



The Emerging Policy for Green Economy and Social Development in Limpopo, South Africa

Agnes Musyoki



United Nations
Research Institute
for Social Development

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Social Dimensions of Green Economy and Sustainable Development

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Acronyms

ARC	Agricultural Research Council
CO₂	Carbon dioxide
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DFID	Department for International Development
DME	Department of Minerals and Energy
DST	Department of Science and Technology
GDP-R	Regional gross domestic product
HIV	Human immunodeficiency virus
IDC	Industrial Development Corporation
LDA	Limpopo Department of Agriculture
LPG	Limpopo Provincial Government
LEGDP	Limpopo Employment Growth and Development Plan
LGEP	Limpopo Green Economy Plan
MMI	Mapfura-Makhura Incubator
NAFU	National African Farmers Union
NGO	Non-governmental organization
RAPS	Rural Area Power Solutions
SBU	Strategic Business Unit
SEDA	Small Enterprise Development Agency
SHS	Solar Home Systems
SMME	Small, medium and micro enterprise
STP	SEDA Technology Programme
TIL	Trade and Investment Limpopo
UNEP	United Nations Environmental Programme
UNGA	United Nations General Assembly
UNIL	University of Limpopo
UNIVEN	University of Venda
WfW	Working for Water programme
ZAR	South African rand

Summary

Many countries in Africa are already experiencing negative impacts of climate change, prompting the emergence of various policies to mitigate and adapt to these changes. This paper evaluates the emerging green economy in South Africa, using ideas from the concept of sustainable rural livelihoods. Rural livelihoods in Africa and other developing countries are intimately connected to ecological services. Contrary to the dominant development discourse where African societies are reflected as being helpless, communities and governments are prioritizing green economy for job creation, poverty alleviation and reducing inequalities, while addressing global environmental concerns. But the concepts of sustainable development and green economy have both been criticized for lack of clear definitions. While it is agreed that there is a lack of clarity on the two concepts and failure in implementation at the global level, this paper argues that the key tenets of the two concepts are particularly relevant for rural development.

What remains problematic, however, is how objectives of a green economy and sustainable development are to be achieved. One of the key challenges in South Africