The 2019 Law on Pastures defines the legal status of pastures and sets the policy directions related to pastures and the rules for the protection, restoration and development of pastures.

The 2018 Resolution of the President No. 3626 “On additional measures for improvement of the efficiency of the State Plant Quarantine Service” established so-called “plant clinics” (of which there were more than 120 as at March 2019) for the promotion of biological processing and treatment of plants against pests.

A number of legal acts provide for economic incentives to introduce water-saving techniques in agriculture, including:

- Subsidies (8 million sum per ha) to raw cotton producers for introducing drip irrigation techniques (2018 Resolution of the President No. 4087);
- Subsidies (8 million sum per ha) to vineyard producers for introducing drip irrigation techniques at new vineyards (2019 Resolution of the President No. 4161);
- Subsidies (up to 6 million sum per ha) to owners of new orchards and greenhouses for introducing

water-saving techniques based on drip irrigation or sprinkler irrigation (2019 Resolution of the President No. 4246).

Policy framework

The main directions of the development of agriculture are defined in the Action Strategy on Five Priority Directions for Development for the period 2017–2021. The Strategy explicitly sets the goal of increasing the efficiency of the agricultural sector through improving the welfare of the population nationwide and reducing Government’s involvement in the regulation of the socioeconomic development of the country, promoting the role of the private sector, increasing the role of NGOs and expanding cooperation with international development institutions. The main objectives for rural development are:

- Deepening the structural reforms within the agrarian sector and the diversification of agricultural production;
- Accelerating the sector’s modernization;
- Promoting the development of the food industry while increasing the processing levels of local agricultural raw materials.

The Action Strategy did not define measurable targets and indicators for agriculture, nor did it prescribe environmental considerations for the development of the sector.

The 2012 Programme for Further Modernization, Technical and Technological Upgrade of Agricultural Production for the period 2012–2016 (2012 Resolution of the President No. 1758) has been adopted with the objective to accelerate the technical modernization of agricultural production. It defined the general framework for the introduction and expansion of modern agricultural machinery and equipment for domestic food production. Even though it did not define any environmental requirement to be met when implementing the programme, technological modernization would certainly contribute to the resource efficiency of the agricultural sector due to the better performance of new equipment.

The 2018 Roadmap on Profound Reform of the Agricultural and Food System (2018 Resolution of the President No. 3671) comprises 50 measures. Most of them aim to increase agricultural productivity by further liberalization of agricultural production and the market and by setting deadlines for some technological and structural changes and modernization measures for the most important agricultural subsectors. Only measure no. 5 contains

explicit environmental goals, since it prescribes the “development and introduction of the mechanism to stimulate farms that take measures to improve soil fertility, land reclamation, introduction and application of water-saving technologies and soil protection, with the definition of specific criteria for assessing the effectiveness of these measures”. The deadline for its implementation was 1 November 2018; however, there is no report on the fulfilment of activities related to this measure. Measure no. 41 relates to the improvement of domestic seed production of cereal crops, fruit and vegetables, and it also aims to gradually increase the area where local varieties are grown, which might contribute to better adaptation to the local land and climatic conditions, as well as to adaptation to climate change in the longer run by the careful selection of traditionally heat-resistant and less water-demanding seed varieties.

The 2013 State Programme for Improvement of Land Reclamation in Irrigated Lands and Rational Use of Water Resources in the period 2013–2017 (2013 Resolution of the President No. 1958) defined exact and measurable objectives for the expansion of water-saving techniques for 2017 and an annual breakdown for the period 2013–2017, as follows:

- Introduction of drip irrigation in gardens, vineyards and when growing vegetables and melons on 25,000 ha;
- Introduction of alternative methods of cotton furrow irrigation (using mobile flexible irrigation pipes) on 34,000 ha;
- Introduction of cotton irrigation technology on screen film furrows on 45,600 ha.

The 2017 Programme of Comprehensive Measures on the Development of Irrigation, Improvement of Land Reclamation of Irrigated Lands and Rational Use of Water Resources in the period 2018–2019 (2017 Resolution of the President No. 3405) set additional goals for 2018 and 2019 related to the expansion of water-saving techniques; in fact, it is a continuation of

the previous programme in terms of water-saving technologies. The goals for 2018 and 2019 are:

- Introduction of a drip irrigation system in orchards, vineyards and plantings of other crops on 22,060 ha;
- Introduction of alternative methods of cotton furrow irrigation (using mobile flexible irrigation pipes) on 83,000 ha;
- Introduction of cotton irrigation technology on shielded foil furrows on 26,600 ha.

The Programme has also defined a new objective related to combating wind erosion: the creation of forest shelter plantations to combat wind erosion of irrigated land and sand entering water management facilities on 2,995 ha in 2018–2019.

In 2019, the target to introduce water-saving techniques in the period 2019–2022, of 253,381 ha of cultivated lands was approved (2019 Decree of the President No. 5742).

These objectives show that the Government has recognized the importance of water saving and the techniques necessary to achieve it, for the further development of the domestic agricultural sector. According to the Ministry of Water Management, the total area under water-saving techniques reached 413,200 ha or 9.6 per cent of irrigated lands in the period 2013–2019. This points to the need to accelerate the expansion of water-saving techniques.

The development strategy for the agricultural sector that will define the vision and strategic objectives until 2030 is under development and consultation as at March 2019.

Sustainable Development Goals and targets relevant to this chapter

The current stand of Uzbekistan vis-à-vis targets 2.3, 2.4, 2.5, 2.a and 5.a of the 2030 Agenda for Sustainable Development is described in box 13.2.

Box 13.2: Targets 2.3, 2.4, 2.5, 2.a and 5.a of the 2030 Agenda for Sustainable Development



Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Target 2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment

The national target 2.3 (By 2030, significantly increase the average agricultural productivity and incomes of food producers) is very similar to the global target, although less ambitious and with a non-quantified goal.

National indicator 2.3.1 (Yields of the main types of crops by farm categories) is different from the global indicator, but the national one seems to be adequate for expressing and describing the development of agricultural productivity in Uzbekistan. The national indicator 2.3.2 is identical to the global one without separate data by gender and indigenous status. The latter is not relevant in the case of Uzbekistan.

In the last several years, government policies and measures are working towards increasing agricultural productivity. This is supported by subsequent deregulation measures and increasing support, particularly for mid- and small-scale farmers. The Government has recognized the potential of the farming done by the so-called homestead landowners, especially in vegetable and fruit growing, and thus a growing number of measures are aimed at improving their income status by allowing and encouraging them to be freely involved in the domestic and export markets and to establish professional business.

Target 2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

The national target 2.4 and indicator 2.4.1 are identical to the global ones.

In Uzbekistan, the application of “productive and sustainable agriculture” techniques is at a very low level. Only drip irrigation has expanded over the past decade, but not enough to qualify sufficient land as being under productive and sustainable agriculture, and neither has the share of drip irrigation reached a level that is measurable within the category of irrigated land. Other sustainable agricultural practices (such as organic agricultural production) are even less present in the country and are mostly practised as a result of pilot projects and other small-scale initiatives.

Target 2.5: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed

The methodology has been defined for both global indicators for this target (indicator 2.5.1: Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities; indicator 2.5.2: Proportion of local breeds classified as being at risk, not at risk or at unknown level of risk of extinction), but, as at March 2019, there were no experts or units within the Ministry of Agriculture designated to deal with the identification of plant and animal species for the purposes of these indicators.

The national target 2.5 is identical to the global one, but the national indicator 2.5.1 (The ex situ/in situ diversity enrichment index) is different from the global indicator, while the national indicator 2.5.2 (Number of local crops and breeds and their wild related species that are at risk of extinction) is similar to the global indicator, with the difference that crops are also included in the national indicator).

Target 2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries

The national target 2.a and two indicators correspond to the global ones.

Due to the strong government commitment to the development of agriculture and, especially, to promoting crop diversification and livestock breeding, the share of the state budget allocated to agriculture has been increasing in recent years: between 2014 and 2017, it increased by 64 per cent, from 1,447.9 billion sum to 2,379.3 billion sum. However, within the structure of the agricultural investments there was a shift from direct state funding towards financing secured through companies and organizations and commercial banks: the share of the state budget has decreased from 37 per cent to 23 per cent in the period 2014–2017, while companies' share has increased from 21 per cent to 38 per cent.



Goal 5: Achieve gender equality and empower all women and girls

Target 5.a: Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws

National target 5.a (Expand women support programmes to exercise their rights and interests in the social and economic sphere) is different from the global one, while the national indicators correspond to the global ones.

According to government data, in 2016, 5.4 per cent of farms (8,105 farms) nationwide were managed by women, but the proportion of women managers was much higher in Bukhara Oblast (19 per cent), the Republic of Karakalpakstan (13.5 per cent) and Khorezm (9 per cent) and Jyzzakh (8 per cent) Oblasts. The share of women owners is increasing. Under the Committee on Women of Uzbekistan, there is a sector on agricultural issues that is in the process of situation analysis related to women's roles, participation and representation in agriculture.

*Institutional framework*Ministry of Agriculture

Since 2018, the Ministry of Agriculture has most of the state responsibilities related to agriculture except land management, land melioration and water management, which are the responsibility of other ministries or state committees.

The division of the former Ministry of Agriculture and Water Resources, as well as other organizational changes affecting agriculture in 2018, have not been prepared thoroughly (e.g. the land melioration unit remained in the Ministry of Water Management while being of primary importance to agriculture).

Ministry of Water Management

The Ministry of Water Management is in charge of issues related to surface waters and responsible for land melioration and maintenance and restoration of the quality of soils.

Ministry of Health

The Ministry of Health is responsible for the issues related to GMOs; however, it conducts GMO testing only on request by private entities.

State Committee on Ecology and Environmental Protection

The State Committee on Ecology and Environmental Protection (SCEEP) has some minor responsibilities related to agriculture, especially the issues that are directly related to protection of the environment, e.g. the 2019 Law on Pastures assigns SCEEP to carry out ecological expertise and ecological control related to pastures.

State Plant Quarantine Inspectorate

The State Plant Quarantine Inspectorate under the Cabinet of Ministers performs phytosanitary control of all the agricultural crops that are exported from or imported into the country. Until 2017, this Inspectorate was under the Ministry of Agriculture, but since 2018 it is subordinated directly to the Government in order to allow better accountability and improve its activity. This shows the Government's determination to improve the effectiveness of measures for plant quarantine, improve the state phytosanitary control system and, ultimately, increase exports of agricultural products by strengthening their quality control.

State Committee for Veterinary Medicine and Animal Husbandry Development

The State Committee for Veterinary Medicine and Animal Husbandry Development is responsible for protecting animal health and the development of animal husbandry and the production, export and import of animals and their products in accordance with veterinary and sanitary rules and regulations, as well as control of compliance with veterinary legislation.

State Committee on Statistics

The State Committee on Statistics conducts the collection and publication of statistical data related to agriculture.

Inspectorate for Control of the Agro-industrial Complex under the Cabinet of Ministers

The organizational background for inspections related to agriculture has been reorganized twice – first, as of August 2018 and again in 2019. The Inspectorate for Control of the Agro-industrial Complex and Ensuring Food Security within the General Prosecutor's Office has been transformed into the Inspectorate for Control of the Agro-industrial Complex under the Cabinet of Ministers in accordance with the 2019 Decree of the President No. 5690. From 1 August 2018, inspections related to the quality of cotton, previously undertaken by the Uzbek Centre for the Certification of Cotton Products, have been also incorporated into the Inspectorate.

Uzstandard

Uzstandard awards so-called compliance certificates for agricultural products after the products have obtained the relevant hygiene, quarantine, ecological and veterinary certificates issued by other states bodies. The compliance certificates give the right to distribute a product on the internal market or for export. The list of products for which the certification is obligatory is defined by the 2011 Resolution of the Cabinet of Ministers No. 122 "On additional measures to improve certification procedures and implement quality management systems". All food products and most agricultural products are subject to this obligatory certification scheme. Uzstandard has at least one laboratory in every oblast and eight specialized laboratories for international (export) certification to conduct examinations. The conformity assessment system will face significant changes, starting from 2020, with regard to testing laboratories and product certification requirements (2019 Resolution of the President No. 4419).

Uzstandard has also been involved in the preparation of standards for organic agriculture.

Council of Farmers, Dekhan Farms and Owners of Household Lands

By law, the Council has the status of an NGO; however, in fact, it acts as the agricultural chamber of the country with organizational units in oblasts and districts and its activities are regulated by the Government. Membership of the Council is obligatory for private and dekhan farmers (since 1 July 2018) and voluntary for homestead landowners. The Council is recognized by the Government as a priority stakeholder and the official representative of the farmers of Uzbekistan. The activities of the Council are diverse: it offers legal protection to its members, some types of extension services and training to members, accounting services to farmers (free of charge for some types of farmers) and financing (loans) of agricultural activities through a newly established fund and also through Tomorkakhizmati LLC, which is owned by the Council.

The Council's Centre for Agro-innovation acts as a knowledge hub and also de facto as a provider of extension services, by providing information on new technologies and know-how (particularly for irrigation, hydroponic technologies and organic farming). It also cooperates with companies organizing fairs, and with universities, connects foreign actors with farmers to disseminate new

technologies in Uzbekistan and organizes specialized training for women farmers.

Uzagroexport

Uzagroexport is the state-owned company for agricultural export promotion, established in 2016. It is also involved in defining the framework of organic farming and implementation of the Government's crop diversification policy.

Uzbekbaliksanoat

Uzbekbaliksanoat was established by the Government in 2017 as an association for the promotion of fishing. Uzbekbaliksanoat has branches in all the oblasts and covers the whole value chain of the fishing industry.

Association of producers and exporters of walnuts

The Association was established by the President in 2017 (2017 Resolution of the President No. 3025) with the overall objective to promote walnut production and export (box 13.3). The Association is organized as a vertical cluster (both farmers and processing companies can join as members) and consists of the organizations that are already involved in nut research, production and related services. The Association also deals with other nut types (pistachios, hazelnuts, almonds and olives), but walnut production is its focus.

Box 13.3: Association of producers and exporters of walnuts

The establishment of the Association represents a good example within the agricultural sector because environmental considerations are explicitly included in its mandate (2017 Resolution of the President No. 3025). The Association is assigned to implement and adopt programmes with the aim to create not only modern and high-yielding walnut plantations but plantations that are adapted to local natural-climatic conditions, and to introduce and expand scientifically grounded methods and techniques of walnut growing that are also resource saving.

The Association is also assigned to carry out extension services related to walnut production, such as organization of special courses for agronomists involved in the care of walnut seedlings, to train them in the proper implementation of agrotechnical measures on walnut plantations.

The 2017 Resolution of the President No. 3025 defined a set of measures for promoting and boosting walnut production in the country. Initially, 10,000 ha of land were assigned by different state institutions for planting walnut seedlings with the mandatory introduction of drip irrigation, and US\$50 million was allocated in the form of loans to finance walnut plantation projects. The member organizations of the Association were exempted from customs payments (except customs duties) until 1 January 2020 for the purchase and import of equipment for drip irrigation, specialized agricultural equipment, seedlings, rootstock, graft and walnut seed material.

The Association promotes not only the walnut variety that is currently the most widely grown globally ("Chandler") but also the traditional local variety, "Boy yong'oq". According to its experts, walnut growing has several beneficial effects on the environment. Walnut and other nut plantations are established on non-arable and non-irrigable lands on foothills, hills and mountainous areas, help to fight soil erosion and improve the moisture content of the soil and improve the microclimatic conditions and biodiversity of their surroundings.

*Regulatory and economic measures*Assistance and support to farmers

The State Plant Quarantine Inspectorate gives practical advice to farmers, including field visits and the provision of necessary equipment (e.g. pheromone traps). The “plant clinics” are established as a public–private partnership: the State provides the building and land free of charge for those who open a clinic and the clinics are exempt from payment of all taxes (2018 Resolution of the President No. 3626).

The Council of Farmers, Dekhan Farms and Owners of Household Lands is mandated to provide several types of financial support to farmers (2018 Resolution of the President No. 3680). The Council manages a fund established by the Government for this purpose. Among other matters, the Fund will provide loans to Tomorkakhizmati LLC (the Council’s company) for agricultural production, processing, procurement, supply, trade organizations, the lease or purchase of agricultural machinery and transport, and the purchase of materials and components for the installation of greenhouses. The fund is exempt from all types of taxes and mandatory payments to state trust funds. Also, Tomorkakhizmati LLC is exempted from payment of all types of taxes and mandatory payments to state trust funds in the framework of its core business for three years.

Until 1 January 2021, the importation of equipment for the installation of greenhouses of light construction, agricultural machinery and agricultural vehicles is exempted from customs payments (except for customs clearance fees).

The 2018 Resolution of the President No. 3680 has also introduced a novelty in agricultural pensions: individual homestead landowners who perform home-based activities and work on the basis of a contract concluded with Tomorkakhizmati LLC or with private farms are exempted from paying income tax for individuals and also from mandatory payments to the Pension Fund.

For investments aiming at the introduction of new technologies and drip irrigation, farmers can get 8 million sum in initial assistance and five years of exemption from income tax.

Extension services

Agricultural extension services in Uzbekistan are still mostly based on the network of state research

institutes established in the Soviet period. In practice, this meant that some universities and research institutes conducted training courses for specialists of the agro-industrial complex in the relevant areas. The Centre for Standardization of Agriculture within the Ministry of Agriculture periodically organizes training and seminars for farmers and agricultural companies on new directions in agriculture, in all the regions of the country. However, the promulgation of agricultural knowledge in unsystematic.

In the last decade, some international donor-funded projects contained elements on extension services (boxes 13.4 and 13.5), but the development of extension services remains an important aspect for further improving the sector’s performance and resilience to climate change, especially since small farmers still cannot afford private consultancy services, which are mostly offered by local branches of foreign companies.

*Participation in international agreements and processes*International Plant Protection Convention

Uzbekistan is not a party to the International Plant Protection Convention, although it is cooperating with the Convention and working on accession based on the roadmap prepared internally by the State Plant Quarantine Inspectorate under the Cabinet of Ministers, which is the designated Convention Information Point. As at March 2019, it has participated in a few workshops and training events organized by the Convention Secretariat and has already submitted a national report on the legislation related to phytosanitary requirements, restrictions and prohibitions, which is one of the 10 reporting obligations that full members need to fulfil.

Cartagena Protocol on Biosafety

In late 2019, Uzbekistan acceded to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity. This is a big step forward, since participation in the Protocol would allow the country to prevent possible risks from uncontrolled movements between countries of living modified organisms (LMOs) resulting from modern biotechnology. Furthermore, it is expected that participation in the Protocol would facilitate public awareness and participation in decision-making on the use of LMOs.

Box 13.4: OSCE project “Support to development of farming and integration by promotion of web technologies”

The OSCE project “Support to development of farming and integration by promotion of web technologies” (2016–2018) developed a web portal, Agomart (www.agomart.uz) and a mobile application to promote digitalization in agriculture and provide free consultancy and advisory services to farmers. Once the web page went live, nearly 9,000 agricultural producers and other stakeholders signed up voluntarily. Agomart connects agricultural producers, suppliers and service providers in a marketplace by engaging all players in the supply chain, such as freight forwarders, financial services providers, food terminals and cold storage owners, in order to ease their access to the market.

The web portal also provides farmers with access to the knowledge database and quality, real-time advisory services, in order to reduce the risk for farmers of losing their harvests or missing the right moment for planting. Agomart’s online advisory services aim at promoting sustainable, environmentally friendly farming solutions in Uzbekistan in the sector that is energy intensive and uses pesticides heavily. The web portal actively promotes sustainable farming practices by developing useful materials on applicable solutions on issues such as organic farming and drip irrigation.

Box 13.5: Mobile application TOMCHI

The National Project on Water Resources Management in Uzbekistan, financed by the Swiss Agency for Development and Cooperation and implemented by the Ministry of Water Management, created a new mobile application called TOMCHI to attract attention to water conservation issues.

The new platform informs users about water-saving irrigation methods and helps calculate the approximate cost of their implementation. The application was designed for farmers, employees of water management organizations and other water users, as well as entrepreneurs who produce and install water-saving irrigation technologies. It targets specialists working on irrigation and agriculture and students of agriculture-related universities, as well as a wider audience relevant to water management issues.

The application is linked to the knowledge portal of the Information-Analytical and Resource Centre under the Ministry of Water Management.

Photo 13.3: Mobile application TOMCHI

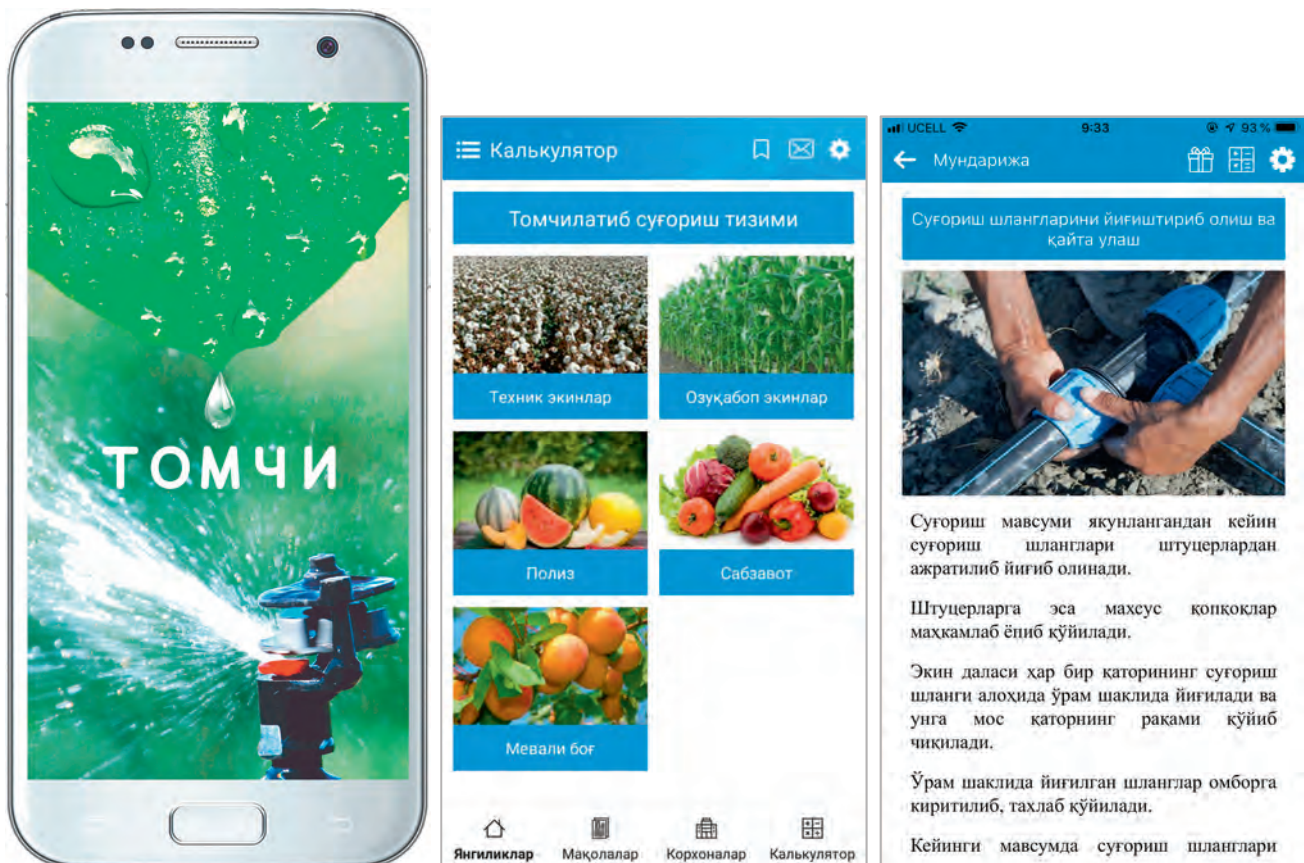


Photo credit: Information-Analytical and Resource Centre under the Ministry of Water Management

13.6 Assessment, conclusions and recommendations

Assessment

Agriculture has an outstanding role within the economy of Uzbekistan. It accounts for about 32 per cent of GDP. About 27 per cent of the workforce is working in agriculture and its role in rural employment and in securing rural incomes is even higher. Agricultural export was and remains a source of foreign currency for the country. Given the favourable agroclimatic conditions, modernization offers an opportunity to make agriculture more productive and sustainable at the same time.

In the years since 2010, gradual deregulation and crop diversification have been among the main policy objectives for agriculture. Implementation of the crop diversification policy implies possible environmental gains in the form of reduced water, fertilizer and pesticide consumption, and thus the halting of soil quality degradation. Nevertheless, these positive gains are eliminated by the poor state of the irrigation infrastructure.

Despite the introduction of new varieties and intensive (fruit and vegetable) growing methods, sustainable agricultural development (except of some small-scale projects) is still not recognized as an essential factor for ensuring the progressive development of agriculture in the long run. Agricultural policy in Uzbekistan still does not pay enough attention to environmental aspects, not even to its most obvious symptom, irrational water use: by the end of 2019, only 9.6 per cent of the total irrigated area will be subject to some type of water-saving technique.

Conclusions and recommendations

Organic agriculture

Although the Government has recognized organic agriculture as one of the flagship subsectors with high export potential and, consequently, possible high revenues, besides the adoption of related standards, the legal framework for organic agriculture is largely lacking. In the absence of legislation on organic agriculture, the establishment of the certification and labelling system is also at a halt. At the same time, organic agriculture is among possible pillars to help Uzbekistan progress towards sustainable agricultural practices and, in a broader sense, towards productive and sustainable agriculture, in line with target 2.4 of the 2030 Agenda for Sustainable Development.

Recommendation 13.1:

The Cabinet of Ministers should ensure the development and adoption of a legal framework, allowing for the establishment of a national certification and labelling system that is recognized internationally, for organic agricultural production.

Use of water in irrigation

The water losses in agriculture amount to around 30 per cent of the sector's water use in Uzbekistan. By reducing or eliminating water losses, the country would be able to solve the problem of forecast water deficit and save enough water to make reservoirs to mitigate the fluctuations in annual available water quantity caused by the variability of precipitation. Strengthening the capacity of the agricultural sector to adapt to climate change (target 2.4 of the 2030 Agenda for Sustainable Development) can most easily be achieved through reduction of water losses in Uzbekistan.

Outdated irrigation methods and poorly maintained irrigation systems seriously limit the crop yields and lead to soil salinization and low soil fertility. Water-saving irrigation technologies, which are favourable for and respect soil fertility, are not widespread enough and not expanding at an adequate pace, despite their promotion by the Government in the past decade.

Recommendation 13.2:

The Ministry of Agriculture and the Ministry of Water Management should enhance their efforts to further promote water-saving irrigation techniques.

See Recommendations 3.5, 9.2.

Sectoral strategy

In the lack of a comprehensive sectoral strategy and vision, there is a threat that government measures and legislative development will not be consistent. Explicit environmental considerations are also missing from the existing sectoral policy documents and from most of the related legal acts, even though ensuring good environmental conditions in agriculture is of the utmost importance for the sector's long-term sustainability and productivity.

Recommendation 13.3:

The Cabinet of Ministers should finalize and adopt a strategy on agriculture that considers environmental matters, particularly for the rational use of water and for the expansion of environmentally friendly crop cultivation techniques.

Participation in the International Plant Protection Convention

Despite its strengthening connections with international organizations in the field of plant protection, Uzbekistan has not yet joined the International Plant Protection Convention, although, as a basic preparatory activity, the State Plant Quarantine Inspectorate has already defined a roadmap for accession to the Convention.

Recommendation 13.4:

The Cabinet of Ministers should consider accession to the International Plant Protection Convention.

Chapter 14

TRANSPORT AND THE ENVIRONMENT

14.1 Overview of transport sector and transport infrastructure

Transport in Uzbekistan is undergoing a revolution with significant investment being undertaken in all the main transport sectors with the aim of modernizing the sector overall and also improving its environmental performance. As Uzbekistan is a double-landlocked country, efficient, land-based transport connections with neighbouring countries are of fundamental importance and current policy is directed at improving national and international connectivity.

In terms of passenger transport, road transport is by far the dominant mode with a market share of 98.3 per cent in 2018. Freight transport is more balanced, but road transport still dominates with a market share of 88.3 per cent in 2018. Passenger aviation is increasing but accounts for only a small share of the total, while waterway transport is very minor in terms of both freight and passenger transport. In 2017, transport and storage services accounted for 9.4 per cent of GDP.

Logistics performance

Uzbekistan has seen some improvement in its Logistics Performance Index scores and rank since 2014. This followed a period of alternating increases and decreases from 2007 (table 14.1). Of particular interest is the low rank assigned to the customs area,

which, although it has improved in recent years, still remains worse than in 2007 and is ranked lowest of all the categories identified. On the other hand, infrastructure has improved dramatically, with a significant jump in comparison with other countries, and is ranked highest of all the categories in 2018.

Road transport

According to data reported by Uzbekistan to ECE, in 2016, there were 42,695 km of roads, of which 98.5 per cent were paved.

Recent years have seen investment in upgrading and renewing the main transit routes, including the following: Tashkent–Osh, Tashkent–Termez, Samarkand–Bukhara–Alat, Kungrad–Beyneu, Samarkand–Bukhara–Alat and Guzar–Bukhara–Nukus–Beyneu. In addition, the reconstruction of the A-380 Guzar–Bukhara–Nukus highway to the border with Kazakhstan, financed by the ADB, serves as an important transit corridor between Afghanistan/Tajikistan/Turkmenistan and Kazakhstan/Russian Federation.

The private sector occupies a leading position in road transport with almost 90 per cent of cargo transportation and almost 100 per cent of passenger transportation executed by private carriers.

Table 14.1: Logistics Performance Index, 2007, 2010, 2012, 2014, 2016, 2018

	2007	2010	2012	2014	2016	2018
LPI rank	129	68	117	129	118	99
LPI score	2.16	2.79	2.46	2.39	2.40	2.58
Customs rank	136	107	118	157	114	140
Customs score	1.94	2.20	2.25	1.80	2.32	2.10
Infrastructure rank	124	70	120	148	91	77
Infrastructure score	2.00	2.54	2.25	2.01	2.45	2.57
International shipments rank	133	83	127	145	130	120
International shipments score	2.07	2.79	2.38	2.23	2.36	2.42
Logistics competence rank	118	89	117	122	116	88
Logistics competence score	2.15	2.50	2.39	2.37	2.39	2.59
Tracking and tracing rank	123	63	105	77	143	90
Tracking and tracing score	2.08	2.96	2.53	2.87	2.05	2.71
Timeliness rank	112	50	101	88	114	91
Timeliness score	2.73	3.72	2.96	3.08	2.83	3.09

Source: World Bank, 2019.

In 2016, there were more than 2.2 million cars on the road network, a motorization rate of 65 passenger cars per 1,000 inhabitants. The existence of a car manufacturing facility in Uzbekistan has meant that the national fleet is dominated by one producer, but the growth rates of vehicle registration are very high with an average of 100,000 new cars being registered annually over the last few years.

Due to the domestic production of vehicles, there are fewer car imports than in neighbouring countries. To further incentivize the acquisition of domestically produced vehicles, duties are levied on vehicles being imported into the country. However, for vehicles worth more than US\$40,000, import duties are waived but excise tax and VAT still apply.

A total of 120.7 billion passenger-km were registered on the roads in Uzbekistan in 2018 and 13.9 billion tonne-km of freight were moved on the road network in 2018, an increase of 3 per cent from 2017 (13.5 billion tonne-km).

Rail transport

Uzbekistan has the highest density of railways in the region (13.7 km of lines operated per 1,000 km², compared with around 6 km per 1,000 km² in Kazakhstan, 2 km per 1,000 km² in Kyrgyzstan and 4 km per 1,000 km² in Tajikistan). The railways sector is managed by the state enterprise JSC “O‘zbekiston temir yo‘llari” (Uzbekistan Railways), which is the largest national enterprise for the transport of goods and passengers by rail.

In 2018, the total length of the country’s railways amounted to 7,000 km, of which around 2,700 km were electrified. In the same year, 94.79 million tons of cargo were transported on the rail network with a total cargo turnover of 22.9 billion tonne-km.

In terms of passengers, 2018 saw a total of 22.3 million passengers transported on the rail network, an increase of 6.1 per cent on the previous year, with a registered value of 4.4 billion passenger-km, an increase of 1.3 per cent on the previous year.

Currently, the locomotive fleet is about 28 per cent electric and 72 per cent diesel powered. The national railway company is currently focusing on rolling stock renewal to reduce the average age of locomotives, thus

increasing their efficiency and ensuring that the environmental and cost (lower maintenance and higher efficiency) benefits of infrastructure electrification works that have been carried out can be maximized. This is being pursued through the project “Updating the fleet of locomotives of O‘zbekiston temir yo‘llari” being undertaken jointly with the ADB. This project will fund the acquisition of 39 new electric locomotives for freight and passenger services. This is being accompanied by a renewal of locomotive engines that is planned to lead to a 15 per cent increase in fuel efficiency and a 30 per cent improvement in environmental performance.

The electrification of the Karsh–Termez line, which opened in January 2019, led to the switch to the use of electric locomotives and enabled the reduction of the consumption of diesel fuel by more than 28,000 tonnes per year and of CO₂ emissions by more than 3,000 tonnes per year.

Railways are fundamental to the economic development of the country and recent years have seen investments in this area. Over the past three decades the following projects can be identified as the main ones on the rail network: construction of the Navoiy–Uchkuduk–Sultaniuzdag–Nukus railway; construction of the road and rail bridge across the Amu Darya River; construction of the Tashguzar–Boysun–Kumkurgan railway; improved connections in the Kashkadarya and Surkhandarya oblasts; and improved connectivity to other countries.

The State and the national railway company are investing in the railways to improve the efficiency of the system and reduce the environmental impact of transport as a whole. Major tasks and actions to improve the railways include: the renewal of railway infrastructure; research into and the introduction of technological advancements; coordinated development of the infrastructure as well as the legal basis, technical regulations and traffic safety; increased foreign investment; improved safety; electrification of more lines; construction of new lines; increasing average speeds; the development of key corridors; the further development of high-speed services; opening up the market for forwarding and other logistics services, including the creation of logistics centres; improving infrastructure and practices at railway border crossings; and improving labour productivity.

Photo 14.1: Electric-powered train Tashkent–Khodjikent



Photo credit: Mr. Sergey Kivenko (tashtrans.uz)

Photo 14.2: High-speed train Tashkent–Samarkand



Photo credit: Ms. Angela Sochirca

Aviation transport

The aviation sector is in the process of reforms to align the national sector with international requirements through the separation of the Civil Aviation Authority from the Ministry of Transport. This has been done to ensure that policy aspects related to the sector are separated from technical and safety-related aspects. In addition, reform has extended to Uzbekistan Airways where it includes the separation of the airline from air traffic control and management of the airports.

In 2018, approximately 2.6 million passengers were transported by air across the country, an 18.7 per cent increase on 2017. In 2018, 8.8 billion passenger-km were covered by air, an increase of 17 per cent on 2017 and of over 50 per cent on the 2010 value (5.8 billion passenger-km).

The sector is focused around Tashkent International Airport, with a small role also being played by other smaller airports. The majority of air transport is carried out by the national carrier Uzbekistan Airways. Furthermore, the airline provides maintenance services to more than 300 foreign aircraft annually.

Eleven airports are currently operational, providing flight services in accordance with international standards. Of these, the airports of Tashkent, Bukhara, Samarkand and Urgench have the status of international airports. Currently, domestic aviation is very limited, although the fact that Uzbekistan pursues an “open skies” policy (in 2019, the Government introduced the “fifth freedom of the air”, for all major airports) may stimulate growth in this area. In addition, the international intermodal logistics centre at Navoiy Airport is one of the largest and most technologically advanced air cargo terminals in the Central Asian region.

Recent years have seen the fleet of Uzbekistan Airways modernized with the acquisition of four Boeing 787 aircraft, expected to be supplemented by a further one in 2020, leading to a reduced average age of the fleet and improved environmental performance. This has had a positive effect on CO₂ and noise emissions from aviation, which have decreased thanks to the use of more efficient aircraft. While no specific data on this have been provided, it is known in the sector that the Boeing 787 aircraft emits 20–30 per cent less CO₂ and makes around 60 per cent less noise than the models it replaces.³⁰

Urban transport

Urban transport is handled by local authorities. In Tashkent, the Tashkent City Khokimiyat oversees and regulates all forms of urban public transport but the operations are carried out by individual companies. In particular, the Tashkent Bus Company operates surface public transport services in the city and Tashkent Metro operates the metro service. In addition, there are a number of licensed minibuss service providers that account for about 5 per cent of the urban fleet and provide additional services throughout the city. The Khokimiyat is pushing to improve road safety, transport accessibility and public transport services, while discouraging car use as much as possible, through the new urban transport strategy that it is in the process of developing with the assistance of a study. This study has been recently commissioned with the aim of helping the Khokimiyat to identify actions that it can take to improve all forms of transport in the city, for example through the introduction of priority lanes for public transport, improving the interchange and integration between modes and seeking to address the problem of parking.

The Tashkent Bus Company is investing in improving public transport in the city and making it more environmentally friendly. It has recently acquired a new fleet of LNG-powered buses, which are more fuel efficient and less polluting as well as being more attractive for users. The Company also plans to introduce electric buses to further improve the environmental performance of the vehicle fleet. The vehicle fleet is gradually expanded with buses equipped with climate control.

The use of public transport in Tashkent remains below its potential as, historically, public transport networks have not covered key residential areas for long period of time and the services themselves have not been attractive, due to, for example, overcrowding. There is the opportunity to increase market share, which local authorities explain is low because much of the population currently prefers to travel in private vehicles. The investments that are being undertaken would help increase the attractiveness of the public transport network, not only through the construction of the new lines but also through the renewal and modernization of the bus fleet, introducing new levels of comfort for the travelling public. A new transport strategy is being developed for the city, focusing on improvements to these services while also discouraging car use through traffic limitations for certain vehicle types, as well as through the promotion

³⁰ <https://aviationbenefits.org/case-studies/boeing-787-dreamliner/>

of these new alternatives. In addition, the strategy should ensure that it maximizes the potential of the city in relation to cycling infrastructure and other alternative forms of transport. The promotion of public transport is something that should be encouraged in, and extended to, all cities in Uzbekistan.

Tashkent is the only city in Uzbekistan with a metro system; its network is currently 36 km long. Tashkent Metro is also investing in expanding its network with the aim of attracting more passengers to its services. New lines and line extensions are being opened to serve new areas of the city and areas with high population density, accompanied by the acquisition of new metro trains and carriages.

A 14.1 per cent increase in passenger traffic by electric transport between 2017 and 2018 was observed, which is due to the growth in passenger transportation by metro (which increased by 12.1 per cent on the previous year). Most of the electric transport is accounted for by the metro (93.4 per cent of all

passengers in 2018), with 5.9 per cent of passengers travelling on trams and 0.7 per cent on trolley busses. Electric passenger transport reached 0.48 billion passenger-km in 2017 and 0.55 billion passenger-km in 2018.

14.2 Environmental pressures

Air pollution

According to official statistics on SO₂ emissions, the “transport and storage” category accounted for 21,900 tons of emissions in 2016, about 7 per cent of the total (table 8.8). In terms of NO_x, transport is the highest emitter with 156,900 tons emitted in 2016, 63 per cent of the total and a 33 per cent increase on the 2009 value. PM₁₀ and PM_{2.5} data for transport are not available; however, the “transport and storage” category accounted for 15,800 tons of total suspended particles in 2016.

Photo 14.3: The first electric bus, Vitovt Electro E420, on the streets of Tashkent City



Photo credit: Mr. Sergey Kivenko (tashtrans.uz)

Greenhouse gas emissions and climate

According to the Third National Communication under the UNFCCC (TNC), transport accounted for 12.4 per cent of GHG emissions from fuel combustion

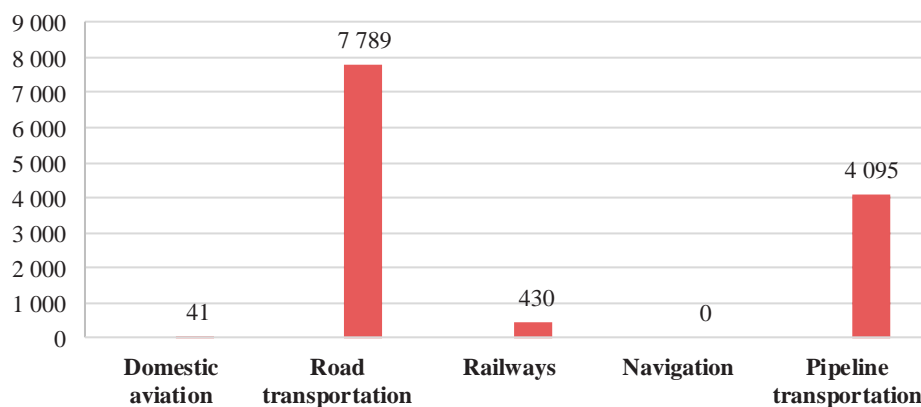
in 2012, emitting 12,355 Gg of CO₂-eq. (or 6.6 per cent of total emissions without LUCF). In 2012, the largest contributors to CO₂ emissions were road (mainly petrol-fuelled) vehicles (63 per cent) and pipeline transport (33 per cent) (figure 14.1).

Photo 14.4: Construction of a new station for a surface line of Tashkent Metro along Akhangaran Road



Photo credit: Mr. Sergey Kivenko (tashtrans.uz)

Figure 14.1: CO₂ emissions by transport mode, 2012, Gg of CO₂-eq.



Source: GHG Inventory for the period 1990–2012, 2016.

The TNC also states that, between 1990 and 2012, GHG emissions from transport decreased by 25.1 per cent thanks primarily to the renewal of the road vehicle fleet and investments in oil and gas transmission. Measures aimed at reducing energy consumption in road transport have so far focused on both technical (e.g. renewal of road fleet) and institutional (e.g. introduction of CO₂ emission standards) initiatives.

Forward-looking GHG emissions scenarios using the For Future Inland Transport Systems tool

Introduction

The For Future Inland Transport Systems (ForFITS) tool (annex IV) provides projections of transport sector CO₂ emissions for Uzbekistan. Four scenarios have been developed to show potential pathways to reduce CO₂ emissions in Uzbekistan to 2045:

- Reference Scenario: It maintains the existing structure of the transport sector and mainly looks at the impact of GDP and population evolution;
- Shift to Mass Transport for Passenger and Freight Scenario (Shift Scenario): This scenario looks at the impact of shifting passenger and goods transport to mass transportation modes such as buses, coaches and trains;
- Improved Fuel Economy Scenario (Improve Scenario): Energy use is evenly distributed between passenger and freight transport. Ambitious and cost-effective vehicle technology deployment to save energy would deliver significant GHG emissions reduction at low or negative costs to vehicle users. Both light and heavy duty vehicles are included in this scenario;
- Combined Shift and Improve Scenario (Combined Scenario): Though not entirely additional, combining both Shift and Improve Scenarios brings additional benefits to energy and emissions reductions by combining the best vehicle technologies with the most adequate mode of transportation.

Baseline projections

Between 2016 and 2045, CO₂ emissions from the transport sector are expected to increase more than sixfold, mainly as a consequence of the expected strong increase in the passenger vehicle stock (figure IV.3).

Alternative scenarios

The Shift Scenario projects future emissions assuming a modal shift towards more efficient mass transportation, buses, coaches and trains. Moving people away from cars to buses and non-motorized modes of transport would halve the CO₂ emissions between the Reference and Shift Scenarios in 2045 (figures IV.8(a) and IV.8(b)). At the same time, the effect of moving goods from trucks to trains is expected to have a limited impact on CO₂ emissions, the existing fuel mix and energy efficiency of trains being similar to that of trucks.

Energy efficiency is a key contributor to energy security and GHG emissions mitigation. Energy use in the Improve Scenario drops dramatically, by around 30 per cent in 2045 compared with the Reference Scenario (figures IV.9(a) and IV.9(b)), as a consequence of the fuel economy improvement and the fuel switching assumptions. This scenario also has a positive impact on energy security as Uzbekistan would be able to rely less on imported energy sources for the transport sector.

The Combined Scenario simulates the cumulative effect of the Shift and Improve Scenarios. Overall CO₂ emissions are reduced by half compared with the Reference Scenario in 2045 (table 14.2). However, in terms of absolute volume, they still increase by a factor of 3 compared with 2016 levels. CO₂ intensity, expressed in CO₂ emissions per unit of GDP, decreases only in the Combined Scenario, showing a decoupling of the economy from CO₂ emissions.

Table 14.2: Main ForFITS outputs for all scenarios

	Unit	2016	2045			
			Reference Scenario	Shift Scenario	Improve Scenario	Combined Scenario
Total pkm	billion pkm	81	364	227	366	226
Total tkm	billion tkm	50	286	282	292	292
Total energy use	million toe	4	24	16	17	12
Total WTW CO ₂ emissions	billion kg CO ₂	12	78	54	53	38
Total WTW CO ₂ emissions per capita	kg CO ₂ /person	387	2 000	1 385	1 359	974
Total WTW CO ₂ emissions intensity	kg CO ₂ /GDP 1,000*	95	158	109	107	77

Note: * GDP is measured in purchasing power parity (PPP) units at 2014 prices. WTW: well-to-wheel.

Conclusions from ForFITS

The transport sector is expected to grow dramatically in the coming decades as the Uzbekistan economy develops further. As set out above, traffic activity in the Reference Scenario is expected to increase significantly in the years ahead. All CO₂ mitigation scenarios will only slow down the expected growth in emissions and emissions are not likely to revert to present levels. However, decoupling of economic growth and CO₂ emissions from transport under the Combined Scenario is an important achievement that Uzbekistan should embrace in order to meet its (I)NDC target submitted in the framework of the Paris Agreement under UNFCCC.

Vehicle emissions

As a result of local resource availability, and the fiscal advantage associated with certain fuels, many vehicles run on natural gas or LPG in Uzbekistan (figure IV.2). This high share is difficult to quantify precisely, as many CNG/LPG fuel systems are retrofitted to vehicles that originally operated on gasoline (for light duty vehicles) or diesel (for heavy duty vehicles). However, the quality, reliability and emissions from such retrofitted systems can be problematic in some cases, unless the right provisions are put in place to ensure they operate appropriately. These retrofits are not part of the original equipment featured in vehicles and are subject to a separate approval rule to ensure that such systems also deliver acceptable environmental performance.

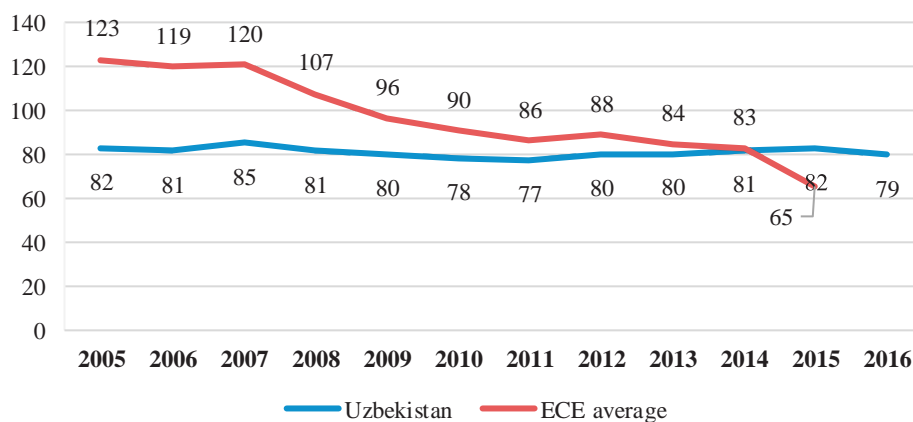
The 1958 Agreement concerning the Adoption of Harmonized Technical United Nations Regulations for

Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations (the 1958 Agreement) facilitates the mutual recognition of vehicle approval for the contracting parties of this multilateral agreement. United Nations Regulation No. 115 under the 1958 Agreement provides a harmonized procedure specifying how CNG/LPG retrofitted systems should be tested and the acceptable emissions limits for such systems once they are fitted to vehicles. The 1958 Agreement enables access to state-of-the-art testing procedures to ensure the acceptable environmental performance of retrofitted CNG/LPG systems. However, Uzbekistan is not a party to the 1958 Agreement.

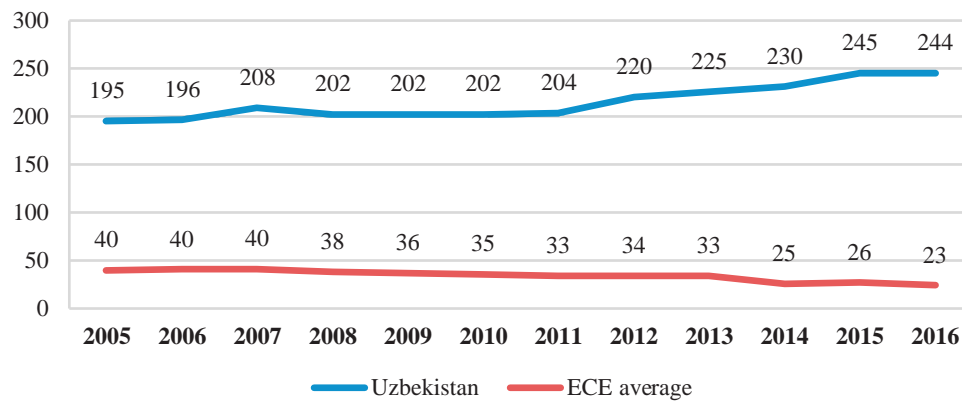
14.3 Road safety

A total of 2,496 fatalities were registered on Uzbek roads in 2016. National data for 2017 point to a 2.2 per cent decrease in fatalities. A further 9,845 injuries and 10,212 injury accidents were recorded in the same year. Between 2011 and 2016, fatalities increased by around 16 per cent, but the rate per inhabitant has remained steadier over this period (approximately 80 fatalities per million inhabitants) due to population growth (figure 14.2). Figure 14.3 displays the severity of road traffic accidents in Uzbekistan over the same period compared with the ECE average. While the ECE average has shown a slight downward trend, the values for Uzbekistan have increased by about 25 per cent, which indicates that road infrastructure and vehicle safety is not improving.

Figure 14.2: Road safety performance, 2005–2016, fatalities per million inhabitants



Source: ECE transport statistics infocards, 2019.

Figure 14.3: Fatalities, 2005–2016, per 1,000 injury accidents

Source: ECE transport statistics infocards, 2019.

In order to ensure traffic safety, all vehicles are subject to mandatory technical inspection. The procedure for the technical inspection of vehicles is defined in the Regulation on the Procedure for Mandatory Technical Inspection of Vehicles (2003 Resolution of the Cabinet of Ministers No. 54). From 1 January 2018, the procedure is in line with the changes made by the 2017 Resolution of the Cabinet of Ministers No. 1010.

Since 2018, mandatory technical inspections of private cars belonging to individual owners can be done by authorized private companies, in addition to the road safety authorities. Private companies are expected to take responsibility for all mandatory technical inspections, starting from 2021. The inspection must be undertaken when the private car is first registered and thereafter on an annual basis. Vehicles used to transport passengers on a commercial basis, buses, trucks equipped for the systematic transportation of people, with eight or more seats, as well as special vehicles and their trailers for transporting bulky, heavy and dangerous goods, must go through technical inspection twice a year.

14.4 Legal, policy and institutional framework

Legal framework

The 1998 Law on Road Transport sets out the basic parameters for passenger and freight road transport operations, including the obligations of the carrier to ensure safety and compliance with environmental requirements. Rules for the transportation of dangerous goods by road are in place (2011 Resolution of the Cabinet of Ministers No. 35).

The 1997 Law on Urban Passenger Transport identifies the main conditions for passenger movements in the urban environment and defines the division of responsibilities between the central public

administration bodies and the local authorities on urban passenger transport management.

The 1999 Law on Railway Transport sets out the organizational and operational requirements of the railways.

The 1993 Air Code sets out the framework for the regulation and management of the aviation sector.

The 2017 Resolution of the President No. 3028 “On measures to further improve management and accelerate development of the automotive industry for the period 2017–2021” aims to improve the corporate governance system of the automotive industry and ensure its growth in the face of fierce competition in foreign markets. Through tax and fiscal measures, it aims to increase the production of competitive national products and deepen the localization of production. It also addresses the management of JSC Uzavtosanoat. The 2019 Resolution of the President No. 4397 cancels the excise duty on vehicles produced by General Motors Uzbekistan (GMU) for sales contracts concluded as of 1 October 2019 (chapter 3).

The 2018 Decree of the President No. 5584 “On measures for the improvement of civil aviation” introduced new management methods in the field of civil aviation. It required the restructuring of aviation industry enterprises, creating conditions for the development of competition in the air transportation market and facilitating investment in the sector.

The 2015 Decree of the President No. 4720 “On measures for the implementation of modern corporate governance methods in joint stock companies” aimed to ensure the openness and attractiveness of JSCs for potential investors through the introduction of modern methods of corporate management.

Several resolutions of the President supported the implementation of projects to extend Tashkent Metro (e.g. 2016 Resolutions of the President No. 2664 and No. 2653).

The 2017 Decree of the President No. 5005 referred to reform of the Ministry of Internal Affairs. It envisaged measures to improve the activities of the road safety units under the Ministry. Several other road safety measures, mostly of an organizational character, were initiated by the 2017 Resolution of the President No. 3127. This Resolution highlighted the need for improved road infrastructure and improved driving culture. It was implemented through 10 detailed regulations focusing on such aspects as environmental protection and the technical inspection of vehicles, among others.

The 2019 Decree of the President No. 5647 “On measures to fundamentally improve the system of public administration in the field of transport” established the Ministry of Transport and outlined major directions for reforms in the transport sector, including:

- Developing a unified state transport policy aimed at the harmonized development of all forms of transport based on their integration into a single transport network and the use of new and efficient transport and logistics systems;
- Creating a unified tariff policy in the field of transport, aimed at stimulating the development of the transport and logistics services market, ensuring their availability for all users and attracting investments in the industry;
- Developing public–private partnerships and increasing the investment attractiveness of the country in the field of transport and road facilities.

The 2019 Resolution of the Cabinet of Ministers No. 429 established a Fund for Development of Transport and Logistics under the Ministry of Transport. The Fund will hold the fines paid for transport-related offences and fees for the licensing of transport operations. Its revenues will be used for the introduction of information and communications technologies (ICT) in transport management and maintenance and repair of transport stations.

Policy framework

As at mid-2019, a draft strategy for transport system development up to 2035, which would cover the entire transport sector, is under development.

Programmes and other policy documents to develop the individual transport sectors in Uzbekistan often

intersect in order to ensure an integrated approach across transport as a whole (an example of this is the cooperation between Uzbekistan Railways and Tashkent Metro in the development of the urban rail network to ensure that the metro is well integrated with it).

The Programme on Development and Modernization of Communications, Road and Transport Infrastructure for the period 2015–2019 (2015 Resolution of the President No. 2313) supported the construction and reconstruction of sections of roads that are part of the Uzbek National Highway, as well as public roads.

The Comprehensive Programme to Improve Transport Infrastructure and Diversify External Trade Routes for Freight Transport for the period 2018–2022 (2017 Resolution of the President No. 3422) aims to ensure that Uzbekistan plays a key role in the development of transit traffic by participating in the creation of the Azerbaijan–Georgia–Turkey–EU transit corridor.

The Programme on the Development of Regional Roads for the period 2017–2018 (2017 Resolution of the President No. 2775) aimed at the overhaul and maintenance of inter-farm rural roads and the streets of cities, urban settlements and villages.

The Programme of Further Development of Transport Services in Cities and Villages for the period 2017–2021 (2017 Resolution of the President No. 2724) aims to improve transport connectivity through improved bus connections in order to address the problem of unemployment in cities and villages of the country. It also addresses passenger transport safety and reducing harmful emissions.

The Metro Development Plan until 2025, officially announced by Uzbekistan Railways in March 2019, foresees that, by 2025, the length of the Tashkent Metro will increase more than fourfold to 157 kilometres, with the addition of 74 stations, of which 17 will be interchange stations.

The Services Sector Development Programme for the period 2016–2020 (2016 Resolution of the Cabinet of Ministers No. 55) aims to create conditions for the accelerated development of the services sector, including through the development of road and transport infrastructure and implementation of modern ICT in these sectors.

The Concept on Road Safety for the period 2018–2022 (2018 Resolution of the Cabinet of Ministers No. 377) builds on previous resolutions to significantly increase the punishment associated with gross violations of the

traffic regulations, as well as providing direction on the improvement of road infrastructure with a particular focus on the quality of roads.

The above policy documents are accompanied by national investment programmes targeted at undertaking major infrastructure investments as well as sector specific programmes. These investment programmes are developed by the Ministry of Investments and External Trade, together with the Ministry of Finance and other responsible ministries. These programmes set out the main parameters for capital investments in their respective year, including for transport infrastructure (e.g. the Investment Programme for 2019 (2018 Resolution of the President No. 4067)). The main investment initiatives in the transport sector are set out in table 14.3.

The Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863) echoes policy documents in the transport sector and provides for further development of the railway network and transition from road to rail transportation for passengers and goods, transfer of the transport fleet to CNG and electric engines, and intelligent traffic management to reduce pollution and ensure road safety.

Sustainable Development Goals and targets relevant to the chapter

The current status of the country vis-à-vis targets 3.6 and 11.2 of the 2030 Agenda for Sustainable Development is described in box 14.1.

Institutional framework

The establishment of the Ministry of Transport in February 2019 to succeed several bodies that were previously in charge of various modes of transport (chapter 1) confirms the increased focus that is being given to the growth of the transport sector in Uzbekistan. The Ministry was established to create and implement the national transport policy as well as to develop appropriate regulations to support the transport policy. It is in charge of the automobile, railway, air, river transport and metro sectors, as well as road facilities.

The other main actors in the transport sector are the Republican Road Fund, Fund for Reconstruction and Development, Uzbekistan Railways, Uzbekistan Airways and Uzavtosanoat. In recent years, the sector has been transformed through a process of

deregulation of the state monopolies and their transformation into independent commercial organizations, in some cases accompanied by their privatization.

The Main Department on Road Safety of the Ministry of Internal Affairs is the body responsible for road safety.

Regulatory, economic and fiscal measures

Road vehicles are taxed as follows:

- A one-off registration fee equivalent to 3 per cent of the market value of the vehicle or 6 per cent for buses and heavy goods vehicles;
- A one-off licence fee;
- A one-off fee for the technical passport of the vehicle;
- An annual fee for the technical inspection of the vehicle equivalent to 10 per cent of the national minimum wage.

Revenues from the registration fee and from the fee for entry into, and transit through, the territory by vehicles registered in foreign countries go to the Republican Road Fund (chapter 3) while revenues from the other one-off fees go to the state budget.

The majority of the vehicle fleet is powered by CNG as a consequence of it being readily available domestically through local production (figure IV.2). Current government policies are aimed at introducing more energy-saving technologies, including in the transport sector, such as adapting public buses to run on gas and building more CNG filling stations. This has been coupled with a gradual increase in fuel prices over time (chapter 3) and a different approach to the regulation of the various types of fuel quality.

For example, tax rates for gasoline are differentiated by octane ratings (80, 91–93, 95) (chapter 3). The regulated prices on fuels below 92 octane are lower than those at 92 octane and above. This has a perverse effect on the quality of the fuel that is being burnt in vehicles as the consumer is incentivized to use lower quality fuel that increases the emissions from vehicles. Significant improvements in vehicle emissions could be achieved by reducing these perverse incentives, for example through reducing access to lower quality fuels, changing the approach to price regulation across all fuels, introducing a ban on certain vehicles in urban areas or introducing a requirement that fuels are not mixed at the pump.

Table 14.3: Selected transport sector investment projects, US\$ million

	Name of project	Financing institution	Amount
2012–2017	Electrification of the Karshi–Termez railway line. Completed with the launch of electric services in January 2019. The transfer of railway sections from diesel to electric locomotives reduced the need for material resources, primarily diesel fuel, by 28,324 tons/year, reduced the harmful effects of rail transport on the environment and reduced emissions of carbon monoxide, nitrous oxide, dioxide, sulfur and other harmful substances into the atmosphere to 3,413 tons/year. The project reduced transportation costs for passenger and cargo transportation by 35 per cent.	Japan International Cooperation Agency (JICA)	160
2016–2019	Construction of a new international passenger terminal in Tashkent International Airport (Tashkent-4)	International banks	236
2010–2017	The development of regional highways. Phase 2	ADB	485
2012–2017	Reconstruction of 85 km of the A-380 Guzar–Bukhara–Nukus–Beyneu highway section 355–440 km (2nd tranche)	ADB	240
2016–2021	Reconstruction and upgrade of the A-380 Guzar–Bukhara–Nukus–Beyneu highway section 228–315 km	ADB	150
2011–2018	The development of regional highways. Phase 3	ADB	500
2016–2021	The development of regional highways of local importance	World Bank	220
2017–2021	Construction of an above-ground metro line in the City of Tashkent	Export-Import Bank of China and Fund for Reconstruction and Development of Uzbekistan (UFRD)	200
2017–2021	Electrification of the Pap–Namangan–Andijan railway section	ADB	80
2016–2021	Reconstruction of 77 km of the Karshi–Shahrisabz–Kitab road	ADB	198
2016–2020	Reconstruction of 87 km of the A-380 Guzar–Bukhara–Nukus–Beyneu highway	ADB	150
2011–2019	Reconstruction of 35 km of the 4R87 Guzar–Chim–Kukdala road	Saudi Fund for Development and Kuwait Fund for Arab Economic Development	51
2016–2019	Construction of the second stage of the Yunusabad metro line from Shahrison station to Turkiston station	Government spending planned and UFRD	70
2017–2020	Construction of the Sergeli metro line	Government spending planned and UFRD	41
2016–2019	Modernization of the Andijan–Savay–Khanabad railway section with the organization of suburban trains	Government funding	2
2017–2019	Electrification of the Karshi–Kitab railway section with the organization of high-speed passenger trains	Government funding	2
2016–2020	Acquisition of four new Boeing 787-8 aircraft	Industrial and Commercial Bank of China, UFRD	551
2013–2021	Construction of a new electrified Angren–Pap railway line with electrification of the Pap–Kokand–Andijan section	International Bank for Reconstruction and Development (IBRD)	545
2018–2021	Construction of an electrified high-speed double-track ring railway in the City of Tashkent	TBA	TBA
2018–2022	Construction of a railway line between Urgench and Khiva	TBA	TBA
2018–2021	Construction of 12 overpasses in Tashkent	TBA	TBA

Source: ECE.

Note: TBA: To be announced.

3 GOOD HEALTH
AND WELL-BEING



Box 14.1: Targets 3.6 and 11.2 of the 2030 Agenda for Sustainable Development

Goal 3: Ensure healthy lives and promote well-being at all ages

Target 3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents

Uzbekistan significantly modified global target 3.6 when it approved its national target “To halve the number of road traffic accidents, including accidents due to violations of traffic rules by pedestrians, by 2025”. The national target implies different underlying concepts from global target 3.6. Also, the national target differs in terms of the time horizon from the global target.

Uzbekistan nationalized global indicator 3.6.1 (Death rate due to road traffic injuries) without change. The national data for this indicator in the period 2010–2016 vary between 77 fatalities per million inhabitants in 2011 to 79 fatalities per million inhabitants in 2016.

More concerted efforts are needed in Uzbekistan given the strong increase in motorization and given the data in relation to the severity of road accidents (figure 14.3). Global target 3.6 requires a reduction in fatalities by 50 per cent by 2020, and Uzbekistan is currently falling well short of that target with only a modest fall in fatalities.

Several changes were introduced to the road traffic safety regulations in 2016, and activities to rigidly control adherence to those are required to reduce road traffic accidents. Further efforts are necessary to strengthen implementation and enforcement of several road safety measures, e.g. on seatbelts and child restraints and measures to enhance vehicle safety, as well as on monitoring the conduct of road traffic regulations classes in kindergartens and schools.

11 SUSTAINABLE CITIES
AND COMMUNITIES



Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

Uzbekistan nationalized global target 11.2 with minor modification, and adopted global indicator 11.2.1 (Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities) as the national indicator. This indicator is one of the very few indicators for which Uzbekistan provides gender-disaggregated data, with slightly more women (85 per cent) than men (84.8 per cent) deemed to have convenient access to public transport in 2017.

The largest cities in Uzbekistan are currently investing in renewing their fleets and improving accessibility. For example, the Tashkent Bus Company is investing in a new fleet of more environmentally friendly buses and is also improving the accessibility and usability of those buses with the installation of wheelchair ramps and air conditioning systems. A further extension of the metro system currently under construction will increase accessibility and draw further passengers away from the use of cars. Furthermore, the City of Tashkent is currently preparing a new transport plan that will give further guidance on improving accessibility for its citizens and help in achieving target 11.2.

14.5 International agreements and processes

Uzbekistan is a party to 13 United Nations transport legal instruments under the purview of ECE; of these, four are road-safety-related conventions and five are related to the facilitation of border crossing. The following United Nations key conventions on transport, which are not among the 13, can have a positive impact on the transport sector and, in particular, on its environmental performance:

- 1958 Agreement concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations; among other matters, this sets out the parameters for vehicle emission categories and the wear of
- tyres and brakes, which have a direct impact on the environmental performance of vehicles;
- 1997 Agreement concerning the Adoption of Uniform Conditions for Periodical Technical Inspections of Wheeled Vehicles and the Reciprocal Recognition of Such Inspections; participation in this Agreement would contribute towards the improvement of the roadworthiness of vehicles travelling on the roads of Uzbekistan, since, among other matters, the Agreement sets out the parameters for how vehicle emissions are to be tested during technical inspection;
- Agreements governing the transport of dangerous goods, aimed at ensuring that dangerous goods are transported safely, thus limiting the potential negative impact on the environment in the event of leakage or an accident:
 - 1957 European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR);

- 1993 Protocol amending article 1 (a), article 14 (1) and article 14 (3) (b) of the European Agreement of 30 September 1957 concerning the International Carriage of Dangerous Goods by Road (ADR);
- 1989 Convention on Civil Liability for Damage caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels (CRTD);
- Agreements on infrastructure networks aimed at ensuring the harmonized development of inland transport infrastructure and thus ensuring that it is developed in a sustainable manner:
 - 1950 Declaration on the Construction of Main International Traffic Arteries;
 - 1975 European Agreement on Main International Traffic Arteries (AGR);
 - 1985 European Agreement on Main International Railway Lines (AGC);
 - 1991 European Agreement on Important International Combined Transport Lines and Related Installations (AGTC).

14.6 Assessment, conclusions and recommendations

Assessment

The transport sector in Uzbekistan relies on road transport. Over 98 per cent of passenger journeys are currently undertaken on roads while over 88 per cent of freight is also moved by road. Aviation traffic continues to grow, albeit with a newer and less polluting fleet. The Government has pushed for significant change and development of the transport sector to increase its performance, through policy initiatives and legal acts. This has been accompanied by targeted investments in rail, road and aviation which has led, for example, to an improvement in most parameters of the Logistics Performance Index.

These initiatives have helped in the modernization of the sector and have also gone some way towards improving the environmental performance of transport, with a particular focus on road transport. These are initial steps in a transformation process that needs to continue to ensure that the sector counters the ever-increasing use of private vehicles and road transport as a whole, with initiatives that aim to reduce the environmental impact of road transport and stimulate the use of alternative forms of transport such as the railways and, where this is not possible, alternative propulsion systems.

Conclusions and recommendations

Road vehicle emissions

Road vehicles remain the main source of transport-related CO₂ emissions. Transport vehicles, in particular private cars and freight vehicles, are currently using low quality fuels on a daily basis. Low octane fuels pollute more and are less efficient when burned in internal combustion engines, leading to negative effects on the environment as well as on the efficiency of vehicles and their durability. This is facilitated by fossil fuel subsidies through regulated prices that incentivize the use of these lower quality fuels. The ForFITS analysis shows that reducing these subsidies can have a significant impact on the environmental performance of the sector henceforth, which can be done not only through the use of cleaner fuels but also through the use of more efficient engines and an increase in electromobility.

Recommendation 14.1:

The Cabinet of Ministers should:

- (a) *Consider the best ways to modulate or reduce fossil fuel subsidies to ensure that higher quality fuels are used in vehicles that have a lower impact on the environment;*
- (b) *Encourage the move away from the use of lower quality fuels and the take-up of alternative, low-carbon-fuelled vehicles;*
- (c) *Encourage the simultaneous deployment of electromobility along with renewable electricity production to help meet the objective of reducing the total amount of vehicle emissions.*

See Recommendation 3.2.

Public transport

The use of public transport remains limited in cities as people continue to prefer to use their private cars to commute and move around the urban environment. This is because, historically, public transport has not been accessible, the networks have not covered key residential areas and the services themselves have not been attractive.

In order to reverse this trend and help in achieving target 11.2 of the Sustainable Development Goals, recent investments have been initiated, such as the extension of the metro and the acquisition of new buses. These initiatives are not supplemented by policies and action plans such as those currently being developed in Tashkent City aimed at rendering public

transport and the use of alternative modes of transport more attractive to users.

Recommendation 14.2:

The Cabinet of Ministers and other relevant authorities should:

- (a) *Improve access to, and use of, public transport in the urban environment to reverse the increase in congestion and emissions;*
- (b) *Develop and implement coherent policies and actions aimed at incentivizing the use of public transport and of alternative modes such as cycling.*

Long-distance transport

Uzbekistan has invested in the railways in recent years, in both electrification projects and the acquisition of new rolling stock. This has started to have a positive effect on the use of the network with the fast trains between the major cities often full. This shows that there is significant potential for the use of the railways to grow further. Therefore, it is important that continued focus is directed towards this area with the aim of increasing capacity and speed for both passenger and freight trains to further draw traffic away from the roads.

Recommendation 14.3:

The Cabinet of Ministers, in cooperation with Uzbekistan Railways, should facilitate further development of the railway network and the switch away from road transport for both passengers and freight while ensuring that there are good intermodal connections for both passengers and freight for their last mile journeys.

Road safety

Data show that the number of road fatalities has remained steady since 2015 with only minor fluctuations, at around 80 fatalities per million inhabitants. The number is not decreasing in Uzbekistan, unlike the average in the ECE area, and is well below the requirements in target 3.6 of the 2030 Agenda for Sustainable Development, which requires a 50 per cent decrease in fatalities by 2020. The severity of accidents has increased by about 25 per cent over the period 2005–2016, which also demonstrates that the road infrastructure is not safe for drivers and pedestrians. Vehicles sold in Uzbekistan do not meet the highest possible technical safety standards for the occupants, but also for pedestrians and other road users. In addition, the enforcement of laws and regulations presents challenges.

Recommendation 14.4:

The Cabinet of Ministers should develop a safe-system approach to road safety covering all aspects of road safety activities, including:

- (a) *Coordinated governmental action and policies on road safety, including the involvement of all relevant stakeholders;*
- (b) *Investment in making the road infrastructure safe;*
- (c) *Appropriate enforcement of driving and road safety laws and regulations;*
- (d) *Ensuring that the vehicles registered domestically meet the highest international technical specification standards.*

United Nations transport-related agreements

ECE develops multilateral agreements and harmonized technical regulations for all inland transport modes, offering off-the-shelf legal texts on energy and emissions measurement and mitigation. Vehicle safety features and harmonized development of transport infrastructure are also covered in these multilateral agreements. Uzbekistan is not a party to some of these important agreements and, consequently, is not reaping the rewards from the regulatory framework that they provide.

Recommendation 14.5:

The Cabinet of Ministers should consider accession to transport-related agreements, including:

- (a) *1958 Agreement concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations;*
- (b) *1997 Agreement concerning the Adoption of Uniform Conditions for Periodical Technical Inspections of Wheeled Vehicles and the Reciprocal Recognition of Such Inspections;*
- (c) *1957 European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR);*
- (d) *1993 Protocol amending article 1 (a), article 14 (1) and article 14 (3) (b) of the European Agreement of 30 September 1957 concerning the International Carriage of Dangerous Goods by Road (ADR);*
- (e) *1989 Convention on Civil Liability for Damage caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels (CRTD);*

- | | | | |
|-----|---|-----|--|
| (f) | <i>1950 Declaration on the Construction of Main International Traffic Arteries;</i> | (h) | <i>1985 European Agreement on Main International Railway Lines (AGC);</i> |
| (g) | <i>1975 European Agreement on Main International Traffic Arteries (AGR);</i> | (i) | <i>1991 European Agreement on Important International Combined Transport Lines and Related Installations (AGTC).</i> |

Chapter 15

INDUSTRY AND THE ENVIRONMENT

15.1 Trends in industry development

According to the State Committee on Statistics, in 2018, the industrial sector accounted for 23.3 per cent of GDP, of which manufacturing industries represented 15.5 per cent and mining and quarrying 6 per cent. The largest contribution to GDP growth was made by industry, which grew by 10.6 per cent compared with the previous year. The positive dynamic was achieved due to the growth of the added value of the mining industry and the development of quarries by 28.2 per cent, manufacturing industry by 6.4 per cent and other industries by 4.7 per cent. In terms of value added, the largest share is accounted for by manufacturing industry, representing 66.8 per cent of the total value added from the industrial sector in 2018. Mining and quarrying and other industries accounted for 25.9 per cent and 7.3 per cent respectively in 2018.

At the end of 2018, in the gross value-added structure of the manufacturing industry, the largest share was accounted for by the metallurgical and metalworking industry (except for machinery and equipment) – 24.5 per cent. The share of food, beverages and tobacco production was 17 per cent, textiles, clothing, leather and related products 16.1 per cent, rubber, plastic products and other non-metallic mineral products 11.3 per cent, chemical products 9.2 per cent, motor vehicles, trailers and other transport equipment 7.4 per cent, electrical equipment 3.5 per cent and other manufactured products 11 per cent.

In the structure of industrial output, the largest share is produced in Tashkent City (18.6 per cent), and Tashkent (15.3 per cent), Andijan (11.8 per cent), Navoiy (0.9 per cent), Kashkadarya (6.2 per cent) and Fergana (5.6 per cent) Oblasts. In 2018, 56,900 industrial enterprises operated in Uzbekistan, of which 13,400 (23.6 per cent of the total number of operating

enterprises) were located in Tashkent City, 6,200 (11 per cent) in Fergana City and 6,010 (10.6 per cent) in Tashkent Oblast.

The value of total exports in 2018 amounted to US\$14,253.9 million (an increase on the previous year of 13.6 per cent). The share of goods in the composition reached 78.7 per cent, of which energy and oil products accounted for 18.7 per cent, food products 7.7 per cent and ferrous and non-ferrous metals 8.2 per cent. According to the State Committee on Statistics, gold is one of the main export goods of the country. During 2018, the country delivered US\$2.9 billion of gold to foreign markets. For comparison, food exports brought in around US\$1 billion, textiles US\$1.6 billion and ferrous and non-ferrous metals US\$1.1 billion, which demonstrates that natural resources dominate the country's exports.

According to preliminary data from the State Committee on Statistics, in 2018, industrial production output reached 228.9 trillion sum, which is almost six times greater than in 2010 (table 15.1), with a notable increase in the volume of production in the period 2016–2018 (table 15.1).

In 2018, the main factor in the growth in total industrial production output was an increase in manufacturing industry production by 13.2 per cent (10.5 percentage point contribution to the increase in total industrial production), mining and quarrying by 25.4 per cent (3.4 percentage point contribution to growth), electricity, gas, steam and air conditioning by 4.1 per cent (0.3 percentage point contribution to growth) and water supply, sewerage, waste collection and disposal by 22.6 per cent (0.2 percentage point contribution to growth), compared with the previous year. In the total volume of industrial production, output with high value added (food products, textiles, chemicals, pharmaceuticals, etc.) has increased.

Table 15.1: Industrial production output, 2010–2018, billion sum

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total	38 119	47 587	57 552	70 634	84 011	97 598	111 869	148 816	228 866
Mining and quarrying	5 704	6 059	8 481	8 963	9 257	10 870	10 721	18 234	36 870
Manufacturing	28 141	36 717	43 620	55 332	67 097	77 088	89 793	117 736	175 357
Electricity, gas, steam supply and air conditioning	4 084	4 538	5 161	5 967	7 118	8 993	10 523	11 656	14 525
Water supply, sewerage, control over waste collection and distribution	189	271	290	371	539	646	832	1 189	2 113

Source: State Committee on Statistics, 2018.

In 2018, manufacturing enterprises produced goods valued at 175.4 trillion sum (table 15.1) and accounted for 76.6 per cent of the total value of industrial production (figure 15.1). The share of manufacturing industry in the structure of industrial output has increased, from 73.8 per cent in 2010 to 76.6 per cent in 2018. The modernization and diversification of leading industries and introduction of modern technologies for processing raw materials and semi-finished products contributed to this increased share.

The production volume of mining and quarrying enterprises increased from 5.7 trillion sum in 2010 to 36.9 trillion sum in 2018 (table 15.1), when it represented 16.1 per cent of total industrial production (figure 15.1).

According to the State Committee on Statistics, in 2017, the total employed population was 13.5 million people. In the same year, employment in the industrial sector was estimated at 1.82 million people, including 83,500 people in the mining industry and 1.59 million people in the manufacturing industry, which presents 4.5 per cent and 87.6 per cent of the total employed population in the industrial sector respectively. The manufacturing industry accounts for 13.4 per cent of the total employed population, while the mining industry accounts for 0.61 per cent.

The number of industrial enterprises has increased by 38 per cent, from 35,000 in 2011 to 49,000 in 2018. The number of newly created enterprises in 2017 was 10,200.

15.2 Developments in main industrial branches

Mining and metallurgy

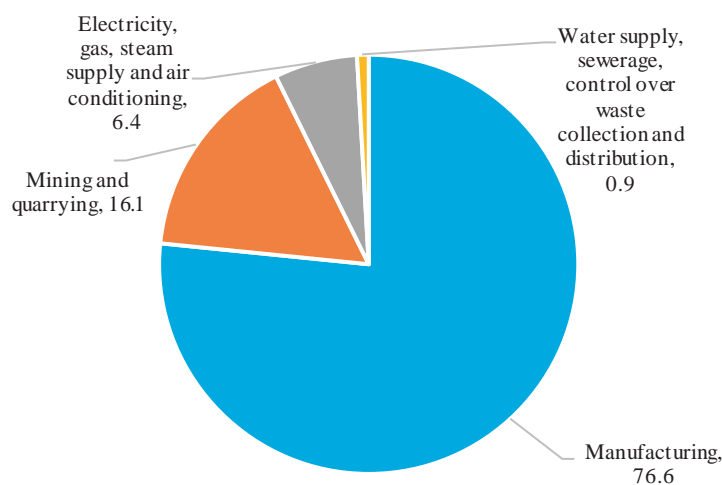
Overview

Uzbekistan is the world's thirteenth largest producer of natural gas and ninth largest producer of gold. It is also the world's seventh largest producer of uranium. In terms of reserves and resources of the most important types of minerals, such as copper, potassium salts, phosphorites and kaolin, Uzbekistan is among the world's top 10 countries. The country produces nitrogen, petroleum, rhenium and sulfur in significant amounts in terms of world production. Other valuable minerals produced include copper, gypsum, silver, tungsten and zinc.

During the past several years, the country had made significant efforts to increase its mineral production, including through expansion of copper and gold production facilities, construction of new phosphate and potash plants and development of shale oil and gas condensate deposits.

As at 1 January 2017, according to the country's State Balance of Mineral Reserves, in total, 1,931 deposits had been discovered in Uzbekistan. In 2017, there was a notable increase in the extraction of black coal (almost sixfold) and gas condensate, compared with 2013, while oil and brown coal (lignite) production have both declined steadily since 2013.

Figure 15.1: Industrial production by sector, 2018, per cent



Source: State Committee on Statistics, 2018.

The volume of metallurgical industry production has increased significantly, from 3,087.2 billion sum in 2010 to 25,570 billion sum in 2018, while production of coke and refined petroleum products has increased more than threefold in the same period, from 1,785.3 billion sum in 2010 to 5,539.1 billion sum in 2018 (figure 15.2).

Ferrous mining and metallurgy

According to the State Committee on Statistics, the industrial production of iron ore commenced in 2017 and its volume reached 26.4 tons in 2017.

The Tebinbulak field is located in the Karauzak District of the Republic of Karakalpakstan. The proved reserves of the deposit are 450 million tons of ore and total reserves are estimated at more than 3 billion tons. A mining and processing plant to produce iron ore concentrate with an average iron content of 65 per cent is planned to be constructed.

Non-ferrous mining and metallurgy

According to Nordgold, the internationally diversified low-cost gold producer, the volume of proven and confirmed gold reserves in Uzbekistan is about 2,100 tons. The total reserves are approximately 3,350 tons.

In 2017, the Government approved a list of 12 gold deposits for their industrial development with the participation of foreign investments. This list includes deposits of mainly gold-quartz and gold-sulphide ores

in four regions of the country – Tashkent, Samarkand and Navoyi Oblasts and the Republic of Karakalpakstan. The total reserves of the proposed deposits (category C2) are more than 14.5 tons of gold.

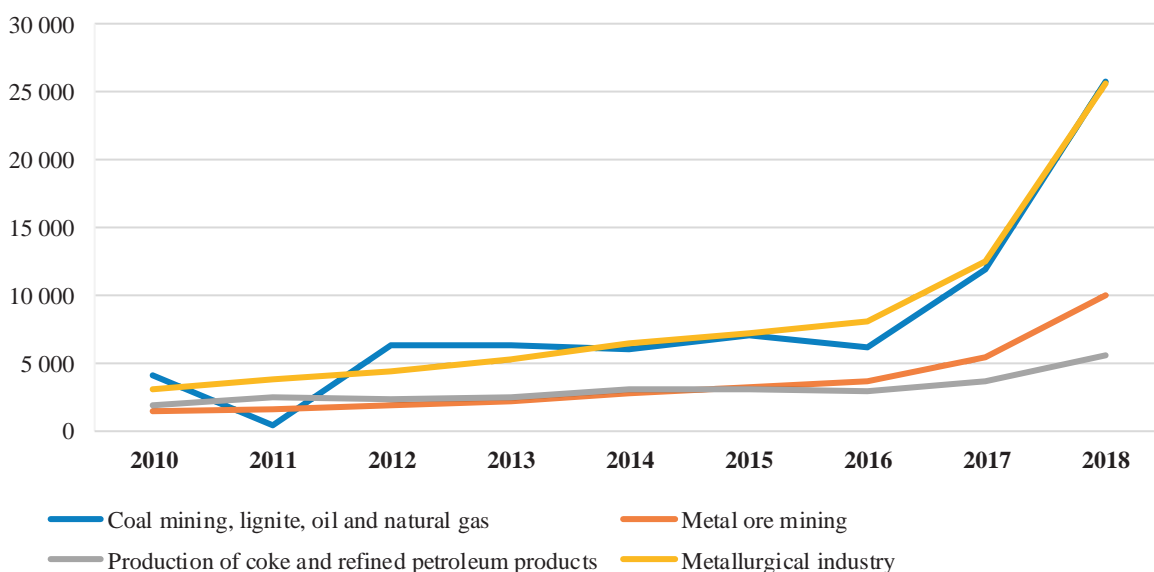
By 2020, the volume of Uzbek gold production is expected to increase to 120 tons per year, from 90 tons per year in 2014. The two main Uzbek mining enterprises, Navoiy Mining and Metallurgical Combine (NMMC) and Almalyk Mining and Metallurgical Combine (AMMC), produce 86 per cent of gold production. In addition, AMMC is the largest silver producer in Uzbekistan, with annual output of around 140,000 tons.

According to the State Committee on Statistics, in 2014, the country had 41 gold deposits; however, only nine of them were developed. The country plans to invest US\$4.5 billion in gold production, which should not only increase the volume of mining by 25–30 per cent but also improve productivity.

In October 2013, AMMC completed the modernization of the Kochbulak gold mine in Tashkent Oblast. The project involved the resumption of work on the Uzun open pit, as well as increasing production from an underground mine. The total cost of the project was US\$10 million.

Uzbekistan has a large number of illegal gold miners. Almost 30,000 are involved, according to local media reports, although the actual volume of illegal gold mining is unknown.

Figure 15.2: Industrial production by economic activity, 2010–2018, billion sum



Source: State Committee on Statistics, 2019.

The only producer of copper in Uzbekistan is AMMC, located in Tashkent Oblast. The mineral deposits of Tashkent Oblast are highly complex and contain more than 170 types of minerals. In addition to copper, AMMC mined and processed lead-zinc-barite ores from the Uch-Kulach deposit, located in Jizzakh Oblast, and the Khandiza polymetallic deposit, located in Kashkadarya Oblast. The AMMC facilities include eight mines, five mining and beneficiation plants, two metallurgical plants, a cement plant, a sulfuric acid plant, a mechanical plant and a lime plant.

Production of copper ores and concentrates increased by 8.2 per cent, from 34,613,900 tons in 2013 to 37,467,900 tons in 2017, while lead ore and concentrates, zinc and tin increased by 11.4 per cent, from 524,156 tons in 2013 to 584,021 tons in 2017.

At the end of 2013, AMMC started production of copper pipes, and in March 2014, the plant started operating at full capacity.

AMMC also produces metallic zinc, lead concentrate and other products. Lead and zinc fields are represented by the fields of strata form type in the carbonate rocks (Uchkulach, Kulchulak), scarn (Kurgashinkan, Kumishkan) and pyrites in volcanogenic rocks (Khandiza and elsewhere).

According to the State Committee on Geology and Mineral Resources, about 40 rare metal (e.g. niobium, tantalum, beryllium, lithium, rubidium, caesium) objects have been identified in the Main Tien-Shan rare-metal belt.

Tungsten raw materials are provided by the tungsten ore mines (Lyangar, Ingichke, Koytash, Yakhton, Sargardon and others) and recently discovered fields of Sautbay and ore-showing fields of Sarytau.

According to the U.S. Geological Survey, in 2014, the production of tungsten metal decreased to 83 tons, or by 15.3 per cent compared with 2013. The decrease was owing to reduced demand on international markets. The only producer of tungsten metal in Uzbekistan was the Uzbek refractory and hard metals complex. Reportedly, the plant was operating at about 20 per cent of its capacity and produced tungsten metal from imported tungsten concentrates.

Approved reserves of lithium in the volcanogenic deposit of coal tufo siltstone of Shavzaysay in Tashkent Oblast are estimated at over 120,000 tons of lithium dioxide, and accompanying components at 3,200 tons of caesium oxide and 8,900 tons of rubidium oxide.

Manganese ore shows are discovered in the territory

of Uzbekistan. The most studied are the formation deposits Dautash, Kyzylbayrak, Takhtakaracha and others. It is required to also study the manganese-bearing strips of the Zarafshon and Gissar mountains. In Kyzylkum Desert, new types of manganese deposits have been discovered (Alisoy, Oqsoy and others).

Construction materials

As of 2018, there are five big cement facilities and several small ones, with total capacity of 8.5 million tons. Qizilqumsement JSC, with capacity of 3.1 million tons, and Akhangarancement JSC, with capacity of 1.7 million tons, are the biggest. In the next five years, Uzbekistan plans to increase the volume of cement output to 17 million tons per year.

Cement holds a significant share (76 per cent) in the total volume of construction materials production in Uzbekistan, according to Ozqurilishmateriallari JSC. The annual production of cement has increased by 19 per cent, from 7,639,000 tons in 2014 to 9,132,000 tons in 2017.

Several new large cement plants are expected to be built in the next few years.

Chemical industry

The chemical industry includes enterprises producing mineral fertilizers, chemical plant protection agents, chemical fibres and threads, synthetic resins, polymeric items and other products. The Republic of Karakalpakstan, and Kashkadarya, Bukhara, Navoiy, Surkhandarya and Fergana Oblasts have an important place in the implementation of large chemical industry projects manufacturing products with high added value and using complex technological processes.

According to the State Committee on Statistics, in 2018, chemical industry output amounted to 18,967.9 billion sum, a 2.1 per cent increase on the previous year. The increase is primarily due to increased capacity utilization and the launch of new enterprises. Production of mineral fertilizers continued to grow and reached 1,141,900 tons in 2017. At the same time, increased production of chromium trioxide, chlorine and caustic soda equalled the level of production of yellow phosphorus, one of the main export products of the country's chemical industry. The share of chemicals in exports increased from 5.1 per cent in 2010 to 6.9 per cent in 2016.

The rapid development of other industries, such as oil and gas and metallurgy, creates favourable conditions for the growth of the chemical industry. The main trends of chemical industry development include:

- Modernization and technological rearmament of existing production of mineral fertilizers;
- Optimizing the variety of mineral fertilizers in production;
- Construction of modern production facilities with the phasing out of outdated technologies and equipment;
- Production of new, scientifically based types of chemical products for the home market and export;
- Mastering the production of non-explosive types of nitric fertilizers.

Despite the recent developments, major obstacles still hamper the increase in competitiveness and profitability of the country's chemical industry, such as obsolete equipment, high operational and transportation costs, and a shortage of qualified personnel and the lack of technology for production of chemicals with high added value.

Pharmaceutical industry

In recent years, the pharmaceutical industry has seen rapid growth. According to the State Committee on Statistics, in 2018, pharmaceutical industry output amounted to 1,705.7 billion sum, a 13.1 per cent increase on the previous year and more than threefold increase compared with 2014. In 2017, the pharmaceutical industry manufactured 1.6 billion packaging units of medicinal products and medical devices, 34 per cent more than in 2016. However, in value terms, the growth was only 16 per cent.

In 2017, the industry began to implement 71 investment projects, commissioned 33 facilities worth US\$148 million and launched the manufacturing of 76 new products.

The overall intention of the Government is to stimulate local production of pharmaceuticals by providing local producers with a more favourable tax, customs and sales regime and also to ensure that the population of Uzbekistan has access to affordable pharmaceuticals. In addition, the Government seeks foreign partners interested in establishing local production of pharmaceuticals and medical equipment. Special attention is paid to ensuring that national products are competitive. Work on introducing international quality standards is being carried out. According to ITE-Uzbekistan, in 2015, the ISO 9001 quality control system has been implemented on 28 national pharmaceutical enterprises. As of 2018, 12 of the 94 pharmaceutical manufacturers in Uzbekistan had Good Manufacturing Practice (GMP) certificates.

In most of the pharmaceutical industry, manufacturing

is limited to single formula medicines. There is still a lack of use of modern technology by pharmaceutical companies, which are still engaged in importing and packaging finished products.

Light industry

According to the State Committee on Statistics, in 2016, light industry accounted for 26.2 per cent of the total industrial volume of the country, 3.8 per cent of GDP and over 44 per cent of non-food consumer goods production. There has been around 18 per cent annual growth in the industry's output in recent years and 10 per cent growth in exports. More than 105,000 people are employed in the industry.

In recent years, the textile industry has seen dynamic development. According to the State Committee on Statistics, industrial production in the textile industry has seen steady growth and increased in value from 12,675 billion sum in 2014 to 31,262 billion sum in 2018.

As at 2018, more than 1,000 enterprises in the textile and garment and knitwear industry were operating as part of the Uztextileprom Association. Over 70 per cent of these have implemented quality management systems and ISO and other certification.

Uzbekistan, the world's sixth largest cotton producer, produced 2.3 million tons of raw cotton in 2018. Traditionally, cotton is Uzbekistan's most important cash crop. In recent years, however, the country has been taking serious steps to develop its textile industry to produce value-added products rather than exporting raw cotton.

According to the State Committee on Statistics, textile exports continued to grow rapidly in 2018, reaching a value of US\$1.6 billion, up by 41.4 per cent on the previous year.

Automotive industry

According to the State Committee on Statistics, in 2018, automotive industry output amounted to 44,697.3 billion sum, a 51.5 per cent increase on the previous year. The automotive industry produces passenger cars, trucks, buses, tractors and automobile engines.

Despite the increased output in 2018, automotive industry production does not meet domestic demand. The Government intends to make the automotive sector more competitive and diverse and has pledged to increase car production threefold in the period

2017–2021 (2017 Resolution of the President No. 3028).

Food industry

Food production in Uzbekistan decreased by 3.7 per cent in 2018 compared with 2017 and amounted to 30,263.6 billion sum in value terms, according to the State Committee on Statistics. The food industry's share in total industrial production decreased from 20 per cent in 2016 to 13.2 per cent in 2018. At the same time, growth was observed on many indicators in food production. In particular, the production of canned fruit and vegetables grew 10.8 per cent to 161,000 tons.

The Government measures in the sector aim to ensure structural reforms, modernization and production diversification, with a focus on four main areas: export supplies; establishment of 15 trade and logistics centres with a total capacity of 60 thousand tons; financial support worth US\$596 million for 180 investment projects; and packaging sector development.

15.3 Environmental pressures from industry

Air

According to the data provided by the SCEEP, there is no consistent trend in industrial air emissions since 2009. The highest increase was noted between 2014 and 2015, when emissions peaked at 222,900 tons; this was followed by a notable decrease in 2016 to 202,200 tons (table 15.2).

In 2017, the monitoring data showed continuous exceedance of emissions of nitrogen oxides, sulfur dioxide, carbon oxides, ammonia and dust (mainly by chemical industry, energy and construction industry enterprises) in Tashkent, Navoiy and Fergana Oblasts. The greatest exceedance of nitrogen oxide emissions was observed at the chemical industry enterprises Navoiyazot Public Joint State Company (PJSC),

AMMC PJSC, construction enterprises Bekabadcement PJSC, Kyzylkumcement JSC and NIES PJSC (table 15.3). Emissions of sulfur dioxide above the norms were noted at the enterprises of Bekabadcement PJSC, Almalykgishtchisi LLC, Hamkorkeramik LLC and AMMC PJSC. In addition, at the enterprises of Navoiyazot PJSC and Maxam-Chirchik JSC, the values of ammonia also exceeded the permissible amount. The energy enterprise Angrenskaya TPP, the construction industry, Akhangarancement JSC, AMMC PJSC, Bekabadcement JSC and Kuvasoycement JSC have also exceeded permissible emission levels for dust. High rates of carbon monoxide emissions were recorded at the refinery enterprise of the joint venture Zharkurgon Nefteikaishashash and at the construction industry enterprise Kyzylkumcement JSC.

These emissions are potential sources of health problems (e.g. respiratory diseases) for industrial workers and the population living near the enterprises, especially when they contain heavy metals (e.g. arsenic, cadmium, lead).

Many of the largest enterprises are carrying out modernization through investment in new technologies and devices to reduce air emissions from their facilities. Automated systems for emissions monitoring have also been installed by large enterprises, but these are not widespread.

Technological upgrading is still lagging behind in small and medium-sized enterprises (SMEs) that cannot afford the implementation of emissions reduction measures.

While significant progress was achieved to reduce gas flaring, 788 million m³ of gas was still flared in 2018 (table 12.8). Efforts to reduce gas flaring include the construction of the Kandym gas processing plant complex in Bukhara Oblast. In April 2018, the second line of the gas processing plant was launched. The plant is focused on the processing of sulfurous gases, which were previously flared.

Table 15.2: Air emissions from industry, 2009–2016, 1,000 tons

	2009	2010	2011	2012	2013	2014	2015	2016
SO ₂	95.9	108.6	113.0	111.1	118.3	152.9	147.2	123.6
NO ₂	9.8	9.5	8.1	8.3	7.8	9.0	9.4	11.2
NH ₃	12.6	12.1	2.3	2.3	2.2	2.1	2.0	2.0
TSP	61.9	53.5	53.6	84.5	52.7	46.6	61.7	63.3
NMVOG	2.6	2.8	2.7	2.4	2.6	2.2	2.6	2.1
Total	182.8	186.5	179.7	208.6	183.6	212.8	222.9	202.2

Source: State Committee on Ecology and Environmental Protection, 2019.

Water

For industrial and domestic needs, enterprises use groundwater sources and water from the municipal water supply networks. Water records are kept for each source, annual targets are established and programmes are being implemented to conserve water resources. Over 96 per cent of the water consumed is contained

in circulating systems used for cooling technical equipment and in air conditioning systems.

Water use by the industrial sector decreased between 2009 and 2017, from 834.5 million m³ to 709.6 million m³ (table 15.4). The industrial sector's share of total water use is negligible, accounting, on average, for 1.4 per cent in 2009–2017.

Table 15.3: Air emissions exceedances from industrial enterprises, 2013–2017, times

Enterprise	NO _x	SO ₂	NH ₃	CO	Dust
Navoiazot PJSC	1.3 (2013)		1.18–1.22 (2013)		
	1.23–2.46 (2014)		1.8 (2014)		
			1.2 (2015)		
AMMC PJSC	1.2–2.3 (2013)	1.2–3.3 (2013)			1.3–2.8 (2013)
	1.2–1.6 (2014)	1.3–2.0 (2014)			1.7–3.4 (2014)
	1.1–2.7 (2015)	1.9–7.7 (2015)			2.5–20.0 (2015)
		1.1–2.8 (2017)			2.7–10.6 (2017)
Bekabacement PJSC	1.7–2.8 (2014)	2.2–2.4 (2014)			1.2–15.6 (2013)
	1.3–2.2 (2015)	4.7–5.9 (2015)			1.2–1.6 (2014)
	1.5 (2017)				1.4–12.2 (2015)
					1.4 (2017)
Kyzylkumcement JSC	3.55–5.83 (2013)			2.36 (2013)	1.6–1.8 (2015)
NIES PJSC	1.81–4.27 (2013)				
Hamkorkeramik LLC		3.9 (2014)			
Maxam-Chirchik JSC			1.5 (2013)		
			1.4–2.31(2014)		
Angrenskaya TPP	1.1 (2013)	1.1–1.3 (2013)			1.4–1.8 (2013)
	1.3 (2015)	1.3 (2015)			4–1.9 (2014)
					1.3–6.1 (2015)
					2.2 (2017)
Akhangarancement JSC					1.3–6.4 (2013)
					1.8–16.3 (2014)
					1.4–4.7 (2015)
					1.1–3.0 (2017)
Kuvasoycement JSC					2.2 (2013)
					3.0 (2014)
					2.0–18.5 (2015)
					1.3–2.1 (2017)
Zharkurgon Nefteikaishashash				1.6 (2015)	

Source: State Committee on Ecology and Environmental Protection, Information Bulletin on Sources of Environmental Pollution and their Impact on the Environment 2013–2017.

Table 15.4: Water use by the industrial sector, 2009–2017, million m³

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total water use by all sectors	50 225.3	57 169.1	48 750.9	56 096.4	53 977.3	51 793.9	55 138.0	54 555.7	58 918.3
Of which:									
Industry	834.5	838.9	837.8	743.9	675.4	691.2	666.7	707.1	709.6
Industry's share of total water use (%)	1.70	1.50	1.70	1.30	1.30	1.30	1.20	1.30	1.20

Source: State Committee on Ecology and Environmental Protection, 2019.

In Uzbekistan, common types of water pollution are contamination from the chemical, oil, manufacturing and metallurgical industries. Many industrial enterprises do not have wastewater treatment facilities on their premises or do not carry out preliminary treatment. Industrial wastewater is often discharged directly into rivers or into urban sewerage systems by illegal connection. Municipal wastewater treatment plants (WWTPs) are mainly intended for the treatment of household wastewater, but the number of industrial enterprises not equipped with local WWTPs is growing, which leads to large amounts of highly polluted and toxic wastewater entering the municipal treatment plants – the proportion of industrial wastewater can reach 80–90 per cent. Monitoring of wastewater inlet and outlet indicators is not carried out systematically. Many enterprises do not have the necessary equipment installed to permit adequate monitoring. Often, laboratories are in poor condition and there is no equipment to perform the tests.

Regular controls, also covering wastewater discharges, are carried out by the territorial bodies of the Centre for Specialized Analytical Control on Environmental Protection under SCEEP at pollution sources of 119 enterprises. The list of enterprises is included in the “Programme for monitoring the sources of environmental pollution”. The results of such monitoring during the period 2013–2017 indicate low cleaning efficiency at a number of enterprises, in particular:

- Cleaning efficiency of WWTPs of up to 30 per cent in: Andijan and Asaka, ETZ Markhamat Kurgontepa Don, Andijonbalik, Krafteks JV, Best Tex Intern, Kurgan Tex, Shakhrikhan Sut, ANTEX Shakhrikhan and Andijan Cable (Andijan Oblast); and Urgench, Pitnak and Khiva, and JSC “Khonkadonmahsulotlari” (Khorezm Oblast);
- Cleaning efficiency of WWTPs of no more than 50 per cent in: Suu Kham Aqaba (City of Takhiatash) and UEMV Tuyamuyun Nukus (Republic of Karakalpakstan); Oktoshdon JSC (Samarkand Oblast); Sirdare IES JSC (Syrdarya Oblast); Almalyk WWTP, Urtachirchikparranda JSC, and first basin of Chirchik (Tashkent Oblast); Salarsky aeration plant, Bozsu aeration plant and Bektemirsky WWTP (Tashkent City); Kuvasay, Kokand and Buvaydinsky WWTPs (Fergana Oblast); and LLC Murruvat tex (Khorezm Oblast).

The main source of pollution of the Chirchik River is the Maxam-Chirchik JV plant, and of the Ahangaran River is AMMC. The discharged effluents into the Chirchik and Akhangaran Rivers, due to their insufficient purification, are characterized by

significant concentrations of nitrogen compounds, specific chemical ingredients and toxic metal ions.

Soil and land

In Uzbekistan, the mining industry occupies vast territories with quarries and waste dumps, which make a significant contribution to soil degradation. Overall, soils are severely degraded by mining activities, which remove large amounts of soil and vegetation for open pit mining. This also affects local habitats and causes loss of biodiversity and arable lands.

Mining tailings and other hazardous industrial waste have a significant impact on soil if effective prevention measures are not in place. Historically low levels of ore recovery in the non-ferrous mining industry is a major factor that contributes to the high volume of tailings accumulated in the country.

Nowadays, soil pollution with concentrations of pollutants beyond maximum allowable concentrations (MACs) occurs in the country’s industrial regions. The level of soil contamination with heavy metals is observed in the territories of industrial zones and in areas located in close proximity to industrial enterprises.

Since 2017, soil monitoring has been carried out in the areas where 104 objects are presenting a potential hazard of soil contamination: tailing dumps and sludge accumulators of large industrial enterprises, oil refineries and oil depots, large warehouses of mineral fertilizers and toxic chemicals, poisons burial sites and former agricultural airfields (chapter 4). According to the monitoring results for the period 2013–2017, on the territory of Akhangarancement JSC, the baseline lead content in soils has been exceeded by 4.6 times, and at the Angren TPP by 4 times. Around the AMMC tailing dump in Tashkent Oblast, the level of soil contamination with copper above the background content ranged from 6.8 to 10.3 times, while the chemical waste dumps of Ammophos JSC exceeded the background content by 2.3–8.2 times.

Soil pollution with oil products is constantly recorded in the territories adjacent to industrial enterprises associated with oil refining. In Bukhara Oblast, this is Gazelineftkazib-Chikarish enterprise, where the excess of oil products is observed at 12–20 times above the background content. In Kashkadarya Oblast, the Mubarakneftegaz enterprise is recorded at 105 times above the background content and, in the Karshi area, the Koson oil and gas production enterprise at 111 times above the background content.

The excess of petroleum products above the background content was observed around the branches of the UE “Gulistan petroleum depot” and “FĖTSH” in the Mirzaabad and Bayavut regions of Syrdarya Oblast by 55 and 65 times respectively.

The general lack of prevention measures to avoid soil pollution by heavy metals from tailings (old and current), such as the installation of a geomembrane, is an important issue for the country, as the costs of related environmental rehabilitation (soil recultivation using phytoamelioration methods, and reestablishment of the soil structure and its self-regulating capacity) are high. Besides, old metal tailings can be considered as ore deposits (if the ore grade is economically viable) to be exploited.

Waste

Energy facilities, and the mining and metallurgical, chemical and construction industries are the main sources of environmental pollution forming waste. Most industrial waste is generated and concentrated in Navoiy Oblast in the central, remote desert part of the country and around the cities of Tashkent, Almalyk and Chirchik. Historic legacies include the abandoned uranium mining sites in Charkesar and Yangiabad.

Approximately 100 million m³ of industrial waste is generated in the country annually (table 10.5), of which 14 per cent is classified as toxic, and about 68 per cent is mining waste. A significant amount of waste is generated in the chemical industry. The chemical industry is a source of toxic waste, such as phosphogypsum, lignin, manganese sludge and sulfur. The volume of phosphogypsum alone is about 70 million tons per year and lignin accounts for 15 million tons per year. As at 2018, accurate statistics for the annual generation of industrial waste were not available. Only 0.2 per cent of the solid industrial waste generated is used as secondary raw materials.

About 10,000 hectares of land are currently used for storage of industrial waste. A landfill site for the burial of toxic wastes has recently been built at the processing plant of DzhiEmUzbekistan JSC. In 2019–2020, a landfill site is scheduled for construction at the Jizakh Accumulator Plant LLC.

Due to the insufficient number of landfills for storage and disposal of industrial waste, there is a widespread practice of dumping in unauthorized places, which is particularly dangerous for the environment.

In recent years, several mining and chemical enterprises have shifted to technologies that allow

more efficient extraction and production, generate less hazardous waste and reuse more of the waste.

Environmental hazards from the legacy of uranium mining persist (chapters 6 and 10).

Ecosystems and biodiversity

Habitat disturbance in connection with engineering and industrial activity is caused by the construction of industrial facilities and their associated infrastructure, the development and mining of mineral resources and the construction works. As at 2018, land occupied by industry and used for other special needs accounted for 1.91 per cent of the total area of the country.

The oil and gas industry is one of the actively developing economic sectors in Uzbekistan. In territorial terms, this activity covers mainly the Ustyurt Plateau and the region of the delta of the Amu Darya River. Separate types of activities, in particular those connected with the construction of the main infrastructure, such as pipes and roads, have a significant impact on migratory routes of saiga antelopes and vulnerable arid ecosystems. Other industrial sectors that negatively affect natural habitats include the chemical, mining and energy industries.

Industrial activities have severely affected the ecosystems in the country, notably in the localities where industrial operations occur. Pressures on the country’s biodiversity, such as loss of habitats with the degradation of soil, forests and water resources, have increased in the last decade as industrial activities have intensified. Despite periodic environmental inspections of mining industry facilities and the availability of various other data that are sufficient for the maintenance of cadastres, full information on industry’s impacts on the condition of populations of endemic and rare plant species is not available.

In the absence of such information, the impacts of large industrial enterprises on biodiversity are not addressed in Uzbekistan. The concept of biodiversity offsetting is currently not applied. Moreover, the economic value of biodiversity and benefits from its use are not properly streamlined into decision-making, including in industrial production sectors.

Climate change

The main climate change impacts related to industrial activities in Uzbekistan include:

- Emissions of GHGs from industrial processes;
- Water resources consumption, use and discharge, which can affect river flows and be a direct source

of surface water pollution and salinization of internal water bodies.

In 2012, the industrial processes and waste sectors accounted for 3.8 per cent and 3.7 per cent of anthropogenic GHG emissions respectively.

The industrial processes sector includes GHG emissions resulting from:

- Processing and use of mineral raw materials (production of cement and lime, and the use of soda);
- Activities of chemical enterprises (production of nitric acid, ammonia, methanol and polyethylene);
- Metal (steel) production;
- Consumption of hydrofluorocarbons (HFCs).

The largest source is the chemical industry; its contribution to sectoral GHG emissions in CO₂-eq. in 2012 was 46 per cent (figure 7.4). The next most important source of emissions was the production and use of mineral products, which accounted for 38 per cent. For the period 1990–2012, the contribution of emissions from the chemical industry decreased by 5 per cent, while that from the production of metals increased by 4 per cent. Carbon dioxide dominates in the total emissions of the sector, accounting for 76 per cent (table 15.5). The main sources of CO₂ emissions are cement clinker, ammonia and steel.

Implementation of projects under the Clean Development Mechanism (CDM) at three enterprises, Navoiyazot PJSC, Ferganaazot PJSC and Maxam-Chirchik PJSC, has significantly reduced emissions of nitrous oxide.

Noise and vibration

Information is not available on noise and vibration from industrial activities.

Health

Industrial air emissions, wastewater discharges and soil pollution by industry can negatively affect human health in communities where the operations occur, and sometimes farther afield. Health impacts mostly include respiratory diseases due to air pollution. Contaminated water (heavy metals, phenols, radionuclides), if used as drinking water or for recreational purposes, is a source of health problems such as cancer, typhoid fever, stomach sickness, poor development of the nervous system, etc. Similarly, polluted soils (by heavy metals and other toxic substances) can contaminate food, which is later consumed by humans, affecting their health. No information is available on health problems in communities in the vicinity of major industrial enterprises.

Uzbekistan has an estimated 30,000 illegal gold miners. Artisanal and small-scale mining can be the source of the large releases of mercury that can have serious health impacts. Detailed information is not available in Uzbekistan to evaluate health impacts from illegal gold mining activities. Despite this activity potentially having negative effects upon the “legal” goldmining activity in the country, no actual work in this area is being carried out. This is because the largest gold producers are not interested in developing the type of deposits the illegal miners are extracting.

According to the State Committee on Statistics, in 2018, 27 per cent of all male workers and 16.3 per cent of all female workers were working in conditions that did not meet sanitary and hygiene standards (chapter 17). These high values are a matter of concern.

Table 15.5: GHG emissions in the industrial processes sector, 1,000 t CO₂-eq.

	Gas	1990	1995	2000	2005	2010	2012	2012 (%)
Production and use of mineral products	CO ₂	3 007	1 765	1 633	2 406	3 127	2 965	37.88
Chemical industry	CO ₂	2 272	1 445	1 292	1 396	1 762	1 783	22.78
Chemical industry	N ₂ O	1 782	1 457	1 287	1 479	1 789	1 783	22.78
Metal production	CO ₂	998	587	665	972	1 170	1 200	15.33
Other production	CH ₄	-	-	-	3	3	3	0.04
Hydrofluorocarbons consumption	HFCs	-	-	6	12	22	94	1.20
Total		8 059	5 254	4 883	6 268	7 873	7 828	100.00

Source: GHG Inventory for the period 1990–2012, 2016.

15.4 Measures towards the greening of industry

Energy efficiency in industry

Uzbekistan's industrial sector is characterized by high energy intensity (chapter 12). According to the International Energy Agency, energy consumption by the industrial sector at the end of 2015 made up half of the total final energy consumption (50 per cent, or 19.141 Mtoe). Mining, chemicals, oil and gas, electricity and the production of construction materials are among Uzbekistan's most energy-intensive industries.

The reduction of energy intensity is considered a priority to ensure the competitiveness of industry.

In 2010, the World Bank piloted a new financial approach through its Energy Efficiency Facility for Industrial Enterprises Project, which provided financing for 32 strategic enterprises to pilot 81 subprojects in Uzbekistan. As a result, AMMC has installed a new 6-kV frequency converter and retrofitted compressor stations at a zinc- and copper-smelting workshop – improvements that led to savings of 12.5 million kWt/h of electric power in 2015. Maksam-Chirchik JSC, which produces agricultural fertilizers, has introduced a natural-gas-fired heater, which has reduced the emission of harmful substances and lowered the temperature of flue gases emitted into the atmosphere.

Phases 1 and 2 of the Energy Efficiency Facility for Industrial Enterprises Project, approved in 2010 and 2013 respectively, supported the introduction of dedicated credit lines for investment in improving industrial energy efficiency. By the end of 2017, these investments had resulted in energy savings equivalent to 360 GWh per year over the lifespans of the modernized equipment or facilities, and more than 580,000 tons of CO₂ emissions per year avoided.

Phase 3 of the Project will continue to finance energy-saving investments in both large industrial enterprises and industrial SMEs, and support energy efficiency capacity development through targeted technical assistance. It is expected that investments under Phase 3 will generate an additional 386 GWh of annual energy savings and help avoid an additional 799,000 tons of annual CO₂ emissions.

Within the Government and the industrial sector, there is broad agreement on the importance of reducing energy use by modernizing industry and reducing energy losses. However, there is insufficient awareness about energy conservation beyond the core group of Uzbek business leaders.

Corporate social responsibility and health and safety management

There is no legislation on corporate social responsibility (CSR) in Uzbekistan, and the concept has not been widely adopted, though many companies are active in charity activities, either on their own initiative or at the direction of local government officials.

CSR in Uzbekistan is implemented by companies in various industries, from mobile phone operators to the construction and pharmaceutical industries. Industries' concerns about the development and well-being of local communities where they operate have improved during recent years. Several companies, such as cement and copper mining companies, are implementing CSR and health and safety management.

Certification

In recent years, measures have also been taken to stimulate enterprises introducing and certifying quality management systems that are consistent with international standards. Current legislation provides certain benefits and preferences for enterprises that have implemented and certified quality management systems. Such businesses are granted certain tax privileges as well as advantages during tender bidding for the purchase of products.

According to Uzstandard, as at 1 January 2018, 15.4 per cent of existing standards in the country are harmonized with international requirements. The Government has set itself the task, in the period 2018–2028, of bringing the level of harmonization to 75 per cent. The adoption and implementation of more than 2,000 international standards in all sectors in the period 2017–2021 is planned. As part of this programme, in 2017, enterprises and business associations adopted and implemented 647 international standards, including: 111 standards for the mining and metallurgical industry, 55 for electrical engineering, 44 for light industry, 42 for the food and chemical industry, 41 for oil and gas, and 26 for the construction industry. As of 1 January 2018, 6,457 enterprises in Uzbekistan implemented quality management systems and were issued 6,632 certificates, including:

- 6,180 certificates for compliance with international standard ISO 9001: 2008;
- 64 certificates for compliance with the international standard of the environmental management system ISO 14001: 2004;

- 83 certificates for compliance with the international standard of the occupational health and safety management system OHSAS 18001: 2007;
- 129 certificates for compliance with the international standard of the food safety management system ISO 22000: 2005 - QMS;
- 41 certificates for compliance with the requirements of the international standard for quality management in the automotive industry and enterprises supplying the relevant component parts of ISO 16949;
- 12 certificates for compliance with the requirements of the international standard Good Manufacturing Practice;
- 35 certificates of compliance with the requirements of the international standard of the energy management system ISO 50001;
- 88 certificates of Integrated Management Systems.

According to Uzstandard, as at 1 January 2018, the total number of enterprises that have introduced and certified management systems is dominated by the food (2,084 units), light (1,152 units), construction (778 units) and chemical and petrochemical (580) industries. An example of measures introducing and certifying quality management systems at Akhangaran cement plant is presented in box 15.1.

Green technologies and cleaner production

The Green Ecology Technologies Central Asia Business Forum – GETCA–2018 was held for the first time in Uzbekistan in June 2018, within the framework of the Central Asian International Environmental Forum. It has provided a platform for exchanging experience in improving the environment and sustainable development of the region, attracting attention and technical assistance of the international

community to solve the most pressing problems in the countries of Central Asia and attract investment and clean technologies to the development of the national economies.

At present, the mechanisms to facilitate the introduction of green technologies in all branches of industry, such as financial incentives, are still lacking. Another barrier to the shift to green technologies is the generally limited access of SMEs to financing.

The establishment of a Green Economy Financing Facility (GEFF) in Uzbekistan in 2018 is expected to help address high levels of energy and carbon intensity through the scaling-up of investments in green technologies.

Labelling

The 2018 Resolution of the President No. 4042 “On measures to introduce modern methods of labelling certain types of goods” introduces measures in the field of consumer protection, including the purchase of products of good quality, safe for life and health, as well as obtaining information about products and their manufacturers. As of 1 August 2019, Uzbekistan will gradually introduce mandatory labelling of imported and locally manufactured goods using a protected label and (or) nano-molecular technology, depending on the category of goods.

However, the application of specific product standards to ensure that the products are designed and manufactured in such a way as to achieve the requirements for waste prevention (e.g. minimizing waste volume/weight), are still lacking in the legislation. Furthermore, measures are not in place for the reuse of waste, or for training and campaigns for raising public awareness on reuse, labelling and marking, such as reuse labels, for example.

Box 15.1: Akhangaran cement plant

Akhangaran cement plant is one of the leading enterprises of the cement industry in Uzbekistan. It ranks second in the country's cement industry in terms of production. It is located in the industrial zone of Akhangaran District of Tashkent Oblast. The design capacity of the plant is 2,180,000 tons of cement per year.

At each stage of production, from the extraction of raw materials to the shipment of finished products to the final consumer, strict quality control is carried out. In 2010, the company passed a certification audit of the quality management system in the National Certification System according to the O'z DSt ISO 9001 standard, as well as the international standard DIN EN ISO 9001: 2008.

In 2013, the company received EMS certifications according to the O'z DSt ISO 14001 standard and the occupational health and safety management systems according to the O'z DSt OHSAS 18001 standard.

In 2019, the company is working on the introduction of investments in the project for the construction of a new technological line to produce cement in an energy-efficient and environmentally friendly manner using a dry method with a capacity of 6,000 tons of clinker per day.

Reduction of major industrial accident risks

Competent authorities have developed and implemented policies on industrial safety concerning hazardous production facilities in the mining industry, including coal mining, and the metallurgy, oil and gas, petrochemical and chemical industries, geological exploration, boiler facilities, trunk pipelines and blasting. During recent years, measures to prevent major industrial accidents and reduce risks have been strengthened. These measures relate mainly to supervision over compliance with industrial safety requirements by hazardous production facilities and organizations operating hazardous technical devices, and accident investigations, together with relevant state bodies and emergency training at hazardous production facilities.

Measures implemented by the industrial sector to manage chemicals safely include:

- Establishment of factory committees on safe handling of chemicals at the enterprises using chemical substances;
- Development of Kst 15359652-10319: 2013 standard “Chemical handling control”;
- Introduction of a material safety data sheet (MSDS) and safe use instructions (SUI);
- Supply of the storage and handling facilities with chemical spill response kits;
- Organization of annual training for emergency situations involving chemical spills.

Industry-relevant targets

The 2015 Resolution of the Cabinet of Ministers No. 8 “On additional measures to reduce production expenditures in industry and reduce net costs of products in industry” established mandatory levels of energy savings for 27 industrial enterprises. Each large enterprise was assigned a target. This made it possible to reduce the existing energy consumption to produce a unit of production in 2015 by 17 per cent for natural gas and 14 per cent for electricity.

The 2017 Programme of Measures for Further Development of Renewable Energy, Increase of Energy Efficiency in Economic Sectors and the Social Sector for the period 2017–2021 set further targets for enterprises to reduce their consumption of energy resources (natural gas, electricity, petroleum products) for the production of goods by 37.4 per cent by 2021.

There are currently no targets and indicators specified for industrial waste.

15.5 Legal, policy and institutional framework*Legal framework*

The 2002 edition of the 1994 Law on Subsoil provides the fundamental legal framework governing exploration and development of all subsoil resources, including minerals and oil and gas. The Law provides for state licensing and control, rights and obligations, basic rules regarding efficient use of resources, types of subsoil use, duration of subsoil use and other matters.

The 1996 Law on Ambient Air Protection regulates the activities of enterprises related to emissions of pollutants. It stipulates that enterprises and organizations are obliged to save fuel and energy resources by introducing energy-saving technologies and alternative energy sources, thereby reducing GHG emissions.

The 1997 Law on Rational Use of Energy provides for state control over compliance with the indicators of energy efficiency and energy quality established by regulatory documents, revised every five years. It determines the conditions for conducting mandatory energy audits at enterprises with a total annual energy consumption of more than 2,000 tons of coal equivalent. Enterprises and organizations can be given preferential tariffs when energy costs are reduced against the established standards or when products have lower energy intensity than the established standard. The Law provides for the administrative liability of individuals and legal entities for the irrational use of energy.

The 2002 Law on Waste defines the obligations of legal entities and individuals to ensure the collection, proper storage and prevention of the destruction and damage of wastes of resource value. The Law obliges waste owners to take measures for the development and implementation of waste management technologies.

The 2006 Law on Industrial Safety of Hazardous Production Facilities stipulates requirements for handling hazardous substances assigned to hazard classes, explosives, and industrial wastes containing substances in concentrations that are hazardous to human health and the environment.

The 2000 Law on Ecological Expertise regulates environmental assessment in order to prevent potential adverse impacts of economic and other activity on the environment and the lives and health of the population. The Law requires subsoil users, prior to financing construction works on mining projects, to

obtain a SEE conclusion as to compliance of the intended activity with ecological requirements. The SEE requirements are focused on emissions and discharge of polluting substances, and waste; however, they poorly reflect specific issues related to impacts on biodiversity.

The 2019 Resolution of the President No. 4124 requests major mining companies to (box 2.1):

- Implement a corporate disclosure process in accordance with the principles and requirements of the International Standards of Accounting and Reporting (ISAR);
- Publish reports on the economic, social and ecological issues in accordance with the Global Reporting Initiative (GRI).

Policy framework

Programme of Actions on Environmental Protection for the period 2013–2017

The Programme of Actions on Environmental Protection for the period 2013–2017 (2013 Resolution of the Cabinet of Ministers No. 142) provides for a number of industry-relevant directions:

- Greening of economic sectors, improvement of technological processes and environmental activities;
- Introduction of environmentally sound low-waste technologies in the mining and metallurgical industry, modernization of the existing technology of sulfur production at gas and chemical enterprises by the method of direct oxidation; construction of an associated gas utilization facility at oil and gas production facilities;
- Prevention and elimination of the harmful effects of industrial and household waste on the environment; reclamation of disturbed lands; rehabilitation of burial grounds and landfills with toxic waste; improvement of the ecological situation in the territories of the former uranium mines;
- Improvement of the ecological situation on the territory of the former mines of Namangan and Tashkent Oblasts; rehabilitation of tailings with toxic waste at mining and metallurgical facilities; reclamation of disturbed lands at the facilities of the mining and metallurgical industry in the Navoiy and Bukhara Oblasts and their return to use.

According to the findings of the 2018 Report of the Chairman of SCEEP on implementation of the

Programme, the implementation of a number of projects (in particular, WWTPs) faced delays.

Programme of Measures to Ensure Structural Reforms, Modernization and Diversification of Production for the period 2015–2019

The Programme of Measures (2015 Decree of the President No. 4707) covers 846 investment projects worth US\$40.8 billion. It is expected that the share of industry in the country's GDP will increase from 23.3 per cent in 2015 to 27 per cent in 2020. The consistent modernization of existing facilities and the creation of new power-generating facilities is expected, based on the introduction of resource-saving and modern combined-cycle plants with solar technologies.

Programme of Measures for Further Development of Renewable Energy, Increase of Energy Efficiency in Economic Sectors and the Social Sector for the period 2017–2021

The Programme of Measures (2017 Resolution of the President No. 3012) sets out the target parameters of reducing energy intensity in the sectors of the economy in the period 2017–2021. In the framework of this Programme, a percentage reduction in the consumption of fuel and energy resources (natural gas, electricity, petroleum products) for the production of goods and services was apportioned to specific industrial enterprises, with a total planned energy consumption reduction of 37.4 per cent by 2021. These targets are planned to be met through further modernization, technical and technological re-equipment of existing production facilities, establishment of new production facilities based on modern energy-efficient technologies, and wider utilization of RES, while also promising tax benefits to entities producing energy from alternative sources.

Implementation in the industrial sector has been slow, but the shift to green technologies has recently started.

Policy documents on chemical industry

The Programme for Chemical Industry Development for the period 2017–2021 (2017 Resolution of the President No. 3236, no longer in force) stipulated investment of US\$3.093 billion and featured 43 projects for the construction of new facilities and modernization and reconstruction of existing facilities. However, the Programme did not propose environmental safeguards to reduce negative environmental impacts of related industrial projects.

Its successor, the Programme for Chemical Industry Development for the period 2019–2030 (2019

Resolution of the President No. 4265), includes a revised list of 31 projects. Planned measures include the development of disposal of used vehicle tyres.

Programme of Measures for Further Development of the Textile, Garment and Knitwear Industry

Based on the importance of the textile industry for the economic development of the country, Uzbekistan is implementing the Programme of Measures for Further Development of the Textile and Knitwear Industry for the period 2017–2019 (2016 Resolution of the President No. 2687). The Programme aims to increase the processing of raw cotton and silk and provides tax incentives to enterprises in these fields. The Programme does not provide for any environment-related clauses.

Concept on Environmental Protection until 2030

The Concept on Environmental Protection until 2030 (2019 Decree of the President No. 5863) includes a section on industrial waste and prevention of negative impacts of industrial waste on population health and the environment (chapter 10).

Sustainable Development Goals and targets relevant to this chapter

The current stand of Uzbekistan vis-à-vis targets 8.2, 9.2 and 9.4 of the 2030 Agenda for Sustainable Development is described in box 15.2.

Institutional framework

Ministry of Economy and Industry

In early 2019, the Ministry of Economy was transformed into the Ministry of Economy and Industry. Among other tasks (chapter 1), the Ministry is mandated to develop strategies for the country's industry based on the effective use of the existing natural and economic resources of the regions of Uzbekistan.

State Committee on Ecology and Environmental Protection

The State Committee on Ecology and Environmental Protection (SCEEP) is the state governing body on ecology, environmental protection and the rational use and restoration of natural resources. One of its new tasks is the organization of an effective collection system for the transportation, processing, recycling

and disposal of municipal solid waste.

SCEEP has a responsibility to conduct environmental inspections of specified enterprises and organizations. Since 1 January 2017, all types of non-scheduled inspections of industrial enterprises have been cancelled. Several other measures have been taken to reduce the number of inspections (chapter 2). Although the Government's policies aiming at reduction of the administrative burden on business may lead to the improvement of general business-enabling conditions, such excessive deregulation may, in turn, aggravate the existing environmental pollution caused by industrial enterprises.

State Committee on Geology and Mineral Resources

The State Committee on Geology and Mineral Resources is the state governing body in the field of geological survey and the use and protection of subsoil resources. Its tasks include the promotion of measures to modernize geology through accelerated implementation of modern and high-performance geological prospecting equipment, advanced technology and innovation.

State Committee on Industrial Safety

The State Committee on Industrial Safety (Goskomprombez) was formed in 2018 on the basis of the former State Inspection for Surveillance on Geological Exploration of Subsoils, Safety in Industry, Mining and Utilities Sector that was under the Cabinet of Ministers (2018 Decree of the President No. 5594).

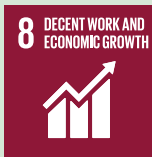
The State Committee will be the responsible authority in the field of radiation and nuclear safety at nuclear power facilities and nuclear technologies, as well as for industrial safety at hazardous production facilities. Its main tasks are supervision and control over compliance with industrial, radiation and nuclear safety legislation, contribution to the development of strategic plans and programmes for the development of the oil and energy sector and basic industries, and licensing in the use of atomic energy.

Chamber of Commerce and Industry

The Chamber of Commerce and Industry focuses on protecting the rights of business entities, improving the business environment and investment climate, assisting entrepreneurship, interacting with government bodies, training entrepreneurs and personnel, foreign economic activities and attracting investment.

Box 15.2: Targets 8.2, 9.2 and 9.4 of the 2030 Agenda for Sustainable Development

Global targets 8.2, 9.2 and 9.4 and their indicators were adopted by Uzbekistan as national targets and indicators without changes.



Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Target 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value-added and labour-intensive sectors

The main policy directions in Uzbekistan include the development and diversification of the national economy. The sustained growth of GDP and industrial production during recent years, combined with the rapid development of manufacturing industry and increased value-added production, show that Uzbekistan is setting up a framework that will allow the achievement of higher levels of productivity in the near future, contributing to the effective implementation of target 8.2. This progress is mostly due to the higher effectiveness and innovation in priority subsectors, the promotion of SMEs and an increase in employment.



Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Target 9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

In terms of raising industry's share of employment, as required in target 9.2, indicator 9.2.1 (Manufacturing value added as a proportion of GDP and per capita) has been assessed. Industry accounted for 23.3 per cent of GDP in 2018. The two largest industrial sectors are mining and manufacturing. The manufacturing sector's share of GDP has grown during the last decade, accounting for 15.5 per cent of GDP in 2018. The Government expects a steady increase in production in many branches of manufacturing industry in the next few years as a result of the Programme of Measures to Ensure Structural Reforms, Modernization and Diversification of Production for the period 2015–2019. The mining industry plays an important role in the country's economy, accounting for 6 per cent of GDP. Crude oil, coal and gas production accounted for 11.2 per cent of total industrial output in 2018.

The employed population was estimated at 13.5 million people in 2017, including 83,500 in the mining industry and 1.82 million in manufacturing industry. Thus, indicator 9.2.2 (Manufacturing employment as a proportion of total employment) shows that the country's manufacturing share of total employment accounts for 13.4 per cent of the employed population. The mining industry accounts for 0.61 per cent of the employed population.

Target 9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

The Programme of Measures to Reduce Energy Intensity, Introduce Energy-saving Technologies in Economic Sectors and the Social Sector for 2015–2019 and the Programme of Measures for Further Development of Renewable Energy, Increase of Energy Efficiency in Economic Sectors and the Social Sector for the period 2017–2021, have been steering the country to shift to green technologies, with higher resource-use efficiency and lower emissions from industrial processes. The programmes set ambitious targets to significantly increase energy efficiency in all sectors of the economy. Targeted parameters were set for reducing the energy intensity of production in the core sectors of the economy for the period 2017–2021, setting the projected reduction in specific energy consumption rates for 25 large industrial enterprises and organizations.

Uzbekistan also established the Green Economy Financing Facility in 2018, which aims to address high levels of energy and carbon intensity in Uzbekistan through: (i) scaling up investments in green technologies; (ii) demonstrating the commercial viability of investments in energy efficiency; and (iii) encouraging Uzbekistan's transition to a green economy.

In the period 2011–2017, the Chamber of Commerce and Industry has supported implementation of a number of projects with a focus on the greening of industry, including projects on improving energy efficiency and facilitating renewable energy deployment. However, the main impetus of activities of the Chamber of Commerce and Industry has recently been on addressing the issue of youth unemployment.

Centre for Advanced Technologies

In 2018, the Centre for Advanced Technologies under the Ministry of Innovation Development was created to support high-tech enterprises and the introduction of innovative ideas, technologies and projects, based on the SUE “Educational and Experimental Centre for High Technologies”.

The 2018 Resolution of the President No. 3983 “On measures for accelerated development of the chemical industry” provides for the establishment of the Centre for Chemical Technologies, a research and design institution, in cooperation with the Korea Research Institute of Chemical Technology.

Participation in international agreements and processes

Convention on the Transboundary Effects of Industrial Accidents

Although, Uzbekistan is not a party to the ECE Convention on the Transboundary Effects of Industrial Accidents, it is a beneficiary of the Convention’s Assistance and Cooperation Programme and has made a high-level commitment to implement the Convention.

Along with four other countries of the subregion, Uzbekistan is a beneficiary of the ECE Project on Strengthening Industrial Safety in Central Asia (2016–2019). In the framework of the Project, in 2018, the country prepared and finalized its updated self-assessment (following the submission of the previous one in 2013), which included clear analysis of the level of implementation of the Convention under the six working areas (identification of hazardous activities; notification of hazardous activities; prevention; preparedness; response and mutual assistance; information and public participation) and identification of challenges faced in each of these areas. Furthermore, Uzbekistan prepared and finalized its updated national action plan (following the submission of the previous one in 2013), setting out actions for those working areas in which the country faces challenges, with clear identification of the authorities responsible and timing foreseen for their implementation. These steps make the country better prepared to accede to the Convention.

Extractive Industries Transparency Initiative

As at 2019, Uzbekistan has not enacted any laws enforcing provisions of the Extractive Industries Transparency Initiative (EITI) standard. This may be explained by an absence of both the internal and external forces promoting the EITI, i.e. the country’s motivation and capacity to join the Initiative, and pressure to do so from international donors or organizations.

15.6 Assessment, conclusions and recommendations

Assessment

The mining and manufacturing industries continue to play an important role in the national economy, being the main drivers of economic growth. During recent years, Uzbekistan has made efforts to diversify its economy through the development of non-resource-based sectors. Nevertheless, the mining industries still account for a significant share of value added and the bulk of exports and foreign investment. Developing a modern approach to the mining sector that can minimize environmental and health impacts while maximizing social and economic benefits can be an opportunity to introduce new, environmentally sensitive practices that can have positive impacts on other, related areas of the economy and ensure that the environmental impact of the mining sector is reduced.

Target 9.2 of the 2030 Agenda for Sustainable Development, on inclusive and sustainable industrialization, is pursued by Uzbekistan through developing manufacturing industry, introducing modernization and innovation and increasing the manufacturing of higher-value-added products. To this end, the Government has adopted several programmes and plans. On the one hand, it has improved modernization and innovation in industry, particularly in manufacturing, during recent years. On the other hand, the lack of environmental, health and safety and social responsibility management objectives lessens their contribution to the well-being of communities that face the negative impacts of industrial operations. Furthermore, programmes on industry development do not systematically include environmental safeguards to reduce the negative environmental impacts of the proposed related industrial projects. This points to a need for a more harmonized approach to the industrial sector, development of which inherently touches upon a number of cross-cutting environmental issues. This need for greater efforts on streamlining environmental considerations into industry sector development should be recognized by the Government whenever mining, manufacturing or large infrastructure investments are planned.

Conclusions and recommendations

The greening of industry

In recent years, Uzbekistan has made strides in the greening of industry, where several mining and chemical enterprises have shifted to technologies that allow more efficient extraction and production, generate less hazardous waste and reuse more of the

waste. Many of the large enterprises are carrying out modernization through investment in new technologies and devices to reduce air emissions from their facilities, making the country better prepared to achieve target 9.4 of the 2030 Agenda for Sustainable Development. Nevertheless, technological developments are still lagging behind in SMEs that cannot afford to implement emissions reduction measures.

Recommendation 15.1:

In order to support the introduction of green technologies in industry, the Cabinet of Ministers should:

- (a) *Create economic and financial incentives for industrial enterprises to move towards green technology;*
- (b) *Foster the creation of small and medium-sized enterprises and start-ups focused on green technology.*

Industrial waste management

Currently, there is no strategy or programme for industrial waste management that includes specific targets and indicators, although some aspects of industrial waste management were reflected in the Concept on Environmental Protection until 2030, adopted in October 2019. In addition, due to the insufficient number of landfills for storage of industrial waste, there is a practice of using unauthorized dumpsites, which are particularly dangerous for the environment. The application of standards to achieve requirements for waste prevention (e.g. minimizing waste volume/weight) are still lacking in the legislation. Measures are not in place for the reuse of industrial waste as a secondary raw material.

There is also a lack of measures to compel manufacturers to design their products in an environmentally sound manner in order to reduce waste and environmental impacts.

Many industrial enterprises do not have wastewater treatment facilities on their premises or do not carry out preliminary treatment. Industrial wastewater is often discharged directly into rivers or urban sewerage systems.

Recommendation 15.2:

The Cabinet of Ministers should:

- (a) *Develop and adopt legislation and policies on the management of industrial waste, setting out specific targets and indicators for*

- industrial waste reduction and reuse;*
- (b) *Elaborate appropriate standards for wastewater treatment facilities in industrial enterprises and facilitate installation of such facilities by creating incentives for investments in wastewater treatment and ensuring the financial viability of modern wastewater treatment plants.*

Statistical data on impacts from industrial activities

There are no data available on the annual waste generation from specific industrial sectors. Neither are estimates available on industrial wastewater discharges. Limited or no quantitative information is available on the land uptake and degradation by industrial enterprises.

Recommendation 15.3:

The State Committee on Statistics, in cooperation with the Ministry of Economy and Industry and the State Committee on Ecology and Environmental Protection, should ensure regular collection of environment-related data from industrial enterprises and the publication of such data.

Environmental safeguards of industrial development

To achieve economic growth, Uzbekistan intensively uses its natural resources, including biodiversity and ecosystem services. Recently adopted programmes on the development of specific industrial sectors do not include environmental safeguards to reduce negative environmental impacts of the proposed related industrial projects; therefore, little information is available on the potential pressures that they may place on the environment.

Recommendation 15.4:

The Cabinet of Ministers should assess the impact of industrial activities on the environment and ensure that new programmes on industrial development contain information on environmental safeguards to reduce negative environmental impacts of the proposed industrial projects.

Convention on the Transboundary Effects of Industrial Accidents

Uzbekistan is not a party to the ECE Convention on the Transboundary Effects of Industrial Accidents. The ECE Project on Strengthening Industrial Safety in Central Asia (2016–2019) provided support to Uzbekistan in enhancing industrial safety and, thus, protecting human health and the environment. The

country prepared and finalized its updated self-assessment, and an updated national action plan, in 2018.

Recommendation 15.5:

The Cabinet of Ministers should:

- (a) *Approve and proceed with the implementation of the National Action Plan for the implementation of priority actions identified based on results of Uzbekistan's self-assessment of progress towards accession to the Convention on the Transboundary Effects of Industrial Accidents;*
- (b) *Consider accession to the Convention to fully enjoy its benefits and enhanced level of prevention of and preparedness for industrial accidents with potential transboundary effects;*
- (c) *Identify hazardous activities that may cause accidents with potential transboundary effects and subsequently notify its neighbours of such activities.*

Extractive Industries Transparency Initiative

As at 2018, Uzbekistan has not enacted any legislation applying provisions of the Extractive Industries Transparency Initiative (EITI) standard. A country's participation in the EITI increases the investment attractiveness of its mining industry.

Recommendation 15.6:

The Cabinet of Ministers should develop and enact legislation to ensure implementation of the Extractive Industries Transparency Initiative (EITI) standard.

Corporate social responsibility

There is no legislation on CSR in Uzbekistan, and the concept has not been widely adopted.

Recommendation 15.7:

The Cabinet of Ministers should develop and adopt legislation on corporate social responsibility.

HUMAN SETTLEMENTS AND THE ENVIRONMENT

16.1 Overview

Population and urbanization

The population of Uzbekistan grew by 14.36 per cent in the last decade, from 28.56 million in 2010 to 32.66 million in 2018. Of a total of 32,656,700 inhabitants, 16,532,700 lived in urban areas and 16,124,000 in rural areas in 2018 (table 16.1). Oblasts with a predominantly urban population are Andijan, Namangan and Fergana.

In 2018, the average population density is 72.7 inhabitants per km², with Tashkent City reaching 7,380 per km² and Navoiy Oblast just 8.6 per km² (table 16.2).

As at March 2019, Uzbekistan has 123 urban settlements, 1,071 urban-type villages and around 12,000 rural villages. In 2019, about 50.5 per cent of the population lives in cities and about 49.5 per cent in rural areas, including those living in rural settlements. In 2012, 64 per cent of the population lived in rural areas and the remaining 36 per cent in urban areas.

Medium-sized cities with a population of 50,000–100,000 people play a crucial role in Uzbekistan's economic development. More than 40 per cent of the country's urban population live in cities with a population of fewer than 100,000 inhabitants.

Land use

Actual land use and the official land use categories differ. In 2018, the total land fund was about 44.90 million ha. Of this, 57.06 per cent was actually used as agricultural land (table 16.3).

Distribution of the land fund by land use categories is shown in figure 16.1 and table 16.4. Over the past decades, a clear trend towards a decrease in the category "agricultural land" can be observed (from 72.76 per cent in 1990 to 45.13 per cent in 2018), along with a considerable increase in the categories of "forest fund lands" (from 5.50 per cent in 1990 to 24.84 per cent in 2018) and "reserve lands" (from 15.92 per cent in 1990 to 24.16 per cent in 2018). The high share of "reserve lands" indicates a large potential for developing new protected areas and designation of ecological corridors in the country (chapter 11).

Spatial planning and housing development

Spatial planning, since independence in 1991 and until recent times, basically maintained the Soviet planning framework, with urban development plans (known as "general plans") elaborated at the national level in a highly centralized way with very little public participation. General plan documents are still considered and treated as a confidential matter and are therefore not public.

Table 16.1: Urban and rural population as at 1 January 2018, number

	Total	Urban	Rural
Total	32 656 700	16 532 700	16 124 000
Republic of Karakalpakstan	1 842 300	905 500	936 800
Andijan	3 011 700	1 576 000	1 435 700
Bukhara	1 870 200	698 600	1 171 600
Jizzak	1 325 000	622 200	702 800
Kashkadarya	3 148 400	1 357 500	1 790 900
Navoiy	958 000	467 600	490 400
Namangan	2 699 600	1 743 700	955 900
Samarkand	3 720 100	1 390 800	2 329 300
Surkhandarya	2 514 200	893 300	1 620 900
Syrdarya	815 900	350 000	465 900
Tashkent	2 861 200	1 411 500	1 449 700
Fergana	3 620 200	2 049 900	1 570 300
Khorezm	1 805 000	601 200	1 203 800
Tashkent city	2 464 900	2 464 900	..

Source: State Committee on Statistics, 2019.

Table 16.2: Population density (at the beginning of the year), 2012–2018, inhabitants/km²

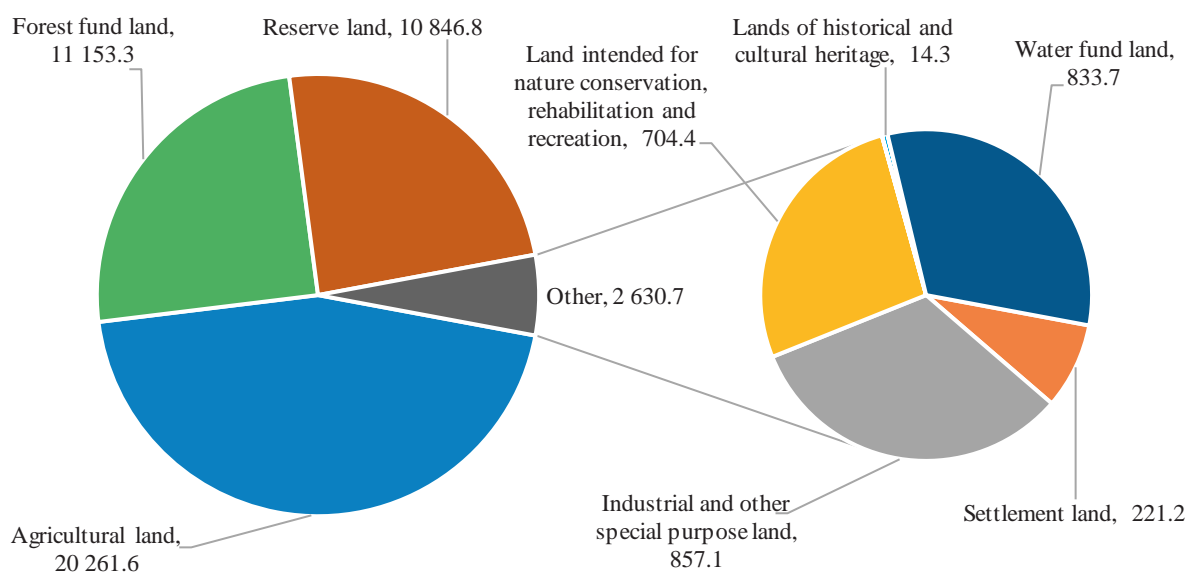
	2012	2013	2014	2015	2016	2017	2018
Uzbekistan	65.8	66.8	67.9	69.1	70.3	71.5	72.7
Republic of Karakalpakstan	10.2	10.3	10.4	10.6	10.8	10.9	11.1
Andijan	631.2	641.0	652.4	664.5	676.9	689.0	700.4
Bukhara	42.3	42.9	43.6	44.3	45.0	45.7	46.4
Jizzakh	55.9	56.8	57.8	58.9	60.2	61.3	62.5
Kashkadarya	97.2	99.1	101.3	103.6	105.9	108.1	110.2
Navoiy	7.9	8.0	8.1	8.2	8.4	8.5	8.6
Namangan	325.3	330.5	336.6	343.3	349.9	356.5	362.8
Samarkand	198.3	201.6	205.5	209.6	213.7	217.8	221.8
Surkhandarya	110.4	112.5	114.8	117.3	120.0	122.5	125.1
Syrdarya	172.8	175.4	178.5	181.6	184.7	187.6	190.6
Tashkent	175.1	176.8	178.7	180.9	183.2	185.5	187.6
Fergana	485.3	492.6	501.0	509.6	518.5	527.3	535.5
Khorezm	269.3	273.4	278.4	283.6	288.7	293.7	298.5
Tashkent city	6 914.0	7 009.0	7 045.0	7 100.0	7 165.2	7 257.9	7 380.0

Source: State Committee on Statistics, 2019.

Table 16.3: Land use by actual manner of use, 1990, 2000, 2017, 2018, 1,000 ha

	As at 01.01.1990	As at 01.01.2000	As at 01.01.2017	As at 01.01.2018	Share of total 2018
Agricultural land	28 080.4	26 753.6	25 625.2	25 614.0	57.1
of which:					
Acreage	4 176.5	4 056.6	4 035.3	4 026.4	9.0
Perennial tree plantations	366.8	352.9	385.6	391.6	0.9
Virgin lands	62.1	80.7	79.9	80.8	0.2
Hayfields and pastures	23 475.0	22 263.4	21 124.4	21 115.2	47.0
Farmland	437.9	642.9	695.3	696.6	1.6
Forest plantations	1 410.0	1 511.9	3 586.3	3 595.4	8.0
Gardening associations	13.4	8.5	7.3	7.3	0.0
Reclaimed land	103.7	79.3	72.1	71.9	0.2
Other lands	15 539.6	15 414.1	14 906.2	14 907.2	33.2
Total	45 585.0	44 410.3	44 892.4	44 892.4	100.0

Source: State Committee on Land Resources, Geodesy, Cartography and State Cadastre, 2019.

Figure 16.1: Land use distribution by land category, 2018, 1,000 ha

Source: State Committee on Land Resources, Geodesy, Cartography and State Cadastre, 2019.

Table 16.4: Land use distribution by land category, 1990, 2018, 1,000 ha

	As at 1 Jan.		As at 1 Jan.		Difference 1990-2018
	1990	%	2018	%	
Agricultural land	33 167.8	72.76	20 261.6	45.13	- 12 906.2
Settlement land	197.2	0.43	221.2	0.49	24.0
Industrial and other special purpose land	1 821.2	4.00	857.1	1.91	- 964.1
Land intended for nature conservation, rehabilitation and recreation	13.9	0.03	704.4	1.57	690.5
Lands of historical and cultural heritage			14.3	0.03	14.3
Forest fund land	2 507.5	5.50	11 153.3	24.84	8 645.8
Water fund land	618.8	1.36	833.7	1.86	214.9
Reserve land	7 258.6	15.92	10 846.8	24.16	3 588.2
Total	45 585.0	100.00	44 892.4	100.00	- 692.6

Source: State Committee on Land Resources, Geodesy, Cartography and State Cadastre, 2019.

General plans were designed on a 30-year timeframe; therefore, many plans are currently in place, but their provisions are outdated. According to the Tashkent Institute of Architecture and Construction, in 2018, only 17 per cent of the settlements in Uzbekistan have an approved and valid general plan.

During the elaboration of new general plans, consultations with the public are held on general strategic visions, which do not contain details and are organized through the involvement of local self-governing units (makhallas).

In 2018, the procedures for the preparation of general plans changed, in particular with regard to the allocation of future business areas in cities. The input to prepare a new general plan must always come from a governmental decree. The khokim (head of representative and executive authority in the territory) has the right to undertake preliminary activities for the initiation of a new general plan, but all the decisions are taken at a higher level.

In the preparation of the general plans for cities, a series of different actors, such as the various departments of urban planning at the oblast, district and city levels, take part in the exercise, which makes the procedures very long and often not open to the full sharing of information with the public at the earliest stage possible.

The local departments of urban planning inside the khokimiyats work with three design institutions: (i) Toshboshplan LITI is responsible for the elaboration of general plans of Tashkent City, cities in the Tashkent Oblast, and Samarkand City; (ii) Uzshakharsozlik LITI foresees the elaboration of master plans for major historical cities, such as Namangan, Andijan, Bukhara, Shakhrisabz, Fergana, Urgench, Khiva and the industrial cities of Navoiy and Zarafshan; and (iii) Kishlokkurlishloicha, which elaborates plans for rural villages in the rest of

Uzbekistan. They are the only institutions allowed to work on general plans and operate through regional branches to cover the territory of Uzbekistan.

There are no specific provisions for the application of strategic environmental assessment (SEA) during the preparation of general plans, since SEA is not used in Uzbekistan (chapter 1), but general plans and other urban planning are subject to state ecological expertise (chapter 1).

With regard to environmental considerations in the preparation of urban plans and programmes, there is a standard provision of considering the “landscape of the site” and the “wind rose”. Regulation KMK 2.01.01-94 “Climatic and physical-geological data for design” (1994 Order of the State Committee on Architecture and Construction No. 40) refers to the development of general plans for cities, towns and rural settlements. However, climate change adaptation is not integrated into the current planning exercise, and neither have mitigation opportunities on the urban scale already been applied. No specific information about the consideration of the landscape value, wind corridors, provisions for orientation of the plots or more detailed design and planning attention to climate change adaptation and mitigation at the local level is available. Maps and GIS tools concerning flood-prone zones and urban heat islands are not developed. General plans cannot benefit from updated geolocalized information.

The placement of industrial facilities in urban areas remains an issue in Uzbekistan and no measures have been taken to remove such facilities from urban areas.

As at 2019, the general plans of Tashkent and Samarkand Cities are currently under revision. The previous general plans, developed in 2013 for Tashkent and in 2009 for Samarkand, were not approved.

Tashkent City benefits from a special status regarding housing development, which represents important opportunities but also challenges for sustainable development of the city (box 16.1).

Cultural heritage

There are four areas in Uzbekistan inscribed on the UNESCO World Heritage List as cultural properties: Historic Centre of Bukhara (1993), Historic Centre of Shakhrisyabz (2000), Itchan Kala (1990) and Samarkand – Crossroad of Cultures (2001).

Several national programmes and projects have been developed to protect and promote Uzbekistan's cultural heritage. However, the preservation of some sites suffers from the absence of management plans, inadequate restoration interventions, the construction of modern buildings and the modernization of private properties, which have affected the authenticity of sites such as Samarkand.

UNESCO has worked on promoting cultural tourism in the Khorezm Oblast and the Republic of Karakalpakstan, highlighting the importance of connecting major protected sites to other areas with a

rich tradition of tangible and intangible cultural heritage. The contribution of intangible cultural heritage (ceramics, embroidery, traditional music), including museums, is of crucial importance in the promotion of sustainable tourism, especially for cities such as Bukhara, where several restoration activities are still ongoing, while several traditional workshops are successfully operating in the revived city centre. In Bukhara, also thanks to UNESCO funding, a part of the city centre has been restored, and some buildings host wood craftsmanship shops that have the competencies to restore wooden parts of the monuments.

Funds for restoration are programme based and consist of state funds and foreign grants.

In Uzbekistan there are 4,203 protected objects of culture. The city centre of Samarkand is the major repository, with 490 objects, of which 256 are residential buildings. Usually, protected sites are in satisfactory condition, but the most remote ones are not well inspected, due to the lack of human resources. In general, there is a lack of awareness among the population of the importance of historical and cultural sites.

Box 16.1: Tashkent City special status

Since October 2018, a legal experiment has been in place for the management of Tashkent City (2018 Decree of the President No. 5515). The experiment refers to many areas, including the development of the general plan for Tashkent City and the management of construction activities in the city.

While the Tashkent General Plan has not yet been approved, the Tashkent Khokim has the power to authorize the development of single housing projects in vacant parts of the city. The Khokim can also attract funds for profitable investment projects by issuing city bonds or shares in newly created companies. This special status makes possible the derogation of the prerequisite of specific general plan provisions for the allocation of land for new purposes. The Department of Investments at the khokimiyat level is responsible for the issue of those permits.

In Tashkent, many plans under the "Obod Makhalla" Programme localized vacant areas or unused spaces/facilities which may be the object of new development. These areas may be assigned for development to foreign investors, who, in principle, may propose the development of new high-rise buildings, to the great concern of the local population.

Tashkent's special status allows for the facilitation of localization of so-called "business class properties", which come with a high added value. Usually, new architectural undertakings require the approval of the chairperson of the territorially competent makhalla, but often local inhabitants complain because of the lack of information and involvement in the decision-making process.

When a new development is approved, previous inhabitants are usually offered apartments in the new buildings, but often they are offered no compensation for the duration of the reconstruction. Mass media report numerous cases in which legitimate inhabitants of apartments in Tashkent have received an order to vacate their properties to allow the demolition of the building for its reconstruction by foreign investors.

An important case to mention is the US\$1.3 billion Tashkent City business centre, located in a central area at the junction of Alisher Navoiy, Almazar, Islam Karimov and Furkat Streets. The Uchki-Almazar Makhalla, the old residential district subject to this renovation project, has been demolished and its residents scattered around various parts of the city. There is no evidence of a specific plan aimed at mitigating the adverse effects on the population of this project. Papers report the "mass eviction of the residents", who were "literally thrown out onto the street, having been promised new housing in the suburbs or the chance to buy existing housing stock elsewhere in the city" (Open Democracy). According to reports from the Fergana News Agency, occupants of several housing blocks were ordered to leave their homes within 10 days, before demolition started, without any accompanying solution.

Photo 16.1: Construction of a multi-storey car park in the centre of Tashkent City

Photo credit: Mr. Vadim Ni

General plans for a city that contains a UNESCO historical site, such as Samarkand, foresee the intervention of the Ministry of Culture. At the national level, the Ministry of Construction and the Ministry of Culture analyse the contents of the plan in detail and verify that the plan's provisions would not potentially interfere with or harm the cultural heritage. In the past, the Ministry of Culture intervened in the preparation of the general plan of Khiva to avoid the development of a modern building complex that would have affected the historical area's buffer zone. As at March 2019, the plans for the cities of Bukhara, Khiva and Samarkand are in the course of preparation with the intervention of the Ministry of Culture because of its competence on their cultural heritage.

The Tashkent Institute of Architecture and Construction is currently carrying out some studies on how to reintroduce ancient typical urban morphologies and urban patterns in contemporary Uzbekistan; however, findings are not implemented to improve the quality of the rapid transformation that its cities and rural areas are undergoing. In general, Uzbekistan does not integrate approaches to cultural identity and urban landscape into the preparation of urban planning documents, as is done in European countries (box 16.2).

Housing stock

The housing stock in the country consists of 33,146 houses and 1,145,891 apartments, 98 per cent of which are privatized. The majority of the housing stock in Uzbekistan dates to the Soviet period.

The housing stock, especially in Tashkent City, is undergoing an injection of new construction that is expected to radically change the aesthetics of the city and the habits of its inhabitants in the years to come. The "new" Tashkent is intended to represent a symbol of the current administration's openness to the international community.

In Uzbekistan, there is no real competition between urban and rural areas, thanks to the national policy after independence that aimed at guaranteeing the same living standards in cities and rural areas. For that reason, the massive programme to build "standard" human settlements in rural areas was launched in 2009. While trying to guarantee decent, affordable and connected homes to the growing population, the programme has failed so far to reintroduce in the built-up environment of its vast territory upgraded elements of traditional culture. Contemporary inhabitants of the rural settlements are pleased with their new homes

because they come with many comforts that have concretely upgraded their living conditions. On the other hand, this massive homogenization of the built environment causes a loss of identity in the local population: the same design and colours and standards are observed in settlements all over Uzbekistan in regions as different as Fergana Oblast and the Republic of Karakalpakstan.

New, modern buildings in big cities such as Tashkent, Samarkand and Bukhara feature a standard international architectural style (with Turkish or European elements, according to the origin of the developer). The new buildings lack representation of the typical elements and preciousness of ancient Uzbek design.

Box 16.2: Landscape as an opportunity: the concept of landscape in the European Landscape Convention

The 2000 European Landscape Convention recognizes the crucial role played by the landscape for the cultural, ecological, environmental and social development. It is based on the generally accepted definition of landscape as a natural context of a certain value, to be preserved and maintained. "Landscape" means an area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors. The Convention highlights the value of landscape as a resource for the development of economic activities and its potential for job creation through its protection, management and planning.

Urban landscapes are an essential part of the daily lives of most European citizens. The Convention recognizes the value of everyday landscapes for the well-being of citizens, in urban areas as well. In many European countries, the integration of this new concept of landscape, which is also extended to degraded areas or industrial sites, has been a useful tool to steer regional and local planning.

In Italy, regional landscape plans, according to the new definition introduced into the legislation after the Convention, cover the entire territory of the regions, and are a precious source for supporting the elaboration of local development plans, because they trace the guidelines for potential transformations compatible with the vision of the territories, and set the aesthetic and morphological elements to be maintained in order to preserve and enhance the identity of the territories. The same approach is followed in France, where detailed guidelines for landscape insertion, even into individual built environments, are provided on the local scale. In Portugal, studies carried out on the urban scale support the elaboration of urban maps that focus on the diversity and uniqueness that provide the character of the urban landscape.

The Convention emphasizes the human perception of landscapes in its definition of landscape and promotes citizen participation in landscape management processes.

Approaching the cultural and technical concepts included in the Convention would allow Uzbekistan to take advantage of the tools it has to boost its economy, also through sound landscape integration into the planning, design and construction processes.

Photo 16.2: Po-i-Kalan complex, Bukhara City



Photo credit: Ms. Alessandra Fidanza

Nevertheless, even though large, residential parallelepiped (multi-faceted) volumes were constructed during the Soviet period, in Uzbekistan these had some unique surface decorations that brightened the austere, sad and grey facades with some remnants of the former culture.

This is also reflected in the urban topology: huge roads, out-of-scale empty spaces and huge buildings. This remains the case in the Soviet parts of Samarkand and Tashkent Cities.

The affirmation of Uzbek cultural identity can be enhanced by reintroducing into urban designs and architectural undertakings, on both a large and small scale, typical Uzbek elements in terms of morphology, materials and tailored technological solutions. It is very often less expensive and less carbon intensive to approach technological solutions considering the availability of local materials, studying how, in the past, the urban forms developed to adapt to local climatic conditions.

In Bukhara, the city centre has maintained the old urban form, and most of the buildings, even after the disruptions of restoration, maintain their old shape and the characteristics they had in the past. In ancient times, the dense and compact urban pattern was crossed by a network of artificial and natural water canals that, from time to time, ended up in pools inside the city. During the Soviet period, the majority of the network was destroyed, and virtually no pool survived. This network was used to mitigate the effects of hot temperatures during the warm season,

which is particularly intense in Uzbekistan. The mulberry tree was the common species that grew in the city. Today, the reappropriation of ancient solutions to improve the distribution of green areas can be an efficient countermeasure to the effects of climate change.

Establishing a network of pools in urban areas is not only useful to accumulate rainwater as a reserve for the dryer seasons, but is also a means to prevent urban flooding. The most up-to-date international examples of urban adaptation to climate change, such as the adaptation plan of the city of Copenhagen or management of the Cheonggyecheon River in Seoul (Republic of Korea) show the importance of urban flood prevention through intelligent urban design.

The City of Samarkand is currently working on studying the urban water channels used in the past, to preserve those still in place and try to restore those that were either destroyed or unused during the Soviet era.

Uzbekistan is an active seismic zone (the east and south-east regions of the country are affected by high seismic activity). The last earthquake to cause significant damage was in 1966, when the centre of Tashkent was heavily damaged. Tremors are still experienced regularly. There is no evidence that constructions are earthquake proof.

Housing development is implemented through governmental agencies, under the direct control of the administration, or, more often recently, through direct contracts with developers.

Photo 16.3: Pond Lyab-i Hauz, one of the few remaining ponds in Bukhara City



Photo credit: Ms. Alessandra Fidanza

Developers are obliged to provide a certain percentage of built-up volume in the form of apartments for allocation to the most vulnerable people. Although municipal administrations are expected to maintain information about vulnerable families in need of housing, no such information is available at the Ministry of Housing and Communal Utilities.

In Uzbekistan, there are no development impact taxes, which are commonly paid by developers in Europe. A development impact tax is a tool for local authorities to help cover the costs of building the infrastructure to support the development of their area. The development impact taxes can be used to finance a wide range of necessary infrastructure, including transport, flood defences, schools, hospitals and other health and social care facilities. Basically, by using a development impact tax, the local community is transferring the infrastructure building costs to the developer.

Housing maintenance and management

In Uzbekistan, residential property units are private, while the land on which they are located belongs to the State. This may change in the future, following the adoption in May 2019 of the Law on Privatization of Non-Agricultural Land. The housing policy is being revised at the national level to focus on the development of new houses and modern infrastructure, as well as to ensure full ownership rights.

Associations of apartment owners are responsible for the maintenance and rehabilitation of the buildings. Occasionally they can access loans from the Government. Regional departments of the Ministry of Housing and Communal Utilities are responsible for monitoring the activities of the associations of apartment owners.

As at early 2019, 5,443 associations of private homeowners, as well as 296 professional management organizations, are responsible for the management and maintenance of apartment buildings.

The 2017 Resolution of the President No. 2922 “On measures to further improve the system of maintenance and operation of the multifamily housing stock for the period 2017–2021” foresees the refurbishment of 33,146 houses along with the improvement of adjacent territories. About 9,915 houses were repaired in 2017 and 7,621 in 2018. Commercial banks allocated soft loans for more than 1.0 trillion sum for the renovations.

Energy efficiency

The existing housing stock is highly energy inefficient. Construction standards changed in 2018 and introduced new energy efficiency requirements. However, they apply only to new projects; therefore, existing buildings are not subject to a specific requirement to upgrade their energy efficiency.

Some of the projects under the Obod Makhalla Programme foresee the refurbishment of common parts and structures of residential buildings.

The Ministry of Construction maintains a database on energy efficient construction materials, initially developed with the support of a UNDP project; the database is updated quarterly.

In Uzbekistan, there are no certification systems aligned with international sustainability and energy efficiency standards (such as Leadership in Energy and Environmental Design (LEED) or Building Research Establishment Environmental Assessment Method (BREEAM)).

Economic and social development in rural areas is greatly affected by energy reliability issues. The very low energy efficiency of rural housing, coupled with the lack of minimum energy performance standards, contributes to the increased recourse to fossil fuels and the consequent increase of GHG emissions from the housing sector.

In recent years, some local producers of energy efficient materials and photovoltaics highlighted that, in Uzbekistan, despite the manufacturing capacity, the development of the market is hindered by low market demand from both the public buildings and private residential sectors, including the rural settlements.

The UNDP-GEF Project “Market Transformation for Sustainable Rural Housing in Uzbekistan”, begun in 2016, has demonstrated the benefits of introducing energy efficient and low carbon solutions for the realization of dwellings in rural areas.

Infrastructure

Existing infrastructure in Uzbekistan is the heritage of the Soviet period, and, in most cases, needs upgrading, maintenance or replacement.

Electricity supply is, in general, provided all over the country, but rural regions experience regular, extended electricity shortages and interruptions. Existing road networks require consistent improvement, and the

connectivity between the secondary and tertiary road networks still has to be fully implemented.

The 2018 World Bank survey on the quality of infrastructure in Uzbekistan showed that poorly maintained distribution networks, underfunded operating budgets, almost non-existent domestic capital budgets and limited customer willingness to pay for utilities cause the lack of or poor conditions of utility services in rural and urban areas (figure 16.2).

Electricity and heating

The heat supply of the housing and utilities sector of the settlements is provided by small individual heating boilers, which provide heat to individual buildings and structures. Heating in urban areas is generally centralized, with boilers connected to combined heat and power plants (CHPPs) serving parts of neighbourhoods. For new buildings, heating is decentralized.

According to the World Bank, many of the district heating systems installed in the 1950s through to the 1970s are no longer fit for purpose and are suffering from insufficient maintenance. The use of solar thermal collectors for hot water and photovoltaics is not widespread enough, in both new and existing buildings.

There is no information about the exploitation of geothermal solutions, which would be a renewable

energy source for heating and cooling for the residential and commercial sectors.

Water supply, sewerage and drainage networks

Since 1991, Uzbekistan has carried out significant work to improve water supply for households, with the provision of high quality drinking water to the population. Nevertheless, according to the Ministry of Housing and Communal Utilities, at present only about 63.5 per cent of the population are covered by centralized drinking water supply services and about 15.6 per cent are connected to centralized sewerage services (chapter 17).

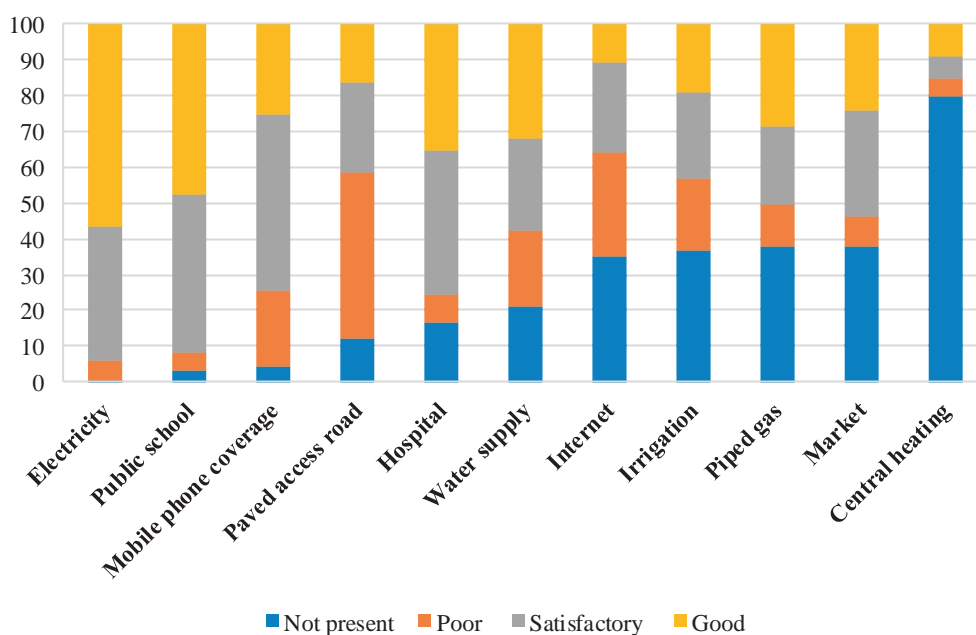
Waste collection

The generation of municipal solid waste (MSW) is estimated by the State Committee on Ecology and Environmental Protection (SCEEP) at 219 kg/person/year. In 2017, the population generated 7 million tons of waste (table 10.1) and the current dynamic economic and demographic growth will lead to an increase in MSW generation (chapter 10). In 2018, 53 per cent of the population was covered by waste collection services.

Cleaning up common areas

Main roads and green areas in major city centres are, in general, in good condition and regularly maintained.

Figure 16.2: Reported availability and quality of infrastructure items, percentage of responses



Source: World Bank, Study – Listening to the Citizens of Uzbekistan, 2018.

Public transport

In Uzbekistan, most passenger transportation is by road (98.3 per cent in 2018). In urban areas, taxis and minibuses are generally widely distributed and used by the local population.

Tashkent has a metro system and a network of buses and minibuses (chapter 14). The urban bus network is not well signposted, the destinations are not marked and journey times are unpredictable.

There is no information on the transport systems of other cities and towns.

Social services to vulnerable groups

In five pilot districts of Tashkent, Samarkand, Bukhara, Andijan and Gulistan Cities, UNICEF has assisted the Republican Centre for the Social Adaptation of Children in developing Family and Children's Support Services, a new model for the provision of child protection services.

UNDP has cooperated with the Ministry of Labour and Social Protection since 2008 in widening social integration and employment opportunities for people with disabilities. In 2014, it started working in the area of support to the lonely elderly.

In 2018, the EU launched the Project "Enhancement of Vulnerable Children Protection Mechanism in Uzbekistan". The project covers 10 makhallas in the City of Tashkent and Samarkand and Khorezm Oblasts, reaching 5,000 vulnerable families and about 15,000 children. It is aimed at strengthening the interaction between state and non-state organizations and local governments in protecting and promoting the interests of families and children by providing social support based on the makhallas.

Green areas

Green areas inside urban and rural settlements occupy, on average, between 0.1 and 2 per cent of the entire territory of the settlement.

The conditions of public urban green spaces vary according to their maintenance status, the different climatic conditions, the status of irrigation networks and the salinity of groundwater and soils.

In recent years, Uzbekistan's policy has aimed at increasing the number of trees planted in urban areas,

with the scope of also creating green belts around major cities. More than 200 tree species grow in the cities of Uzbekistan, and are represented by both local flora, such as poplar, oak, elm, chestnut, juniper, plane, ash, maple, sophora, etc., and imported flora from other countries (e.g. Norway maple, tulip tree, evergreen magnolia, paper tree, ginkgo, pine, lime, box, cypress).

According to SCEEP, in 2018, 160 million bushes and trees were planted all over Uzbekistan. At the city level, greening activities are implemented by dedicated departments of khokimiyats.

According to local media, the City of Tashkent today has 15,200 ha of green areas, compared with 6,800 ha in 1990. The "Green Belt Initiative" began in Tashkent in February 2019; oaks, chestnuts, catalpas and fruit trees have been planted in different parts of the city. More than 409,000 trees were planted in March 2019, with the involvement of more than 2,000 volunteers. Fast-growing deciduous and coniferous trees adapted to the local climate and resistant to low water will be planted in the future.

In Bukhara City, the local authorities plan to add 200 km of green areas with an average width of 10 km around the city, with the support of SCEEP.

A careful assessment of the sustainability of the greening activities in urban areas, especially in the light of available water resources and climate change adaptation, has not yet been conducted in the country. Local vegetation should, in general, be preferred to more aesthetically attractive species, in order to avoid excessive water consumption and to guarantee efficiency in terms of maintenance and the total cost of environmental services.

Illegal construction

The Ministry of Culture reports that illegal constructions are sometimes built in the proximity of archaeological sites: there have been about five cases in the past five years. The phenomenon is mainly due, on the one hand, to the country's vast territory and the lack of appropriate fencing of the sites, and, on the other hand, to the lack of inspectors who can physically control the areas. Control activities do not use GIS or satellite images matched with remote sensing and aerial surveys, which would improve their efficiency.

Photo 16.4: Park in Samarkand City Centre

Photo credit: Ms. Angela Sochirca

Socio-spatial divide

The rapid housing boost that is observed in Uzbekistan's major cities, mainly in Tashkent, has some drawbacks that need to be addressed. The majority of old multi-storey residential buildings lack proper maintenance and need urgent upgrading. Their status affects the "aesthetics" of cities, the improvement of which Uzbekistan has been investing in in recent years.

The implementation of urban development and construction policies in recent years has resulted in numerous cases in which the rights of inhabitants of buildings ordered for demolition were violated, leaving many people, especially the most vulnerable, in critical situations.

Several cases are reported of people receiving an order to leave their residences to allow for new buildings to be built, without the provision of new housing or adequate compensation.

16.2 Environmental pressures from human settlements

Air

Air pollution is measured but air monitoring is not yet automated (chapters 4 and 8). The housing sector, boosted in recent years, is partially accountable for the worsening of urban air quality. Construction sites lack specific regulations to prevent pollution due to particulate matter and dust during construction. The application of sustainability standards in the housing sector during construction, such as the LEED standards, is not in place to reduce the impact of construction sites on air quality.

Industrial sites are sometimes still present in urban areas, and their emissions directly affect air quality in urban areas. In some areas, such as Almalik in Tashkent Oblast, there are a CHPP, a metallurgic plant and a chemical plant; in Bekabad, there is a metallurgic plant and a CHPP. In Tashkent City, industrial sites are still present and are affecting the city's air quality.

Water

The primary sources of pollution of groundwater and surface water are discharges of wastewater (chapter 9). The pollution is associated with the lack of a centralized sewerage system, the lack of stormwater sewers and wastewater treatment systems at industrial facilities, and the poor sanitary condition of the territory.

Biodiversity and landscape

The concept of an urban ecological network, consisting of core areas, corridors and buffer zones, is not implemented in Uzbekistan. Green corridors are envisaged only for road management.

In Uzbekistan, unfinished construction projects and empty buildings remain an issue. These buildings are not only not used rationally in economic and social terms, but also affect the landscape and aesthetic perception of human settlements. This problem is especially acute in the regions, where there are a significant number of inactive and inefficiently used buildings and unfinished construction objects owned by the State or enterprises partly owned by the State, as well as those built by business entities.

Land

The construction of rural settlements has an impact on Uzbekistan's territory. The new settlements are built on previously undeveloped land. The only constraint is that the assigned areas are not reserved for agriculture, but other landscape considerations are not required for the implementation in the new built-up areas. At the same time, there are cases in which land reserved for agricultural purposes was occupied for new settlements.

Soil

The territory of Uzbekistan is classified as an arid zone that is subject to air and soil drought, and therefore susceptible to degradation and desertification. The progressive extension of rural settlements and cultivated lands has increased soil sensitivity and degradation. Soil remediation and restoration activities are not undertaken in the most affected and vulnerable areas.

Human health

Waterborne diseases play a significant role in Uzbekistan's health status (chapter 17). The water quality is often poor (figure 9.1), with microbial and chemical pollution due to inadequate infrastructure to

treat wastewater and purify drinking water. Bacterial pollution increases in warmer temperatures and is reflected in an increased number of cases of intestinal diseases during summer. Bacterial dysentery, for example, increases significantly during the summer.

Even though public health experts recognize asbestos as a harmful material, it is used in the construction industry in Uzbekistan. Asbestos is still considered a cheap and appropriate construction material in Uzbekistan, and therefore is extensively used. The interviewed population and technical officers believe that it is not harmful as long as it is used to produce "compact" products, and they see no risk of volatile emissions.

16.3 Impact from and adaptation to climate change

The rapid growth of rural settlements, which occupy previously undeveloped lands all over the country, and the rapid expansion of existing cities, increase the number of people exposed to the effects of "urban" climate change on the one hand, and upsurges in the production of GHG emissions from human settlements on the other.

Climate adaptation planning in urban areas and rural settlements has not yet been introduced in Uzbekistan, nor have specific zoning requirements to mitigate the GHG emissions and energy efficiency been put in place.

GHG emissions

In 2012, the buildings sector emitted 44 million tons of CO₂-eq., representing 21.46 per cent of total emissions. The construction sector is included in the industry and construction sector, which emitted 8 million tons of CO₂-eq. (3.9 per cent of total emissions) in 2012.

The production of building materials, and facilities for cement and burnt bricks, have a very high energy intensity: in 2013, over 980 million kWh of electricity and over 1 billion m³ of natural gas were consumed by enterprises in this industry (of which 93 per cent were at cement plants). Due to the use of outdated technologies, the energy consumption in the production of 1 ton of cement or burnt bricks exceeds that in most developed countries. There are no incentives to introduce modern technologies in the cement industry to save energy resources, nor to reduce GHG emissions in the housing sector. Using a carbon footprint calculation for the housing sector would allow households to reduce their carbon footprint.

Floods and mudslides

Regarding the flooding risk, Uzhydromet is tasked to monitor the hydrometeorological situation in the areas of risk of hydrometeorological events. Uzhydromet, along with the Ministry of Emergencies and representatives of interested khokimiyats, conducts two-cycle (December, November) surveys of dangerous territories of the country, issuing orders for the protection of residential and technical facilities located in the water-hazardous zone. The surveys allow the preparation of a list containing the number of dwellings, farms and technical facilities located in areas prone to water hazards, which is shared with the Government Flood Commission, the Ministry of Emergencies and relevant khokimiyats. GIS and remote sensing are not used to allow the rapid checking and monitoring of the flood risk for human settlements.

Mudslides are another threat posed to human settlements in Uzbekistan (chapter 17). March–July is the period with a higher risk of mudflow events.

Owing to intense precipitation and increase in temperature in the mountainous areas in March–April, snow avalanche hazards occur, threatening the lives and livelihoods of the population (chapter 17). The high-risk areas are located in Tashkent, Namangan, Kashkadarya and Sukhandarya Oblasts.

Human settlements are not designed or refurbished in order to balance the impervious/pervious surface ratio inside the cities. The presence of adequate pervious areas has the natural capacity to mitigate thermal excursions and to support the adaptation to flooding events. At present, there is a lack of climate change adaptation/mitigation considerations in the design of the new rural settlements. There is vast potential for the design of new settlements to pay attention to resilience to the changing climate, shaping settlements to exploit local climatic conditions. In particular, new built-up volumes could create a design that is climate friendly, such as in terms of sun orientation, prevailing wind direction, reduction of impervious surfaces and establishment of green infrastructure.

16.4 Legal, policy and institutional framework

Legal framework

The 2001 Law on the Protection and Use of Cultural Heritage provides a protection regime for cultural objects.

The 2019 Law on Privatization of Non-Agricultural Land, to enter into force in March 2020, will enable

the privatization of non-agricultural land by Uzbek citizens and legal persons residing in Uzbekistan. Before March 2020, procedures for privatization will be tested in Surdarya Oblast.

The 2002 Code on Urban Construction defines the urban planning activities, documentation, and responsibilities of state bodies, legal entities and physical persons in town planning. While the Code provides for the participation of citizens, local self-government units and NGOs in decision-making on urban planning, public participation procedures are not detailed. Local administrations do not have a predominant role in the planning framework. No general plans and schemes of settlements or technical assessments of their content are publicly available. As at 2019, a draft of the new edition of the Code is under development that would significantly extend the requirements to public participation and would also regulate in more detail the issue of compensation to citizens affected by the expropriation of land or buildings.

The 1998 Housing Code regulates property rights on housing, preservation and maintenance of housing, procedures for the distribution and provision to citizens of premises according to lease agreements, the payment system for housing and utilities, and other aspects. As at 2019, a draft of the new edition of the Housing Code is under development.

The 2018 Resolution of the President No. 4028 “On additional measures to improve the construction of affordable houses in rural areas and for individual categories of citizens” addresses issues posed by the implementation of the Programme for the Construction of Affordable Residential Houses on Updated Model Projects in the Rural Areas for the period 2017–2021, such as the construction of new settlements on agricultural land – despite its being forbidden by the law, and the need to address the issue of energy efficiency for the standard rural houses. The Resolution sets priority areas for further development of housing construction in rural areas and the provision of affordable housing. It mentions explicitly the UNDP-GEF project “Market Transformation for Sustainable Rural Housing in Uzbekistan” on assistance in the development of the construction of energy efficient housing in rural areas.

The 2009 document ShNK 2.07.01-3 prescribes the measures for rational use of natural resources in the design of settlements, including:

- Urban planning measures (e.g. requirements for the organization of water protection zones along rivers, canals and reservoirs, as well as zones of

sanitary protection of water resources, zones of formation of groundwater deposits; creating green belts around cities; relocating industries that are in violation of environmental and town planning legislation; and developing and reconstruction of the road transport system);

- Engineering and technological measures (e.g. reconstructing industrial and energy facilities; introducing non-waste technologies; developing engineering infrastructure and utilities at a high technological level; and providing settlements with engineering equipment).

Uzbekistan introduced a moratorium on cutting down valuable species of trees and shrubs that are not part of the state forest fund, from November 2019 until the end of 2020 (2019 Decree of the President No. 5863). This measure is designed to prevent the felling of trees in human settlements during the development of new infrastructure and construction – in these cases, valuable tree species must be preserved, including by replanting them in other places.

Policy framework

State programmes for rural development, including housing

Providing people with decent housing in rural areas in Uzbekistan has remained a pressing issue since 1991; the availability of houses does not satisfy the growing demand due to population growth. Together with limited employment opportunities, this has caused many people to relocate to urban areas in search of work and a suitable place to live.

For that reason, since 2009, practically every year, the Government has launched rural housing programmes (e.g. 2012 Resolution of the President No. 1687; 2013 Resolution of the President No. 1902). They aimed at building thousands of new, “modern” rural houses, along with infrastructure such as schools and sports facilities.

In addition to governmental authorities, the players in the development of the rural housing programmes were the financial institutes (banks) and the construction companies (such as Qishloq Qurilish Invest). New rural settlements and houses were built by the Government with loans from several banks, then people could buy individual houses by accessing specific mortgages.

The programmes had built “standard design” houses with practically the same shapes, materials, colours and urban pattern all over Uzbekistan.

Initially, the rural single-family houses were built based upon a plot of six acres, or 24,281.1 m², with a one-storey single-family home. The standard design of individual houses evolved from the original 6-acre single plot to the new 4-acre model (2017) then the 2-acre one (2019), also with the provision of multi-storey multi-family buildings.

The 2016 Programme for the Construction of Affordable Residential Houses on Updated Model Projects in the Rural Areas for the period 2017–2021 (2016 Resolution of the President No. 2639) provides the following data: in the period 2009–2016, in the 1,308 residential areas in the countryside, 69,557 residential buildings with a total area of 9,573,000 m² were built, serving over 83,500 rural families.

The number of new settlements and new houses to be built during the year is publicly announced. The Government plans to significantly increase investment in new rural housing and infrastructure, including social facilities (schools/hospitals), gas supply pipelines, roads and water supply networks. Under the Programme for the Construction of Affordable Residential Houses on Updated Model Projects in the Rural Areas for the period 2017–2021, in 2017 alone, more than US\$692 million in government funds and commercial bank lending of more than US\$690 million was allocated. This initiative enjoys continued support from the ADB through its Affordable Rural Housing Programme and through the Islamic Development Bank. Loans from the ADB operate through the National Bank for Foreign Economic Activity, QQB and the JSC Mortgage Bank “Ipotekabank”. The Ministry of Economy and Industry manages the Programme.

The ADB estimates that investment in affordable rural housing would have a further substantial impact on employment, as the Programme is expected to generate up to 220,000 jobs. The Programme would specifically target women, with a goal that 30 per cent of all mortgages are issued to women over the course of the programme’s duration. Encouraging women’s ownership of dwelling units is likely to increase the participation of women in economic activities and contributes to their empowerment.

Since 2011, the ADB has requested the preparation of an environmental assessment along with the project proposals for new settlements, in order to evaluate their potential harm to the environment and also to ensure that no plot is located on land reserved for agriculture. The “environmental management guidelines” were used from 2011 to 2016, and were updated in 2017 with provisions for monitoring construction sites, noise levels, dust and the follow-up

of complaints. As of 2019, Uzhydromet is part of the assessment board, in particular for the climate change component, which has not been taken into account to date.

Plans for the development of the new rural settlements are prepared based on requests from the local population, which, recently, have been requesting improved housing standards. The standardized design of houses, however, fails to capture opportunities to use local sources of alternative energy, nor can it offer maximum comfort and well-being to residents in terms of cultural identity. A GEF project proposal is being developed by the Ministry of Construction and UNDP to improve the energy efficiency standards and test a green mortgage mechanism.

In contemporary Uzbekistan, there is a general lack of appreciation of the cultural and architectural identity typical of its different regions. Of course inhabitants are pleased to live in houses with upgraded standards that are better than the average prior living conditions. However, they would benefit much more, in terms of social and cultural well-being, if they could also exercise their own cultural identity by identifying themselves with features and design typical of the territory they belong to. While the rural settlements programme was initially conceived to answer an urgent issue, today, modern Uzbekistan has the opportunity to take advantage of the results accomplished to promote a cultural reappropriation of the Uzbek identity, which bears some typical features that mark its difference from the western world.

Nowadays, rural areas could well be upgraded through the provision of affordable, decent new housing, which would benefit greatly from the rediscovery of traditional and local shapes, materials and volumes, for instance by integrating, where possible, local materials or traditional structural design.

Land-use plans for the new settlements do not contain low-carbon considerations in the zoning design, and thus fail to realize significant energy efficiency gains to be made from applying village-level energy solutions and passive solar design techniques. By implementing holistic, sustainable urban design, new rural settlements may well address critical issues such as climate change adaptation and mitigation at the site level, which also entails energy efficiency benefits for entire settlements and their buildings. Modern heating and cooking facilities using natural gas would avoid the recourse to solid fuels, which are linked to respiratory diseases.

“Obod Makhalla” (“Prosperous neighbourhood”) Programme

The 2018 Programme “Obod Makhalla” (2018 Decree of the President No. 5467) consists in the participatory preparation and implementation of neighbourhood plans that aim at improving common spaces, infrastructure facilities and building facades, and also to identify vacant areas where it will be possible to undertake further housing or infrastructure development. Proposals to upgrade existing objects, such as buildings or facilities, can be included in Obod Makhalla projects.

Photo 16.5: Standard design houses in the suburbs of Bukhara City



Photo credit: Ms. Alessandra Fidanza

To support the implementation of the Programme, khokimiyats receive funding for constructing and repairing water pipes, electric networks, gas pipes and sewerage systems, among other things. The following activities are included in the Obod Makhalla plans/projects:

- Construction of a “makhalla centre” in each makhalla, which will include pharmacies, amenities and services, playgrounds and small amusement parks;
- Revival or new development of business, commercial and artisanal potential;
- Organisation of microindustrial zones and craft centres; to support this measure, entrepreneurs and artisans may receive for free vacant land areas or unused buildings or structures within the territory of the makhalla;
- Support for the provision of electricity, drinking water, coal and natural gas, creating the necessary infrastructure for the collection and removal of household waste;
- Establishment of irrigation systems based on available water resources, as well as modernization of collector and drainage systems;
- Construction and repair of internal roads and footpaths, improvement and landscaping of the roadside zone, organization of the lighting system;
- Reconstruction and repair of kindergartens, schools, medical, sports and cultural institutions located on the territory of makhallas;
- Provision of material and financial assistance to families in need of housing repair, provision of the population with construction materials on preferential terms.

Under the Programme, at least two makhallas in each city of Uzbekistan were upgraded in 2018, and at least three makhallas will be upgraded annually until 2022.

The City of Tashkent hosts 505 makhallas, of which 44 developed their Obod Makhalla plans/projects in 2018, while 24 others are planned for 2019. The kokhimiat of a district is responsible for choosing the best versions of Obod Makhalla plans/projects, among those prepared in the form of a concept by district architects, with the participation of the public and, almost regularly, with the engagement of students in the process. Districts are also responsible for the issue of construction permits, which must be compliant with the provisions of the Obod Makhalla plans. When the plans/projects locate vacant public objects (vacant areas or constructions), usually one of the three existing state-owned design institutes is involved in the development of new projects. This point is crucial to understanding the current boost in construction activities in Uzbekistan: not only empty spaces but

also unused or underused buildings and complexes may be recognized as requiring transformation.

Makhalla chairpersons regularly report to the khokim and receive instructions on the administrative tasks to be undertaken at the local level. Makhallas are tasked to hold consultations with the public on proposals for new developments or the implementation of specific projects on their territory. Sometimes local inhabitants report that the makhalla chairperson has failed to guarantee a real participatory process, so that, especially in Tashkent, decisions affecting the lives and well-being of the citizens are taken without proper engagement of the local population.

“Obod Qishloq” (“Prosperous village”) Programme

The 2018 Programme “Obod Qishloq” (2018 Decree of the President No. 5386) supported the construction of infrastructure and landscaping activities in 386 villages of 159 districts in 2018. The activities were: repair of 3,000 km of roads, restoration of 142,000 individual houses and more than 1,000 multi-storey residential buildings, new provision or the restoration of 2,500 km of electricity networks, construction of 2,000 km of water pipes and construction of other infrastructure facilities. The first phase of the Programme, supported by the World Bank, targets the Fergana Valley, specifically, Fergana, Andijan and Namangan Oblasts.

Draft urbanization policy

In line with the 2019 Decree of the President No. 5623, the Agency for Urbanization under the Ministry of Economy and Industry prepared a draft concept of urbanization policy to 2030 for Uzbekistan. The draft contains provisions on the modernization of existing satellite towns adjacent to cities. It aims to ensure full access of the population to infrastructure. It envisages the development of a new housing policy, which will provide access to housing for all population groups, as well as the modernization and energy efficiency of the existing housing stock. The draft pays special attention to improving the environmental sustainability of cities, including the introduction of clean technologies in urban construction and the expansion of green spaces in towns and cities. The draft provides for the removal of polluting industrial facilities from urban areas.

Others

A draft programme to improve the energy efficiency of buildings, including the reconstruction of old high-rise and individual buildings is under development as

at 2019. In 2018, Uzbekistan requested the assistance of the World Bank to develop a national medium-size cities programme that would aim at achieving the integrated and balanced socioeconomic development of the oblasts, districts and cities of Uzbekistan. Initial steps will be taken as part of the Medium-Size Cities Integrated Urban Development Project in Chartaq (Namangan Oblast), Qagan (Bukhara Oblast) and Yangiyul (Tashkent Oblast).

Sustainable Development Goals and targets relevant to this chapter

The current stand of Uzbekistan vis-à-vis selected targets under Goal 11 of the 2030 Agenda for Sustainable Development is described in box 16.3 and vis-à-vis target 11.b – in box 7.1.

Institutional framework

The Uzbek governance system is highly centralized, with the central Government taking the most critical decisions on budgets and administrative appointments. Officials at the subnational level are appointed by the central Government. The khokim, head of representative and executive authority in the territory, is the highest official in an oblast, district or city. At the oblast level, most ministries provide services and directly manage budgets and planning. District khokims have a double subordination to oblast khokims and to regional line ministry officials. This affects decision-making and weakens responsiveness to citizens' needs. Governance at the village level is heavily influenced by makhalla committees (local self-government units). In practice, makhallas are not self-governing but are subordinated to subnational government officials who often veto the appointment of makhalla leaders.

Among other matters, the Ministry of Economy and Industry is responsible for the development of urbanization policies. At the beginning of 2019, the Agency for Urbanization under the Ministry of Economy and Industry was established.

According to the 2018 Resolution of the President No. 3502, supervision of the procedure for the preparation of general plans is done by the Ministry of Construction, through architectural councils operating at the oblast level. For big cities, general plans are approved by the Cabinet of Ministers.

The Ministry of Housing and Communal Utilities is responsible for the provision of utilities and municipal services.

The Ministry of Culture is responsible of the preparation of the historic preservation component of general plans. The Ministry of Culture is responsible for the inspection and maintenance of a certain number of “objects of culture” (buildings, monuments, archaeological sites) around the territory of Uzbekistan (mainly in urban areas). The list and the geographical localization of the objects are not available. The elaboration of the general plan for cities such as Samarkand entails a process of scrutiny by the Ministry of Culture.

The State Committee on Land Resources, Geodesy, Cartography and State Cadastre maintains the State Land Cadastre, the State Cadastre of Buildings and Facilities and several other cadastres.

QQB is a state-owned bank (75 per cent share). From 2000 to 2009, it was the only bank in Uzbekistan dedicated to financing the housing sector. In 2018, around 60 per cent of its activities are dedicated to individual mortgage loans. Since 2015, five more banks operate in this field.

Participation in international agreements and processes

Uzbekistan did not take part in the Habitat III process.

No town or city of Uzbekistan participates in the Covenant of Mayors movement, which supports local governments to take climate and energy action.



Box 16.3: Selected targets under Goal 11 of the 2030 Agenda for Sustainable Development

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable
Target 11.1: By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums

Uzbekistan nationalized global target 11.1 in slightly revised wording, omitting reference to slums. It has also modified global indicator 11.1.1 (Proportion of urban population living in slums, informal settlements or inadequate housing) to two national indicators. National indicator 11.1.1 (Provision of housing to population (m²/person)) stood at 15.7 m² in 2017. National indicator 11.1.2 (Proportion of households having no housing in ownership) stood at 2.1 per cent in 2017.

Through the extensive implementation of programmes on rural housing, Uzbekistan is trying to provide affordable housing to rural inhabitants, also targeting vulnerable categories such as single mothers, the elderly and disabled people. These efforts aim at upgrading existing living conditions and providing basic services in zones that were not previously served.

There is no information about social housing aimed at giving a home to the socially vulnerable and low- or no-income people.

Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries

Uzbekistan nationalized global target 11.3 and its indicator 11.3.1 without changes, but has not adopted global indicator 11.3.2 (Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically).

Uzbekistan has not yet introduced a proper system of participatory urban planning and management. Usually, new architectural undertakings require the approval of the territorially competent makhalla chairperson, but often local inhabitants complain because of the lack of information and involvement in the decision-making process. Preliminary discussions about the projects under development (mainly new commercial and residential developments) sometimes involve the public, but the effectiveness and impact of such involvement is often questioned.

Reportedly, in the case of the 2018 makhalla renovation plans (neighbourhood development plans), despite some public participation at the neighbourhood level, the final decisions taken at the higher level by khokims sometimes introduced new built-up objects in areas indicated as “vacant”.

In 2019, the Ministry of Construction has proposed the participation of active citizens, as well as self-government bodies and NGOs in the decision-making process on urban planning. The draft urban planning code which includes these proposals has been published for discussion in 2019.

Target 11.7: By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

National target 11.7 is to extend, by 2030, the area of green spaces, parks and children playgrounds in cities and settlements with special focus on persons with disabilities.

In recent years, Uzbekistan’s policy has aimed at increasing the number of trees planted in urban areas, with the scope of also creating green belts around major cities. According to media reports, in 2019, the City of Tashkent has 15,200 ha of green areas, compared with 6,800 ha in 1990. The “Green Belt Initiative” began in Tashkent in February 2019; oaks, chestnuts, catalpas and fruit trees have been planted in different parts of the city.

There are no specific data on the targeting of women, children and persons with disabilities in implementation of target 11.7.

Target 11.a: Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning

Uzbekistan has not nationalized global target 11.a. There is not a specific policy aimed at supporting linkages between urban and rural areas. It is intended to develop a national medium-size cities programme aimed at achieving the integrated and balanced socioeconomic development of oblasts, districts and cities.

16.5 Assessment, conclusions and recommendations

Assessment

Human settlements are at the core of the economic development in contemporary Uzbekistan. Their rapid growth also implies rapid changes in the economy, society and the environment – the three pillars of sustainable development.

Rapid growth in the housing sector in any country must be thoroughly sustainable; otherwise, the development is done at the expense of cultural identity, social well-being and the environment.

Intervening on the issue of human settlements is an excellent opportunity for Uzbekistan to deliver a new, sustainable country for the next generations and to uplift the country’s economy in the world ranking. However, the Government should invest in carefully steering this rapid growth towards successful, long-lasting and truly sustainable development.

Uzbekistan is intensifying its efforts to give a strong impulse to the economy, including through the development of the housing sector and new planning policies, but this rapid evolution does not fully exploit the considerable potential of human settlements in the fight against climate change. Since 2009, Uzbekistan is significantly investing in building new settlements

in rural areas, with standardized houses for the rural population. More new dwellings are expected in the years to come; however, in rural areas, new human settlements are resulting in the same model of housing everywhere.

Since 2017, there has been a boost in the construction sector, especially in the City of Tashkent, but also in other major cities. Foreign investors are attracted to support the transformation of the country into a modern state. Support is still lacking for environmental considerations to steer this process, which sometimes does not carefully consider the needs of citizens when investments in large renovation and construction projects take place.

*Conclusions and recommendations*³¹

Climate change concerns

The rapid growth of rural settlements, which occupy previously undeveloped lands all over the country, and the rapid urban expansion of existing cities increase the number of people exposed to the effects of “urban” climate change on the one hand, and upsurges in the production of GHG emissions from human settlements on the other. The country has not yet developed specific policies for adaptation to climate change, and limited information is available on the expected measures to reduce GHG emissions from the housing sector. Such measures are indispensable for the country to deliver on global target 11.b of the 2030 Agenda for Sustainable Development.

Recommendation 16.1:

The Cabinet of Ministers should consider:

- (a) *Introducing climate adaptation planning in urban areas and rural settlements;*
- (b) *Introducing specific zoning requirements to mitigate GHG emissions and energy efficiency in urban areas and rural settlements;*
- (c) *Fully exploiting the potential for GHG emissions reduction from the housing sector;*
- (d) *Implementing the use of local materials for the housing sector, to reduce its energy intensity and their carbon footprint;*
- (e) *Introducing incentives for investments in low carbon buildings;*
- (f) *Introducing incentives to reduce the carbon footprint of the housing sector and to introduce modern technologies in the cement*

industry by using the carbon footprint calculations;

- (g) *Prescribing the integration of traditional materials, morphologies and aesthetic shapes with contemporary techniques and technologies for the design and construction of new rural housing;*
- (h) *Elaborating, maintaining and updating the maps of flood-prone areas;*
- (i) *Addressing climate resilience of rural settlements by designs tailored to local climatic conditions (in terms of sun orientation, prevailing wind direction, pervious surfaces, establishment of green infrastructure) and not based on standard multiplication of rows of buildings;*
- (j) *Introducing climate change adaptation and mitigation in the policy documents related to urban development.*

See Recommendation 7.1.

Industrial facilities in urban areas

The placement of industrial facilities in urban areas remains an issue in Uzbekistan and no measures have been taken to remove such facilities from urban areas. Improvements in this area could significantly contribute to Uzbekistan’s progress towards achievement of Sustainable Development Goal 11.

Recommendation 16.2:

The Cabinet of Ministers should ensure:

- (a) *Removal of existing industrial facilities from urban areas;*
- (b) *Strengthening environmental requirements for the localization of new factories, or the upgrading of existing ones in urban areas.*

Cultural identity and urban landscape

Uzbekistan does not integrate the approaches to cultural identity and urban landscape envisaged by the European Landscape Convention into the planning, design and construction processes. The Tashkent Institute of Architecture and Construction is carrying out studies on how to reintroduce ancient typical urban morphologies and urban patterns in contemporary Uzbekistan. The findings of these studies are not used to improve the quality of urban areas and rural settlements and the life of their inhabitants.

³¹ In 2014, Uzbekistan hosted a Country Profile on Housing and Land Management, published by ECE in 2015. Many recommendations of the Country Profile remain relevant in 2019.

Recommendation 16.3:

The Cabinet of Ministers should consider:

- (a) Introducing an extended concept of landscape, which takes into account the promotion of Uzbek cultural identity;
- (b) Taking stock of existing studies carried out by Uzbek universities to introduce distinctive elements of Uzbek identity in housing and urban and rural settlement design, to improve the quality of life in cities and rural areas;
- (c) Promoting awareness-raising activities on distinctive Uzbek cultural identity and architectural and urban forms.

Public participation

Effective public participation is not ensured in the choices affecting the territory, nor do the local administrations have a predominant role in the planning framework. The new architectural undertakings require the approval of the territorially competent makhalla chairperson, but often local inhabitants complain because of the lack of information and involvement in the decision-making process.

Recommendation 16.4:

The Cabinet of Ministers should ensure:

- (a) Effective public participation in the elaboration of plans and programmes affecting the territory at the earliest stage possible;
- (b) Effective public participation in decision-making on projects to be implemented in inhabited areas, and specifically those that would entail their total or partial transformation;
- (c) That due account is taken of the outcomes of such public participation procedures.

See Recommendation 5.3.

GIS systems and remote sensing

GIS systems and remote sensing allow the geolocalization and management of cultural heritage, the monitoring of illegal settlements and territorial management. They also enable web interfaces to inform the public and disseminate environmental information. However, GIS systems and remote sensing are not used for these purposes in Uzbekistan.

Recommendation 16.5:

The Cabinet of Ministers should facilitate the updating of remote sensing and GIS systems to:

- (a) Geolocalize, manage and monitor protected sites and objects of culture;
- (b) Share information about cultural heritage and raise awareness among the population about the importance of cultural heritage;
- (c) Monitor the construction activities inside and outside urban areas.

Energy efficiency of housing

The existing housing stock is highly energy inefficient. Construction standards changed in 2018, introducing new energy efficiency requirements. Those standards apply only to new construction projects; therefore, existing buildings are not subject to a requirement for improving energy efficiency. The UNDP-GEF Project “Market Transformation for Sustainable Rural Housing in Uzbekistan” has demonstrated the benefits of introducing energy efficient and low carbon solutions for the construction of rural housing. As of November 2019, the use of solar thermal collectors for hot water and photovoltaics is not widespread in new and existing buildings.

No certification systems aligned with international standards, such as Leadership in Energy and Environmental Design (LEED) or Building Research Establishment Environmental Assessment Method (BREEAM) are implemented in the country.

Recommendation 16.6:

The Cabinet of Ministers should:

- (a) Develop and introduce energy efficiency standards and requirements for existing buildings;
- (b) Enforce the 2018 construction standards;
- (c) Promote in the housing sector the use of:
 - (i) Market-based solutions for energy efficiency;
 - (ii) Geothermal systems;
 - (iii) Solar thermal collectors for heating water and air and generating electricity.

Urban ecological networks

Urban ecological networks are not developed in Uzbekistan. The development of ecological networks within urban areas would be useful to promote their sustainability, and would allow Uzbekistan to move

beyond merely greening cities towards having cities that provide habitats for native biodiversity.

Recommendation 16.7:

The Cabinet of Ministers should consider developing and implementing urban ecological networks.

Asbestos

Asbestos is still considered a cheap and appropriate construction material in Uzbekistan, and therefore is extensively used. The interviewed population and technical officers believe it is not harmful as long as it is used to produce compact materials, and they see no risk of volatile emissions.

Recommendation 16.8:

The Cabinet of Ministers should:

- (a) *Ban asbestos as a construction material and its use in the remediation of existing buildings;*
- (b) *Organize dedicated campaigns to inform the population of the extreme danger of asbestos for human health.*

Social protection and social housing

Issues related to the rapid development and refurbishment of inhabited parts of cities to safeguard inhabitants of residential buildings listed for demolition and reconstruction are not adequately addressed by the Government.

There is no information about the provision of social housing aimed at giving a home to the socially vulnerable and low- or no-income people.

Recommendation 16.9:

The Cabinet of Ministers should:

- (a) *Implement social protection measures aimed at safeguarding the rights of inhabitants of residential buildings that receive demolition orders;*
- (b) *Ensure the provision of social housing for people in vulnerable categories and the low-income population.*

Urban development

In Uzbekistan, developers do not pay development impact taxes but are obliged to provide a certain percentage of built-up volume in the form of apartments to be allocated to most vulnerable people. In Europe, the development impact taxes can be used to finance the building or upgrading of necessary urban infrastructure or funding health and social care facilities.

Recommendation 16.10:

The Cabinet of Ministers should consider:

- (a) *Introducing development impact taxes;*
- (b) *Requiring that large construction developments fully compensate the communities affected by demolition and reconstruction;*
- (c) *Introducing strategic environmental assessment as a support tool to develop sustainable urban planning documentation.*

See Recommendation 1.3.

Chapter 17

HEALTH AND THE ENVIRONMENT

17.1 Population health status

Population development

With its 32.66 million inhabitants in 2018, Uzbekistan is the most populous country in Central Asia. With a median age of 28.7 years in 2018, Uzbekistan's population is considerably younger than that of the WHO European Region, with a median age of 39.7 years. Around 66 per cent of the population are in the age range of the potentially economically active population (15–64 years), which is close to those indicators for the Commonwealth of Independent States (CIS) and the WHO European Region (table 17.1).

Uzbekistan witnessed population growth at a rate of 1.5 per cent in 2015, due to the persistently high birth rate and relatively low death rates, which have remained almost unchanged since 2009. The fertility rate is higher than that of the CIS countries and the

WHO European Region. A large proportion of the population (50.6 per cent in 2018) live in urban areas but about half the population (49.4 per cent) still live in rural areas.

According to 2016 estimates by WHO, life expectancy in Uzbekistan was 75.0 years for females and 69.7 for males, 1.4 years higher than in 2010. Although one of the main developmental achievements of Uzbekistan is that life expectancy has increased by approximately five years since 1995, it is still one of the lowest in the WHO European Region.

Officially recorded life expectancy rates do not fully reflect actual trends. Official statistics overestimate life expectancy: in 2016, the respective values were 71.4 years for males and 76.2 years for females; in 2017, they were 71.3 years for males and 76.1 years for females. However, life expectancy in Uzbekistan is lower than in the WHO European Region and slightly higher than the CIS average (table 17.2).

Table 17.1: Key demographic indicators, 2010, 2015, 2017

	Uzbekistan			CIS	WHO European
	2010	2015	2017	2015	2015
Mid-year population (million)	28.6	30.3 ^{a)}		282.3 ^{a)}	910.5 ^{a)}
Population aged 0–14 (%)	29.1	28.1	28.6	19.7	17.8
Population aged 65+ (%)	4.5	4.2	4.4	11.5	15.5
Live births (per 1,000 population)	22.2	24.4 ^{b)}	22.1	15.7	12.5
Deaths (per 1,000 population)	4.8	4.9 ^{b)}	5.0	11.3	10.0
Natural growth rate (per 1,000 population)	17.4	19.5 ^{b)}		4.4	2.5
Total fertility rate (children per woman)	2.2 ^{c)}	2.5 ^{b)}	2.4	1.7	1.7

Source: All data are from WHO Regional Office for Europe, Health for All Database, 2018, except data for Uzbekistan for 2017, which were provided by the State Committee on Statistics, 2019.

Note: a) Data refer to 2016; b) Data refer to 2014; c) Data refer to 2011.

Table 17.2: Selected population health indicators, 2016

	Uzbekistan	CIS	WHO European Region
Life expectancy at birth (years)	72.3	72.0	77.5
Adult mortality rate (per 1,000 adults 15–59 years)	131.0	181.0	113.0
Infant mortality (per 1,000 live births)	21.3	11.0	8.1
Under-5 mortality rate (per 1,000 live births)	23.9	12.6	9.3
Maternal mortality ratio (per 100,000 live births)*	36.0	26.0	16.0

Source: WHO Global Health Observatory data repository <http://apps.who.int/gho/data/node.home>; accessed January 2019.

Note: * Data refer to 2015.

There is an urban–rural divide in life expectancy. In 2016, people living in the cities tended to live 1.5 years longer than their rural counterparts; the difference for the female population was more than 2 years, most likely due to better living and working conditions and access to health services in urban areas. Within the country, there is lower life expectancy at birth in the Republic of Karakalpakstan (the Aral Sea region) and Andijan, Syrdarya and Tashkent Oblasts.

The adult mortality rate is lower than the CIS average but higher than the average of the WHO European Region.

Maternal and child mortality

The United Nations Interagency Group (WHO, UNICEF and United Nations Population Fund (UNFPA)) estimates on maternal mortality in Uzbekistan show a decrease from 54 per 100,000 live births in 1990 to 36 per 100,000 live births in 2015. The reduction in maternal mortality during this period indicates that the country has met the national target of Millennium Developmental Goal (MDG) 5 aimed at reducing the maternal mortality ratio by one third between 1990 and 2015. The official statistics report lower values and a decreasing trend, from 23.5 per 100,000 live births in 2007 to 17.4 per 100,000 live births in 2016, mostly owing to the use, until mid-2014, of the definition of live births adopted during the Soviet period, which is different from that of WHO. Nevertheless, the official statistics for 2017 show an increase to 21 per 100,000 live births. In any case, the country levels are higher than those of the CIS countries and much higher than the WHO European Region average (table 17.2).

Both the under-5 mortality rate and infant mortality rate have been decreasing since 2000. According to WHO estimates, the under-5 mortality rate fell from 36.2 per 1,000 live births in 2010 to 23.9 per 1,000 live births in 2015, and infant mortality from 31.6 per 1,000 live births to 21.3 per 1,000 live births, but both still remain high compared with the WHO European Region and CIS countries. Important differentials in infant mortality in relation to income quintile continue to persist, with babies born in the bottom income quintile being twice as likely to die before the age of 1 compared with those in the top quintile.

Infant mortality among the rural population was consistently lower than that of the urban population, most probably due to deficiencies in registration and reporting in rural areas.

As regards the infant mortality rate, official statistics show lower values than the WHO estimates, with no

significant dynamics: 11 per 1,000 live births in 2010, 10.8 per 1,000 live births in 2014 and 11.5 per 1,000 live births in 2017. As regards the under-5 mortality rate, official statistics are again lower than WHO statistics, showing a decrease from 14.9 per 1,000 live births in 2010 to 12.0 per 1,000 live births in 2013.

In terms of the causes of under-5 mortality, in 2012, the largest share (37.5 per cent) was due to respiratory diseases. Mortality from these diseases is preventable. Perinatal causes rank second and some conditions attributed to these, such as asphyxia and infections, are also preventable.

The current stand of Uzbekistan vis-à-vis targets 3.1, 3.2 and 3.7 of the 2030 Agenda for Sustainable Development is described in box 17.1.

Mortality by main causes of death

Non-communicable diseases (NCDs) continue to represent by far the major share of deaths and of years of life lost in the country. The State Committee on Statistics data on mortality from the most important NCDs (diseases of the circulatory, digestive and respiratory systems, malignant neoplasms and external causes of injury and poisonings) show a decrease for all causes during the period 2007–2017, with the exception of malignant neoplasms, which are on the rise, especially after 2013, at about 4 per cent of relative change against the previous year. Cause-specific mortality rates per 100,000 population decreased in the period 2007–2017, from 723 to 638 for circulatory system diseases, from 62 to 46 for digestive system diseases, from 54 to 33 for respiratory system diseases and from 20 to 11 for infectious and parasitic diseases. The decrease in mortality from each of these causes slowed after 2013. In 2015, mortality from the leading cause – diseases of the circulatory system – was twice as high in Uzbekistan than in the WHO European Region (table 17.3).

Similarly to the rest of the WHO European Region, in Uzbekistan, ischaemic heart and cerebrovascular diseases constitute the leading cause of death, followed by cancer (table 17.3). Their share in all-causes mortality in the country is larger than in the CIS countries and much larger than in the WHO European Region. The distribution of cause-specific mortality by external causes, respiratory diseases, digestive system diseases and communicable diseases is different in Uzbekistan, with diseases of the digestive system ranking third in the cause of death. Though the incidence of liver cirrhosis in the country has decreased over the last five years, it remains a very significant cause of death, killing about 11,000 people

in 2015. The share of deaths due to respiratory diseases in Uzbekistan is similar to that by external causes, ranking fourth and fifth respectively, whereas injuries and poisoning are the third leading cause of mortality in the CIS and the WHO European Region.

Dietary risks, malnutrition, tobacco and alcohol use, as well as air pollution, are among the top 10 risk

factors that drove the highest number of deaths and cases of disability combined during the period 2007–2017 in Uzbekistan.

The current stand of Uzbekistan vis-à-vis target 3.4 of the 2030 Agenda for Sustainable Development is described in box 17.2.



Box 17.1: Targets 3.1, 3.2 and 3.7 of the 2030 Agenda for Sustainable Development

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.1: By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births

Uzbekistan's national target 3.1 is to reduce by one third the maternal mortality ratio by 2030.

This target is measured by two indicators: 3.1.1, Maternal mortality ratio, which is estimated by the United Nations Interagency Group at 36 per 100,000 live births in 2015; and 3.1.2, Proportion of births attended by skilled health personnel, which is reported by the country to be 100 per cent in 2015.

Maternal mortality is decreasing but the annual rates of reduction have slowed since 2005 and the levels still remain among the highest in the WHO European Region. The nutritional status of women in Uzbekistan is one of the main concerns in maternal health, as anaemia and deficiencies of several micronutrients which are associated with higher maternal mortality risks are still persistent. Also, owing to economic pressure, women are sometimes required to perform hard physical work during their pregnancy, which is also preventing them from seeking health care.

Half the maternal deaths are related to obstetric factors, most of which occur among rural women less likely to have delivered with a skilled birth attendant.

Target 3.2: By 2030, end preventable deaths of new-borns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births

National target 3.2 is to reduce by half neonatal mortality and under-5 mortality by 2030.

The under-5 mortality rate (indicator 3.2.1) declined from 36.2 per 1,000 live births in 2010 to 23.9 per 1,000 live births in 2015, and the neonatal mortality rate (indicator 3.2.2) from 19.4 per 1,000 live births in 2010 to 12.1 per 1,000 live births in 2017.

Undernourishment continues to be a problem in Uzbekistan, given the prevalence of stunting and wasting in children under the age of 5. The country is aiming to achieve the international goal of reducing stunting and wasting by 2025 through improving food security. The State Programme "Year of a healthy mother and child" of 2016, among other activities, reflects the efforts made towards providing quality health-care services and building the capacities of health workers.

Target 3.7: By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes

National target 3.7 is to ensure universal access to sexual and reproductive health-care services, including for family planning, raising the marriageable age for girls to 18, and integration of reproductive health into national strategies and programmes by 2030.

No data are collected on the proportion of women of reproductive age (aged 15–49 years) who have their need for family planning satisfied with modern methods (indicator 3.7.1). According to the official gender statistics, in 2015, about 45 per 100 women of reproductive age applied contraceptive methods. The birth rate among adolescent girls (indicator 3.7.2) was still high in 2010: almost 30 per 1,000 in the age-group 15–19 years. There are no data on the birth rate in the younger age group (10–14 years). In August 2019 Uzbekistan raised the marriageable age for girls from 17 years to 18 years.

The State Programme on Strengthening Reproductive, Maternal and Children's Health for the period 2014–2018 has resulted in certain improvements. The profound health system reform currently under way in the country would further enhance quality, availability and accessibility of health-care services towards the achievement of target 3.7.

Table 17.3: Standardized death rates for the most important causes of death, 2015, per 100,000 population

	Uzbekistan		CIS		WHO European Region	
	SDR	%	SDR	%	SDR	%
All causes	932.80	100.00	1 014.43	100.00	718.27	100.00
Diseases of circulatory system	640.40	68.65	559.01	55.11	314.89	43.84
Malignant neoplasms	75.10	8.05	143.42	14.14	151.31	21.07
External causes of injury and poisoning	35.80	3.84	88.03	8.68	49.93	6.95
Diseases of digestive system	48.10	5.16	54.60	5.38	33.88	4.72
Diseases of the respiratory system	36.40	3.90	46.85	4.62	46.41	6.46
Infectious and parasitic diseases	12.80	1.37	17.85	1.76	12.32	1.72

Source: WHO Regional Office for Europe, Health for All Database, 2019 (<https://gateway.euro.who.int/en/hfa-explorer/>); State Committee on Statistics, 2019 (<https://gender.stat.uz/ru/osnovnye-pokazateli/demografiya/smernost/123-standartizovannye-koeffitsienty-smernosti-ru>).

Note: SDR = standardized death rates.

3 GOOD HEALTH AND WELL-BEING



Box 17.2: Target 3.4 of the 2030 Agenda for Sustainable Development

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.4: By 2030, reduce by one third premature mortality from non-communicable diseases (NCDs) through prevention and treatment and promote mental health and well-being

National target 3.4 is to reduce by 30 per cent premature mortality among the population from cardiovascular diseases, oncological diseases, diabetes mellitus and chronic respiratory diseases by 2030.

In 2016, the probability of dying between age 30 and exact age 70 from any of cardiovascular disease, cancer, diabetes or chronic respiratory disease (national indicator 3.4.1) in Uzbekistan was 24.5 per cent, compared with 16.7 in the WHO European Region. The probability has been decreasing since 2000. As for global/national indicator 3.4.2 (Suicide mortality rate), the suicide rate in Uzbekistan was lower than in the WHO European Region, but the age-standardized suicide rate increased from 6.0 per 100,000 population in 2010 to 7.4 per 100,000 population in 2016, with higher rates among men.

NCDs pose a huge burden and contribute to economic losses in the country, and the health system is oriented predominantly towards treatment, giving less attention to NCD reduction through prevention. In addition, the gap in life expectancy between women and men suggests that the gender-related influence on mortality has not been sufficiently addressed. Several surveys were conducted from 2005 to 2016 but the results were not published officially, so evidence-based policy development is an issue.

Most deaths from NCDs arise in the age range of 30–70 years, where the risk factors are amenable to interventions. Environmental pressures, such as exposure to air pollution and noise, contribute to high levels of blood pressure and low birth weight, which are among the most important risk factors for NCDs in the country, along with diet, child and maternal malnutrition and tobacco use. Effective prevention and control of NCDs and risk factors are essential to reduce premature mortality. New skill sets are required to engage in strengthening public health and health system reform towards health promotion and disease prevention, early detection and other actions, in order to advance NCDs management. Equally, mechanisms for effective multisectoral collaboration and integrated policy action are keys to reducing and preventing premature mortality and disability in the country.

Selected trends in morbidity

Diseases of the respiratory system and blood are the main causes of hospitalization. With respect to communicable diseases, acute respiratory and intestinal infections are the main causes of hospitalization.

According to the World Bank's 2016 Systematic Country Diagnostic, the majority of the population subsists near the poverty line and is at significant risk of falling below it. Tuberculosis (TB) incidence rates, which began declining steadily around 2005, remain twice as high as those in the WHO European Region

(figure 17.1). Children account for more than 11 per cent of all TB cases. Within the country, the Republic of Karakalpakstan and Tashkent Oblast have the highest incidence of TB. While the burden of TB and HIV/AIDS has declined somewhat in recent years, the prevalence of multidrug-resistant TB has been increasing rapidly and presents a serious challenge.

Uzbekistan is among the countries attaining zero indigenous malaria cases for three consecutive years (2011–2013) and has moved forward from malaria control to elimination. The country received the WHO certificate on elimination of malaria in 2018. Despite the high immunization coverage against traditional

vaccine-preventable diseases, communicable diseases such as Hepatitis A, which are associated with poor hygiene, and also rabies are on the rise.

The current stand of Uzbekistan vis-à-vis targets 3.3 and 3.8 of the 2030 Agenda for Sustainable Development is described in box 17.3.

Morbidity in the Aral Sea area

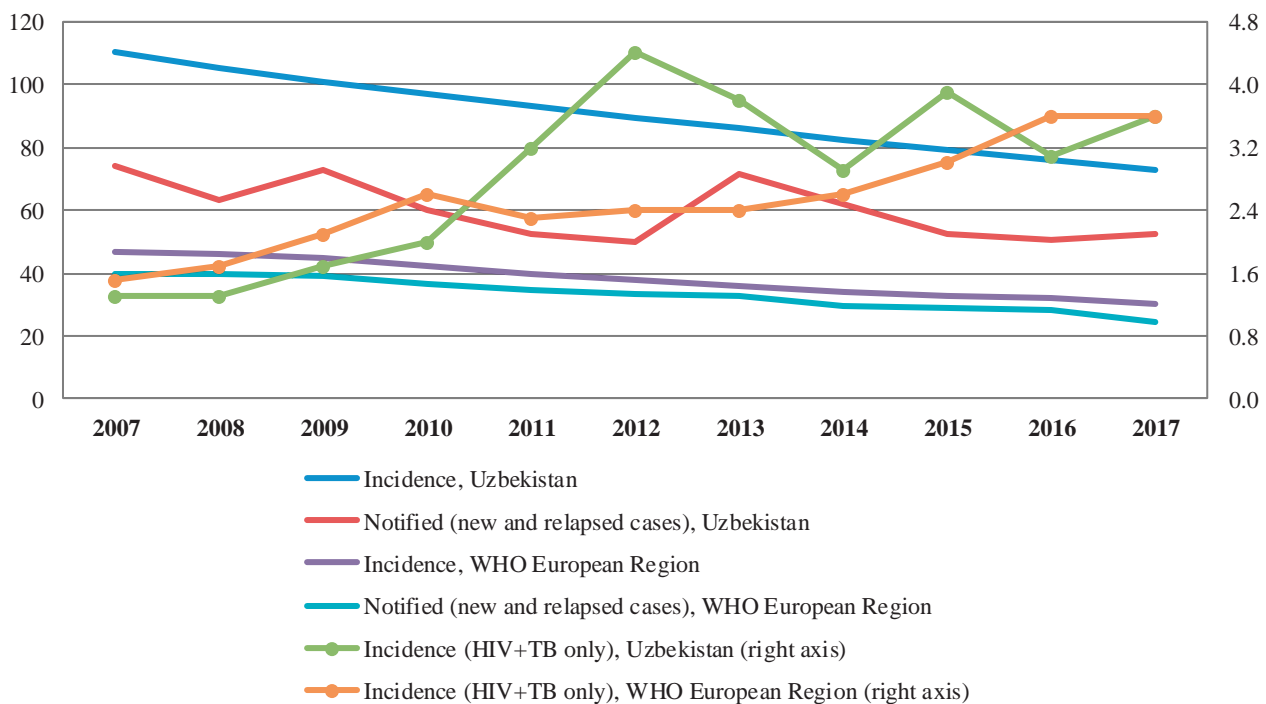
The Aral Sea region in Uzbekistan comprises the Republic of Karakalpakstan and Khorezm Oblast, with a total population of 3.647 million in 2018. The crisis of the drying Aral Sea has brought profound impacts on the entire ecosystem and a large burden of disease and disability to the population. There are no systematic epidemiological studies on the population's health status and trends and associated environmental, socio-economic and other factors following the Aral Sea disaster. Some human biomonitoring surveys were conducted more than 15 years ago.

In the framework of the seven-country initiative of the WHO Regional Office for Europe aimed at protecting health from climate change, a study found high morbidity from respiratory diseases in the Republic of

Karakalpakstan during the period 2006–2010 and an increase towards the end of the period, which was attributed to climatic factors, in particular ambient air dust and temperature. Within the same initiative, analysis of morbidity in the Republic of Karakalpakstan for the period 2007–2009 carried out by the State Sanitary and Epidemiological Surveillance Centre of the Republic of Karakalpakstan has shown an increase in diseases of the endocrine system (endemic goitre), digestive system (gallstones) and urological system (kidney stones), as well as chronic bronchitis and asthma.

Even if the routinely reported morbidity data have limitations for assessment of the population's health status in the Aral Sea Region, very limited statistics were published but they are rather difficult to access, especially at the subnational level. The data reported in the framework of the regional and international initiatives on the Aral Sea show chronic bronchitis morbidity persisting throughout the period 2005–2016 at levels from 86 per 100,000 population to 113 per 100,000 population. The incidence of urological system disease (kidney stones) was on the rise, from 17 per 100,000 population in 2005 to 39 per 100,000 population in 2016.

Figure 17.1: Tuberculosis incidence, incidence among HIV-positive persons, 2007–2017, estimated rates per 100,000 population



Source: WHO Global Health Observatory data repository (<http://apps.who.int/gho/data/node.home>), accessed January 2019; State Committee on Statistics, 2019.



Box 17.3: Targets 3.3 and 3.8 of the 2030 Agenda for Sustainable Development

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases

National target 3.3 is to reduce the incidence of TB and HIV and to combat hepatitis, water-borne diseases and other communicable diseases.

The country ranked sixth highest in the WHO European Region on the incidence of new HIV infections, with an estimated 0.21 new infected persons per 1,000 uninfected population (indicator 3.3.1) in 2017. The growing rate of new infections in the age groups 15–24 and 25–49 years, where it is associated with the sexual transmission of HIV, has become predominant in recent years, underlining the importance of preventive and control measures in the general population. The country does not conduct sufficient prevention and control measures to counteract growing rates of HIV infection, overcome HIV-related stigma and provide psychosocial support to children and adolescents on HIV-related issues.

The country also ranked sixth highest in the WHO European Region on the incidence of TB, with an estimated 73 persons per 100,000 population (indicator 3.3.2) in 2017. TB incidence is steadily decreasing, but levels well above the WHO European Region average and the resurgence of TB in the country require urgent measures to be taken (figure 17.1). Uzbekistan is among the 18 high-priority countries in the WHO European Region with regard to fighting TB and among the 30 highest ranked countries in the world with regard to the burden of multidrug-resistant TB, having a low TB detection rate. One of the main challenges in TB control in Uzbekistan is the absence of an electronic surveillance system. The same holds true for other infectious diseases, such as hepatitis and HIV/AIDS. Therefore, considerable efforts are required to improve the quality of prevention, diagnosis and treatment towards achievement of the Global End TB strategy targets.

Malaria incidence per 1,000 population (indicator 3.3.3) was zero in 2017. Although Uzbekistan received the WHO malaria elimination certificate, there is still a risk of importing malaria, because of increased migration. Also, there are concerns about insufficient attention being paid to malaria prevention, which might lead once more to local malaria transmission.

The prevalence of Hepatitis B surface antigen among children under 5 years of age (key data input for indicator 3.3.4, Hepatitis B incidence per 100,000 population) was 0.6 per cent in 2015. Viral hepatitis is highly endemic in Uzbekistan and the private sector is supporting vaccinations against hepatitis A and B.

The reported number of people requiring interventions against neglected tropical diseases (indicator 3.3.5) was about 406,000 in 2016, showing some increase since 2014 in contrast to the expected decrease towards “the end of those diseases” by 2030 as a result of their effective control, elimination and eradication. Since 2010, Uzbekistan has been among the countries (mostly from the Caucasus and Central Asia) in the WHO European Region that have reported the highest number of people requiring such interventions.

Combating infectious diseases requires strengthening the sanitary-epidemiological system and introducing modern public health methods. There is no computerized nationwide surveillance system for priority infectious diseases that would be instrumental to identifying causal agents/sources and populations at risk, to inform policy and programme development at the local and central levels and monitoring and evaluation of implementation progress.

Target 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all

National target 3.8 is identical to the global target.

Coverage of essential health services (indicator 3.8.1) was estimated at 72 per cent in 2015, close to the threshold level set at 80 per cent (defined as the lower limit of the top quintile), indicating fairly good coverage of essential services for reproductive, maternal, newborn and child health and for infectious and non-communicable diseases, and service capacity and accessibility among the general and the most disadvantaged populations.

According to household surveys organized by statistical authorities of Uzbekistan, the proportion of the population with large household expenditure on health as a share of total household expenditure (indicator 3.8.2) was as follows:

- (a) Over 10 per cent of expenditure on health: in 2018, 13.8 per cent of households; in 2017, 12.5 per cent; in 2016, 10.9 per cent;
- (b) Over 25 per cent of expenditure on health: in 2018, 3.0 per cent of households; in 2017, 2.5 per cent; in 2016, 2.1 per cent.

Financing of the health-care system is predominantly from tax revenues and currently covers about half of total health expenditures – a share that is insufficient to ensure quality health services without additional (out-of-pocket) expenditures. Thus, the burden of cost falls disproportionately on the poor and vulnerable.

The health system reform in Uzbekistan has brought some improvements in accessibility to quality, effective and safe health care through several actions, including in rural areas by the creation of more medical centres and increasing

production of domestic medicines, with the aim to increase access to essential medicines. Also, the country runs a successful immunization programme. The Government has launched reform of primary health care, since strong and multi-profiled primary health care is a key pillar in progressing towards universal health coverage.

According to the Ministry of Health, in 2017, in the Republic of Karakalpakstan, diseases of the blood, blood-forming organs and certain immunity disorders, mostly anaemia, as well as mental disorders, were higher by 10 per cent than the national averages. In Khorezm Oblast, morbidity from diseases of the nervous, circulatory, digestive and urological (kidney stones) systems was higher than the national averages by about 50 per cent and the corresponding incidence rates per 100,000 population were: 2,806 vs. 1,750; 2,932 vs. 2,295; 9,092 vs. 6,766; and 110 vs. 70. In 2017, the incidence of antenatal, perinatal and post-neonatal health conditions/complications in the entire Aral Sea region exceeded the national average by 50 per cent (5,727 vs. 3,782 per 100,000 population). In 2017, Khorezm Oblast, with an incidence of 7,301 per 100,000 population, ranked the highest in the country, also because of the lack of access to quality and effective maternal health care in that oblast.

With respect to infectious diseases, the incidence of TB in the Republic of Karakalpakstan is twice as high as the national average. Within the Republic, the incidence of TB in the districts of Muynak, Karauzyak and Takhtakupyr is twice the average for the Republic overall. This again points to health system deficiencies, but also to poor living conditions and malnutrition. According to the data of the Ministry of Health for the period 2009–2017, in the Republic of Karakalpakstan, morbidity from acute intestinal infections was well over the national averages during the entire period (by an average of 60 per cent), while morbidity from viral hepatitis A exceeded the national average only once, in 2011 (by 50 per cent). In Khorezm Oblast, morbidity levels for both infections were always below national levels.

17.2 Health risks associated with environmental factors and environmental causes of morbidity and mortality

Air quality

Ambient air quality

In 2016, WHO estimated annual mean concentrations of fine particulate matter (PM_{2.5}) in Uzbekistan at 25.3 µg/m³ – far beyond the WHO Air Quality Guideline value of 10 µg/m³ – with the population in the urban

areas of Uzbekistan being exposed to even higher levels of pollution.

Two air quality monitoring stations covering PM₁₀ and PM_{2.5} were installed in 2010 in Nukus and Tashkent in the framework of a WHO programme to support the country in assessment of the impact of air pollution on respiratory health, as a part of the seven-country initiative of the WHO Regional Office for Europe aimed at protecting health from climate change. PM₁₀ and PM_{2.5} concentrations in those cities reported to WHO in 2011 and 2012 consistently exceeded the WHO Air Quality Guidelines but the monthly averages showed a differential pattern of variations over time between the two cities, with higher levels in Tashkent that increased in the winter months. After 2012, PM₁₀ and PM_{2.5} monitoring at the Nukus station was discontinued and only data from Tashkent were published. Tashkent measuring station was in operation until 2017. In 2018, both stations were out of order because of a lack of finance for spare parts. No modelling was applied to identify differences in the properties of particle suspension and transportation to effectively guide pollution abatement measures.

Available data for ambient PM₁₀ and PM_{2.5} concentrations in Tashkent for the period 2012–2014³² show that, during all three years, annual mean PM_{2.5} exceeded WHO Air Quality Guideline levels by a factor of 2.6–3.3 (2.9 for the three-year average equal to 28.8 µg/m³). This value also exceeds the EU limit value of 20 µg/m³. Though PM_{2.5} concentrations from October 2013 until February 2014 were higher than in other periods, seasonal variation of PM_{2.5} levels were not very large, and hence there is no strong signal of pollution from household heating in Tashkent City. There were prolonged dusty periods from March until October, with a higher contribution of the coarse fraction in PM₁₀. The average PM_{2.5}/PM₁₀ ratio was in the range of 0.47–0.62, indicating the substantial, but not extremely high, contribution of mineral dust in PM₁₀. Based on mean PM_{2.5} concentration from the three years, one can estimate about 10.7 per cent of all-cause natural mortality in Tashkent in the population aged 30+ years to be attributable to PM exposure exceeding WHO Guidelines.

Throughout the country, ambient air quality monitoring conducted by Uzhydromet does not encompass PM₁₀ and PM_{2.5} (chapters 4 and 8). The

³² Ekologiya Xabarnomasi, No. 9 (209) (2018).

State Sanitary and Epidemiological Surveillance Service (SSESS), which is responsible for environmental health, has not specified PM₁₀ and PM_{2.5} limit values in the sanitary rules and norms. Databases of the air quality parameters levels are lacking. The most recent statistical collection on the state of the environment is limited to air pollutant emissions and compliance with national maximum allowed concentrations (MACs), without reference to the population concerned or potentially “at risk”. There is no information available to allow estimation of health effects.

No policy actions on pollution abatement are in place, despite high levels of ambient PM throughout the years. These give rise to a range of adverse health effects: in 2016, the estimated burden of disease attributed to ambient air pollution exposure in the country amounted to 14,414 deaths, most from ischemic heart disease – among the highest rates in the WHO European Region. WHO estimates the age-standardized death rate attributable to *ambient* air pollution at 69 per 100,000 population in Uzbekistan in 2016. In 2015, a study by WHO and the OECD reported on the economic cost of public health impacts of ambient and household air pollution as of 2010, with particular reference to the countries of the WHO European Region. In 2010, estimates of the effects of air pollution in Uzbekistan amounted to 27,672 premature deaths, with about two thirds of these due to ambient air pollution. The estimated economic cost of the premature death toll due to air pollution is about US\$12.267 million.

Indoor air quality

Indoor air pollution has not received due attention in the Government’s agenda, even though people spend a considerable period of their lives indoors. Gas and electricity shortages and a lack of clean and affordable fuel, as well as the use of unsafe heating and cooking appliances, pose significant indoor air problems, especially during the winter months and particularly in small towns and rural areas, which, in turn, affect people’s health significantly.

Even though, according to the WHO Global Health Observatory data repository, the proportion of the country’s population that relies primarily on clean fuels and technologies is on the rise, from 80 per cent in 2000 to 92 per cent in 2016, and about 20 per cent of the rural population was using solid fuels in 2013, fatalities by carbon monoxide poisoning were reported at the end of December 2018 in Tashkent and Samarkand Oblasts. Emissions from faulty, incorrectly installed, poorly maintained or poorly ventilated cooking or heating appliances that burn

fossil fuels, the burning of biomass fuels and tobacco smoke are the most important sources of exposure to carbon monoxide. No data system or register of carbon monoxide poisoning is established in the country.

No data are collected on second-hand tobacco smoke in and outside the home among the population aged 13–15 years. With the prevalence of daily smoking in 2014 at less than 1 per cent in females but 16.6 per cent in males, exposure to environmental tobacco smoke at home can be expected.

Uzbekistan’s national Sustainable Development Goals indicator 3.9.1, “Mortality rate attributed to the toxic effect of chemicals per 100,000 population”, differs from the corresponding global indicator, which is centred on mortality (deaths per 100,000 population) attributed to ambient and household *air* pollution (box 8.3). The national definition of this indicator is somewhat vague, lacking a clear rationale.

Water and sanitation

Population connected to drinking water supply and sanitation

According to the Ministry of Housing and Communal Utilities, at present, 20.7 million people or about 63.5 per cent of the population are covered by centralized drinking water supply services. Of these, 13.5 million or about 41 per cent have in-house connections to piped water supply, and 7 million or about 22 per cent use street standpipe services. Although most urban and rural areas are supplied with water, the water supply infrastructure, built in the late 1960s–1970s, is now in need of repair and inefficient, which leads to frequent breakages, intermittent water supply and contamination. Eight million people or about 25 per cent of the country’s population must use wells, springs, rivers and other water sources, and 3.3 million or about 10 per cent depend on water supplied by carriers.

According to the Ministry of Housing and Communal Utilities, about 6 million people in rural areas do not have access to a centralized drinking water system. They use water from irrigation channels and ditches without disinfection and purification, with a simple basic filtration at home.

Although the entire population in the country has access to basic sanitation, in early 2019, only 5.1 million people or about 15.6 per cent of the population are connected to a centralized sewerage system, according to the Ministry of Housing and Communal Utilities.

The WHO/UNICEF Joint Monitoring Programme estimated access to basic drinking water, sanitation and hygiene (WASH) in schools in 2016 at 90 per cent, 92 per cent and 89 per cent respectively, with slightly higher values for primary schools than secondary schools, but there was no information about urban–rural differences.

The WASH in Schools situation assessment during the period 2011–2012,³³ commissioned by UNICEF in six countries and conducted in Uzbekistan by the Republican Centre for Social Adaptation of Children, revealed marked urban–rural disparities in Uzbekistan. About 93 per cent of urban schools had piped water supply, compared with 63 per cent of schools in rural areas. The majority of schools in rural areas used pit latrines located 20–100 metres from the school building. Providing hand-washing facilities in the absence of a centralized water supply remained challenging, particularly in winter, and, consequently, in cold weather there was less use of school sanitation facilities and the use of hand-washing facilities was nearly negligible. Hygiene was taught in primary school as a part of the optional curriculum; children’s knowledge was high, but their hygiene behaviours were weak. As for regional differences, schools in the western regions, nearest to the Aral Sea, had disproportionately limited WASH access compared with those in the rest of the country, and it was further obstructed by water scarcity and the deterioration of centralized infrastructure.

Drinking water safety

Drinking water quality and safety subject to monitoring and control by SSESS shows around 5–25 per cent levels of non-compliance with the national standards. With regard to drinking water, rates of exceedance of the national standards for bacteriological and chemical indices by category of water supply system (municipal/urban, rural and water reservoirs) during the period 2012–2017 are given in figure 9.1.

Overall, the drinking water provided through urban water supply systems showed the lowest bacteriological exceedances when compared with that from rural systems and water reservoirs, but the levels of chemical exceedance were always greater than those of bacteriological exceedance in all bodies used for water supply and throughout all years. Chemical exceedances were twice as high as microbiological

exceedances, and even higher in the water reservoirs, where the sanitary situation is the worst of the three categories of water supply system.

Small and very small individual water supplies (e.g. wells, springs or rainwater collection tanks) that typically serve one family or a small number of households (e.g. farmers or dekhans) and are generally operated by the users themselves, are not subject to monitoring and control. Surface water consumed by 6 million people living in rural areas who are not connected to a centralized drinking water system is subject to pollution from livestock, farm runoff and fertilizer wash. The water has a high content of nitrates and pesticides and is contaminated with intestinal pathogenic protozoa, helminth eggs and pathogenic microflora from surface drains. Uzbekistan is among the four countries in the WHO European Region where more than 1 per cent of the population relies on surface water that is prone to severe microbial contamination.

Advancement in drinking water safety, as well as progress towards the 2030 Agenda for Sustainable Development targets on access to safe drinking water and adequate sanitation in the country, is centred on the large, centralized infrastructure. Thus, small-scale water supply systems typical of the countryside are left out of policy and regulatory oversight. Ensuring safe drinking water under those conditions requires an integrated approach focused on health risk prevention and control. The WHO Guidelines for Drinking Water Quality (first issued in 1958) introduced water safety plans (WSPs) as the means of consistently ensuring the safety of drinking water supply through the use of a comprehensive risk assessment and risk management approach at all stages from catchment to consumer. There is an incremental WSP uptake, with about one third of the countries in the WHO European Region having (regulatory) provisions on WSP approaches in place. As at 2019, there have been no demonstration projects on piloting WSPs in Uzbekistan. Uzbekistan is not a party to the ECE/WHO Regional Office for Europe Protocol on Water and Health to the Convention on the Use and Protection of Transboundary Watercourses and International Lakes, which prioritizes WSPs and sets an international framework enabling methodological and technical support for their implementation.

Measures to improve hygiene and sanitation conditions, coupled with hygiene education, can, in

³³ *Equity of Access to WASH in Schools: A Comparative Study of Policy and Service Delivery in Kyrgyzstan, Malawi, the Philippines, Timor-Leste, Uganda and Uzbekistan* (New York, UNICEF, n.d.).

the short term, provide a cost-effective solution for reducing the spread of waterborne infections in communities that rely on surface water for drinking. There is no evidence of targeted sanitation and hygiene programmes including hygiene education in such high water-related risk areas in Uzbekistan.

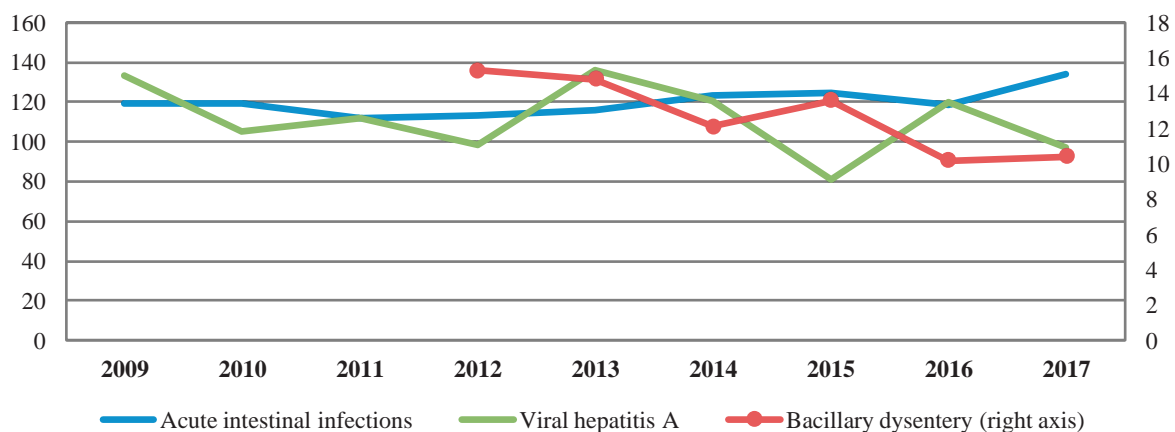
According to the Ministry of Health, in the period 1991–2015, the incidence of salmonellosis decreased by 19.2 times, acute intestinal infections by 4.5 times, bacterial dysentery by 8.8 times and viral hepatitis A by 6.6 times. Since 2015, no typhoid fever has been registered in the country. However, the incidence of acute intestinal infections, which remains high and has even tended to increase in recent years, indicates a significant burden of ill health associated with unsafe water in the country (figure 17.2). Equally, the incidence of viral hepatitis A, particularly frequent under poor sanitary and hygiene conditions, does not show a steady decrease over time. Within the country, high incidence rates have persisted in the Republic of Karakalpakstan and Navoiy and Tashkent Oblasts. Relatively low bacillary dysentery incidence levels, which tended to decrease in the period 2012–2017, may not reflect the real situation, because there is insufficient human and technical capacity necessary to detect the disease/underlying pathogen on a countrywide scale.

A study of spatial distribution and time trends of WASH-related diseases in Tashkent Oblast during the period 2011–2014 revealed four major diseases: enterobiasis, viral hepatitis A, acute intestinal infections and bacillary dysentery.³⁴ The incidence of all of them persisted during the entire four-year period; the highest was for enterobiasis, followed by acute intestinal infections and viral hepatitis A. The rates per 100,000 population in 2014 were 1,152 (enterobiasis), 174 (acute intestinal infections) and 190 (viral hepatitis A).

The country's infectious disease surveillance system is deficient concerning water-related diseases that have a high epidemic potential. With its insufficient scope and microbiological capacity, the system does not enable identification of those diseases transmitted by water and their disease burden so as to define intervention measures for their control and prevention. It is not possible (also because of the lack of databases) to identify communities impacted by water-related diseases, pollution hazards and risks in order to target resources towards those with priority needs.

The current stand of Uzbekistan vis-à-vis target 3.9 of the 2030 Agenda for Sustainable Development, in particular with regard to reducing deaths and illnesses from water contamination, is described in box 17.4. The position of the country vis-à-vis targets 6.1 and 6.2 of the 2030 Agenda is described in box 9.3.

Figure 17.2: Incidence of water-related acute intestinal, bacillary dysentery and viral Hepatitis A infections, 2009–2017, per 100,000 population



Source: SSESS, 2019; State Committee on Statistics (<https://gender.stat.uz/ru/osnovnyepokazateli/zdravookhranenie/infektsionnye-bolezni>), accessed January 2019.

³⁴ Veluswami Saravanan Subramanian and others, “Spatial distribution and trends of waterborne diseases in Tashkent Province”, *Central Asian Journal of Global Health*, vol. 6, No. 1 (2017).

3 GOOD HEALTH
AND WELL-BEING

Box 17.4: Target 3.9 of the 2030 Agenda for Sustainable Development (water pollution aspects)
Goal 3: Ensure healthy lives and promote well-being for all at all ages
Target 3.9: Reduce the number of deaths and illnesses as a result of water and air pollution, toxic effects of chemicals, including chemical production and burial sites

National target 3.9 is slightly differs in wording from the global target. This target covers several aspects, including air pollution (box 8.3), chemicals (box 10.1) and water pollution.

WHO estimates the mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene in Uzbekistan at 0.4 per 100,000 population in 2016. This is global/national indicator 3.9.2, showing a low level of the attributed burden in terms of mortality. The burden of disease due to diarrhoea from inadequate water, sanitation and hygiene was estimated at about 14,860 disability-adjusted life years (DALYs) in 2016 and the country ranked sixth in the WHO European Region in this respect. Poor household hygiene practices and hygiene education are a major contributing factor. Most of the diarrhoeal disease burden (about 12,950 DALYs) is in children under 5 years of age.

Gender aspects

In Uzbekistan, women have the main responsibility for activities related to collecting and using water for different domestic purposes, which may include water treatment to ensure its safety. In case of water shortages, unsafe drinking water, shortage of indoor water supply and poor sanitation, the activities associated with collecting and using water become a daily burden for women and girls, thus increasing the challenges of following good hygiene practices and implying a higher risk of waterborne diseases. Adding to that, the different water and sanitation needs of men and women, especially in public facilities, where access to clean water and sanitation services is lacking, prevent the use of such facilities by women and girls.

In a survey conducted in rural areas of Uzbekistan in the framework of a World Bank assessment (published in 2014), more than 20 per cent of the women interviewed expressed their dissatisfaction with the latrines situation, as the latrines were located 50–60 metres from the houses, and 500 metres from some houses – a situation that makes women feel unsafe using these latrines. According to an assessment undertaken by the ADB in 2014, a large proportion of households in Fergana Valley did not have access to basic bathrooms with piped water supply or showers, which prevented women and girls from fulfilling their bathing needs, while men, having more social freedom, could find other means of doing so, such as bathing in rivers.

UNICEF assessed equity of access to WASH in schools in six countries, including Uzbekistan, in 2011–2012. The outcomes show that, in Uzbekistan, school sanitation infrastructure provides insufficient privacy for girls of secondary school age, and menstruating girls are confronted with a disproportionate obstacle to a comfortable learning environment. Poor maintenance of sanitation facilities

in schools and lack of privacy led the girls to avoid the use of school WASH facilities, which may have deleterious health effects. Limited access to private, clean sanitation facilities at schools, coupled with limited hygiene education, presents a particular disadvantage to secondary school girls in Uzbekistan.

Despite the essential role of water, sanitation and hygiene in women's lives, their actual participation in the decision-making on these issues is not ensured through respective laws and policies in Uzbekistan. National policies and programmes on water supply and sanitation are not grounded in gender analysis.

Food safety

The incidence of acute intestinal infections, which has remained high throughout the years (figure 17.2), indicates the importance of the issue of food safety and overall sanitation and hygiene in the country.

Morbidity attributable to major notifiable zoonoses such as bovine tuberculosis, brucellosis and echinococcosis and leishmaniosis reported by Uzbekistan to the World Animal Health Information System in the period 2009–2016 shows the presence of those life-threatening diseases affecting animals and transmitted to humans by contact with infected animals or their products. Incidence of brucellosis and echinococcosis is the most common.

Similarly to water-related diseases, the country's surveillance of food-borne diseases does not enable assessment of the actual burden of ill health so as to guide preventive and control measures. A survey of the most common food-borne diseases – salmonella and campylobacter – in humans and poultry and their antimicrobial resistance in Uzbekistan was conducted by the Scientific Research Institute of Epidemiology, Microbiology and Communicable Diseases under the Ministry of Health in 2015 in the framework of the collaborative country agreement with WHO. The

survey revealed that salmonella and campylobacter are important causes of diarrhoeal disease for Uzbekistan's people, with poultry being an important source of both infections. Both human and poultry pathogens are frequently multi-resistant, which reflects the use of antibiotics in poultry production in the country.

During the period 2018–2020, the Institute is implementing a project on the development of a system for control and prevention of food-borne diseases through surveillance of salmonella and campylobacter antimicrobial resistance among humans and poultry, with the aim to inform food safety manufacturing and management policy.

No information was provided by Uzbekistan about food contamination monitoring activities. However, the national capacity has improved in the area of preparedness to respond to food-borne disease risks, through several activities in collaboration with WHO that targeted capacity-building and awareness-raising on antimicrobial resistance from a food safety perspective.

In 2014, Uzbekistan started to introduce hazard analysis and critical control points (HACCP) in the framework of a three-year programme supported by the International Finance Corporation (IFC). Enterprises should fulfil these food safety standards in order to be able to export products to European countries, the Russian Federation and Kazakhstan. Despite the implementation of several projects with the support of foreign donors, the introduction of HACCP and international food safety management and quality standards faces considerable challenges. These include the costs of implementing the standards, which are high for small enterprises, the lack of experts on the topic and challenges with regulations related to obtaining the necessary certifications.

Nutrition

In 2015, Uzbekistan reported the achievement of the Millennium Development Goal 4 target that aimed to halve the proportion of underweight children in the period 2000–2015.

The last few years have seen improvements in some of the determinants of nutrition status. In 2016, 7 per cent of the population experienced undernourishment, compared with 10 per cent in 2008. The decreasing prevalence of undernourishment accompanied an increase in the availability of fruit and vegetables, but there has not been a big change in total calories available from non-staple foods. While the prevalence of underweight among children and adolescents (aged

5–19) was decreasing between 2000 and 2015, the prevalence of overweight and obesity in that age group was on the rise in the same period, for both sexes; the pattern was similar among adults.

The prevalence of anaemia among women of reproductive age was decreasing slowly between 2011 and 2015 and is still an issue, with a prevalence of 36 per cent in 2015. Additionally, 18 per cent of children under 5 had vitamin A deficiency in 2013. Wheat fortification has become mandatory as of 2015. The country has adequate iodine intake among the population according to the Iodine Global Network and banned non-iodized salt in 2015.

A systematic analysis of the Global Burden of Disease estimated cardiovascular mortality attributable to dietary risk factors in 51 countries of the WHO European Region and revealed that unhealthy diet (low in whole grains, nuts and seeds, unsaturated fats and omega-3, and legumes, and high in sodium) was most deadly in Uzbekistan, where there were 394 diet-related deaths per 100,000 population in 2016. Dietary risk factors are the highest risk category, which had driven the greatest number of deaths and cases of disability in the country in both 2007 and 2017.

Chemical safety

Persistent organic pollutants

The stockpiles of obsolete or banned pesticides present a serious problem in Uzbekistan. There are 14 toxic burial sites of obsolete or banned organochlorine and organophosphate pesticides (e.g. DDT, HCCH) and other hazardous agrochemicals (e.g. butyphos, chlorophos) in the country, on a total area of 60 ha (chapter 10). The current conditions of major burial sites in the Republic of Karakalpakstan and the Bukhara, Jizzakh, Kashkadarya, Syrdarya, Samarkand, Surkhandarya, Khorezm and Navoiy Oblasts do not meet health and safety requirements and thus pose significant persistent risks to both the environment and human health. Of serious concern are the former airfields for agricultural aviation, located in certain districts of Jizzakh and Syrdarya Oblasts, and in Khorezm Oblast.

According to the State Committee on Ecology and Environmental Protection (SCEEP), persistently high levels of DDT and organochlorine pesticides were reported during the period 2013–2017 in the soil in close proximity of the above-mentioned pesticide burial sites. There are no biomonitoring activities on population exposure to persistent organic pollutants (POPs). Uzbekistan acceded to the Convention on Persistent Organic Pollutants (Stockholm Convention)

only in 2019; that is why the country has not participated in any of the WHO/UNEP-coordinated surveys on dioxins and other POPs in human breast milk in the framework of the Convention.

In 2001, a study on the levels of certain metals, organochlorine pesticides and dioxins in cord blood, maternal blood, human milk and some commonly used nutrients in the surroundings of the Aral Sea was conducted in the Republic of Karakalpakstan. Findings revealed significantly elevated levels of beta-hexachlorocyclohexane, dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyltrichloroethane (DDT), and levels of the most toxic dioxin, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), six times higher than those found in Western Europe and among the highest in any country in the world. These results suggest chronic, long-term environmental exposure to these compounds, with cotton defoliants being the likely origin of exposure and contaminated foodstuffs the pathway to human ingestion.

Heavy metals

According to SCEEP, in Tashkent Oblast, high levels of heavy metal contamination, in particular of lead and cadmium, exceeding by several times the background values/MACs, were reported during the period 2013–2017 in the soil in close proximity to major industrial facilities. A 2014 study on potential contamination of trace elements in Chadak mining area in Namangan Oblast aimed at assessing the potential risk of environmental contamination with trace elements from tailing dumps of the Chadak mine. Levels of arsenic, zinc and lead were much higher in abandoned tailings than in active tailing dumps, with values exceeding the background area concentrations. Arsenic levels were highest in the abandoned tailing dumps, greatly exceeding the eco-toxicological levels and thus presenting a considerable risk for the environment and health of the local population.

There is no information on exposure of the population to heavy metals, due to the lack of human biomonitoring. A 2014 study examined levels of lead, cadmium and mercury among children with iron-deficiency anaemia in Kazakhstan, Kyrgyzstan and Uzbekistan. The highest levels of mercury and cadmium were found in the Uzbek children.

Asbestos

Asbestos is still in use in Uzbekistan. Asbestos-containing products are legally available, e.g. pipes and corrugated roofing materials are produced in the

country's cement plants and also exported to other countries. Workers at the asbestos facilities undergo regular occupational medical check-ups. According to the information provided in 2019 by the Scientific Research Institute on Sanitary, Hygiene and Occupational Diseases under the Ministry of Health, asbestos-related occupational diseases are not registered as the country does not have its own mines and uses chrysotile asbestos imported from the Russian Federation and Kazakhstan.

Exposure to asbestos, including chrysotile asbestos, occurs through inhalation of fibres in the air in the working environment, ambient air in the vicinity of point sources (such as factories handling asbestos) or indoor air in buildings containing asbestos materials. Asbestos causes cancer of the lungs, larynx and ovaries, mesothelioma and asbestosis (fibrosis of the lungs). In 2017, a WHO assessment of the economic costs and benefits of banning the use and production of asbestos in the WHO European Region showed that no negative mid- or long-term economic impacts from banning asbestos are to be expected. In contrast, the mid- and long-term health and economic benefits largely outweigh the short-term transition costs. The International Labour Organization (ILO) and WHO are urging their member States to eliminate asbestos-related diseases by banning all forms of asbestos production and use.

Uzbekistan is among the countries making the greatest use of chrysotile asbestos. As at 2019, Uzbekistan has no policy on banning asbestos (chapter 16).

Radiation

Uranium tailings in Uzbekistan remain an environmental and public health risk. They are located in the Fergana Valley. Several activities conducted in the framework of different projects aim at the remediation of two legacy sites (Charkesar and Yangiabad) (chapters 6 and 10).

The Environmental Modelling for Radiation Safety (EMRAS) project of the IAEA, second phase (2009–2011), focused on environmental radiation dose assessment. Data was collected on exposure pathways, gamma dose rates and indoor and outdoor radon concentrations in mines and disposal areas near Charkesar in Uzbekistan and three other sites close to uranium tailings in Ukraine and Tajikistan. The radiation hazards in Charkesar were characterized by elevated (above background) radionuclide and radiation levels in areas close to and away from the industrial site, at the industrial site, and in water bodies.

Photo 17: Roofing with corrugated asbestos sheets, Samarkand City

Photo credit: Ms. Angela Sochirca

Housing

No country-representative surveys of the indoor environment in public and residential buildings or surveys on health-related aspects of housing are conducted. The World Bank's 2016 Systematic Country Diagnostic found that many households remain vulnerable to external shocks, which are often linked to climate and disaster risks, especially in rural areas. Also, despite improvements after the 1990s, the country's power generation and distribution infrastructure remains vulnerable to weather conditions; thus, during winter, the population in the rural regions experiences regular and long electricity shortages and interruptions. In Tashkent, the power is off for one to two hours a day during winter, while in other large towns it can be off for up to six hours a day. Moreover, many of the district heating systems, originally installed in the 1950s through to the 1970s, are no longer fit for purpose and are suffering from insufficient maintenance. Housing energy efficiency is low (chapters 8 and 16).

Radon and lead

In Uzbekistan, the main radiation hazards are associated with exposure to naturally occurring radioactive materials (rocks, rubble, slags, ash) used in construction, the burning of radioactive coals, and construction of industrial and residential buildings and houses on soils and rocks with high radiation levels. Radon has been classified as a human carcinogen and is associated with an increased risk of lung cancer. In Uzbekistan, there is a growing concern about the existence of a large number of buildings with radon concentrations that represent a residential health hazard.

Due to a lack of appropriate sensitivity equipment, it is difficult to determine radon concentration distribution, although mapping methods are already under way in Uzbekistan. In Charkesar, where the local population has long used uranium tailing materials for construction and insulation of their houses, the indoor radon (Rn-222) concentrations exceeded $1,000 \text{ Bq/m}^3$, while WHO's recommended reference levels should not exceed 300 Bq/m^3 . High gamma dose rates were found in the local hospital and school. Adequate remediation measures are not taken

to reduce the resident population's exposure to radiation.

Decorative paint for household use has been identified as the main source of lead exposure from paints. Even at very low levels, lead has important health effects on neurological and cognitive development and can cause anaemia, increase the risk of kidney damage and impair reproductive function. Young children and pregnant women are especially vulnerable to the adverse effects of lead. According to the most recent update (October 2018) of the global report on the elimination of lead in paints by the Global Alliance to Eliminate Lead Paint, 41 countries of the WHO European Region have lead paint laws and many have enacted legally binding limits. Uzbekistan is among the countries with no data on lead in paints or its regulatory control.

Noise and vibration

The physical factors of noise and vibration are predominantly considered occupational health issues and controlled at workplaces. With existing urban planning practices locating residential areas in proximity to large industrial facilities and transport corridors, the importance of noise pollution has increased in the country. Awareness of the health effects of noise has been growing recently.

The Scientific Research Institute of Sanitation, Hygiene and Occupational Diseases under the Ministry of Health conducted a series of studies in the period 2006–2008 with the aim to assess the environmental pollution in Tashkent City by physical factors such as urban noise and the electromagnetic fields of 50 Hz industrial frequency created by high-voltage power lines, as a basis for development of environmental health measures. Health and safety requirements for electromagnetic fields of industrial frequency in residential and public buildings and residential areas have been defined, and sanitary norms and rules for residential population safety in the vicinity of high-voltage power lines have been endorsed by the Ministry of Health (SanPiN No. 0236-07). Major outcomes consist of a noise map of the road network of Tashkent City, prepared in 2007, and a mid-term forecast of noise pollution on the main transport highways in the city until 2015. Those two useful information tools are well out of date as at 2019 but there is no information on follow-up activities.

Occupational health and safety

During the period 2007–2017, occupational injuries comprised less than half of all injuries; this share

tended to decrease and caused an average of around 15,000 person-days of work-related disability per year. About 70 per cent of the cases of occupational disease during the period 2011–2018 were due to exposure to dust, 15 per cent to physical factors (noise and vibration), 12 per cent to chemicals and 3 per cent to other causes, including biological risks.

Gender aspects

According to the State Committee on Statistics, in 2018, 27 per cent of all male workers and 16.3 per cent of all female workers were working in conditions that did not meet sanitary and hygiene standards. Analytical reports that would add value to the data are currently lacking.

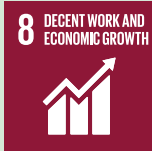
In 2019, the Government changed the approach to regulating women's employment in difficult labour conditions. While, previously, there was a list of 44 areas/occupations in which women's employment was banned, under the new approach, the ban no longer applies and a new list of a recommendatory nature will be developed to include areas/occupations that may adversely affect women's health (2019 Resolution of the President No. 4235).

Child and forced labour

The ILO has been monitoring the cotton harvest for child labour since 2013, through an agreement with the Uzbekistan Government, employers and trade unions. By 2014, it was already recognized that child labour on a systematic basis no longer existed in Uzbekistan, and the country was excluded from the list of 25 countries that systematically do not comply with international commitments. Child labour, which was previously a serious problem during harvest time, is no longer a major concern.

In 2015, as part of an agreement with the World Bank, the ILO began monitoring the use of forced labour during the cotton harvest. Up until 2018, ILO experts carried out 11,000 unaccompanied and unannounced interviews with cotton pickers and others involved in the harvest in all regions of the country. Ninety-three per cent of those involved in the 2018 cotton harvest worked voluntarily and the systematic recruitment of students, teachers, doctors and nurses has not been identified, although recruitment of staff from state institutions and enterprises still occurs in some places.

The country's stand vis-à-vis target 8.8 of the 2030 Agenda for Sustainable Development is described in box 17.5.



Box 17.5: Target 8.8 of the 2030 Agenda for Sustainable Development

Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Target 8.8: Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment

The wording of national target 8.8 (Protect labour rights and promote safe and secure working environments for all workers) is shorter than the global target and does not emphasize any particular vulnerable groups.

Occupational injuries are low (in the range of 0.4-0.9 injured per 1,000 workers), with some decrease since 2012. Occupational fatalities persist at 0.1 per 1,000 workers, i.e. equivalent to about one fifth of all injuries since 2012. Both fatal and non-fatal injuries are greater among males. However, data do not cover small and medium-sized enterprises and the agriculture sector.

There is no information on the proportion of enterprises that have entered into collective agreements in accordance with ILO conventions (global/national indicator 8.8.2), the reason probably being that the methodology for this indicator at the global level is still under development.

Under the Decent Work Country Programme 2016–2017, Uzbekistan has made important progress with respect to ratifying international labour standards; specifically, in 2016, the country joined the 1948 Convention concerning Freedom of Association and Protection of the Right to Organise (No. 87). Also, the Chamber of Commerce and Industry established a new training service on occupational safety and health for its member companies. In 2018, the Government launched the reform of labour inspection in order to counteract forced labour and informal agreements for work and enforce the occupational safety standards. However, the legislation still does not fully comply with the ILO standards, in particular those enabling progress in occupational health and safety, and also does not encourage enterprises to invest more in ensuring safe labour conditions for their employees.

Extreme weather events

In the last 10 years, 80 meteorological and geophysical events that constitute emergencies were recorded in the country; around 64 per cent of these were mudflows, around 33 per cent were landslides and the remainder were avalanches. There is no consolidated information about the number of people affected.

According to the Third National Communication to the UNFCCC, rising climate variability and change is expected to lead to an increase in the frequency of extreme and hazardous meteorological and hydrometeorological events. The country is and will increasingly be particularly vulnerable to floods, in particular flash floods and mudflows, and to avalanches, extreme air temperatures and heatwaves, droughts and dust storms.

Flash floods and mudflows

Flash floods and mudflows are most common in spring (April to May), but they also occur with destructive potential in summer. Long-term observations in Uzbekistan show that the areas in which flash floods and mudflows originate most frequently are the lowest slopes of the valleys (river canals, plains and terraces), as well as foothills and low mountain areas. Data provided by Uzhydromet show an average of 30 mudflows per year during the period 2014–2018 and an increase over the years, with most mudflows occurring in the Fergana Valley where the mudflow

hazard has a transboundary nature. Floods originating in mountain river areas of Kyrgyzstan and Tajikistan threaten foothill and lowland areas of Uzbekistan, especially the cities of Fergana and Andijan, as well as rural areas in the north-east and south-east of the valley. Climate change will increase flash floods and mudflow hazards, primarily because of more intense rainfall events and warming in winter, resulting in rainfall occurring instead of snow, which will extend the seasons of flash floods and mudflows and also high evaporation, leading to increased soil aridity in flat and foothill areas and the upper soil layer being washed away more easily.

Flooding poses multiple risks to people's health, such as heart attacks, trauma, an increase in waterborne infectious diseases, and common mental and post-traumatic stress disorders. Damp housing and damage to water and sanitation infrastructure can further reinforce the adverse effects on health. People living in the countryside face greater risks, owing to deteriorating housing and infrastructure and various vulnerabilities. According to information from Uzhydromet over the last five years, Navoiy Oblast has the greatest share of households located in mudflow hazard zones (more than 50 per cent of all households), followed by Fergana Oblast, albeit to a lesser extent (about 10 per cent of households). Four settlements are situated in the mudflow hazard zones in Tashkent Oblast, and the highest share (about 50 per cent) of technical facilities are also concentrated in those zones. Available data are limited to distribution

of households and technical facilities by administrative districts and the flood/mudflow hazard zones. Appropriate spatial resolution for population estimates and characterization of the population at risk, along with the mapping of flood hazards (by category) and flood risks, are not available to enable assessments of vulnerability, especially of the population.

Avalanches

Owing to intense precipitation and an increase in temperature in the mountainous areas in March and April, snow avalanche hazards occur, which threaten the lives and livelihoods of the population and disrupt economic activities. The high-risk areas are located in Tashkent, Namangan, Kashkadarya and Surkhandarya Oblasts. Despite the general trend towards a decrease in avalanches, the hazard remains high during extremely snowy winters, particularly upstream of the Akhangara River.

Heatwaves

Excess heat represents a serious threat for the entire population, but the elderly and small children, and people with pre-existing cardiovascular, respiratory and renal diseases, diabetes and neurological disorders, are more susceptible. Prolonged periods (at least three days) of extremely high air temperatures, called heatwaves, directly affect people's health and an increase in the daily mortality rate is the major measurable impact of a heatwave. Urban areas tend to be at greater risk due to the "urban heat island" effect.

Long-term observations of hot days during the June–August period in Tashkent City show considerable variability in the number of days of heatwaves and a steady increase throughout the years. An increase in the number of days of heatwaves is observed across the entire country, with the highest rates in the Aral Sea area, Fergana Valley and the foothills of the west Tien-Shan mountain range. The frequency of heatwaves varies across the country, with high frequency rates in the south and in desert areas, where maximum air temperatures are close to 40°C. Air temperature of 40°C and above is a severe health hazard, irrespective of its duration; it is an alert/emergency/limit value for occupational health and safety regulations. Currently, the average number of days with extreme temperatures (above 40°C) is 5–10 days per year for the country and 18–25 days for the desert area, and reaches 34 days in the south of the country.

The available information is rather limited: only the number of days, frequency rates and area distribution

by district/oblast are recorded. Thus, it is difficult to draw estimates of the population concerned or potentially affected by excess heat. Climate change projections show an increase in the number of days of extremely high air temperatures and the frequency, intensity and duration of heatwaves and, consequently, an increase in heat-related deaths.

Heat-related deaths are largely preventable. At the same time, no early warning system (EWS) based on reliable meteorological forecasting is in place in the country; if there were one, it would enable a response from the beginning of a period of high temperature (the maximum effect on mortality occurs after one or two days). No research has been conducted in the country to link long-term weather and climatic observations and health indicators to define parameters as a basis for issuing early warnings for health.

Droughts

The arid continental climate exposes large areas of the country to meteorological drought conditions. These have become more frequent as aridity has risen, together with the number of days with above-average temperatures and below-normal precipitation in the summer and fall seasons, particularly near the Aral Sea, due to its desiccation, but also in Navoiy, Bukhara, Kashkadarya and Surkhandarya Oblasts.

The hydrological drought depends upon the availability of water in the upper catchments of the river basins and, owing to the high degree of flow regulation, the management of reservoirs and other water infrastructure. Hence, it is largely influenced by water management within the country but also at transboundary scale. Hydrological drought has become more prevalent in the last few decades as drought years are now recorded in three out of every 10 years. The Amu Darya River basin has experienced more frequent hydrological drought with the "depth" of extremely low-water years (i.e. deviation of the mean flow in low-water years from the average) having increased by 1.5 times in the last two decades. The Republic of Karakalpakstan and Khorezm Oblast are under constant threat of drought.

A high number of days with high temperatures (above 35°C) on the background of droughts leads to considerable decrease in crop yields, particularly in the south and central areas of the country. An increase in the areas affected by drought leads to the degradation of agricultural land, causing surface and groundwater deterioration and pollution of water sources, and a greater risk of food and water shortages and malnutrition of the population. Local changes in

dietary content and seasonal micronutrient deficiencies were identified in relation to droughts in the Republic of Karakalpakstan. Drought reduces the amount of water and worsens the conditions for hygiene and food supply in rural areas, which are directly dependent on agricultural production.

Climate change is expected to heighten exposure to meteorological and hydrological drought, particularly during the summer months. In the framework of a UNDP/Uzhydromet project, a drought EWS was piloted in Kashkadarya Oblast in 2015; the necessary activities to advance it were then determined but, as of May 2019, it has not been established.

Dust storms

The country has major natural aerosol emission sources, such as the Karakum and Kyzylkum Deserts and their frequent dust storms, as well as the Aral Sea region where dust storms are quite a common phenomenon, particularly after denudation of a sizeable part of the sea bottom. The average annual number of days with dust storms is comparable to those in more remote deserts. The annual course of dust storm recurrences reaches a maximum peak in the warm season (April–August). The main components of solid suspended particles (aerosols) from these sources are soil and mineral particles.

Excessive exposure to dust constitutes a major health risk for many parts of the country. In particular, the retreat of the Aral Sea has exposed the former seabed to significant winds, which has led to extremely high airborne dust deposition rates and, in the Republic of Karakalpakstan, the concentration of total suspended particles (TSP) typically exceeds the maximum safe threshold by more than a factor of 2. The different composition and origins of those particles, including toxic salts containing pesticides and fertilizers from the run-off of the agricultural fields near the Sea, further exacerbate the health risks. Inhalation of salt can cause severe throat and lung problems; salt can also poison agricultural products and cause chemical damage to buildings. Winds transport sand particles for long distances, extending the geographical boundaries affected by this phenomenon, and more than 5.5 million people have become increasingly affected by the dust storms.

Climate change in Uzbekistan is being associated with an increase in the number of hot days along with an increased number of dust storm events, as well as more warm days in winter, affecting human body adaptation. The observed and projected increase in the number of warm days and associated dust storms is leading to increased incidence of respiratory disorders

in areas prone to dust storms. In winter, an increasing number of warm days is affecting the habitual physiological patterns of adaptation to abrupt seasonal changes in weather, thus increasing the prevalence of respiratory infections, particularly in children.

17.3 Impact from and adaptation to climate change

The assessment conducted in the framework of the seven-country initiative of the WHO Regional Office for Europe aimed to protect health from climate change (2009–2013) reported Uzbekistan among the countries most vulnerable to climate change. Increased air temperatures and decreased precipitation in the country as a result of climate change have led to increased microbial and pathogenic pollution in water and heighten the risk of acute intestinal infections. Bacterial pollution increase in warmer temperatures is reflected in a greater number of cases of intestinal diseases during summer (e.g. bacterial dysentery increases by a factor of 3). It is not possible to estimate the impact of climate change associated with intestinal diseases, because of (i) the country's lack of capacity in communicable disease surveillance and consequent inability to record climate change-indicative water- and food-borne infections (such as cryptosporidiosis and salmonellosis) and to detect the causative microbial agent of acute intestinal infections, its source and local outbreaks, and (ii) the country's diverse deficiencies in data reporting. Also, long-term climate change increases the risk of some transmissible diseases such as leishmaniasis and malaria, by creating favourable conditions for their agents.

Furthermore, heat and heatwaves affect the incidence of cardiovascular and respiratory diseases. Lack of health information on the right spatial and time scale does not enable linkage analyses of climatic parameters and health outcomes.

Dust storms are a particular problem for Uzbekistan. Water shortages and increasing aridity caused by climate change, coupled with land degradation problems, have aggravated the desertification processes, with the major consequence of increased frequency and intensity of dust storm events. Their impacts on health cannot be assessed due to the lack of regular PM₁₀ and PM_{2.5} air quality monitoring and analysis (chapter 8).

During the period 2012–2015, Uzbekistan was one of the countries included in the global initiative on equipping health personnel and the wider population with essential tools and knowledge to prevent detrimental effects of changing climate on health. The

initiative was jointly implemented by WHO and UNDP and co-funded by GEF. Activities piloted in the Tashkent and Syrdarya Oblasts centred on: (i) the establishment of an EWS for climate-sensitive health risks; (ii) capacity-building of the health services to respond to climate-sensitive risks and raise public awareness on self-protection measures; and (iii) disease prevention measures for climate-sensitive health outcomes and hygiene and health education to promote the use of disinfection for prevention of waterborne/acute intestinal diseases.

The Ministry of Health, in cooperation with relevant national authorities and with the support of the WHO Regional Office for Europe, prepared a climate change adaptation strategy for the health-care system in Uzbekistan. Priorities for policy actions were identified, based on the assessment of vulnerabilities, impacts and adaptation options. Measures inherent to the health sector envisaged capacity-building for risk assessment of cardiovascular and acute intestinal diseases and other climate change-related diseases, improving communicable disease surveillance, specific interventions at the local level during periods of maximum risk, climate change and health education, and enhancing public health research. Cross-sectoral measures were put forward on EWSs and specific plans for preparedness and response to extreme weather events, awareness-raising on health effects of climate change among diverse target groups, setting mechanisms for intersectoral and interagency collaboration and information exchange among health, meteorological, environmental and other stakeholders. An action plan was developed for the period 2013–2016 to support implementation of the strategy. The strategy and the action plan have not been officially adopted.

17.4 Legal, policy and institutional framework

Legal framework

The 2015 Law on the Sanitary-Epidemiological Well-Being of the Population sets out the general rights and obligations of persons, private entrepreneurs and legal entities on health protection and epidemiological safety. It sets out the content of population health surveillance – as a broad activity also involving health promotion, disease prevention and control measures and sanitary-epidemiological expertise. Provision of information to the public and the people's right to a safe environment are also encompassed. The Law stipulates that air and water quality and food safety and waste management activities are subject to sanitary-epidemiological monitoring and control. The Law sets out the competences and powers of central and local government authorities and, in particular, the

responsibilities, powers and organization of SSESS. Measures to deal with non-compliance focus primarily on suspension, restriction and prohibition of the activities of natural and legal entities, remedial measures aimed at minimizing the risk of non-compliance being left aside. Also, disease prevention and control measures explicitly consider immunization, vaccination and disinfection rather than action on environment-related health determinants, with the aim to reduce health risks from polluted air, contaminated water, etc. The Law also defines actions to be taken during public health emergencies.

The 2013 Law on Counteracting the Disease caused by the Human Immunodeficiency Virus (HIV infection) sets the competences of the central, regional and local authorities in combating the spread of HIV infection and provision of medical care to HIV-infected patients. It establishes legal requirements for compulsory examination and treatment of HIV-infected persons, and for social support for HIV-infected persons and health workers and employees at risk of HIV infection.

The 2013 Law on Environmental Control delineates the system of state and public measures aimed at compliance with the legal requirements on environmental protection. The Law defines the mandates and the competences of the central and local governments, including the role of the Ministry of Health, in particular on the control of environmental pollution from radioactive, chemical and biological substances and drinking water quality.

According to the 1993 Law on Water and Water Use, SSESS under the Ministry of Health is responsible for control of drinking water quality and is also part of the environmental monitoring programme, specifically, for water reservoirs, i.e. checking the sanitary-hygiene and microbiological parameters of the waters in the reservoirs and transboundary rivers.

In 2010–2011, several activities on water quality norms and standards were conducted with the technical support of ECE and WHO, with the aim to move towards harmonization of national water quality standards and norms with international standards, including approximation to EU integrated pollution prevention and control parameters. As a result, the national standards: “Drinking Water. Hygiene requirements and quality control” (Oz'DSt 950: 2011) and “Sources of centralized drinking water supply. Hygiene, technical requirements and selection rules” (Oz'DSt 951: 2011) were revised and, currently, the MAC values for most of the parameters conform to those of international standards, including WHO

drinking water quality guidelines, and the number of the controlled parameters is comparable to the EU Directives.

The 1997 Law on Quality and Safety of Food Products covers: (i) standardization; (ii) registration of foodstuffs and manufacturing equipment; (iii) certification; and (iv) surveillance and control. Standardization covers setting hygiene, sanitary, and veterinary and phytosanitary requirements for product quality, safety, processing, storage, transportation and sale. Registration of food produced and equipment manufactured in the country and imported into it is carried out by SSESS, which issues a sanitary-epidemiological certificate. Food products, technologies, equipment and tools intended for production, storage, transportation or trade are subject to certification of their compliance with the rules and regulations. SanPiN No. 0283-10 sets hygiene requirements for safe food production, while SanPiN No. 0309-14 sets sanitary-hygiene requirements for public catering facilities.

The 2010 Law on Prevention of Micronutrient Deficiencies among the Population includes measures to identify needs and secure production and consumption of enriched foods.

The 2000 Law on Radiation Safety aims at protecting human health and the environment from the effects of ionizing radiation. The amendments of 2011 introduced the concept of radioactive waste and categories of exposure to ionizing radiation and set legal mechanisms for radiation safety control, including by the public.

The 2016 edition of the Law on Protection of Workers replaced the 1993 version. The Law provides for a more modern approach to occupational safety management. Legal provisions on protection of workers from specific occupational risks or hazards are also contained in the 2000 Law on Radiation Safety and the 2013 Law on Counteracting the Disease caused by the Human Immunodeficiency Virus (HIV infection). The 2009 Law on Technical Regulation covers compulsory technical requirements for the safety of products and services.

The 1999 Law on Protection of the Population and Territory from Natural and Man-made Disasters has undergone several amendments as the Government's understanding of emergency prevention, preparedness and response has evolved. The amendments of 2010 introduced the concept of emergency and emergency warning and response and a shift from "protection" to "saving lives and preserving people's health". The 2011 Resolution of the Cabinet of Ministers No. 242

endorsed improvements to the state system of preparedness and response to emergency situations. In 2016, a joint resolution of several ministries endorsed a regulation on the provision of medical service as part of the state emergency preparedness and response system.

The 2011 Law on Restriction of Distribution and Use of Alcohol and Tobacco Products designates all public transportation as the only smoke-free places, smoking in all other public places being allowed in designated smoking areas and (or) special rooms for the use of tobacco products. The 2018 Law on Restriction of Smoking of Hookahs and Electronic Cigarettes in Public Places includes the list of public places where the smoking of such devices is prohibited and also prohibits advertising the smoking of hookahs and electronic cigarettes.

Policy framework

Recent years have seen a boost in strategic policy developments and organizational reforms. The 2017 Action Strategy on Five Priority Directions for Development for the period 2017–2021 largely coincides with the 2030 Agenda for Sustainable Development and the Sustainable Development Goals, one of the five priority areas being development of the social sphere. Policy measures focus on the health-care sector, with the aim of improving the accessibility and quality of medical and public health services and creating a healthy lifestyle for the population. The need for comprehensive measures to improve family health, maternal and child health and the health of vulnerable population groups is emphasized. With respect to environment-related determinants of health, the focus is on living conditions, in particular the provision of safe and affordable housing and improved access to utilities. Improved access to clean drinking water is also a government priority. Priority policy measures cover public transport services and infrastructure and provision of the population with reliable electric power supply and alternative heating fuel and energy resources, and with modern waste disposal and treatment facilities.

The 2018 Decree of the President No. 5590 "On complex measures on the radical improvement of the health-care system" puts forward a concept (strategy) for health system development for the period 2019–2025, setting the goals, objectives and main directions together with an action plan for the period 2019–2021. The concept has three major goals: (i) increasing life expectancy at birth through active prevention and treatment of the diseases and health conditions representing the leading causes of premature mortality

and disability; (ii) reforming health financing and organization to increase efficiency and improve access to health care; and (iii) enhancing the Ministry of Health's governance capacity. Specific objectives concern a healthy and safe environment, improvements in water supply and sanitation and healthy nutrition through sustainable mechanisms of intersectoral cooperation, and building a strong public health system through further enhancing the sanitary-epidemiological service, control of infectious and chronic diseases and compliance with the International Health Regulations (IHR). Quantitative targets are set for increased life expectancy, reduction of maternal and child mortality, premature mortality from NCDs and TB, and HIV and hepatitis morbidity. The indicators for monitoring and evaluating the progress of the implementation belong entirely to the health sector.

Although there are various policies tackling the risk factors for NCDs in the country, an integrated NCD action programme is lacking. The 2018 Resolution of the President No. 4063 "On measures to prevent non-communicable diseases, support a healthy lifestyle and increase the level of physical activity of the population" further reinforces the 2018 Decree of the President No. 5590 and endorses the establishment of a centre for the promotion of a healthy lifestyle and physical activity, under the Ministry of Health.

With regard to TB, a consolidated national strategic plan for 2016–2020 was prepared in 2015 in the framework of the National TB Control Programme. Guidelines on programmatic management of drug-resistant TB, monitoring and evaluation, infection control and childhood TB were also developed. The Ministry of Health adopted the first national guidelines on identifying and treating multidrug-resistant TB. The 2019 Resolution of the President No. 4191 focuses on measures to control the spread of TB and non-specific lung diseases in the period 2019–2021 and improving diagnosis, prevention and treatment through innovative methods while integrating the efforts of related programmes, e.g. on HIV/AIDS, maternal and child health.

The Strategic Programme for HIV infection control for the period 2013–2017 targeted reducing the spread of HIV and ensuring universal access to comprehensive HIV prevention and treatment, but there is no evaluation of the implementation. In 2018, two Presidential Resolutions (No. 3493 and No. 3800) to counter the spread of HIV were introduced. These Resolutions highlighted the way for further improving the provision of medical and social assistance in prevention, diagnosis and treatment of HIV infection to the population.

The Concept of the population's healthy nutrition for the period 2015–2020 (2015 Resolution of the Cabinet of Ministers No. 251) emphasizes the need to improve logistics for the delivery of agricultural and livestock products as well as to promote the processing of agricultural fruit and vegetables and meat and dairy products. The 2018 Decree of the President No. 5303 "On further advancing food security" focuses on the economic and legal tools to change the operation of the food market in order to improve food security. Diversification is an important element of ongoing efforts in the agricultural sector and should contribute towards a steady market of safe and affordable food in the country.

The topic of the environment and health is not yet high on the national agenda as there is no integrated policy programme on the environment and health, but it is gaining momentum. The Programme of Actions on Environmental Protection for the period 2013–2017 included measures of high relevance for public health.

With respect to climate change, the national adaptation plan is under preparation. The 2017 (I)NDC presented adaptation measures the country plans to take in the period up to 2030, including prevention of disease outbreaks and aggravation caused by climate change.

The Comprehensive Programme of Measures related to Mitigation of the Consequences of the Aral Disaster, Rehabilitation and Socio-economic Development of the Aral Sea Region for the period 2015–2018 (2015 Resolution of the Cabinet of Ministers No. 255) was an important step in improving the living conditions of the population in the region. The State Programme on Development of the Aral Sea Region for the period 2017–2021 (2017 Resolution of the President No. 2731) covers measures on increasing the availability of clean drinking water supply and sewerage systems, solid waste management, the upgrading of heating systems in Nukus and Urgench Cities and other measures.

Institutional framework

Ministry of Health

Within the currently ongoing major institutional reform in the country, the 2018 Resolution of the President No. 4055 lays down the organizational aspects of the Ministry of Health. The Ministry carries the responsibility for realization of the state policy of protecting public health and providing health-care services. It is responsible for conducting analyses of public health status and its determinants and trends. The Ministry is mandated with ensuring prevention of diseases and promoting healthy lifestyles. The

Ministry is also entrusted with the monitoring of environmental pollution from radioactive, chemical and biological substances, the drinking water supply and the physical factors affecting ambient air quality. The Resolution initiated the establishment of a centre for the development of ICT under the Ministry, responsible for the development and maintenance of the health information systems and national health databases.

Under the Ministry, two institutes conduct applied research on the population's health and the environment. The Scientific Research Institute of Epidemiology, Microbiology and Communicable Diseases is the national centre for control and prevention of infectious and parasitic diseases. The Scientific Research Institute of Sanitary, Hygiene and Occupational Diseases conducts research on environmental and occupational health risks, child and adolescent health, toxicology of pesticides and fertilizers, and nutrition. The Institute also has a clinical department for diagnosis, treatment and clinical examination of occupational disease patients and those exposed to adverse risk factors at work.

The Main Department of the State Sanitary-Epidemiological Control under the central administration of the Ministry of Health oversees the sanitary-epidemiological system, and develops strategies aimed at combating infectious diseases and reducing the adverse environmental impacts on public health.

SSESS is the authorized state body responsible for public health protection and epidemiological safety. It comprises the Republican Centre, 14 regional centres (12 for the oblasts, 1 for the Republic of Karakalpakstan and 1 for Tashkent City) and 194 centres at the district and municipal levels. Some enterprises, such as the JSC O'zbekiston temir yo'llari (Uzbekistan Railways), the National Air Company, the National Security Service and some structural-territorial units of the Ministry of Defence and the Ministry of Interior, have their own sanitary-epidemiological centres.

The core functions of SSESS focus on: (i) epidemiological surveillance, monitoring and control of the sanitary-epidemiological situation, including sanitary-quarantine control at border checkpoints; and (ii) control for compliance with sanitary-hygiene norms and regulations by private and public entities, as well as of project documentation of industrial, commercial or other enterprises, and enforcement in the case of non-compliance.

The Republican Centre collects data on sanitary status and epidemiological safety and manages national reports on communicable and non-communicable diseases. It conducts quality control of the reports of the regional, district and municipal centres, provides technical and methodological support and serves as a training centre for them. The regional, district and municipal centres of SSESS undertake the core functions in their jurisdictions and report to the Republican Centre. Their structures and organization vary with the size of the population served, but all have two distinct sections (of sanitation and epidemiology), reflecting the dichotomy throughout the entire sanitary-epidemiological system. The sanitation division is responsible for controlling the sanitary problems related to common industrial hazards: hygiene, radiation, food safety and sanitary-epidemiological expertise and certification. Traditionally, the sanitation division covers a broad range of issues, such as environmental and occupational matters, but also child and adolescent health and communal hygiene, food hygiene and nutrition and related activities. The epidemiology division is responsible for preventing and combating communicable diseases. Care related to TB, oncology, mental health, drug addiction, endocrinology and occupational conditions classified as "socially significant and hazardous" is provided by the state health institutions.

Typically, seven types of laboratories, i.e. bacteriology, virology, parasitology, "especially dangerous infectious diseases", sanitary-hygiene, toxicology and radiology, complement and support health-related activities. Throughout the country, SSESS has 208 laboratories of parasitology, 205 of bacteriology, 157 of sanitation and hygiene, 15 of virology, 15 of especially dangerous infectious diseases and 15 of radiology. There are also 13 toxicology units. These laboratories differ considerably in diagnostic capabilities at different administrative levels, due to outdated or absent equipment and infrastructure, reagents and consumables. Erratic supply of water and electricity with no adequate backup is another problem many of the laboratories face, in addition to a lack of required human resources. Uzbekistan benefits from participation in the WHO programme on strengthening laboratory capacity in quality management systems and critical infrastructure in the framework of the ongoing initiative "Better Labs for Better Health", launched in 2013.

SSESS carries out surveillance of communicable diseases, including those mediated by the environment, i.e. water- and food-borne diseases, as well as food poisoning, but the national system is at a

very basic stage. It is prone to underreporting as there are no clearly specified data flows and service delivery models in place to integrate all sources of water- and food-borne disease data, including primary health-care centres and hospitals. Deficiencies in laboratory testing of clinical and environmental (e.g. water, food) samples include the fact that reportable diseases are included in the broader class of acute intestinal infections, without detection of the causative agent and its source. Because of the difficulty in determining the background disease incidence rate, the majority of local outbreaks remain undetected, as do their sources. Vertical data flows (from district to centre) and mainly paper-based reporting, as well as the lack of early reporting tools, fundamentally limit the reliability and timeliness of the surveillance system.

SSESS, through its territorial bodies, conducts monitoring and control of drinking water quality and the safety of centralized water supply systems and wells in rural areas, in particular the level of chlorine at the end-use point and microbiological tests, including pathogen testing, as per SanPiN No. 0182-05 and No. 0256-08. Coverage in rural areas is poor, due to the lack of technical capacity, laboratory equipment and transportation. SSESS also conducts control and inspection of the water reservoirs as per SanPiN No. 0255-08. Reports contain aggregated data on the incidence of infectious diseases and compliance rates. There is a lack of capacity and knowledge in environmental health risk assessment and management throughout the country.

SSESS is authorized to issue permits for the building and establishment of new food processing enterprises, new markets and retail outlets and to implement control and inspection activities according to SanPiNs, standards and guidelines.

The responsibility for occupational health lies with the health sector. The Ministry of Health is responsible for the establishment of sanitary rules, norms and hygiene standards on priority hazards and risk factors in the working environment, for certification of occupational diseases and for periodic medical examinations.

State Committee on Ecology and Environmental Protection

SCEEP – the central executive body responsible for environmental policy implementation – has recently undergone institutional reforms (chapter 1). The 2017 Decree of the President No. 5024 strengthened the Department of Coordination and Monitoring of Environmental Pollution, as well as the Fund for Ecology, Environmental Protection and Waste Management, with the purposeful allocation of funds,

including for activities related to environmental monitoring. Pursuant to the 2018 Resolution of the President No. 3956 to improve the efficiency of sanitary cleaning enterprises, the Republican Association of Specialized Sanitary Cleaning Enterprises was set out under SCEEP (chapter 10).

Ministry of Emergencies

The Ministry of Emergencies is responsible for coordinating the activities of all authorities involved in preparedness and response to emergencies. The 2017 Decree of the President No. 5066 “On radical improvement of the effectiveness of the system for preparedness and response to emergencies” initiated consolidation of institutional resources under the Ministry. In particular, Uzhydromet (later transferred to the Cabinet of Ministers) and its structural subdivisions, the State Inspectorate for Control and Supervision over the Technical State and Safety of Large and Particularly Important Water Management Infrastructure (later transferred to the Ministry of Water Management), the Early Reporting Service and the Republican Network of Seismological Monitoring of Seismic Hazard and Prognostic Monitoring of the Institute of Seismology, were transmitted to the Ministry of Emergencies. The Republican Centre of Seismological Monitoring was established. The scope of the competences of the strengthened Ministry was extended towards early identification of emergency risks and hazards for early warning and prevention of their occurrence.

Uzhydromet comprises the Centre and 13 territorial administrations (12 for each oblast and one for the Republic of Karakalpakstan) with main responsibilities for the systematic hydrometeorological observations and monitoring of pollution in ambient air, surface waters and soil, as well as the onset and development of extreme weather events (chapter 4). However, the analytical capacity of the institution is limited: the reports on the state of the environment for air, soil and surface waters lack analytical findings. Uzhydromet conducts weather forecasting, providing alerts on extreme weather events or pollution episodes. Also lacking are EWSs to make use of the hydrometeorological observations. Uzhydromet is responsible for maintaining national hydrometeorological and climatic databases and coordinates all the work on the development and maintenance of the State Water Cadastre. In cooperation with the Ministry of Emergencies and representatives of local administrations, it conducts annual two-cycle surveys of areas in high flood hazard zones and issues prescriptions for protection of the residential and technical facilities located in those zones.

Others

The Ministry of Employment and Labour Relations is responsible for promoting employment and ensuring and guaranteeing occupational safety. In 2018, an integrated State Labour Inspectorate was established under the Ministry with responsibilities for control and enforcement of the labour-related legislation by all individuals and legal entities, whether public or private. Responsibilities for ensuring healthy and safe conditions at the workplace lie with the employer. Enterprises with 51 or more employees that belong to occupational risk categories 15–20 have their own occupational safety and health services, which control compliance with the rules and regulations on occupational safety and health.

Two authorities are mandated on nuclear and radiation safety issues: the State Committee on Industrial Safety (Goskomprombez) (chapter 15) and Agency for the Development of Nuclear Energy (Uzatom) (chapter 12).

Data and information on health

There is no integrated information system on population health, its determinants and trends in the country. Despite efforts to modify it, the current data collection system is fragmented. There are several data collection systems in the country, which function independently from each other without clear coordination. For example, SSESS, though part of the Ministry of Health, operates a separate data collection system. Public health facilities are thus required to report data to different data-collecting agencies. Inter-agency coordination is weak, and efforts on integration and interoperability are lacking. Several problems undermine the quality and validity of the data, e.g. the paper-based administrative data and patient records, manual system of pooling data, lack of clear lines of responsibility, lack of quality control/quality assurance and insufficient capacity and skills required for uniform diagnosis and case registration and reporting throughout the country.

Data on non-communicable and communicable diseases for a list of predefined indicators are collected by the territorial units of the Ministry of Health, then pooled at the district and regional levels and reported to the State Committee of Statistics. The indicators are mostly from the mortality and morbidity domains and health-care resources and provision; there is a huge data and information gap on health determinants and risk factors, including environmental factors. Though the range of indicators for which data are collected is immense, information relevant to the health of

children and other vulnerable population groups is very limited.

Reports focus heavily on quantitative indicators in the form of statistical tables, without assessments of health status, major health risk factors and their relative importance and time trends. They are prepared mostly in paper format, which shows their limited use, i.e. only for planning and control at the national and oblast levels with little attention paid to the lower level. This hampers the possibility to conduct linkage analyses between health surveillance data and other data (microbiological, meteorological, etc.) for timely detection of extreme events of high health significance at local scale.

Health statistics are published by the State Committee on Statistics, both as printed publications and online. In recent years, there has been substantial progress made towards modernization and the introduction of international standards in the national statistical system, including in the health sector. Examples are the use of the WHO definition of childbirth as of 2014, the use of standardized death rates by main cause of death using WHO methodology, and production of occupational injury and fatality statistics. The health-related statistics published on the website are mostly presented in the format of statistical tables, without analysis. As of 2019, the State Committee on Statistics also publishes the Sustainable Development Goal 3 indicators for the past 10 years (<http://nsdg.stat.uz/>).

In general, the lack of staff with analytical and statistical capacity is clearly felt on several levels. Capacity and knowledge in health impact and risk assessments in public health in general, as well as in environmental health in particular, are lacking. There is no capacity and knowledge to apply geographical and analytical epidemiological methods to support information and evidence for disease control and prevention in the country.

Coordination

As at mid-2019, several state bodies, i.e. SCEEP, Uzhydromet, the Ministry of Water Management, the State Committee on Land Resources, Geodesy, Cartography and State Cadastre, the State Committee on Geology and Mineral Resources and the Ministry of Health, are mandated with environmental monitoring responsibilities. SCEEP is the coordinating body and its Centre for Specialized Analytical Control on Environmental Protection is the main body for integration of the information, monitoring and analysis of the environmental situation and trends, as well as the preparation of reports and communication with the population (chapter 4).

However, there are shortcomings that fail to enable a modern, integrated, yet distributed environmental monitoring system. These shortcomings are: (i) the lack of mechanisms of intersectoral integration and operational exchange of data and information; (ii) the lack of fully fledged and clearly structured countrywide information on the state of the environment within adequate time frames; and (iii) the lack of mechanisms for dissemination of environmental information among the population.

There is no evidence about specific mechanisms or structures for coordinated activities on the environment and public health throughout the entire policy process. Working groups composed of experts as well as sector-specific policymakers are often established for the development of policy documents and legal acts during the policy preparation phase. Partnerships among different sectors in the implementation of policy and legislation on the environment and public health at the operational level are often limited to donor- or project-driven cases such as those related to climate change and health. Sustainable mechanisms for coordination of activities within, for example, the environmental monitoring and emergency preparedness and response systems, are not sufficiently regulated. This results in each authority managing its own network without coordination and cooperation, as well as without data

exchange. Highly hierarchical vertical organization of the sectors makes effective local intersectoral collaboration on environment and health issues difficult.

17.5 Participation in international agreements and processes

Protocol on Water and Health

The accession process is ongoing in Uzbekistan for the country to become a party to the 1999 ECE/WHO Regional Office for Europe Protocol on Water and Health (chapter 6).

Framework Convention on Tobacco Control

The country's stand vis-à-vis target 3.a of the 2030 Agenda for Sustainable Development is described in box 17.6.

International Health Regulations

The revised International Health Regulations (IHR), adopted in 2005 and in force since 2007, provide an international legal framework to ensure global health security. The current stand of Uzbekistan vis-à-vis target 3.d of the 2030 Agenda for Sustainable Development is described in box 17.7.

3 GOOD HEALTH AND WELL-BEING



Box 17.6: Target 3.a of the 2030 Agenda for Sustainable Development

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.a: Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate

Uzbekistan's national target 3.a is identical to the global target.

Age-standardized prevalence of current tobacco use (smoking) among persons aged 15 years and older (indicator 3.a.1) was estimated at 24.7 per cent for males and 1.3 per cent for females in 2016 (WHO Global Health Observatory data repository). It has declined since 2000, particularly for males; in 2000, it was 30.9 per cent for males.

In 2012, Uzbekistan acceded to the WHO Framework Convention on Tobacco Control. Similarly to many other countries, the country adopted a voluntary global target to reduce the use of tobacco by 30 per cent by 2025 and create zones free from smoking tobacco products. The Concept of the population's healthy nutrition for the period 2015–2020 and its action plan also aim to decrease the consumption of tobacco.

Progress in decreasing tobacco use is nevertheless slow. As at March 2019, the implementation of tobacco control policies in Uzbekistan is limited to achieving a decrease in tobacco consumption. WHO projects that 11 per cent of the population (22 per cent of males and 1 per cent of females) will be smokers in 2025 if the tobacco control interventions remain as they are.

3 GOOD HEALTH
AND WELL-BEING



Box 17.7: Target 3.d of the 2030 Agenda for Sustainable Development

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.d: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

Uzbekistan's national target 3.d is to ensure implementation of the International Health Regulations and preparedness for emergency public health interventions.

The country average of 13 IHR core capacity scores (global indicator 3.d.1) was 83 in 2014 (the WHO Regional average score was 79 in 2017). The indicator is based on self-reporting by the State party; data have to be submitted biannually. However, the country has not organized a joint evaluation of IHR implementation since 2015.

The 2015 Resolution of the Cabinet of Ministers No. 220 mandated the Ministry of Health as the National Coordinator for IHR implementation in cooperation with 17 governmental authorities and public companies. The Resolution requests the Ministry of Emergencies to approve a notification and decision-making scheme for the assessment and notification of events that constitute a potential public health emergency of international concern. The entry points to Uzbekistan in the event of a complicated epidemic situation and occurrence of threats of a radiological, biological and chemical nature at the cross-border regions of neighbouring countries were established. Ensuring the availability of trained personnel at sanitary control entry points and at veterinary quarantine points presents challenges, as does provision of the necessary technical equipment and first aid medicines and equipment to victims in the event of emergency situations at the points. According to the Government, no events that constitute a public health emergency of international concern have occurred in the country since 2010, when there was a refugee crisis.

Selected International Labour Organization conventions

Uzbekistan is not a party to the following ILO conventions: Convention concerning the Protection of Workers against Ionising Radiations, 1960 (No. 115); Convention on Protection against Hazards from Benzene, 1971 (No. 136); Convention concerning Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents, 1974 (No. 139); Convention concerning the Protection of Workers against Occupational Hazards in the Working Environment Due to Air Pollution, Noise and Vibration, 1977 (No. 148); Convention concerning Occupational Safety and Health and the Working Environment, 1981 (No. 155); Convention concerning Occupational Health Services, 1985 (No. 161); Convention concerning Safety in the Use of Asbestos, 1986 (No. 162); and Convention concerning Safety in the use of Chemicals at Work, 1990 (No. 170).

Strategic Approach to International Chemicals Management

Uzbekistan joined the Strategic Approach to International Chemicals Management (SAICM) in 2010 (chapter 6).

Climate change

Uzbekistan is a party to the United Nations Framework Convention on Climate Change (chapter 7). In 2018, using the Carbon Reduction Benefits on Health (CaRBonH) calculation tool, the WHO Regional Office for Europe estimated the potential

environmental and health benefits to be achieved through reductions in domestic carbon emissions, specifically via the (I)NDC pledges submitted by the Member States of the WHO European Region to the UNFCCC. It estimated that reduction in air pollutant emissions in the year 2030 and beyond would result in averting 807 deaths and gaining 12,710 life-years in Uzbekistan annually. Improved air quality would result in averted morbidity in the country, in particular in 18,625 fewer incidences of asthma attack and 4,200 cases of chronic bronchitis in children, and in 242,125 fewer lost work days yearly.

Overall, the country has placed greater emphasis on emergency preparedness and prevention than on building disaster resilience, or on post-emergency response and recovery. The lack of effective early warning systems at the community and other levels, together with the insufficient capacity to monitor and prevent natural hazards and weak communication at the national and regional levels, present challenges.

17.6 Assessment, conclusions and recommendations

Assessment

Improvement of the health of the population, achieved within the past decade, has led to increased life expectancy. However, progress has been slow, and Uzbekistan still faces public health challenges. Those include a high burden of disease through the rising prevalence of NCDs, in particular, cardiovascular diseases leading to premature mortality and disability. At the same time, the incidence and prevalence of

some communicable diseases, such as TB and, in particular, multidrug-resistant TB, remain a concern. Health risks related to behavioural and metabolic factors are persisting, showing that public health interventions have not been effective enough.

Environment-related health risks and hazards remain high: population exposure to air pollution far exceeds WHO Air Quality Guidelines and is leading to a burden of disease and mortality that is among the highest in the WHO European Region. Access to safe water and sanitation remains a major problem, with important regional disparities, yet the burden of waterborne diseases is not adequately recognized, owing to deficiencies in infectious disease surveillance. Changing and variable climate is creating greater potential for such hazardous environmental exposures. A significant number of people live in areas prone to flash floods, mudflows, heatwaves, droughts and dust storms, which are becoming more frequent and intense, resulting in damage and loss and excessive rates of morbidity and mortality. Though limited, the available data suggest that the consequences of and losses due to disasters do not seem to be decreasing and this is also because of the weak disaster resilience.

Several policies and regulations were put in place that aimed at reducing environmental pressures from economic sectors and improving environmental quality, but health aspects have not been sufficiently considered. On the other hand, the health sector is being primarily focused on health care, while prevention measures are limited to immunization. A lack of reliable information on public health and its determinants and trends undermines consideration of health aspects during policy formulation and monitoring and evaluation of policy effects on health during implementation.

As at mid-2019, the country is in the middle of implementation of a profound economic and societal reform and has started the implementation of the 2030 Agenda for Sustainable Development. The coincidence of the two processes creates a good opportunity to advance the integration of health and environmental aspects in other sectors' policies and regulations.

Conclusions and recommendations

Strengthening systematic generation of health information and its use

Reliable information on public health status, including its determinants and trends, is essential to guide health-care providers, managers and decision-makers,

as well as to make policy in other sectors accountable concerning the health of the population. Despite efforts to modify it, the current data collection system is fragmented, with different data collection mechanisms operating independently from each other without clear coordination. Several aspects of data collection and reporting mechanisms that are in place undermine the validity and reliability of data. Information on population health, also in the context of indicators for Sustainable Development Goal 3, is becoming increasingly available on the State Committee on Statistics website, but primarily in the format of numerical tables; analytical information on health, including the environment and health dimension, is lacking.

Recommendation 17.1:

The Ministry of Health, in cooperation with relevant governmental authorities, should:

- (a) *Introduce legally specified data flows to streamline data reporting by public health authorities, avoiding duplication while ensuring the involvement of all relevant institutions, e.g. primary health-care centres, hospitals and health-care institutions;*
- (b) *Ensure training of all involved in data reporting in uniform diagnosis and case registration;*
- (c) *Establish a publicly available information system that includes data and indicators and some simple indicator-based analysis and reporting tools at the national, oblast and district levels.*

Advancing disease surveillance

The current surveillance system is prone to underreporting as organizational arrangements on disease data reporting from all relevant health-care institutions to SSESS are not in place. Surveillance of infectious diseases, in particular those related to the environment, such as water- and food-borne diseases, as well as human zoonoses, has severe limitations. Detection of pathogens in water supply and food products is rather limited and so is the associated analytical capacity.

Recommendation 17.2:

The Ministry of Health, in cooperation with relevant governmental authorities, should:

- (a) *Enhance infectious disease surveillance through the introduction of integrated service delivery;*
- (b) *Strengthen laboratory networks through cost-effective upgrading of selected laboratories with enhanced capabilities to diagnose a range*

of infectious diseases and to detect bacterial, viral and parasite pathogens in water and food samples;

- (c) *Improve capacity and skills to apply analytical epidemiological and public health methods to both infectious and non-communicable diseases, and other relevant data at the national and subnational levels, in order to prepare periodic reports aiming at informing health managers and as a basis for disease control and prevention.*

Maternal and child health

The health of mothers and children is one of the high priorities for the Government, and the country has made considerable efforts to improve the quality and coverage of health-care services. As a result, maternal, neonatal and under-5 mortality rates have decreased, but they are still among the highest in the WHO European Region, making targets 3.1 and 3.2 of the 2030 Agenda for Sustainable Development of crucial importance to Uzbekistan. The unequal distribution of health-care services throughout the country and the lack of qualified health professionals in remote rural areas present important challenges for mothers' and children's health. Under current health-care financing, differences in income among population groups results in further health inequalities.

A large proportion of the burden of disease due to diarrhoea and respiratory and other infections falls on children, most of it being preventable, but available data is insufficient for setting effective and targeted measures throughout the country.

Recommendation 17.3:

The Ministry of Health, in cooperation with relevant governmental authorities, should:

- (a) *Improve access to quality preventive and therapeutic and diagnostic services for pregnant women and newborns throughout the country, in particular in remote rural areas, and introduce changes in health-care financing to ensure equitable access to health services;*
- (b) *Improve collection of data and information on maternal and child health and its determinants to meet the needs of health-care providers and those engaged in health protection.*

Advancing population access to safe drinking water and adequate sanitation

Uzbekistan has made substantial investments in upgrading its water supply and sanitation services in the last decade, but provision of safe water and

sanitation remains a problem with important regional disparities. The burden of diarrhoeal diseases due to a lack of adequate water, sanitation and hygiene is one of the highest in the WHO European Region. The level of connection to sewerage systems is low, creating an unsanitary environment and posing a risk of groundwater contamination.

Present policies focus on large infrastructure and do not allow small-scale services to be addressed effectively. Implementation of water safety plans for small-scale water supplies throughout the country, targeted measures to improve hygiene and sanitation conditions and strengthening hygiene education would provide cost-effective solutions and health benefits by reducing water-related risks in the entire population.

Recommendation 17.4:

The Cabinet of Ministers should:

- (a) *Ensure that the modernization of water treatment systems and distribution networks and connection to sewerage systems is governed by achieving maximum reduction of population health risks from water contamination;*
- (b) *Ensure progressive implementation of the WHO water safety plans for small-scale water supplies across the country;*
- (c) *Ensure that gender analysis is taken into account in the development of measures on access to water and sanitation;*
- (d) *Support development and implementation of programmes to improve hygiene and sanitary conditions in the countryside and reinforce hygiene education.*

See Recommendation 9.2.

Climate change and extreme weather events

Climate change in Uzbekistan is bringing excessive cardiovascular and respiratory morbidity and mortality and acute intestinal infections, and its impacts are growing. The flash floods and mudflows, heatwaves, dust storms and droughts to which the country is and will be particularly vulnerable pose multiple risks to people's health. Yet there are no systematic policy actions in place targeted to protecting people's health from climate change and to reducing life-threatening risks from natural disasters.

The capacity of the health sector to assess climate change-related health status and trends as a basis for planning preventive measures and monitoring their effects and effectiveness is insufficient. The country is advancing in emergency preparedness and response

systems but lacks practical experience in disaster risk reduction and prevention, building disaster resilience and instituting effective early warning systems at the community and other levels.

Recommendation 17.5:

The Cabinet of Ministers should:

- (a) *Ensure integration of concrete actions on protecting the population's health from climate change, along with mechanisms for monitoring their effects and effectiveness in future national strategic documents on climate change adaptation and mitigation and on disaster risk reduction;*
- (b) *Ensure development and sustainable operation of early warning systems, in particular for flash floods, mudflows and heatwaves;*
- (c) *Support the broader dissemination and use of climatic and meteorological information and data among various stakeholders at the central and local levels, to advance preparedness for and resilience to extreme weather events;*
- (d) *Reinforce the building of climate-resilient water supply and sanitation services following the 2010 Guidance on Water Supply and Sanitation in Extreme Weather Events developed under the Protocol on Water and Health;*
- (e) *Ensure capacity-building on climate change, the environment and health among the relevant authorities.*

See Recommendation 7.1.

Intersectoral collaboration on the environment and health

Sustainable improvements in health and the environment can be achieved only through coordinated policy actions across sectors. Specific mechanisms to ensure this are currently not present in the country.

Recommendation 17.6:

The Cabinet of Ministers should endorse mechanisms for intersectoral collaboration on the environment and health and the necessary organizational arrangements, and allocate financial resources for these purposes.

See Recommendation 1.4.

ANNEXES

Annex I: Implementation of the recommendations in the second Environmental Performance Review

Annex II: Participation of Uzbekistan in multilateral environmental agreements

Annex III: List of environment-related legislation

Annex IV: Results of the For Future Inland Transport Systems (ForFITS) tool

Annex V: Sources

Annex I

IMPLEMENTATION OF THE RECOMMENDATIONS IN THE SECOND REVIEW³⁵

Chapter 1: Policymaking framework for sustainable development and environmental protection

Recommendation 1.1:

The Cabinet of Ministers should consider re-establishing the National Commission for Sustainable Development and designate the Ministry of Economy as its secretariat.

The recommendation was not implemented, but, as at 2019, it is no longer relevant. The National Commission for Sustainable Development (abolished in 2005) was not re-established. However, in October 2018, the Coordination Council on Implementation of National Sustainable Development Goals was established. This Coordination Council is meant to guide the implementation of the 2030 Agenda for Sustainable Development (chapter 1).

Recommendation 1.2:

The Cabinet of Ministers, with the involvement of relevant ministries and agencies, should:

- (a) *Carry out a peer review of the 1997 National Sustainable Development Strategy and amend it with indicators of, and procedures for, monitoring implementation;*
- (b) *Review and renew the key documents that constitute the policy and legal framework in order to maintain their accordance with the National Sustainable Development Strategy.*

The recommendation was not implemented.

Recommendation 1.3:

The State Committee for Nature Protection, in cooperation with relevant ministries and agencies, should prepare a comprehensive national environmental action plan taking into account the current social, economic and environmental situation and establishing new objectives and targets on this basis with concrete funding possibilities and the designation of relevant institutions.

The recommendation was implemented. No new national environmental action plan was developed to replace the 1998 one. However, the 2008 Programme of Actions on Environmental Protection for the period 2008–2012 and the 2013 Programme of Actions on Environmental Protection for the period 2013–2017 were approved, and many activities under these programmes were implemented.

Recommendation 1.4:

The State Committee for Nature Protection and relevant ministries and agencies should consider preparing a draft environmental code that will establish the overriding principles of the law and set the full regulatory framework for implementation.

The recommendation was not implemented. No draft environmental code was prepared. As at 2019, preparation of an environmental code is envisaged by several national policy documents.

Recommendation 1.5:

The Ministry of Economy together with the State Committee for Nature Protection should amend the Welfare Improvement Strategy to reflect adequately, among others, the National Sustainable Development Strategy and all relevant key environmental concerns.

The recommendation was not implemented.

³⁵ The second review of Uzbekistan was carried out in 2009 and published in 2010.

Chapter 2: Compliance and enforcement mechanisms

Recommendation 2.1:

The State Committee for Nature Protection, together with relevant bodies, should:

- (a) *Develop a strategy on environmental enforcement that defines objectives and priorities, appropriate time frames and performance indicators ensuring compliance with and the enforcement of environmental requirements;*
- (b) *Ensure the capacity-building activities necessary for the effective implementation of the strategy at relevant administrative levels.*

The recommendation was not implemented.

Recommendation 2.2:

The State Committee for Nature Protection should:

- (a) *Draft by-laws on environmental policy instruments, such as environmental audits, environmental impact assessments and strategic environmental assessments;*
- (b) *Promote their practical application through detailed implementation plans and guidelines.*

The recommendation was partially implemented. The regulation on environmental audit (2015 Resolution of the Cabinet of Ministers No. 286) sets basic legal terms and conditions for application of this tool. It also sets the procedure for conducting environmental audit, as well as requirements of environmental auditors and audit reports. No effective measures were taken for practical application of the regulation, including through implementation plans and guidelines.

Activities on the development of new regulatory acts on environmental impact assessment (chapter 2) and on the introduction of strategic environmental assessment (chapter 1) are in progress in Uzbekistan.

Recommendation 2.3:

The State Committee for Nature Protection, together with relevant bodies, should:

- (a) *Ensure public access to the relevant data, such as reviews and summaries, on inspection and enforcement activities in environmental protection and the use of natural resources;*
- (b) *Update these data regularly.*

The recommendation was not implemented.

Recommendation 2.4:

The State Committee for Nature Protection should review the efficiency and effectiveness of the current use of administrative sanctions for environmental offences and consider possibilities to strengthen them in cases of repeated or systemic violations of environmental legislation.

The recommendation was partially implemented.

SCEEP periodically reviews the efficiency and effectiveness of administrative sanctions for environmental offences. As a result, the 1994 Code on Administrative Liability was amended and set more severe penalties for repeated administrative offences relating to the protection of underground resources (article 70) and water resources (article 72), as well as for violations relating to protected areas (article 82). The Code on Administrative Liability provides for the application of administrative fines for illegal dumping of solid municipal and construction waste and illegal discharge of municipal wastewater, including higher fines for repeated violations. These amendments do not address the issue of systemic violation of environmental legislation. Non-compliance with each environmental requirement is still being treated separately and no administrative tools are available to deal with environmental non-compliance of a systemic nature.

Recommendation 2.5:

In order to harmonize the instruments of environmental impact assessment and public participation with the relevant ECE instruments, the Cabinet of Ministers should:

- (a) *Speed up the process of ratification of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), the Convention on Access to Information, Public*

Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) and the Kiev Protocol on Pollutant Release and Transfer Registers of the Aarhus Convention;

- (b) *Establish a detailed legal and regulatory framework to ensure the full implementation of these instruments.*

The recommendation was not implemented.

Chapter 3: Monitoring, information, public participation and education

Recommendation 3.1:

The State Committee for Nature Protection, in coordination with other government bodies and with the assistance of the inter-agency coordination council on environmental monitoring, should:

- (a) *Enlarge the environmental monitoring networks in an optimal way to meet the requirements of monitoring regulations;*
- (b) *Increase the number of parameters measured, in particular PM_{2.5}, PM₁₀, volatile organic compounds, polyaromatic hydrocarbons and persistent organic pollutants in ambient air, and additional biological parameters in water;*
- (c) *Switch gradually to automatic measurement, and improve data quality control and storage procedures;*
- (d) *Make the monitoring of biodiversity an effective part of the state monitoring programme;*
- (e) *Establish an integrated environmental database at the State Committee for Nature Protection which should be interlinked with the environmental databases of the other public authorities operating environmental monitoring programmes.*

The recommendation was partially implemented.

- (a) There has been no noticeable increase in the environmental monitoring networks. In some cases, the number of stations actually decreased, for example, the air quality monitoring network. The density of the latter has decreased since 2010, remaining lower than the requirements of national monitoring regulations (one station per 50,000–100,000 city dwellers).
- (b) There was no increase in the number of parameters monitored and, in the case of air quality, PM_{2.5} and PM₁₀ are still not being regularly monitored.
- (c) There was no gradual switch to automatic measurements in the environmental monitoring network during the period 2010–2019.
- (d) Although biodiversity monitoring has been an effective part of the state monitoring programme since 2011, as at 2019, an integrated biodiversity monitoring system is still not operational.
- (e) An integrated database at SCEEP interlinked with the environmental databases of other relevant public authorities with responsibilities in the implementation of the state environmental monitoring programme was not established.

Recommendation 3.2:

The Ministry of Health, jointly with the State Committee for Nature Protection, should review the list of maximum allowable concentrations (MACs) to limit substantially the number of regulated parameters to those that can be measured, to the extent possible, and to make the MACs consistent with international standards and guidelines.

The recommendation was partially implemented.

The national standards “Drinking water. Hygienic requirements and quality control” (Oz’DSt 950: 2011) and “Sources of centralized drinking water supply. Hygienic, technical requirements and selection rules” (Oz’DSt 951: 2011) were revised. As a result, the MAC values for most parameters conform to international standards, including the WHO Drinking Water Quality Guidelines, and the number of the controlled parameters is comparable to the EU Directives (chapter 17).

The 2011 SanPiN No. 0293-11 set MAC values for a large number of air pollutants (485) but fail to define specific standards for PM₁₀, PM_{2.5} and TSP (chapter 8).

Recommendation 3.3:

The Centre of Hydrometeorological Service (Uzhydromet), the State Committee on Statistics, the Ministry of

Health, the Ministry of Agriculture and Water Management and the State Committee on Geology and Mineral Resources should make the environmental data that they collect and process easily accessible to the public by uploading data sets and their easy-to-read interpretations on their websites, while considerably increasing the number of copies of their current environment-related publications for wide circulation throughout the country and launching new ones, such as a freely accessible annual compendium of environmental statistics.

These public authorities and the State Committee for Nature Protection should use the UNECE Guidelines for the Preparation of Indicator-based Environment Assessment Reports in Eastern Europe, Caucasus and Central Asia endorsed at the sixth Environment for Europe Ministerial Conference (Belgrade, 2007).

The recommendation was partially implemented.

Only very limited environment-related data are made easily accessible to the public through websites, such as, for example, on air pollution in Tashkent City, which is published on the website of Uzhydromet. Uzhydromet does not make any other environmental data available online, neither do SCEEP, the State Committee on Geology and Mineral Resources, the Ministry of Agriculture, the Ministry of Water Management or the State Committee on Statistics (which does publish a variety of data and statistics on its website, but not environmental statistics).

Similarly, most environmental or environment-related publications are not made publicly available. The many environmental monitoring bulletins and reports produced monthly, quarterly and annually by Uzhydromet are for distribution to other government agencies only and are not made available to the public in any format.

The last national report on the state of the environment and use of natural resources (which was produced in 2013 and covered the period from 2008 to 2011) was not developed as an indicator-based report in line with the ECE Guidelines for the Preparation of Indicator-based Environment Assessment Reports in Eastern Europe, Caucasus and Central Asia (chapter 4).

Recommendation 3.4:

The State Committee for Nature Protection and the Ministry of Justice, in cooperation with the representatives of civil society, should continue their work to introduce mechanisms and requirements of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) in the national legislation and regulations to make them clear, transparent and consistent.

The recommendation was partially implemented. As of 2018, the public is provided with the opportunity to participate in commenting on draft laws and by-laws. Other than that, there is little evidence that the provisions of the Aarhus Convention have been introduced into the national legislation and regulations to make them clear, transparent and consistent. Moreover, no information is available to assess whether representatives of civil society have been involved in the work carried out from 2008 until 2019 to introduce mechanisms and requirements of the Aarhus Convention into the national legislation and regulations. Detailed specifications, procedures and guidance are lacking to make access to information, public participation and access to justice in environmental matters a reality (chapter 5).

Recommendation 3.5:

The Ministry of Higher and Secondary Special Education and the Ministry of Public Education, in cooperation with the State Committee for Nature Protection and other stakeholders, including non-governmental organizations and the mass media, should:

- (a) Speed up the finalization of the national action plan for the implementation in Uzbekistan of the UNECE Strategy for Education for Sustainable Development;*
- (b) Review the composition of the Coordinating Council on Environmental Education and Education for Sustainable Development by raising the level of representation and involving all stakeholders to make the Council an effective instrument for implementing the Strategy.*

The recommendation was not implemented.

Chapter 4: Implementation of international agreements and commitments

Recommendation 4.1:

The State Committee for Nature Protection should:

- (a) *Develop a comprehensive programme to protect biodiversity in accordance with the requirements stipulated in the relevant international agreements, especially the Convention on Biological Diversity;*
- (b) *Update and implement its 1998 National Biodiversity Strategy and Action Plan.*

The recommendation was implemented only in 2019 when the new National Biodiversity Strategy and Action Plan was adopted. Only a few rare and threatened fauna species, and no flora species, are currently covered by single-species conservation plans (chapter 11).

Recommendation 4.2:

The State Committee for Nature Protection, in cooperation with agencies involved in international environmental matters, should develop a coordinating mechanism for designating focal points in order to facilitate coordination and information exchange

The recommendation has not been implemented.

Recommendation 4.3:

The responsible ministries should further comply with the substantive elements as incorporated in the Convention on Long-range Transboundary Air Pollution and the Convention on the Transboundary Effects of Industrial Accidents.

The Cabinet of Ministers should decide to accede to these two UNECE conventions and to the Geneva Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol) under the framework of the Convention on Long-range Transboundary Air Pollution.

The recommendation was partially implemented. The country has progressed in recent years in preparation for joining the Convention on Long-range Transboundary Air Pollution, the Convention on the Transboundary Effects of Industrial Accidents and the EMEP Protocol. However, as at 2019, no accession had taken place.

Recommendation 4.4:

The Cabinet of Ministers should decide to accede to the Stockholm Convention on Persistent Organic Pollutants and the Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

The recommendation was partially implemented. Uzbekistan acceded to the Stockholm Convention in 2019. It has not yet acceded to the Rotterdam Convention.

Recommendation 4.5:

The Cabinet of Ministers should accede to the Framework Convention on Environmental Protection for Sustainable Development in Central Asia so as to foster regional cooperation, especially on environmental matters

The recommendation was not implemented.

Chapter 5: Economic instruments and expenditures for environmental protection

Recommendation 5.1:

The State Committee for Nature Protection, the Ministry of Finance and the Ministry of Economy should:

- (a) *Define a mechanism to review the rates of payments for environmental pollution;*
- (b) *Simplify the system of pollution charges, focusing on a reduced number of pollutants and determining rates to create stronger incentives for changes in behaviour.*

The recommendation was partially implemented.

- (a) Rates of payments for environmental pollution established in 2006 were revised upwards in 2017 and 2018. Moreover, from the beginning of 2018, these rates are indexed on the official monthly minimum wage.
- (b) This part was not implemented.

Recommendation 5.2:

The State Committee for Nature Protection, together with the Ministry of Finance and the Ministry of Economy, should quantify the privileges and exemptions given to budgetary organizations and enterprises and assess their effectiveness, in order to facilitate decision-making.

The recommendation was not implemented.

Recommendation 5.3:

The State Committee for Nature Protection and the Cabinet of Ministers should increase the transparency and effectiveness of the activities of the governing councils of environmental funds by:

- (a) *Improving decision-making rules for the adoption of decisions in the governing councils;*
- (b) *Improving the methodology for selecting projects for funding and evaluating their effectiveness and making this information publicly available;*
- (c) *Publishing annual reports on the activities of funds which provide details on financial performance and show the impact on the achievement of policy targets.*

The recommendation was not implemented. No changes have taken place concerning these recommendations. Local/regional environmental funds were abolished in 2017 and consolidated into the national environmental fund (chapter 3). No annual reports of the activities of the funds are publicly available. Quarterly reports on revenues and expenditures are submitted to the Ministry of Finance, which exercises state control in these matters.

Recommendation 5.4:

The Cabinet of Ministers, in cooperation with the State Committee for Nature Protection, should:

- (a) *Consider the possibility of replacing some pollution charges with product charges;*
- (b) *Draft by-laws that increase the cost of environmentally damaging products through taxes and allocate the revenues raised for environmental purposes.*

The recommendation was partially implemented.

- (a) This part was not implemented.
- (b) Uzbekistan has continued to impose taxes on a range of energy products, such as petrol and diesel fuel. The corresponding revenue is allocated to the state budget.

Chapter 6: Sustainable management and protection of water resources

Recommendation 6.1:

The Ministry of Agriculture and Water Management, together with the basin administrations of irrigation systems and water user associations, should implement water-saving measures for irrigation, including:

- (a) *Minimizing infiltration via unlined irrigation canals and ditches;*
- (b) *Implementing modern water efficient irrigation techniques.*

The implementation of this recommendation is ongoing.

- (a) The Government has worked with donors and IFIs to deliver investments to upgrade infrastructure, including irrigation canals and associated infrastructure. However, the impact of these investments with regard to water saving is not assessed on a regular basis, which does not allow prioritization of future investments. Water losses in irrigation remain very high. Between 14.6 km³ and 17.7 km³ of water is lost annually through agricultural activities (table 13.4).
- (b) There is evidence of a significant roll-out of drip irrigation technologies, with plans for further deployment. Efficient irrigation practices are also being adopted.

Recommendation 6.2:

The Cabinet of Ministers should:

- (a) *Develop and introduce legal acts on integrated water resources management principles;*
- (b) *Establish an appropriate structure with sufficiently high status focused on integrated water management planning and responsible for ensuring the coordination of actions in the water sector, and promote the required institutional development, taking into account international experience;*
- (c) *Establish a mechanism with stakeholders from the Government, non-governmental organizations, academia and the private sector to initiate and carry on a national policy dialogue on integrated water management within the framework of the European Union Water Initiative, as well as the UNECE Water Convention and its Protocol on Water and Health, with the UNECE as key strategic partner.*

This recommendation was partially implemented.

- (a) A legal act specifically on IWRM principles was not adopted. However, a number of decisions have been made that are starting to position water management in this general direction, for example, the reorganization of the basin organizations. The requirement to update the water strategy by 2023 might allow for further development in this area.
- (b) The Ministry of Water Management has a number of key tasks that should position the country well with regard to IWRM. These include implementation of a unified policy on water resources management and coordination of the activities of state bodies, financial management bodies and other organizations in the field of rational use and protection of water resources.
- (c) A national policy dialogue on IWRM was not established.

Recommendation 6.3:

- (a) *The Agency Uzkommunkhizmat and the local authorities should improve the efficiency of wastewater treatment.*
- (b) *The Cabinet of Ministers should develop a national strategy and a long-term programme in order to identify the aims, priorities and financial resources for the water supply and wastewater treatment infrastructure, and the Agency Uzkommunkhizmat and the local authorities should implement this strategy.*

The implementation of this recommendation is ongoing.

- (a) The establishment of Suvsoz has allowed a focus on wastewater treatment in Tashkent City. It has secured finances to upgrade the infrastructure. Wastewater treatment elsewhere in the country is of variable quality and industrial discharges remain a particular concern.
- (b) Infrastructure planning is done according to five-year programmes established by resolutions of the President, for example, the 2017 Programme for Comprehensive Development and Modernization of the Drinking Water Supply and Sewerage Systems for the period 2017–2021 (2017 Resolution of the President No. 2910). There is currently no long-term national water strategy. All ministries are updating their strategic documents at present and the water strategy is reported as being scheduled for delivery in 2023.

Chapter 7: Land management and protection**Recommendation 7.1:**

The Ministry of Agriculture and Water Management should consider promoting the use of agricultural conservation tools for saving water and protecting soil on irrigated croplands, which could be supported with training and demonstration projects.

The implementation of this recommendation has started with regard to water-saving techniques. The expansion of environmentally friendly crop cultivation techniques has not started.

Recommendation 7.2:

The Ministry of Economy, the Ministry of Agriculture and Water Management and the local authorities should develop and implement market mechanisms and innovative economic incentives that improve the socio-economic condition of the rural population and, at the same time, are conducive to improving land and water management.

The implementation of this recommendation is ongoing.

There has been little progress in creating a liberalized market environment in agriculture. Land ownership has remained public and land allocations to the two strategic crops (cotton and wheat) are not driven by market signals. Household farms which produce high-value horticulture products and livestock are constrained by a lack of access to value chains and essential farm support services. Weak property rights in land have curtailed management and investment incentives and raised issues of “fair and just” access to farmland by the rural population. In early 2019, the Government initiated a new wave of farm consolidation, with the main target of increasing the size of wheat and cotton farms rather than focusing on creating more effective market signals and developing agricultural support services.

Recommendation 7.3:

The State Committee for Nature Protection should establish an integrated network of protected natural areas, strengthening the monitoring of biological diversity, and prepare the necessary legal and institutional decisions to extend and complete the current network.

The recommendation was partially implemented. An integrated network of protected natural areas was not established. The monitoring of biodiversity remains weak. Some extensions of the protected area network took place in the past decade and there are some positive examples of ecological connectivity on a local scale (chapter 11). The policy framework for the management of protected areas was enhanced with adoption of the 2019 Roadmap for the development of the protected area system for 2019–2022, but the concepts of the ecological network and ecological corridors remain absent from the legislation.

Recommendation 7.4:

The Ministry of Agriculture and Water Management, in cooperation with the State Committee on Land Resources, Geodesy, Cartography and State Cadastre and the Centre of Hydrometeorological Service (Uzhydromet), should address rain-fed and irrigated land in policy documents on climate change adaptation.

The recommendation was not implemented.

Recommendation 7.5:

The Cabinet of Ministers should implement the cadastral land information system of urban land in such a way as to plan and manage urban land use.

The recommendation was not implemented.

Chapter 8: Energy and the environment

Recommendation 8.1:

Uzbekenergo, in cooperation with the Agency Uzkommunkhizmat and the State Committee for Nature Protection, should consider the possibility and feasibility of establishing a state agency on energy efficiency and renewable energy based on international experience in these areas.

The recommendation was partially implemented. A JSC National Energy Saving Company was created in 2017 but dismantled in 2019 following the establishment of the Ministry of Energy, which assumed the responsibilities in the field of energy efficiency. No separate state agency on energy efficiency and renewable energy is in place.

Recommendation 8.2:

Uzbekenergo, in cooperation with the Agency Uzkommunkhizmat and the State Committee for Nature Protection and local authorities, should draft medium-term local action plans to meet energy demands at the local level, to promote energy efficiency and to optimize the share of energy sources in the national energy balance.

The recommendation was not implemented.

Recommendation 8.3:

The Government should:

(a) *Develop and adopt a package of measures consisting of three core components, namely guarantees for*

the long-term purchase of energy produced from renewable sources, subsidies for their purchase tariffs and tax credits;

- (b) *Seek international assistance to develop renewable energies.*

The recommendation was partially implemented.

- (a) Traditional RES support schemes such as feed-in tariffs and competitive bidding/auctions have not been applied to date. There are, however, provisions for support in the form of investment tax credits and reduction in import taxes for RES technologies.
- (b) There are examples of agreements signed with international investors on renewable energy development. However, much more can be done in this area.

Chapter 9: Climate change and the environment

Recommendation 9.1:

Uzhydromet, in cooperation with the State Committee for Nature Protection and other relevant national authorities, should develop a national adaptation strategy as soon as possible.

The Government should adopt a national adaptation strategy as soon as possible and derive sectoral programmes, policies and projects from that strategy.

The Government should ensure that adequate funding is available for the top priorities. If that is not possible, it should seek funds either through established international market-based mechanisms, such as the Clean Development Mechanism, or through the assistance of the international community.

The implementation of the recommendation is ongoing. As at 2019, Uzhydromet, in collaboration with UNDP, is preparing a project submission under the Green Climate Fund Readiness and Preparatory Support window to obtain necessary resources for the development of the National Adaptation Plan.

Recommendation 9.2:

The Government should initiate the process to become party to the Protocol on Strategic Environmental Assessment of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention).

The State Committee for Nature Protection should initiate procedures so that the provisions defining the scope of environmental impact assessment in the current legal framework are modified to explicitly cover GHGs.

The State Committee for Nature Protection should initiate procedures to make amendments to the current legal framework to introduce strategic environmental assessments to sectoral programmes and strategies so as to explicitly cover GHGs.

The recommendation was partially implemented. As at February 2019, the country is not a party to the Protocol on Strategic Environmental Assessment to the Espoo Convention, but some preparatory activities have taken place (chapter 1). Strategic environmental assessment is not applied in practice in Uzbekistan. Provisions defining the scope of state ecological expertise and environmental impact assessment do not explicitly cover emissions of GHGs.

Recommendation 9.3:

In order to produce a more robust inventory of GHGs, the Government should:

- (a) *Ensure that a sustainable system of monitoring and registering GHGs is developed, including through providing the necessary budgetary resources for this purpose;*
- (b) *Ensure cooperation between key players in the statistical reporting related to the country's GHG inventory.*

The implementation of the recommendation is ongoing. The GHG inventory development process is still externally funded, with Uzhydromet, in collaboration with UNEP, having recently received funds from GEF for the development of the Fourth National Communication to the UNFCCC.

*Recommendation 9.4:**The Government should:*

- (a) Give adequate attention to projects with a high mitigation potential, especially in terms of CO₂ and CH₄ emissions;*
- (b) Ensure CO₂ and N₂O emissions do not increase as a result of increased brown coal combustion and extraction, which is part of the country's new energy policy.*

The recommendation has been partially implemented. Uzbekistan has been very active in registering CDM projects, which mostly focus on CH₄, a sensible choice given the scale of the problem with fugitive emissions in the energy sector. Given the lack of availability of recent data on GHG emissions, there is no basis for indicating whether energy policy changes considered in 2010 have had an effect on GHG emissions.

*Annex II****PARTICIPATION OF UZBEKISTAN IN
MULTILATERAL ENVIRONMENTAL AGREEMENTS***

Year	Worldwide agreements	Uzbekistan	
		Year	Status
1958	(GENEVA) Convention on the Continental Shelf		
1958	(GENEVA) Convention on Fishing and Conservation of the Living Resources of the High Seas		
1958	(GENEVA) Convention on the Territorial Sea and the Contiguous Zone		
1958	(GENEVA) Convention on the High Seas		
1960	(GENEVA) Convention concerning the Protection of Workers against Ionising Radiations (ILO 115)		
1961	(PARIS) International Convention for the Protection of New Varieties of Plants	2004	Ac
1963	(VIENNA) Convention on Civil Liability for Nuclear Damage		
	1997 (VIENNA) Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage		
1968	(LONDON, MOSCOW, WASHINGTON) Treaty on the Non-Proliferation of Nuclear Weapons (NPT)	1992	Ac
1969	(BRUSSELS) Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties		
1971	(RAMSAR) Convention on Wetlands of International Importance Especially as Waterfowl Habitat	2001	Ac
1971	(GENEVA) Convention on Protection against Hazards from Benzene (ILO 136)		
1971	(BRUSSELS) Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage		
	1992 Fund Protocol		
1971	(LONDON, MOSCOW, WASHINGTON) Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-bed and the Ocean Floor and in the Subsoil thereof		
1972	(PARIS) Convention concerning the Protection of the World Cultural and Natural Heritage	1993	Su
1972	(LONDON) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter		
	1996 (LONDON) Protocol		
1972	(LONDON, MOSCOW, WASHINGTON) Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and on their Destruction	1996	Ac
1972	(LONDON) International Convention on the International Regulations for Preventing Collisions at Sea		
1972	(GENEVA) International Convention for Safe Containers		
1973	(WASHINGTON) Convention on International Trade in Endangered Species of Wild Fauna and Flora	1997	Ac
	1979 (BONN) Amendment	1997	At
	1983 (GABORONE) Amendment	1998	At
1973	(LONDON) Convention for the Prevention of Pollution from Ships (MARPOL)		
	1978 (LONDON) Protocol relating to the International Convention for the Prevention of Pollution from Ships		
	1997 (LONDON) Protocol to Amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto		
1974	(GENEVA) Convention concerning Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents (ILO 139)		
1977	(GENEVA) Convention on Protection of Workers against Occupational Hazards from Air Pollution, Noise and Vibration (ILO 148)		

Worldwide agreements		Uzbekistan	
Year		Year	Status
1979	(BONN) Convention on the Conservation of Migratory Species of Wild Animals	1998	Ra
	1995 (THE HAGUE) Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)	1998	Ra
1980	(NEW YORK, VIENNA) Convention on the Physical Protection of Nuclear Material	1998	Ac
1981	(GENEVA) Convention Concerning Occupational Safety and Health and the Working Environment (ILO 155)		
1982	(MONTEGO BAY) Convention on the Law of the Sea		
	1994 (NEW YORK) Agreement related to the Implementation of Part XI of the Convention		
	1995 (NEW YORK) Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks		
1985	(GENEVA) Convention Concerning Occupational Health Services (ILO 161)		
1985	(VIENNA) Convention for the Protection of the Ozone Layer	1993	Ac
	1987 (MONTREAL) Protocol on Substances that Deplete the Ozone Layer	1993	Ac
	1990 (LONDON) Amendment to Protocol	1998	Ac
	1992 (COPENHAGEN) Amendment to Protocol	1998	Ac
	1997 (MONTREAL) Amendment to Protocol	2006	Ra
	1999 (BEIJING) Amendment to Protocol	2006	Ra
	2016 (KIGALI) Amendment to Protocol		
1986	(GENEVA) Convention Concerning Safety in the Use of Asbestos (ILO 162)		
1986	(VIENNA) Convention on Early Notification of a Nuclear Accident		
1986	(VIENNA) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency		
1989	(BASEL) Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	1996	Ac
	1995 Ban Amendment		
	1999 (BASEL) Protocol on Liability and Compensation		
1990	(GENEVA) Convention concerning Safety in the use of Chemicals at Work (ILO 170)		
1990	(LONDON) Convention on Oil Pollution Preparedness, Response and Cooperation		
1992	(RIO DE JANEIRO) Convention on Biological Diversity	1995	Ac
	2000 (MONTREAL) Cartagena Protocol on Biosafety	2019	Ac
	2010 (NAGOYA) Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization		
	2010 (NAGOYA - KUALA LUMPUR) Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety		
1992	(NEW YORK) United Nations Framework Convention on Climate Change	1993	Ac
	1997 (KYOTO) Kyoto Protocol	1999	Ra
	2012 (DOHA) Doha Amendment to the Kyoto Protocol		
	2015 (PARIS) Paris Agreement	2018	Ra
1993	(ROME) Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas		
1993	(PARIS) Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction	1996	Ra
1994	(VIENNA) Convention on Nuclear Safety		
1994	(PARIS) United Nations Convention to Combat Desertification	1995	Ra
1997	(VIENNA) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	2009	Ac
1997	(NEW YORK) Convention on the Law of Non-navigational Uses of International Watercourses	2007	Ac
1997	(VIENNA) Convention on Supplementary Compensation for Nuclear Damage		
1998	(ROTTERDAM) Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade		
2001	(STOCKHOLM) Convention on Persistent Organic Pollutants	2019	Ac
2001	(LONDON) Convention on Civil Liability for Bunker Oil Pollution Damage		
2003	(GENEVA) WHO Framework Convention on Tobacco Control	2012	Ac
2004	(LONDON) Convention for the Control and Management of Ships' Ballast Water and Sediments		
2013	(KUMAMOTO) Minamata Convention on Mercury		

Year	Regional and subregional agreements	Uzbekistan	
		Year	Status
1957	(GENEVA) European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)		
1958	(GENEVA) Agreement - Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts		
1968	(PARIS) European Convention - Protection of Animals during International Transport (revised in 2003)		
1969	(LONDON) European Convention on the Protection of the Archaeological Heritage (revised in 1992)		
1976	(STRASBOURG) European Convention for the Protection of Animals Kept for Farming Purposes		
1979	(BERN) Convention on the Conservation of European Wildlife and Natural Habitats		
1979	(GENEVA) Convention on Long-range Trans-boundary Air Pollution		
	1984 (GENEVA) Protocol - Financing of Co-operative Programme (EMEP)		
	1985 (HELSINKI) Protocol - Reduction of Sulphur Emissions by 30%		
	1988 (SOFIA) Protocol - Control of Emissions of Nitrogen Oxides		
	1991 (GENEVA) Protocol - Volatile Organic Compounds		
	1994 (OSLO) Protocol - Further Reduction of Sulphur Emissions		
	1998 (AARHUS) Protocol on Heavy Metals		
	1998 (AARHUS) Protocol on Persistent Organic Pollutants		
	1999 (GOTHENBURG) Protocol to Abate Acidification, Eutrophication and Ground-level Ozone		
	2009 (GENEVA) Amendments to the Text and to Annexes I, II, III, IV, VI and VIII to the 1998 Protocol on Persistent Organic Pollutants		
	2009 (GENEVA) Amendments to Annexes I and II to the 1998 Protocol on Persistent Organic Pollutants		
	2012 (GENEVA) Amendment of the text and annexes II to IX to the Protocol to the 1979 Convention on Long-range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground-level Ozone and the addition of new annexes X and XI		
	2012 (GENEVA) Amendments to the Text of and Annexes Other than III and VII to the 1998 Protocol on Heavy Metals		
1991	(ESPOO) Convention on Environmental Impact Assessment in a Transboundary Context		
	2001 (SOFIA) First Amendment		
	2003 (KIEV) Protocol on Strategic Environmental Assessment		
	2004 (CAVTAT) Second Amendment		
1992	(HELSINKI) Convention on the Protection and Use of Transboundary Watercourses and International Lakes	2007	Ac
	1999 (LONDON) Protocol on Water and Health		
	2003 (MADRID) Amendments to Articles 25 and 26	2011	At
1992	(HELSINKI) Convention on the Transboundary Effects of Industrial Accidents		
	2003 (KIEV) Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters		
1993	(OSLO and LUGANO) Convention - Civil Liability for Damage from Activities Dangerous for the Environment		
1994	(LISBON) Energy Charter Treaty	1995	Ra
	1994 (LISBON) Protocol on Energy Efficiency and Related Environmental Aspects	1995	Ra
	1998 Amendment to the Trade-Related Provisions of the Energy Charter Treaty		provisional application
1998	(AARHUS) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters		
	2003 (KIEV) Protocol on Pollutant Release and Transfer Registers		
	2005 (ALMATY) Amendment on GMOs		
1998	(STRASBOURG) Convention on the Protection of Environment through Criminal Law		
2000	(FLORENCE) European Landscape Convention		

Ac = Accession; Ad = Adherence; Ap = Approval; At = Acceptance; De = Denounced; Si = Signature; Su = Succession; Ra = Ratification.

*Annex III****LIST OF ENVIRONMENT-RELATED LEGISLATION***

The Constitution dated 08.12.1992 as amended

Codes

Code on Administrative Liability, dated 22.09.1994

Housing Code, dated 24.12.1998

Land Code, dated 30.04.1998

Code on Urban Construction, dated 04.04.2002

Criminal Code, dated 22.09.1994

Tax Code, dated 25.12.2007

Budget Code, dated 26.12.2013

Air Code, dated 07.05.1993

Electoral Code, dated 25.06.2019

Laws

On Nature Protection, No. 754-XII dated 09.12.1992

On Environmental Control, No. ZRU-363 dated 27.12.2013

On Ecological Expertise, No. 73-II dated 25.05.2000

On Ambient Air Protection, No. 353-I dated 27.12.1996

On Protection and Use of Flora (new edition), No. ZRU-409 dated 21.09.2016

On Protection and Use of Fauna (new edition), No. ZRU-408 dated 19.09.2016

On Protected Natural Territories, No. 710-II dated 03.12.2004

On Forests (new edition), No. ZRU-475 dated 16.04.2018

On Subsoil (new edition), No. 444-II dated 13.12.2002

On Waste, No. 362-II dated 05.04.2002

On Water and Water Use, No. 837-XII dated 06.05.1993

On the Safety of Hydrotechnical Installations, No. 826-I dated 20.08.1999

On Public Procurement, No. ZRU-472 dated 09.04.2018

On the Use of Nuclear Energy for Peaceful Purposes, No. ZRU-565 dated 09.09.2019

On Rational Use of Energy, No. 412-I dated 25.04.1997

On Road Safety (new edition), No. ZRU-348 dated 10.04.2013

On Industrial Safety of Hazardous Production Facilities, No. ZRU-57 dated 28.09.2006

On Privatization of Non-Agricultural Land Plots, No. ZRU-552 dated 13.08.2019

On Tourism, No. 830-I dated 20.08.1999

On the Cabinet of Ministers of the Republic of Uzbekistan (new edition), No. 524-II dated 29.08.2003

On the Permitting Procedures in Business Activities, No. ZRU-341 dated 20.12.2012

On State Control of Activities of Economic Entities, No. 717-I dated 24.12.1998

On the Use of Renewable Energy Sources, No. ZRU-539 dated 21.05.2019

On Public-Private Partnerships, No. ZRU-537 dated 10.05.2019

On Appeals of Individuals and Legal Entities, No. ZRU-378 dated 03.12.2014

On Guarantees and Freedom of Access to Information, No. 400-I dated 24.04.1997

On Principles and Guarantees of Freedom of Information, No. 439-II dated 12.12.2002

On Openness of Activity of Public Authorities and Administration, No. ZRU-369 dated 05.05.2014

On Public Associations in Uzbekistan, No. 223-XII dated 15.02.1991

On Non-State Non-Profit Organizations, No. 763-I dated 14.04.1999

- On Guarantees of Activity of Non-State Non-Profit Organizations, No. ZRU-76 dated 03.01.2007
- On Treaties, No. ZRU-518 dated 06.02.2019
- On Licensing of Certain Activities, No. 71-II dated 25.05.2000
- On Pastures, No. ZRU-538 dated 20.05.2019
- On Production Sharing Agreements, No. 312-II dated 07.12.2001
- On Electricity, No. ZRU-225 dated 30.09.2009
- On Dekhan Farms, No. 604-I dated 30.04.1998
- On Farms (new edition), No. 662-II dated 26.08.2004
- On Protection of Agricultural Plants from Pests, Diseases and Weeds, No. 116-II dated 31.08.2000
- On Veterinary Medicine, No. ZRU-397 dated 29.12.2015
- On Road Transport, No. 674-I dated 29.08.1998
- On Urban Passenger Transport, No. 419-I dated 25.04.1997
- On Railway Transport, No. 766-I dated 15.04.1999
- On the Protection and Use of Cultural Heritage, No. 269-II dated 30.08.2001
- On Privatization of Non-Agricultural Land, No. ZRU-552 dated 13.08.2019
- On the Sanitary-Epidemiological Well-Being of the Population, No. ZRU-393 dated 26.08.2015
- On Counteracting the Disease caused by the Human Immunodeficiency Virus (HIV infection), No. ZRU-353 dated 23.09.2013
- On Quality and Safety of Food Products, No. 483-I dated 30.08.1997
- On Prevention of Micronutrient Deficiencies among the Population, No. ZRU-251 dated 07.06.2010
- On Radiation Safety, No. 120-II dated 31.08.2000
- On Protection of Workers (new edition), No. ZRU-410 dated 22.09.2016
- On Technical Regulation, No. ZRU-213 dated 23.04.2009
- On Protection of the Population and Territory from Natural and Man-made Disasters, No. 824-I dated 20.08.1999
- On Restriction of Distribution and Use of Alcohol and Tobacco Products, No. ZRU-302 dated 05.10.2011
- On Restriction of Smoking of Hookahs and Electronic Cigarettes in Public Places, No. ZRU-478 dated 02.07.2018
- On Social Partnership, No. ZRU-376 dated 25.09.2014
- On Public Control, No. ZRU-474 dated 12.04.2018
- On accession of the Republic of Uzbekistan to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Montreal, 29 January 2000), No. ZRU-569 dated 14.10.2019
- On ratification of the Stockholm Convention on Persistent Organic Pollutants (Stockholm, 22 May 2001), No. ZRU-535 dated 08.05.2019
- On ratification of the Paris Agreement (Paris, 12 December 2015), No. ZRU-491 dated 02.10.2018

Decrees of the President of the Republic of Uzbekistan

- “On measures for fundamental improvement of the system of payments for the collection and removal of municipal solid waste” No. UP-5580 dated 22.11.2018
- “On measures for fundamental improvement of payment discipline in the provision of water supply and sanitation services” No. UP-5241 dated 16.11.2017
- “On measures to fundamentally improve urbanization processes” No. UP-5623 dated 10.01.2019
- “On additional measures to improve the state Regulation in the field of construction” No. UP-5577 dated 14.11.2018
- “On Action Strategy for Further Development of the Republic of Uzbekistan” No. UP-4947 dated 07.02.2017 (approved the Action Strategy on Five Priority Directions for Development for the period 2017–2021)
- “On additional measures to ensure further economic development and enhance the efficiency of the economic policy” No. UP-5614 dated 08.01.2019 (approved the Roadmap for Structural Reforms in the Republic of Uzbekistan for the period 2019–2021)
- “On the Programme 'Obod Qishloq' (Prosperous village)" No. UP-5386 dated 29.03.2018
- “On the Programme 'Obod Makhalla' (Prosperous neighbourhood)" No. UP-5467 dated 27.06.2018
- “On additional measures for the accelerated development of tourism in the Republic of Uzbekistan” No. UP-5611 dated 05.01.2019 (approved the Concept for Development of the Tourism Sector for the period 2019–2025)
- “On complex measures on the radical improvement of the health-care system of the Republic of Uzbekistan” No. UP-5590 dated 07.12.2018 (approved the Concept on Development of the Health System in the Republic of Uzbekistan for the

period 2019–2025)

- “On approval of the Strategy for Innovative Development in the Republic of Uzbekistan for the period 2019–2021” No. UP-5544 dated 21.09.2018
- “On radical improvement of the effectiveness of the system for preparedness and response to emergencies” No. UP-5066 dated 01.06.2017
- “On approval of the Concept to Conduct the Population Census in 2022 in the Republic of Uzbekistan” No. UP-5655 dated 05.02.2019
- “On improving the public administration system in the field of ecology and environmental protection” No. UP-5024 dated 21.04.2017
- “On measures to fundamentally improve the management system of the fuel and energy industry of the Republic of Uzbekistan” No. UP-5646 dated 01.02.2019
- “On measures to fundamentally improve the system of public administration in the field of transport” No. UP-5647 dated 01.02.2019
- “On measures to fundamentally improve the system for implementing the state policy in the field of economic development” No. UP-5621 dated 10.01.2019
- “On the formation of the Ministry of Innovative Development of the Republic of Uzbekistan” No. UP-5264 dated 29.11.2017
- “On measures to further improve the management of the housing and communal services system” No. UP-5017 dated 18.04.2017
- “On measures to further improve the state policy in the field of employment and fundamentally increase the efficiency of the work of labour authorities” No. UP-5052 dated 24.05.2017
- “On the establishment of the State Committee on Forestry of the Republic of Uzbekistan” No. UP-5041 dated 11.05.2017
- “On measures to fundamentally improve the system of public administration and supervision in the areas of industrial, radiation and nuclear safety” No. UP-5594 dated 12.12.2018
- “On measures to ensure the accelerated development of the tourism industry of the Republic of Uzbekistan” No. UP-4861 dated 02.12.2016
- “On approval of the Concept of Administrative Reform in the Republic of Uzbekistan” No. UP-5185 dated 08.09.2017
- “On a legal experiment to introduce a special management order in the city of Tashkent” No. UP-5515 dated 17.08.2018
- “On measures to fundamentally reduce and further optimize interdepartmental collegial bodies” No. UP-5527 dated 28.08.2018
- “On measures to further improve the system of protection of rights and legitimate interests of business entities” No. UP-5490 dated 27.07.2018
- “On measures to fundamentally improve the system of protecting business activity and optimizing the activities of prosecution authorities” No. UP-5690 dated 15.03.2019
- “On measures to further simplify procedures and accelerate the sale of state property for use in business purposes” No. UP-4933 dated 17.01.2017
- “On measures to fundamentally enhance the role of civil society institutions in the process of democratic renewal of the country” No. UP-5430 dated 04.05.2018
- “On measures for the further development of alternative energy sources” No. UP-4512 dated 01.03.2013
- “On measures to fundamentally improve the activities of the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan” No. UP-5134 dated 04.08.2017 (ceased to be in force 01.08.2018)
- “On measures to develop nuclear energy in the Republic of Uzbekistan” No. UP-5484 dated 19.07.2018
- “On the Programme of Measures to Secure Structural Reforms, Modernization and Diversification of Production for the period 2015–2019” No. UP-4707 dated 04.03.2015
- “On measures for the improvement of civil aviation of the Republic of Uzbekistan” No. UP-5584 dated 27.11.2018
- “On measures for the implementation of modern corporate governance methods in joint stock companies” No. UP-4720 dated 24.04.2015
- “On measures to fundamentally increase the efficiency of the activities of internal affairs bodies, strengthen their responsibility to ensure public order and reliable protection of the rights, freedoms and legitimate interests of the citizens” No. UP-5005 dated 10.04.2017
- “On further advancing food security” No. UP-5303 dated 16.01.2018
- “On measures for rational use of land and water resources in agriculture” No. UP-5742 dated 17.06.2019 (approved the Concept for Rational Use of Land and Water Resources in Agriculture)
- “On approval of the Concept on Environmental Protection in the Republic of Uzbekistan until 2030” No. UP-5863 dated 30.10.2019

Resolutions of the President of the Republic of Uzbekistan

- “On measures to increase the efficiency of water resources use” No. PP-3823 dated 02.07.2018
- “On measures to further improve the system of water protection” No. PP-3286 dated 25.09.2017
- “On measures to ensure the rational use of energy resources” No. PP-3379 dated 08.11.2017
- “On measures to radically improve the system of freight and passenger transportation” No. PP-4230 dated 06.03.2019
- “On measures for the development of agricultural cooperation in the fruit and vegetable industry” No. PP-4239 dated 14.03.2019
- “On urgent measures to create favourable conditions for the widespread use of drip irrigation technology in the production of raw cotton” No. PP-4087 dated 27.12.2018
- “On the introduction of a new procedure for the formation and financing of state development programmes of the Republic of Uzbekistan” No. PP-3437 dated 18.12.2017
- “On the State Programme on Development of the Aral Sea Region for the period 2017–2021” No. PP-2731 dated 18.01.2017
- “On accelerated development of infrastructure, transport and communications networks for the period 2011–2015” No. PP-1446 dated 21.12.2010 (approved the Programme on Accelerated Development of Infrastructure, Transport and Communications Networks for the period 2011–2015)
- “On the Programme on Development and Modernization of Communications, Road and Transport Infrastructure for the period 2015–2019” No. PP-2313 dated 06.03.2015
- “On the Programme for Comprehensive Development and Modernization of the Drinking Water Supply and Sewerage Systems for the period 2017–2021” No. PP-2910 dated 20.04.2017
- “On additional measures to develop water supply and sewerage systems in the Republic of Uzbekistan” No. PP-4040 dated 30.11.2018
- “On measures to strengthen control and accounting for the rational use of groundwater resources for the period 2017–2021” No. PP-2954 dated 04.04.2017
- “On approval of the Strategy on Municipal Solid Waste Management in the Republic of Uzbekistan for the period 2019–2028” No. PP-4291 dated 17.04.2019
- “On measures to improve public administration in the field of protected natural areas” No. PP-4247 dated 20.03.2019 (approved the Roadmap for Development of the Protected Areas Network of the Republic of Uzbekistan for the period 2019–2022)
- “On the Programme of Measures to Reduce Energy Intensity and Introduce Energy Efficient Technologies in Economic Sectors and the Social Sector for the period 2015–2019” No. PP-2343 dated 05.05.2015
- “On the Programme of Measures for Further Development of Renewable Energy, Increase of Energy Efficiency in Economic Sectors and the Social Sector for the period 2017–2021” No. PP-3012 dated 26.05.2017
- “On the Programme for Development of the Heat Supply System for the period 2018–2022” No. PP-2912 dated 20.04.2017
- “On the Programme of Measures for Further Development of Hydropower for the period 2017–2021” No. PP-2947 dated 02.05.2017
- “On approval of the Programme to Increase the Extraction of Hydrocarbons for the period 2017–2021” No. PP-2822 dated 09.03.2017
- “On the Programme for the Further Development and Modernization of the Coal Industry for the period 2017–2021” No. PP-3054 dated 13.06.2017
- “On approval of the Concept for the Development of Nuclear Energy in the Republic of Uzbekistan in the period 2019–2029” No. PP-4165 dated 07.02.2019
- “On measures to improve transport infrastructure and diversify foreign trade routes for the transportation of goods for the period 2018–2021” No. PP-3422 dated 02.12.2017 (approved the Comprehensive Programme to Improve Transport Infrastructure and Diversify External Trade Routes for Freight Transport for the period 2018–2022)
- “On measures to improve the landscaping system and architectural and landscape design of roads” No. PP-3262 dated 11.09.2017 (approved the Programme for Greening the Roads, including Roads of Common Use and Streets in the period 2018–2020)
- “On the Programme of Localization of Goods, Components and Materials for the period 2015–2019” No. PP-2298 dated 11.02.2015
- “On the Programme of Measures for Further Development of the Textile and Knitwear Industry in the period 2017–2019” No. PP-2687 dated 21.12.2016
- “On measures for accelerated development of the chemical industry of the Republic of Uzbekistan” No. PP-3983 dated 25.10.2018

- “On the Programme for Further Modernization, Technical and Technological Upgrade of Agricultural Production for the period 2012–2016” No. PP-1758 dated 21.05.2012
- “On measures to organize the activities of the Ministry of Agriculture of the Republic of Uzbekistan” No. PP-3671 dated 17.04.2018 (approved the Roadmap on Profound Reform of the Agricultural and Food System)
- “On measures for improvement of land reclamation in irrigated lands and rational use of water resources in the period 2013–2017” No. PP-1958 dated 19.04.2013 (approved the State Programme for Improvement of Land Reclamation in Irrigated Lands and Rational Use of Water Resources in the period 2013–2017)
- “On the Programme of Comprehensive Measures on the Development of Irrigation, Improvement of Land Reclamation of Irrigated Lands and Rational Use of Water Resources in the period 2018–2019” No. PP-3405 dated 27.11.2017
- “On the organization of activities of the State Committee on Forestry of the Republic of Uzbekistan” No. PP-2966 dated 11.05.2017 (approved the Programme of Measures for Effective Organization of Forest Management Organizations, Introduction of Advanced Scientific and Technological Measures in Forestry, Renewal of Equipment and Raising International Funds for Forestry for the period 2017–2021)
- “On measures to prevent non-communicable diseases, support a healthy lifestyle and increase the level of physical activity of the population” No. PP-4063 dated 18.12.2018
- “On measures to accelerate the development of e-commerce” No. PP-3724 dated 14.05.2018 (approved the Programme of Measures on Developing E-Commerce in the Republic of Uzbekistan for the period 2018–2021)
- “On additional measures to improve the public administration system in the field of ecology and environmental protection” No. PP-3956 dated 03.10.2018
- “On measures to organize the activities of the Ministry of Water Management of the Republic of Uzbekistan” No. PP-3672 dated 17.04.2018
- “On the organization of the activities of the Ministry of Investment and External Trade of the Republic of Uzbekistan” No. PP-4135 dated 28.01.2019
- “On measures for the further implementation of modern energy-efficient and energy-saving technologies” No. PP-3238 dated 23.08.2017
- “On priority measures to create a legal and institutional framework for the development of public–private partnership” No. PP-3980 dated 20.10.2018
- “On the formation of the International Innovation Centre for the Aral Sea Region under the President of the Republic of Uzbekistan” No. PP-3975 dated 16.10.2018
- “On measures to further improve the activities of enterprises of the mining and metallurgical industry” No. PP-4124 dated 17.01.2019
- “On measures to further improve the rating of the Republic of Uzbekistan in the annual report of the World Bank and the International Finance Corporation ‘Doing Business’” No. PP-3852 dated 13.07.2018
- “On the forecast of the main macroeconomic indicators and parameters of the State budget of the Republic of Uzbekistan for 2017” No. PP-2699 dated 27.12.2016
- “On the forecast of the main macroeconomic indicators and parameters of the State budget of the Republic of Uzbekistan for 2019 and budget guidelines for the period 2020–2021” No. PP-4086 dated 26.12.2018
- “On the forecast of the main macroeconomic indicators and parameters of the State budget of the Republic of Uzbekistan for 2018” No. PP-3454 dated 29.12.2017
- “On the forecast of the main macroeconomic indicators and parameters of the State budget of the Republic of Uzbekistan for 2015” No. PP-2270 dated 04.12.2014
- “On measures to further streamline the foreign economic activity of the Republic of Uzbekistan” No. PP-3303 dated 29.09.2017 (ceased to be in force 01.01.2019)
- “On measures to further streamline the foreign economic activity and improve the system of customs and tariff regulation of the Republic of Uzbekistan” No. PP-3818 dated 29.06.2018
- “On measures to accelerate the development and ensure the financial sustainability of the electricity industry” No. PP-3981 dated 23.10.2018
- “On additional measures for the implementation of investment projects in the field of renewable energy sources” No. PP-3687 dated 28.04.2018
- “On measures to improve the activities of the State Committee on Statistics of the Republic of Uzbekistan” No. PP-3165 dated 31.07.2017
- “On additional measures to assist the development of civil society institutions” No. PP-2085 dated 12.12.2013
- “On measures to organize the activities of public councils under state bodies” No. PP-3837 dated 04.07.2018
- “On additional measures to ensure openness and transparency of public administration, as well as increase the country’s statistical potential” No. PP-4273 dated 09.04.2019
- “On measures to assist the development of civil society institutions in Uzbekistan” No. PP-107 dated 23.06.2005

- “On measures to further improve the organization of activities of the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan” No. PP-3172 dated 04.08.2017 (ceased to be in force 01.08.2018)
- “On measures to further improve the system of municipal waste management” No. PP-3730 dated 18.05.2018
- “On measures for drastic improvement and development of the waste management system for the period 2017–2021” No. PP-2916 dated 21.04.2017
- “On the Strategy for the Further Development and Reform of the Electric Power Industry of the Republic of Uzbekistan” No. PP-4249 dated 27.03.2019
- “On measures to further reform and develop agriculture in the period 2016–2020” No. PP-2460 dated 29.12.2015
- “On additional measures for improvement of the efficiency of the State Plant Quarantine Service” No. PP-3626 dated 28.03.2018
- “On the establishment and organization of activities of the Association of producers and exporters of walnuts” No. PP-3025 dated 01.06.2017
- “On additional measures to improve the activities of farmers, dekhkan farms and owners of personal land” No. PP-3680 dated 26.04.2018
- “On measures to further improve management and accelerate development of the automotive industry for the period 2017–2021” No. PP-3028 dated 01.06.2017
- “On measures for the implementation of the project ‘Construction of the Sergeli line of the Tashkent Metro’” No. PP-2664 dated 29.11.2016
- “On measures for the implementation of the project ‘Construction of the second stage of the Yunusabad line of the Tashkent Metro’” No. PP-2653 dated 07.11.2016
- “On measures to further improve the system of road safety” No. PP-3127 dated 11.07.2017
- “On the Programme on the Development of Regional Roads for the period 2017–2018” No. PP-2775 dated 14.02.2017
- “On measures to further improve the system of public transport and passenger bus systems in cities and villages” No. PP-2724 dated 10.01.2017 (approved the Programme of Further Development of Transport Services in Cities and Villages for the period 2017–2021)
- “On measures for the implementation of the Investment Programme of the Republic of Uzbekistan for 2019” No. PP-4067 dated 19.12.2018
- “On measures to introduce modern methods of labelling certain types of goods” No. PP-4042 dated 30.11.2018
- “On the Programme for Chemical Industry Development for the period 2017–2021” No. PP-3236 dated 23.08.2017 (ceased to be in force 04.04.2019)
- “On measures to further reform and increase the investment attractiveness of the chemical industry” No. PP-4265 dated 03.04.2019 (approved the Programme for Chemical Industry Development for the period 2019–2030)
- “On measures to further improve the system of maintenance and operation of the multifamily housing stock for the period 2017–2021” No. PP-2922 dated 24.04.2017
- “On additional measures to improve the construction of affordable houses in rural areas and for individual categories of citizens” No. PP-4028 dated 24.11.2018
- “On the Programme for the Construction of Individual Housing Based on Updated Standard Design Projects in Rural Areas for 2012” No. PP-1687 dated 14.01.2012
- “On the Programme for the Construction of Individual Housing Based on Updated Standard Design Projects in Rural Areas for 2013” No. PP-1902 dated 04.01.2013
- “On the Programme for the Construction of Affordable Residential Houses Based on Updated Standard Design Projects in Rural Areas for the period 2017–2021” No. PP-2639 dated 21.10.2016
- “On measures to ensure master plans for settlements in 2018–2022, improve the activities of project organizations, as well as improve the quality of training of specialists in the field of urban planning” No. PP-3502 dated 02.02.2018
- “On measures to further strengthen labour rights guarantees and support women’s entrepreneurial activities” No. PP-4235 dated 07.03.2019
- “On measures to improve the system for the provision of specialized TB and pulmonary care” No. PP-4191 dated 13.02.2019
- “On measures to further improve the system of counteracting the spread of the disease caused by the Human Immunodeficiency Virus in the Republic of Uzbekistan” No. PP-3493 dated 25.01.2018
- “On additional measures to counteract the spread of the disease caused by the Human Immunodeficiency Virus and the prevention of nosocomial infections” No. PP-3800 dated 22.06.2018
- “On measures to organize the activities of the Ministry of Health of the Republic of Uzbekistan” No. PP-4055 dated 07.12.2018
- “On approval of the Strategy for Transition to Green Economy for the period 2019–2030” No. PP-4477 dated 04.10.2019

- “On organization of the Agency for the Development of Viticulture and Winemaking under the Ministry of Agriculture of the Republic of Uzbekistan” No. PP-4161 dated 05.02.2019
- “On measures to further develop horticulture and greenhouses in the Republic of Uzbekistan” No. PP-4246 dated 20.03.2019
- “On additional measures to accelerate the development of the construction materials industry” No. PP-4335 dated 23.05.2019
- “On additional measures to raise the efficiency of forest use in the Republic” No. PP-4424 dated 23.08.2019
- “On further improvement of the conformity assessment system and the development of the testing laboratories system” No. PP-4419 dated 15.08.2019
- “On additional measures to accelerate the development of the automotive industry in the Republic of Uzbekistan” No. PP-4397 dated 18.07.2019
- “On organization of activities of the Ministry of Economy and Industry of the Republic of Uzbekistan” No. PP-4105 dated 10.01.2019
- “On accelerated measures to increase energy efficiency of economic sectors and the social sector, introduce energy efficient technologies and renewable energy sources” No. PP-4422 dated 22.08.2019

Orders of the President of the Republic of Uzbekistan

- “On approval of lists of special equipment, technological equipment and components that are not produced in the Republic of Uzbekistan, imported as part of the creation of clusters for the collection, transportation, utilization, processing and burial of household waste in the cities of the Republic, which are exempted from customs payments” No. R-5057 dated 15.09.2017

Resolutions of the Cabinet of Ministers

- “On the improvement of the system of environmental monitoring in the Republic of Uzbekistan” No. 737 dated 05.09.2019
- “On approval of the Regulation on the procedure for exercising state environmental control” No. 216 dated 05.08.2014
- “On approval of regulatory legal acts in the field of environmental control” No. 286 dated 08.10.2015
- “On approval of the model Regulations for the implementation of the public environmental control” No. 287 dated 08.10.2015
- “On approval of the Regulation on state ecological expertise” No. 949 dated 22.11.2018
- “On measures to further improve the Regulation of imports into the Republic of Uzbekistan and exports from the Republic of Uzbekistan of ozone-depleting substances and products containing them” No. 17 dated 09.01.2018
- “On the settlement of the use of biological resources and on the procedure for passing licensing procedures in the field of environmental management” No. 290 dated 20.10.2014
- “On the Programme of Actions on Environmental Protection in the Republic of Uzbekistan for the period 2008–2012” No. 212 dated 19.09.2008
- “On measures to organize the preparation, publication and maintenance of the Red Book of the Republic of Uzbekistan” No. 1034 dated 19.12.2018
- “On some issues of regulating the visits to protected areas” No. 13 dated 08.01.2018
- “On approval of regulatory acts aimed at implementing the provisions of the Law of the Republic of Uzbekistan ‘On Protected Natural Territories’” No. 339 dated 04.05.2018
- “On approval of regulatory acts in accordance with the Law of the Republic of Uzbekistan ‘On Subsoil’” No. 20 dated 13.01.1997
- “On measures on the development and rehabilitation of protective forest plantations to combat wind erosion of irrigated lands and prevent the sanding of water infrastructure” No. 422 dated 05.06.2018
- “On approval of regulatory acts in the field of waste management” No. 95 dated 06.02.2019
- “On measures to further improve the efficiency of work in the field of municipal waste management” No. 787 dated 02.10.2018
- “On amendments and additions to the Rules for the provision of water supply and sanitation services to consumers” No. 950 dated 23.11.2018
- “On additional measures to improve environmental protection in the public utilities system” No. 11 dated 03.02.2010
- “On measures to further improve the economic mechanisms for the protection of nature” No. 820 dated 11.10.2018
- “On measures to further develop the insurance services market” No. 413 dated 27.11.2002
- “On measures to further expand the domestic production of energy-saving lamps” No. 299 dated 20.10.2015

- “On approval of the Regulation on the procedure for the provision of energy services” No. 551 dated 18.07.2018
- “On approval of the rules for road freight in the Republic of Uzbekistan” No. 213 dated 01.08.2014
- “On approval of the general technical Regulation on the safety of road vehicles operating on compressed natural gas, liquefied petroleum gas or on a mixture of diesel and gaseous fuels” No. 326 dated 11.11.2015
- “On approval of the general technical Regulation ‘On the safety of railway transport in technical use’” No. 192 dated 04.07.2012
- “On approval of the general technical Regulation on the requirements for motor and aviation gasoline, diesel and marine fuel, jet fuel and fuel oil” No. 931 dated 21.11.2017
- “On approval of the Regulation on organization of the industrial safety expertise and issuance of its conclusions” No. 784 dated 02.10.2018
- “On the forecasted volumes of raw cotton production and distribution of lands by cotton type in 2019” No. 1037 dated 22.12.2018
- “On approval of the Regulation on the methodology for organization of recreational parks and green areas” No. 671 dated 17.08.2018
- “On measures to develop ecotourism and improve allocation of land plots in river protection zones of water reservoirs” No. 978 dated 03.12.2018
- “On measures to further increase the efficiency of the use of biological resources of the Aydar-Arnasay Lakes System” No. 347 dated 22.04.2019
- “On the Programme of Actions on Environmental Protection of the Republic of Uzbekistan for the period 2013–2017” No. 142 dated 27.05.2013
- “On the Comprehensive Programme of Measures related to Mitigation of the Consequences of the Aral Disaster, Rehabilitation and Socioeconomic Development of the Aral Sea Region for the period 2015–2018” No. 255 dated 29.08.2015
- “On approval of the National Action Plan of the Republic of Uzbekistan on Implementation of International Commitments on Chemical, Biological, Radiation and Nuclear Safety for the period 2018–2021” No. 968 dated 27.11.2018
- “On approval of the Strategy for the Conservation of Biological Diversity in the Republic of Uzbekistan for the period 2019–2028” No. 484 dated 11.06.2019
- “On approval of the Programme of State Environmental Monitoring in the Republic of Uzbekistan for the period 2011–2015” No. 292 dated 31.10.2011
- “On approval of the Programme of Environmental Monitoring in the Republic of Uzbekistan for the period 2016–2020” No. 273 dated 23.08.2016
- “On measures to further promote production and instalment of biogas plants in the period 2017–2019” No. 338 dated 01.06.2017
- “On approval of the Programme of Modernization, Technical and Technological Re-equipment of the Coal Industry Enterprises and its Balanced Development for the period 2013–2018” No. 161 dated 06.06.2013 (ceased to be in force 27.06.2017)
- “On measures to further improve the road safety system in the Republic of Uzbekistan” No. 377 dated 19.05.2018 (approved the Concept on Road Safety in the Republic of Uzbekistan for the period 2018–2022)
- “On approval of the Concept to Implement the Smart City Approach in the Republic of Uzbekistan” No. 48 dated 18.01.2019
- “On approval of the Concept on Developing E-Commerce in the Republic of Uzbekistan for the period 2016–2018” No. 353 dated 04.12.2015
- “On the Programme for Development of National Infrastructure for Quality Assurance until 2020” No. 298 dated 19.10.2015
- “On additional measures to ensure economizing on paper and its rational use in the Republic” No. 155 dated 22.07.2010
- “On additional measures to implement the Millennium Development Goals in Uzbekistan” No. 21 dated 26.01.2011
- “On measures to implement the national Sustainable Development Goals and targets for the period until 2030” No. 841 dated 20.10.2018
- “On approval of the Programme of State Statistical Activities for 2019” No. 91 dated 05.02.2019
- “On approval of the Regulation of the Cabinet of Ministers of the Republic of Uzbekistan” No. 242 dated 22.03.2019
- “On organizational measures to ensure the rational use of the biological resources of the Aydar-Arnasay Lakes System” No. 124 dated 07.03.2017
- “On approval of standard Regulation on control apparatus of khokimiyats regions, cities and areas” No. 123 dated 27.04.2016
- “On the organization of activities of the National Committee on Large Dams of Uzbekistan” No. 88 dated 25.03.2011

- “On measures to create a technology park of software products and information technology” No. 17 dated 10.01.2019
- “On approval of the Regulation on State Ecological Expertise in the Republic of Uzbekistan” No. 491 dated 31.12.2001
- “On approval of the Regulation on the order of preparation and approval of draft emission limits” No. 14 dated 21.01.2014
- “On measures to implement the Law of the Republic of Uzbekistan ‘On licensing procedures in the field of business activities’” No. 225 dated 15.08.2013
- “On the implementation of a voluntary eco-labelling system of products in the Republic of Uzbekistan” No. 435 dated 27.05.2019
- “On approval of the Regulation on water use and water consumption in the Republic of Uzbekistan” No. 82 dated 19.03.2013
- “On improving the system of payments for special nature management” No. 15 dated 06.02.2006
- “On measures to improve the development, approval and setting of regulated prices (tariffs) for water supply and sewerage” No. 309 dated 13.04.2019
- “On measures to further improve the tariffs policy in the electrical industry” No. 310 dated 13.04.2019
- “On improving the system of payments for environmental pollution and waste disposal in the Republic of Uzbekistan” No. 199 dated 01.05.2003 (ceased to be in force 01.01.2019)
- “On the gradual change of prices and tariffs for fuel and energy resources” No. 897 dated 01.11.2018
- “On measures to further improve the procedure for declaring (approval) and establishing regulated prices (tariffs) for goods (work, services)” No. 239 dated 28.10.2010
- “On approval of the Regulation on the order of formation and use of resources of the Fund for Ecology, Environmental Protection and Waste Management” No. 375 dated 15.06.2017
- “On approval of the Regulation on the Funds for Environmental Protection” No. 246 dated 24.05.1993
- “On measures to further improve the forest management system” No. 530 dated 19.07.2017
- “On measures to further develop the research base in the field of ecology and environmental protection” No. 958 dated 26.11.2018
- “On approval of the Regulation on State Environmental Monitoring in the Republic of Uzbekistan” No. 111 dated 03.04.2002 (ceased to be in force 06.09.2019)
- “On measures to strengthen the material and technical resources of the Centre of Hydrometeorological Service under the Ministry of Emergency Situations of the Republic of Uzbekistan in the period 2019–2022” No. 970 dated 29.11.2018
- “On approval of the Regulation on the procedure for monitoring the subsoil of the Republic of Uzbekistan” No. 119 dated 12.05.2014
- “On approval of the Regulation on the Centre for Specialized Analytical Control in the Field of Environmental Protection under the State Committee on Ecology and Environmental Protection of the Republic of Uzbekistan” No. 377 dated 15.06.17
- “On approval of the Regulation on the development and maintenance of the State Water Cadastre of the Republic of Uzbekistan” No. 11 dated 07.01.1998
- “On maintaining the state accounting, accounting of volumes of use and the State Cadastre of Flora and State Cadastre of Fauna” No. 914 dated 07.11.2018
- “On approval of the Programme of Environmental Monitoring in the Republic of Uzbekistan for the period 2006–2010” No. 48 dated 16.03.2006
- “On measures to further improve the governmental portal of Uzbekistan on the Internet, taking into account the provision of open data” No. 232 dated 07.08.2015
- “On measures for further improvement of activities of information services of the state authorities and administration of the Republic of Uzbekistan” No. 125 dated 15.02.2018
- “On the Regulation of the import into the Republic of Uzbekistan and the export from its territory of environmentally hazardous products and waste” No. 151 dated 19.04.2000
- “On approval of the rules for the use of electrical and thermal energy” No. 245 dated 22.08.2009
- “On measures for the effective organization of the implementation and financing of the drip irrigation system and other water-saving irrigation technologies” No. 176 dated 21.06.2013
- “On measures to further streamline activities in the field of groundwater use” No. 430 dated 27.06.2017
- “On improving the organization of water management” No. 320 dated 21.07.2003 (ceased to be in force 10.12.2018)
- “On approval of the Regulation on the organization of collection and disposal of used mercury-containing lamps” No. 266 dated 21.09.2011
- “On approval of the Regulation on the procedure for the implementation of state accounting and control in the field of waste management” No. 295 dated 27.10.2014

- “On measures to improve the system of allocation of territories for provision of waste collection services in the field of sanitary cleaning” No. 765 dated 25.09.2018
- “On approval of the Regulations on the Ministry of Housing and Communal Utilities of the Republic of Uzbekistan, the Inspectorate for Control in the Field of Operation of Multi-Unit Housing Fund and the Kommunkhizmat Agency” No. 340 dated 02.06.2017
- “On approval of the Rules for the transport of hazardous goods by road vehicles in the Republic of Uzbekistan” No. 35 dated 16.02.2011
- “On measures to streamline issues related to the creation and organization of integrated (landscape) nature reserves” No. 238 dated 22.07.2016
- “On the creation of the National Park ‘Durmen’” No. 144 dated 05.06.2014
- “On the further improvement of the state system of warning and emergency response of the Republic of Uzbekistan” No. 242 dated 24.08.2011
- “On the formation of the Ugam-Chatkal State Biosphere Reserve” No. 367 dated 16.05.2018
- “On the National Biodiversity Strategy and Action Plan of the Republic of Uzbekistan” No. 139 dated 01.04.1998 (ceased to be in force 12.06.2019)
- “On approval of the rules for the use of petroleum products” No. 164 dated 23.06.2014
- “On approval of the Regulation on the procedure for the formation of geological exploration programmes at the National Holding Company ‘Uzbekneftegaz’” No. 230 dated 14.08.2014
- “On measures of obligatory energy-efficient labelling and certification of domestic electrical appliances and newly constructed buildings and infrastructures” No. 86 dated 09.04.2015
- “On additional measures to optimize the land plots of farms and other agricultural enterprises and effective use of cultivated areas in agriculture” No. 14 dated 09.01.2019
- “On measures for the introduction of modern forms of organization of cotton-textile production” No. 53 dated 25.01.2018
- “On additional measures to improve certification procedures and implement quality management systems” No. 122 dated 28.04.2011
- “On approval of the Regulation on the procedure for the mandatory technical inspection of vehicles” No. 54 dated 31.01.2003
- “On additional measures to improve the procedure for the mandatory technical inspection of vehicles” No. 1010 dated 22.12.2017
- “On approval of the Regulation on the Fund for Development of Transport and Logistics under the Ministry of Transport of the Republic of Uzbekistan and the Regulation on the procedure for additional material incentives for employees of the Ministry of Transport of the Republic of Uzbekistan and its subordinate organizations at the expense of the Transport and Logistics Development Fund under the Ministry of Transport of the Republic of Uzbekistan” No. 429 dated 24.05.2019
- “On the Services Sector Development Programme for the period 2016–2020” No. 55 dated 26.02.2016
- “On additional measures to reduce the production expenditures in industry and reduce the net costs of products in industry” No. 8 dated 22.01.2015
- “On approval of the Concept and the Set of Measures to ensure the healthy nutrition of the population of the Republic of Uzbekistan for the period 2015–2020” No. 251 dated 29.08.2015
- “On measures for the implementation of International Health Regulations in the Republic of Uzbekistan” No. 220 dated 31.07.2015
- “On measures to implement the Sendai Framework for Disaster Risk Reduction 2015–2030 in the Republic of Uzbekistan” No. 299 dated 12.04.2019
- “On measures to accelerate the planting of protective forest “яшил қопламлар” in the dry areas of the Aral Sea Basin” No. 132 dated 15.02.2019
- “On approval of the Concept for Environmental Education Development in the Republic of Uzbekistan” No. 434 dated 27.05.2019

Decisions of the Cabinet of Ministers

- “Composition of the Coordination Council for the development and implementation of measures on adaptation of the United Nations Sustainable Development Goals” No. 111 dated 15.02.2016

Regulatory legal acts of ministries and other state bodies

- Order of the Chairperson of the State Committee for Nature Protection of the Republic of Uzbekistan “On approval of the rules of hunting and fishing in the territory of the Republic of Uzbekistan” No. 27 dated 22.03.2006
- Order of the Minister of Emergency Situations of the Republic of Uzbekistan “On approval of the Rules on the safety of

hydrotechnical installations” No. 3039 dated 16.07.2018

Resolution of the State Committee on Land Resources, Geodesy, Cartography and the State Cadastre of the Republic of Uzbekistan “On approval of the Regulation on the procedure for work and approval of materials on soil appraisal” No. 2521 dated 07.11.2013

Regulation “On the procedure for conducting audits of business entities and maintaining a book of registration of inspections” No. 917 dated 06.04.2000 (approved by the Ministry of Justice)

Order of the General Prosecutor “On approval of the temporary Regulation on the procedure of receiving consent and conducting inspection checks of business entities by enforcement authorities” No. B-55 dated 06.09.2018

Joint Resolution of the Kengash of the Legislative Chamber of Oliy Majlis of the Republic of Uzbekistan and the Kengash of the Senate of Oliy Majlis of the Republic of Uzbekistan “On measures to strengthen support for NGOs and other civil society institutions” No. 842-I dated 03.07.2008

Joint resolution of the State Committee for Nature Protection, the Ministry of Public Education and the Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan “On the Concept of Education for Sustainable Development (ESD) of the Republic of Uzbekistan” No. 2/20/305 dated 19.07.2011

Resolution of the State Committee for Nature Protection, the Ministry of Emergency Situations, the Ministry of Finance and the Ministry of Health “On approval of the Regulation on the procedure for the disposal of toxic chemicals and other toxic substances, as well as the protection and maintenance of special landfills” No. 2438 dated 20.03.2013 (registered by the Ministry of Justice)

Order of the Chairperson of the State Committee for Nature Protection “On the Rules of hunting and fishing in the territory of the Republic of Uzbekistan” No. 27 dated 22.03.2006

Order of the State Committee on Architecture and Construction of the Republic of Uzbekistan “Climatic and physical-geological data for design” No. 40 dated 29.06.1994

Order of the State Committee for Nature Protection “On approval of the Regulations on the procedure for developing management plans for protected natural territories” No. 3 dated 05.01.2012 (registered by the Ministry of Justice No. 2325 dated 06.02.2012)

Regulatory legal acts of subnational authorities

Resolution of the Council of Ministers of the Republic of Karakalpakstan “On approval of the Territorial State Programme of Actions on Environmental Protection for the period 2013–2017” No. 135 dated 31.05.2013

Standards, building standards, technical and sanitary regulations

SanPiN No. 0267-09 “On acceptable noise levels in the premises of residential, public buildings and in residential areas” dated 19.06.2009

SanPiN No. 0293-11 “Hygienic Standards list of Maximum Permissible Concentrations (MPC) of pollutants in the atmospheric air of populated areas on the territory of the Republic of Uzbekistan” dated 16.05.2011

SanPiN No. 0283-10 “Hygienic requirements for food safety” dated 05.02.2010

SanPiN No. 0109-01 “Hygienic standards for pesticides in environmental objects and food” dated 25.08.2001 (replaces No. 0035-95)

SanPiN No. 0168-04 “List of asbestos-cement materials and constructions permitted for use and the scope of its application in construction” dated 15.10.2004

SanPiN No. 0354-18 “Hygienic requirements for the safety of toys (games) for children” dated 11.05.2018

SanPiN No. 0191-05 “Sanitary Maximum Permissible Concentrations (MPC) and Tentatively Permissible Concentrations (TPC) of exogenous harmful substances in soil” dated 05.10.2005

SanPiN No. 0200-06 “Sanitary rules and norms of hygienic assessment, definition of classes of surface water and groundwater sources, and their selection for centralized drinking water supply of the population of Uzbekistan” dated 15.05.2006

SanPiN No. 0297-11 “Sanitary rules and norms for cleaning the territories of populated areas from solid household waste in the conditions of the Republic of Uzbekistan” dated 27.08.2011

SanPiN No. 0127-02 “Sanitary rules for the inventory, classification, storage and disposal of industrial waste” dated 29.07.2002

SanPiN No. 0300-11 “Sanitary rules and standards for the organization of collection, inventory, classification, neutralization, storage and disposal of industrial waste in Uzbekistan” dated 16.11.2011

SanPiN No. 0128-02 “Hygienic classifier of toxic industrial wastes in the conditions of the Republic of Uzbekistan” dated 29.07.2022

SanPiN No. 0157-04 “Sanitary requirements for the storage and disposal of municipal solid waste at special landfills in the conditions of Uzbekistan” dated 12.07.2004

SanPiN No. 0158-04 "Sanitary rules and norms for the collection, transportation and disposal of asbestos-containing waste in the conditions of Uzbekistan" dated 29.10.2015

SanPiN No. 0236-07 "Sanitary norms and rules to ensure safety for the population living near high voltage power lines" dated 06.09.2007

SanPiN No. 0309-14 "Sanitary and hygiene requirements for public catering facilities" dated 09.03.2014

SanPiN No. 0182-05 "Hygiene requirements for water quality of non-centralized water supply and sanitary protection of sources in the conditions of Uzbekistan" dated 10.01.2005

SanPiN No. 0256-08 "Hygiene requirements for water treatment processes in centralized household-drinking water supply systems in Uzbekistan" dated 17.10.2008

SanPiN No. 0255-08 "The main criteria for hygienic assessment of the degree of pollution of water and water bodies in terms of danger to public health in Uzbekistan" dated 16.10.2008

SanPiN No. 0318-15 "Hygiene and anti-epidemic requirements for protection of water in water bodies in the territory of the Republic of Uzbekistan" dated 10.02.2015

SanPiN No. 0366-19 "Hygiene standards for food safety"

O'zDSt ISO 50001:2015 "Energy Management Systems. Requirements and Application Guide"

O'zDSt ISO 50002:2015 "Energy audits. Requirements and Application Guide"

O'zDSt 950:2011 "Drinking water. Hygiene requirements and quality control" (replaces O'z DSt 950:2000)

O'zDSt 951:2011 "Sources of centralized drinking water supply. Hygiene, technical requirements and selection rules" (replaces O'z DSt 951:2000)

O'zDSt 3084:2016 "Organic agricultural and food products. Terms and definitions"

O'zDSt 3290:2018 "Organic agricultural and food products. Rules of production, storage and transportation"

Annex IV

RESULTS OF THE FOR FUTURE INLAND TRANSPORT SYSTEMS (ForFITS) TOOL

IV.1 Introduction

Objective and scope

This annex addresses projected well-to-wheel³⁶ (WTW) CO₂ emissions stemming from the transport sector in Uzbekistan using the For Future Inland Transport Systems (ForFITS) tool. All references to emissions in this annex refer to CO₂ emissions only.

Description of the model

ForFITS meets two sets of key features:

- The estimation/assessment of CO₂ emissions in transport;
- The evaluation of transport policies for CO₂ emission mitigation.

In order to assist the country's ability to achieve its climate change mitigation targets, ForFITS evaluates transport activity (expressed in terms of passenger kilometres (pkm),³⁷ ton kilometres (tkm)³⁸ and vehicle kilometres (vkm)), related to the vehicle stock, energy use and CO₂ emissions in a range of possible policy contexts.

ForFITS covers both passenger and freight transport services in all transport modes, including aviation and maritime transport, but mainly targets inland transport, especially road, rail and inland waterways. Pipelines and non-motorized transport (walking and cycling) are also considered in the model. Each mode is further characterized in submodes (when relevant) and vehicle classes. Vehicle classes are further split to take into account different power train technologies and age classes. Finally, power trains are coupled with fuel blends that are consistent with the technology requirements.

ForFITS does not provide information on evaluation of the overall effects of changes in the transport system on economic growth.³⁹

Application of ForFITS in Uzbekistan

For the analysis of Uzbekistan, ForFITS projections account for road vehicles, non-motorized transport, rail transport and aircraft. Projections for vessels are excluded as Uzbekistan has no or very limited inland waterways. Despite the high use of pipeline transport in Uzbekistan, especially for natural gas, pipeline transport has not been considered in the scenarios because commodities transported by pipelines cannot easily be shifted to other modes of transportation. Projections for freight transport by air are also excluded as the fleet for this specific purpose is very small.

Four scenario projections of CO₂ emissions from the transport sector, incorporating the potential evolution of the mobility sector in the country, are considered:

³⁶ Well to wheel (WTW) refers to CO₂ emissions from vehicle operation as well as emissions from the production and distribution of the fuel used for vehicle operation.

³⁷ A passenger kilometre is defined as a unit of passenger carriage equal to the transportation of one passenger one kilometre.

³⁸ A ton kilometre is defined as a unit of freight carriage equal to the transportation of one ton of freight one kilometre.

³⁹ Comprehensive information on the ForFITS tool can be found at: www.unece.org/trans/theme_forfits.html

- Reference Scenario: This accounts for the expected evolution of socioeconomic parameters such as population and GDP. It is based on default data in ForFITS on the expected evolution of fuel consumption characteristics by power train to reflect future improvements in vehicle technology and their associated costs. Other characteristics defining the transport system in the base year (e.g. fuel taxation schemes, road pricing, passenger/freight transport system structure, fuel characteristics, power train technology shares, behavioural aspects) remain unchanged in projections;
- Shift to Mass Transport for Passenger and Freight Scenario (Shift Scenario): Given the investments in infrastructure in the country in recent years, and the population distribution concentrated in the east of the country, the scaling-up of passenger and freight traffic using mass transport modes (buses, coaches and trains) in cities and between cities would reduce the reliance on individual modes and enable significant energy savings;
- Improved Fuel Economy Scenario (Improve Scenario): Energy use is evenly distributed between passenger and freight transport. Ambitious and cost-effective vehicle technology deployment to save energy (e.g. hybrid and electric vehicles) would deliver significant GHG emissions reduction at low or negative costs to vehicle users. Both light and heavy duty vehicles are included in this scenario;
- Combined Shift and Improve Scenario (Combined Scenario): Shift and Improved are two pillars of the Avoid–Shift–Improve approach to sustainable mobility.⁴⁰ Though not entirely additional, combining both Shift and Improve scenarios brings additional benefits to energy and emissions reductions by combining the best vehicle technologies with the most adequate mode of transportation.

IV.2 Current situation and baseline projections

Current situation

Data to include as input in the model were collected from official national sources as well as from the local experts. In some cases, data were adjusted when the scope of data provided did not match the required input definitions or data were not internally consistent.

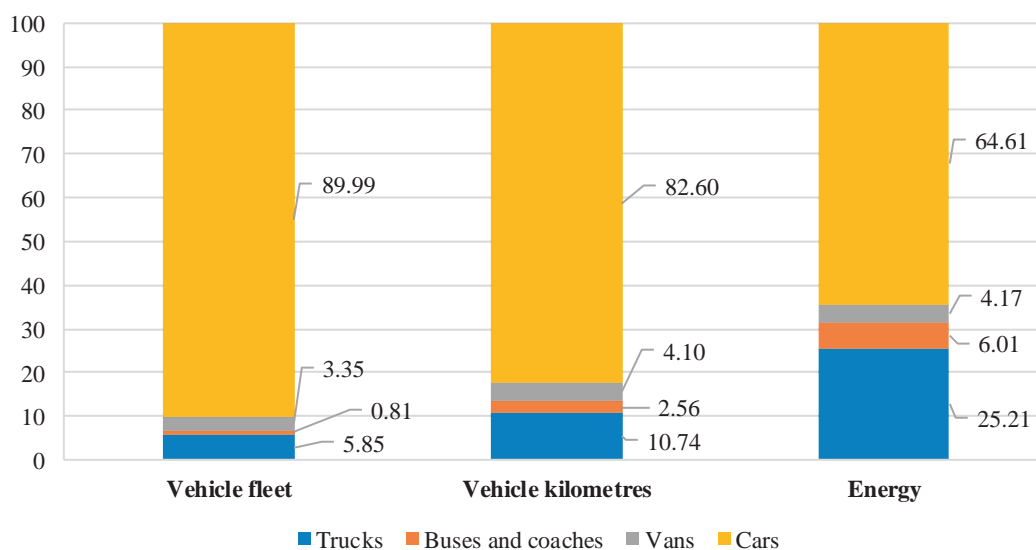
Sources for road transport data include the Ministry of Transport and the State Committee on Statistics. The primary sources for railway and aircraft transport data were Uzbekistan Railways and Uzbekistan Airways respectively. In all cases, data from these sources were adjusted or supplemented with estimations based on expert judgement, and are the sole responsibility of ECE.

Uzbekistan has a motorized vehicle fleet for road transport of more than 2.2 million vehicles, dominated by light duty vehicles. Despite heavy duty vehicles (buses, coaches and trucks) representing only about 7 per cent of the fleet, they represent almost 25 per cent of the energy used by motorized road vehicles. This is due to the fact that heavy duty vehicles are driven more often and consume more energy by distance (figure IV.1).

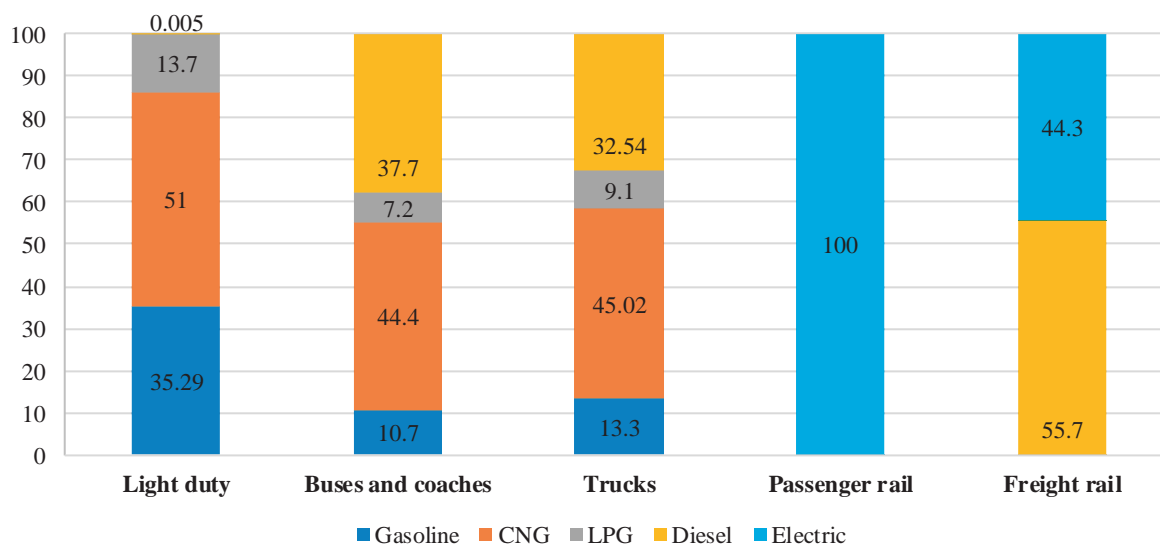
As input data for historical fuel consumption and annual distances for most vehicle categories have not been identified, proxies have been used taking into account the technical specifications of the most popular cars sold in Uzbekistan, along with data for other countries of similar characteristics.

Due to local fuel resource availability, and the fiscal incentives provided for those fuels, many vehicles run on natural gas or LPG in Uzbekistan. This high share is difficult to quantify precisely, as many CNG/LPG retrofit fuel systems are fitted to vehicles that originally operated on gasoline (for light duty vehicles) or diesel (for heavy duty vehicles).

⁴⁰ www.sutp.org/files/contents/documents/resources/E_Fact-Sheets-and-Policy-Briefs/SUTP_GIZ_FS_Avoid-Shift-Improve_EN.pdf

Figure IV.1: Fleet, activity and energy use by mode, 2016, per cent

The breakdown of power trains for each vehicle type is also a required input for ForFITS; data for Uzbekistan are shown in figure IV.2. Data for historical power train breakdowns in Uzbekistan were unavailable or unaligned with vehicle stock data. Consequently, current vehicle stock data were used.

Figure IV.2: Energy sources of the vehicle fleet, 2018, per cent

Baseline projections

Socioeconomic data and data on final fuel price were also collected. Population projections are taken from the United Nations World Population Prospects. GDP data were collected from the World Bank database. GDP projections are based on those available from the OECD and the World Development Index (WDI) of the World Bank and assume annual growth between 3 and 5 per cent by 2045. These figures show GDP growing more than fourfold between 2016 and 2045 (table IV.I).

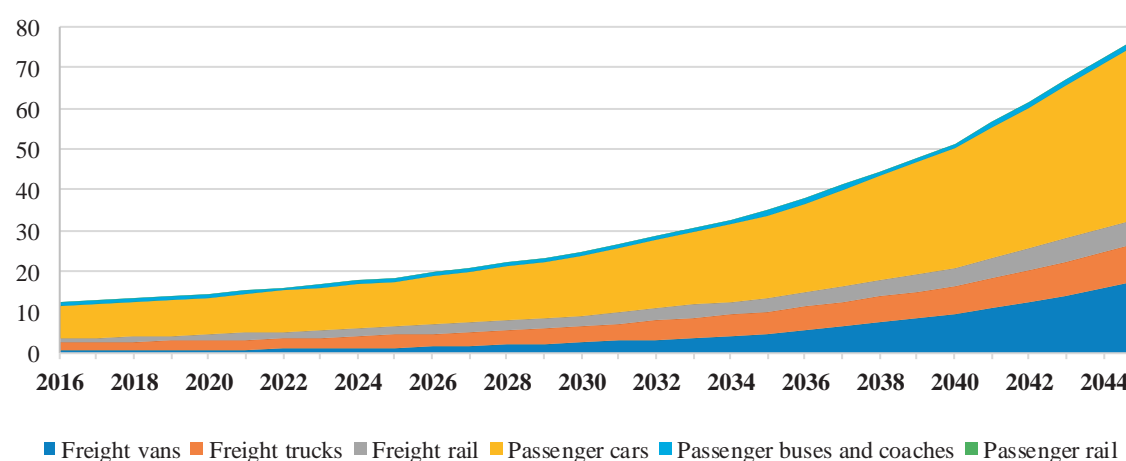
Fuel price and taxation data were based on data acquired from the local experts.

Table IV.1: Socioeconomic data and projections with fuel price data, 2016, 2020, 2025, 2030, 2040, 2045

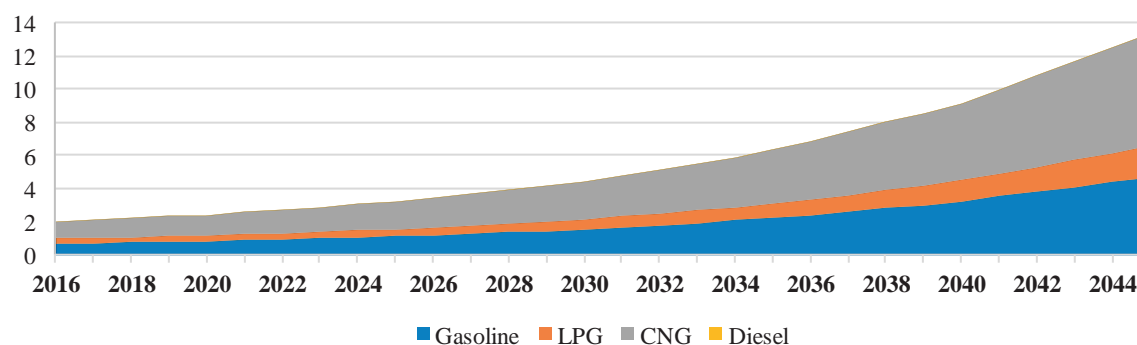
	2016	2020	2025	2030	2035	2040	2045
Population (million)	31	33	35	36	38	39	40
GDP (2014, constant PPP US\$ billion)	126	154	206	276	369	494	662
Fuel price after taxation (US\$/lge)							
Gasoline	0.50						
Methane	0.25						
Diesel	0.50						
Electricity	0.03						

Notes: PPP = purchasing power parity; lge = litres of gasoline equivalent.

Figure IV.3 shows the projected WTW CO₂ emissions from Uzbekistan's transport sector by mode for passenger and freight transport. The ForFITS tool generated projections based on transport-specific inputs as partially shown in figures IV.1 and IV.2, as well as projections of a socioeconomic nature as specified in table IV.1. The Reference Scenario also includes default data in ForFITS on the expected evolution of fuel consumption characteristics by power train.

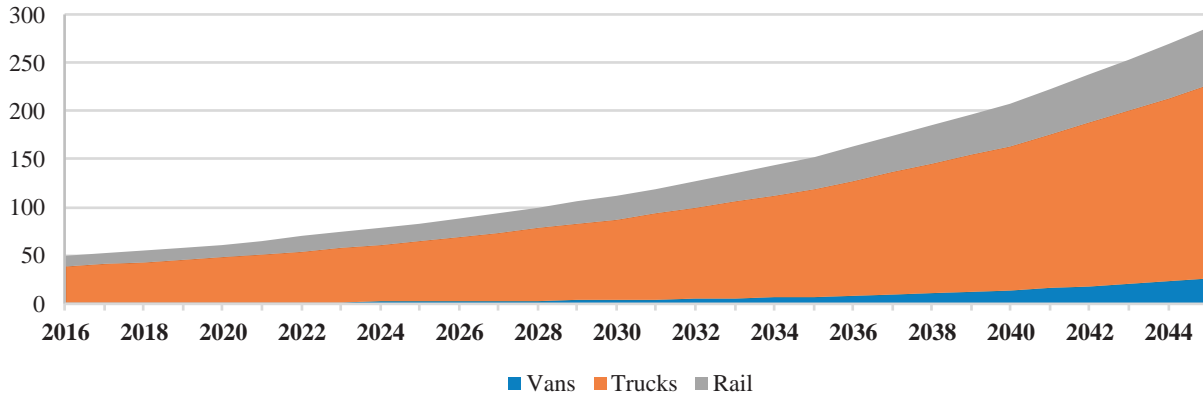
Figure IV.3: WTW CO₂ emissions under Reference Scenario by mode, 2016–2045, Mt CO₂

The GDP per capita of the country is projected to more than triple between 2016 and 2045 (in constant PPP units). The per capita GDP level over the analysed time period is lower than the historic levels and is coupled with a saturation of personal vehicle ownership. This explains the projected increase in the total passenger car fleet to be at a greater rate than the population increase. In the Reference Scenario, vehicle ownership is expected to rise from about 65 cars per 1,000 people in 2016 to more than 300 cars per 1,000 people in 2045. This is equivalent to the vehicle fleet numbering more than 13 million cars by 2045. In the Reference Scenario, the fuel mix is assumed to remain stable throughout 2045, with vehicles capable of running on natural gas representing 51 per cent of the vehicle fleet in 2045 (figure IV.4).

Figure IV.4: Car fleet projection in the Reference Scenario by fuel type, 2016–2045, million

ForFITS assumes that the amount of goods transported in the freight sector is proportional to GDP, so the expected GDP growth explains the increase in freight transport activity (figure IV.5). In line with the relatively low level of GDP per capita and the lack of alternatives to trucks for freight transport, CO₂ emissions from freight transport are estimated to be 70 per cent of the transport sector in 2016. This share is expected to decrease to 57 per cent by 2045.

Figure IV.5: Freight traffic activity in the Reference Scenario by mode, 2016–2045, billion tkm



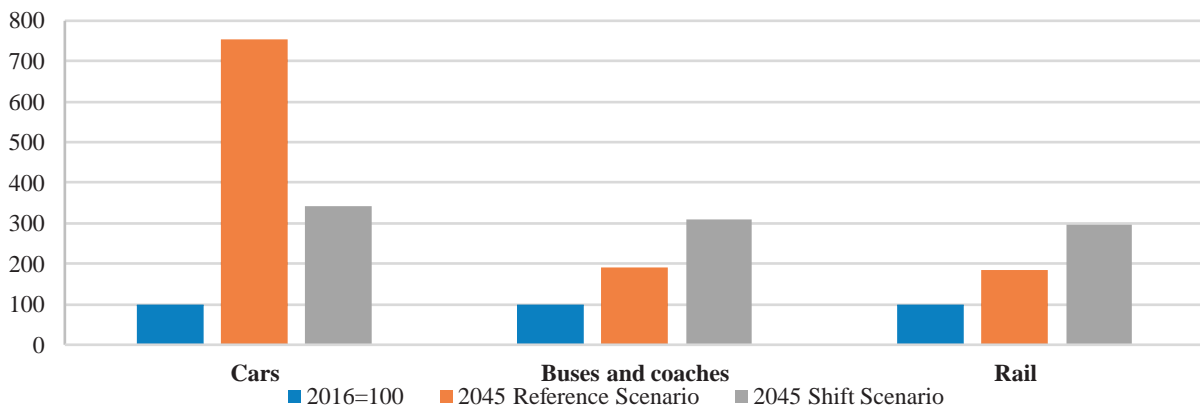
Energy use is projected to grow over time in line with projected transport activity. Fuel savings associated with the improving evolution of power train technologies in terms of fuel consumption only partly offset the upward influence of growing transport activity. As the fuel mix does not change in the Reference Scenario, the projected growth of WTW CO₂ emissions is proportional to the evolution of energy demand.

IV.3 Alternative scenarios

Shift to Mass Transport Scenario

The Shift to Mass Transport Scenario (Shift Scenario) projects future emissions assuming a modal shift towards more efficient mass transportation: buses, coaches and trains. Bus, coach and train vkm have tripled between 2016 and 2045 in the Shift Scenario, and increased by 50 per cent compared with the Reference Scenario in 2045 (figure IV.6).

Figure IV.6: Traffic activity projections for the Reference and Shift Scenarios, 2016, 2045, vkm (2016=100)

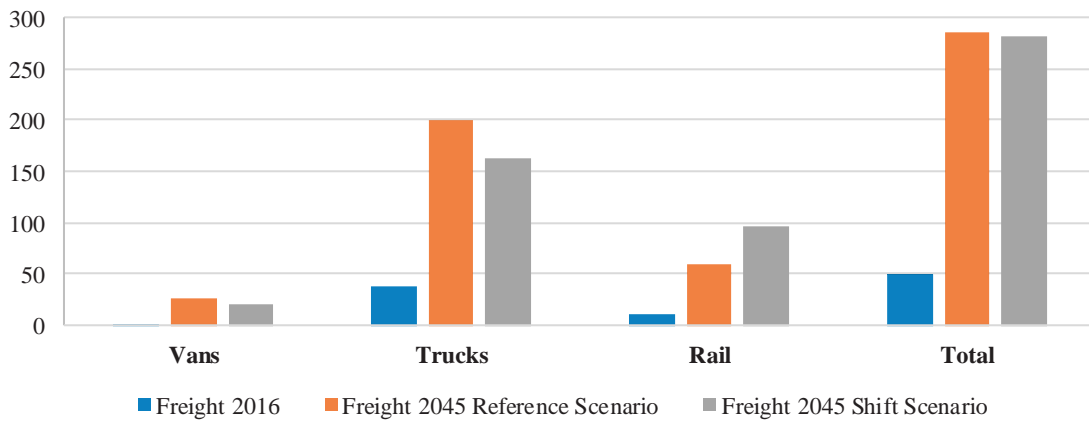


In the Reference Scenario, car activity is expected to increase dramatically, more than sevenfold. In the Shift Scenario, the increase is more modest, but still represents more than a tripling of car vkm between 2016 and 2045. Given the current low level of car ownership in Uzbekistan, car traffic activity is expected to increase, regardless of the scenario considered.

Achieving such an increase for public transport in the Shift Scenario is ambitious but realistic, as shift policies usually require more time to deliver on their climate mitigation potential than do technology policies covered under the Improve Scenario. The recent investment in the rail sector and in metro systems in the biggest metropolitan areas in Uzbekistan shows there is a political will to promote mass transportation in cities and between cities (table 14.3). Increasing punctuality, speed and frequency will also be important contributors to the attractiveness of such modes in the coming decades.

For freight, the shift from trucks to rail has been considered in the Shift Scenario. Total freight volume is expected to increase significantly, more than fivefold between 2016 and 2045. Shifting around 50 billion tkm to the rail sector in 2045 will be challenging as it would require the doubling of the cargo transported by rail between the Reference and Shift Scenarios in 2045 (figure IV.7).

Figure IV.7: Freight traffic activity in the Reference and Shift Scenarios, 2016, 2045, billion tkm



The Shift Scenario has very different effects on CO₂ emissions for passenger and freight transport. Indeed, passenger CO₂ emissions are reduced by about half by containing the growth in car use. For freight, the expected effect is more limited, as CO₂ efficiency of trains in the Shift Scenario is similar to that of trucks, bringing limited CO₂ mitigation benefits in switching from trucks to rail (figure IV.8).

Figure IV.8(a): WTW CO₂ emissions from passenger transport under the Reference and Shift Scenarios, 2016–2045, Mt CO₂

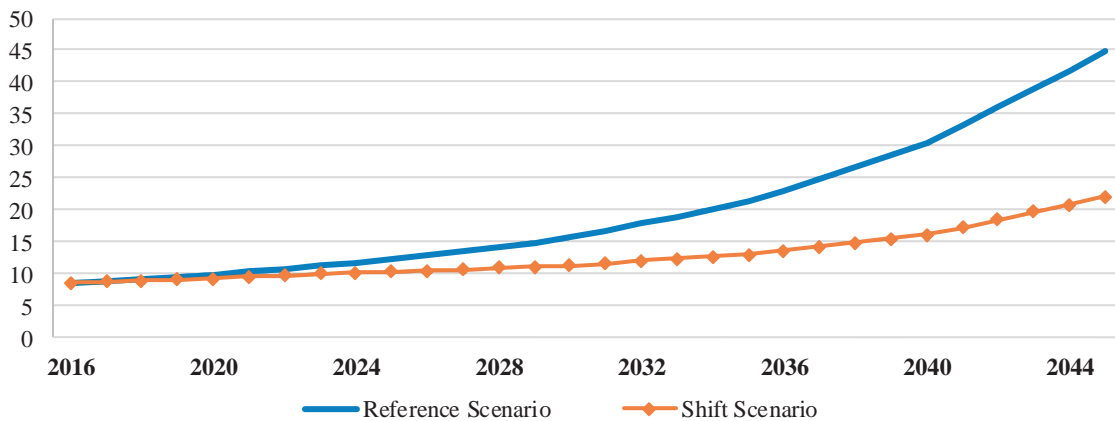
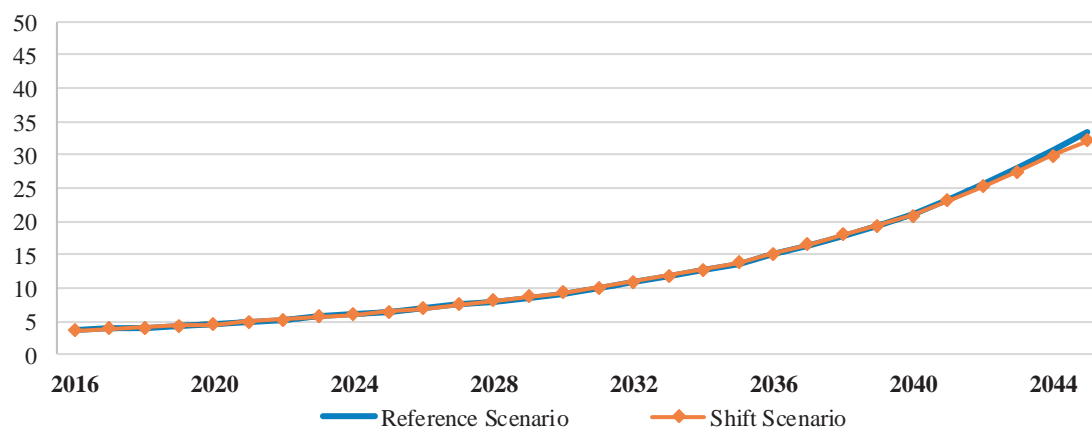


Figure IV.8(b): WTW CO₂ emissions from freight transport under the Reference and Shift Scenarios, 2016–2045, Mt CO₂



Improved Fuel Economy Scenario

Energy efficiency is a key contributor to energy security and GHG emissions mitigation. There is a high penetration of CNG engines in Uzbekistan, for both light and heavy duty vehicles. CNG has a lower carbon intensity than other liquid fuels, but engine efficiency, especially for retrofit systems, is not as good as in state-of-the-art gasoline and diesel engines. This makes the case for potential substantial improvement in the energy efficiency of vehicles, either by switching to state-of-the-art technologies for conventional fuels (gasoline, diesel) or by adopting advanced technologies for the existing fleet, which runs primarily on CNG.

In the long term, a gradual switch to hybrid and electric vehicles has been assumed in the Improve Scenario as a way to improve energy efficiency and lower CO₂ emissions. Nevertheless, given that the electricity mix mainly relies on natural gas (and marginally on coal), the carbon intensity of electricity consumption also needs to be lowered to fully capture the benefits of switching to electricity to mitigate CO₂ emissions. The Improved Fuel Economy Scenario (Improve Scenario) assumes that the carbon intensity of electricity is halved by 2045, which will require significant use of renewable energy, such as wind and solar, in the power generation mix in Uzbekistan.

In the Improve Scenario, the share of more advanced, fuel-efficient technologies is considered. The Improve Scenario assumes ambitious shares of efficient power trains, with significant penetration of hybrid and electric vehicles, in all vehicle categories, coupled with a higher share of electric rail (table IV.2).

Table IV.2: Assumptions in the Improve Scenario for advanced power trains in the fleet, percentage of each technology in the fleet by 2045

	Hybrids and plug-ins	Battery electric	Overhead electric
Cars	30	20	
Buses and coaches	65		
Vans	33		
Trucks	15		
Rail			80

In a fast-growing vehicle market, as is expected to be the case in Uzbekistan in the decades to come, the average age of the fleet is assumed to be very young; therefore, the penetration of alternative technologies will be rapid, with new vehicles representing a significant share of the total vehicle fleet.

On top of alternative technology deployment, ambitious progress in fuel economy for all road vehicles has been assumed, with the average car in 2045 consuming 5 litres per 100 km instead of 7.5 litres per 100 km as in the Reference Scenario.

Fuel economy is a cost-effective way to decrease CO₂ emissions; even though fitting advanced technologies to vehicles might increase the cost of the vehicle slightly, such cost premiums are recovered after a few years in fuel savings, depending on the fuel prices.

By adopting ambitious fuel economy targets, existing fuel subsidies in Uzbekistan (chapter 3) could be reduced without increasing the cost of driving per kilometre. Fuel prices after taxation (table IV.1) are under what is considered to be a fuel subsidy by international standards,⁴¹ especially for diesel fuel. The natural gas price is even lower, indicating a higher level of subsidy that could be reduced over time to fund the transport sector's development towards a more efficient and sustainable system.

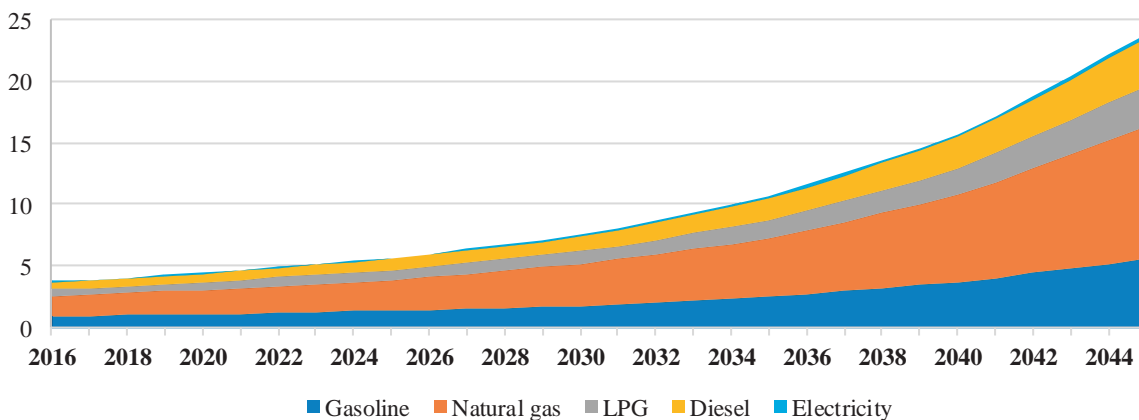
Uzbekistan could seek best practices and off-the-shelf fuel economy policies such as through the Global Fuel Economy Initiative (GFEI), which is assisting countries such as Uzbekistan in developing the policy agenda to incentivize the uptake of more efficient vehicles. The Improve Scenario is in line with the targets set in the GFEI. Policies to reach such improvement can include fuel pricing (chapter 3), fuel economy standards, labelling or registration fees based on fuel economy.

The energy use in the Improve Scenario drops dramatically as a consequence of the fuel economy improvement and the fuel switching assumptions. The biggest share of the energy use reduction is caused by fuel economy improvements, e.g. through wide deployment of advanced combustion systems for engines and hybridization of power trains. Natural gas is expected to remain the dominant fuel for the transport sector in the decades to come (figure IV.9) unless Uzbekistan considers revising its fuel fiscal incentive policies.

The contribution of passenger and freight transport to the reduction of CO₂ emissions in the Improve Scenario is balanced (figure IV.10), with passenger transport contributing 57 per cent of the overall reduction in 2045.

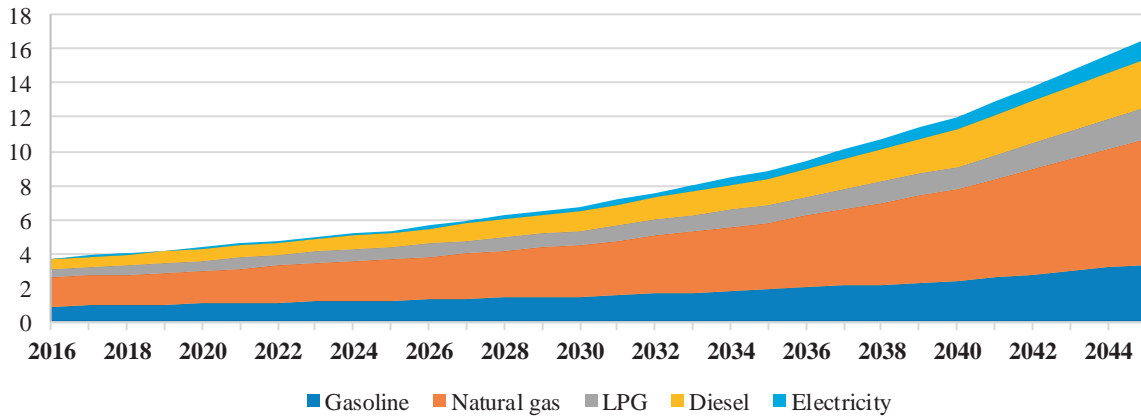
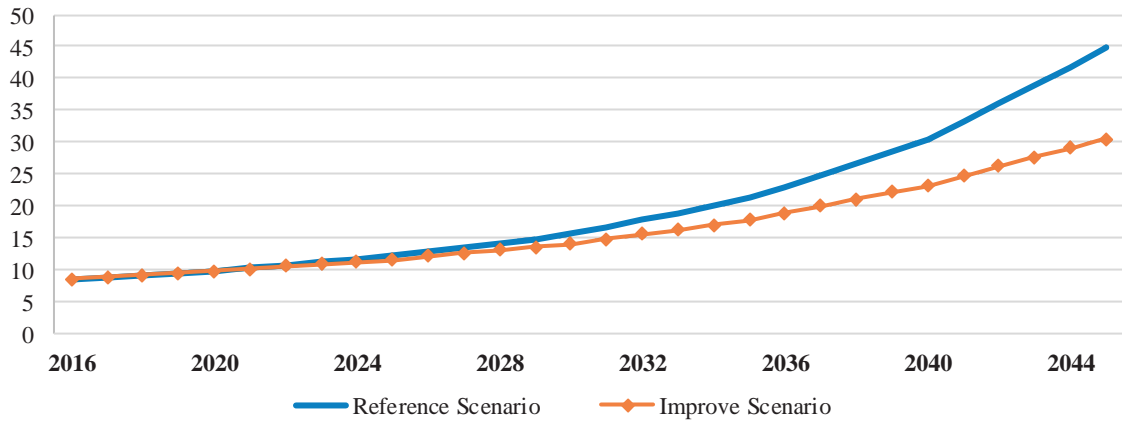
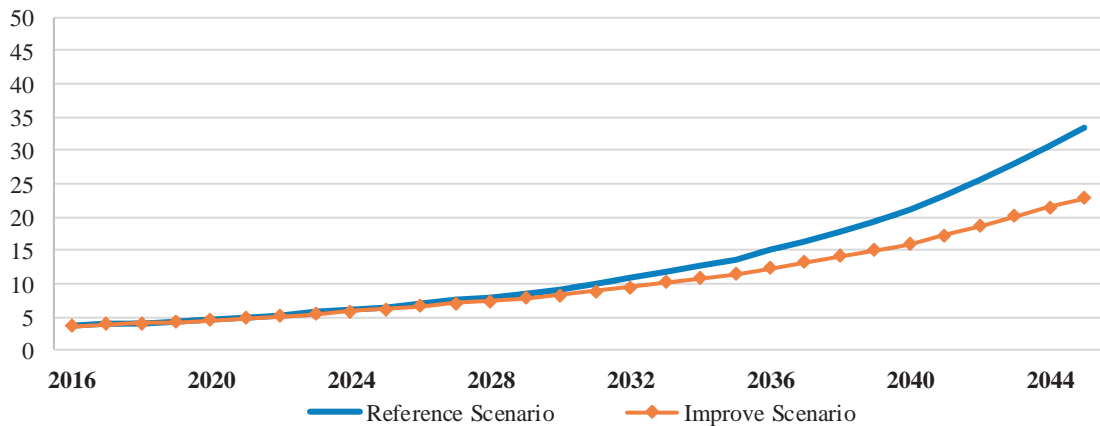
All the actions undertaken in the Shift and Improve Scenarios are expected to slow down the sharp increase in the impact on the climate under the Reference Scenario, with no saturation or decrease in energy use and associated CO₂ emissions in sight by mid-century. Energy use from the transport sector is expected to increase sixfold between 2016 and 2045 in the Reference Scenario, with the Improve Scenario reducing energy use by 30 per cent compared with the Reference Scenario in 2045.

Figure IV.9(a): Energy use in the Reference Scenario, 2016–2045, Mtoe



⁴¹ GIZ, 2019, International Fuel Prices 2018/19,

www.sutp.org/files/contents/documents/resources/K_International%20Fuel%20Prices/GIZ_SUTP_IFP_2018-19_EN.pdf

Figure IV.9(b): Energy use in the Improve Scenario, 2016–2045, Mtoe**Figure IV.10(a): WTW CO₂ emissions from passenger transport under the Reference and Improve Scenarios, 2016–2045, Mt CO₂****Figure IV.10(b): WTW CO₂ emissions from freight transport under the Reference and Improve Scenarios, 2016–2045, Mt CO₂**

Combined Shift and Improve Scenario

The Combined Shift and Improve Scenario (Combined Scenario) simulates the cumulative effect of the Shift and Improve Scenarios. This scenario shows the result of implementing these policies concurrently. It is important to note that the impact of combining the two scenarios is not equal to the addition of the individual impacts. Indeed, impacts are not cumulative. For example, the impact on energy and emissions of shifting to

mass transportation is decreased if the energy efficiency of individual modes improves dramatically. As a result, the levels of CO₂ saved separately in the Shift and Improve Scenarios is higher than that in the Combined Scenario.

In the Combined Scenario, overall CO₂ emissions are reduced by half compared with the Reference Scenario in 2045, and still grow by a factor of 3.5 compared with 2016.

Results

The Combined Scenario enables significant energy savings and GHG emissions reductions from the Reference, Shift and Improve Scenarios (table IV.3). Per capita CO₂ emissions from transport in Uzbekistan are set to increase dramatically nonetheless, as individual modes of transport are expected to drive up mobility and energy demand. Only the Combined Scenario is able to decrease the GDP carbon intensity (CO₂/GDP) by 2045, signalling a decoupling of economic growth and CO₂ emissions from transport.

Table IV.3: Main ForFITS outputs for all scenarios

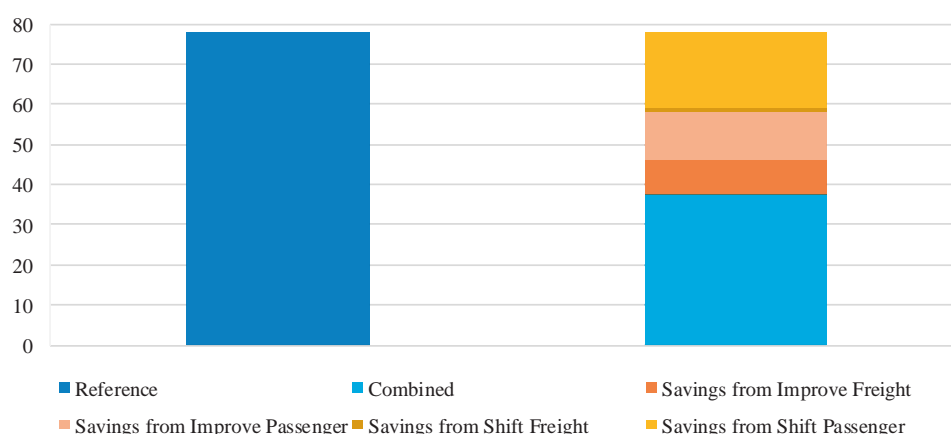
	Unit	2016	2045			
			Reference Scenario	Shift Scenario	Improve Scenario	Combined Scenario
Total pkm	billion pkm	81	364	227	366	226
Total tkm	billion tkm	50	286	282	292	292
Total energy use	million toe	4	24	16	17	12
Total WTW CO ₂ emissions	billion kg CO ₂	12	78	54	53	38
Total WTW CO ₂ emissions per capita	kg CO ₂ /person	387	2 000	1 385	1 359	974
Total WTW CO ₂ emissions intensity	kg CO ₂ /GDP 1,000*	95	158	109	107	77

Note: * GDP is measured in PPP units at 2014 prices.

Traffic activity in the rail sector increases faster than in any other mode due to the assumed modal shift away from road transport. The modal shift reducing the growth in car traffic is the largest contributor to the emissions reductions, followed by the energy efficiency gains in cars and trucks (figure IV.11). The modal shift from trucks to rail does not bring a significant reduction, as today's energy efficiency and CO₂ intensity of trucks and rail are similar. Projections also show that the CO₂ intensity of trucks and trains will remain on the same level.

The switch to electric freight trains coupled with the consumption of lower carbon electricity matches the energy efficiency gains of trucks. Many countries have now implemented fuel economy standards for trucks, requiring continuous technological innovations to improve the energy efficiency of long-haul trucks. Such improvements are also likely to benefit countries that do not currently apply standards, as fuel-efficient technologies are expected to be cheaper and widespread, as assumed in the Improve Scenario.

Figure IV.11: Contributions of scenarios to CO₂ emissions reductions, by passenger and freight transport, 2045, Mt CO₂



Passenger transport CO₂ emissions are expected to increase by 70 per cent in the Combined Scenario compared with an approximately eightfold increase in the Reference Scenario, through the small increase in the vehicle fleet and advanced technologies for future vehicles. Freight transport CO₂ emissions are increasing more significantly in the Combined Scenario to 2045, efficiency improvement (for road freight) and electrification (for rail freight) driving the CO₂ emissions down compared with the Reference Scenario (figure IV.12).

Figure IV.12(a): WTW CO₂ emissions from passenger transport under the Reference and Combined Scenarios, 2016–2045, Mt CO₂

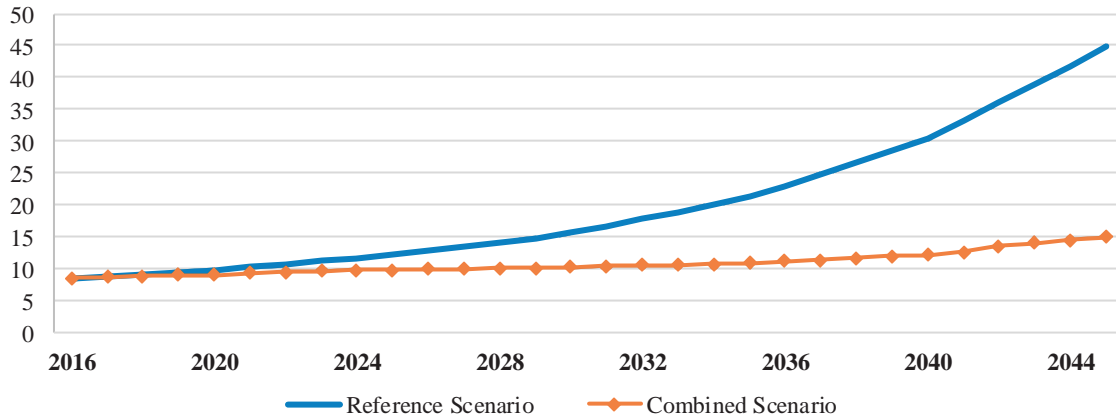
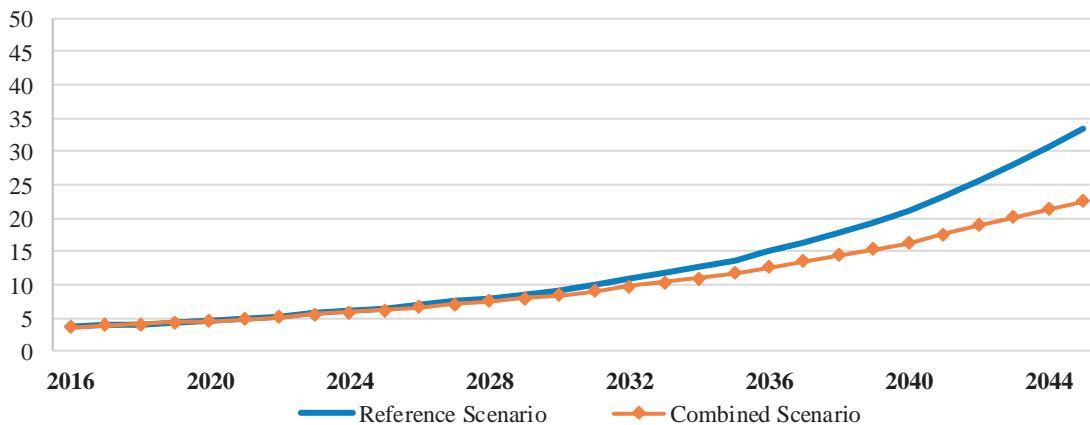


Figure IV.12(b): WTW CO₂ emissions from freight transport under the Reference and Combined Scenarios, 2016–2045, Mt CO₂



IV.4 Conclusions

The transport sector is expected to grow dramatically in the coming decades as the Uzbekistan economy develops further. GDP and GDP per capita are expected to increase in the decades to come, leading to higher mobility needs and the further development of individual mobility. Traffic activity in the Reference Scenario, using GDP growth as the main driver, is expected to increase more than sixfold between 2016 and 2045. All CO₂ mitigation scenarios slow down the expected CO₂ emissions growth, and emissions are not likely to revert to present levels during the time horizon up to 2045. However, the Combined Scenario enables a decoupling of transport CO₂ emissions from economic growth. Reducing the carbon intensity of the economy would allow Uzbekistan to meet its (I)NDC target submitted as part of the Paris Agreement under the UNFCCC. The Combined Scenario is the only scenario that enables a reduction in the carbon intensity of the transport sector compared with 2016 (table IV.3).

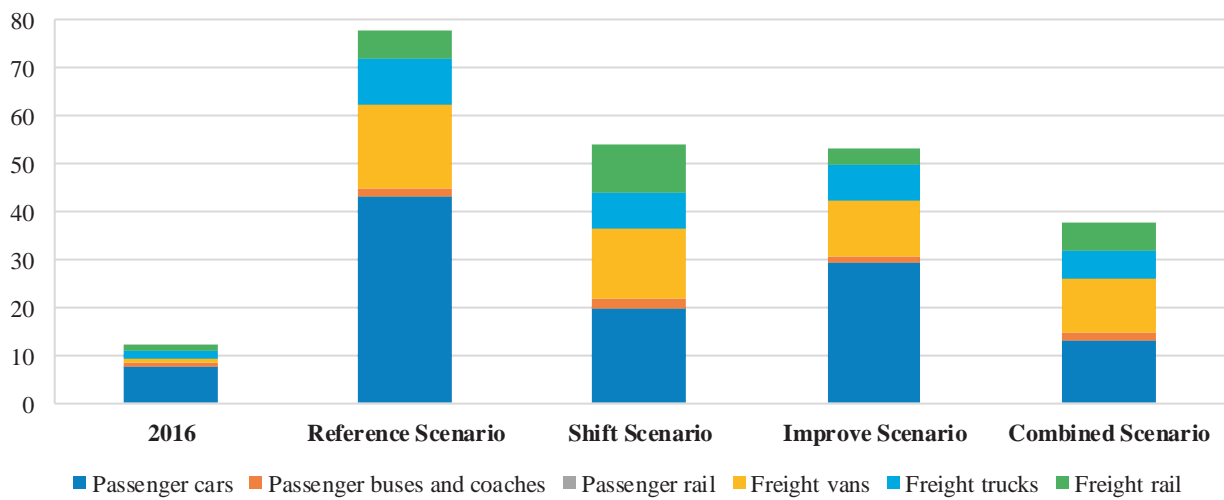
The Shift Scenario, using a modal shift from individual to mass modes of passenger and freight transportation, has the medium- to long-term potential to deliver significant CO₂ savings with limited impacts on overall traffic

activity of passengers and goods. Modal shift policies, nevertheless, require time to deliver CO₂ emissions savings, and also require higher levels of strategic planning by policymakers.

The Improve Scenario relies on vehicle technology deployment that can quickly deliver CO₂ savings, especially in a dynamic vehicle market as is the case in Uzbekistan, with a sharp increase in new vehicle registrations expected in the near future. Policy incentives to promote the deployment of low-CO₂, fuel-efficient vehicles are fundamental to steering the market towards vehicles with lower rates of fuel consumption. Fiscal policies on fuels and CO₂- or fuel-economy-based vehicle taxation are efficient tools to deploy.

Both shorter and longer term solutions assumed in the Improve and Shift Scenarios respectively are needed to sustainably mitigate CO₂ emissions from the transport sector in Uzbekistan. The Combined Scenario, which implements all policies from the Shift and Improve Scenarios, halves the CO₂ emissions of the Reference Scenario in 2045, with the reduction of passenger car emissions contributing the most to the overall reduction between the Reference and Combined Scenarios (figure IV.13).

Figure IV.13: WTW CO₂ emissions by mode, all scenarios in 2045, Mt CO₂



Annex V

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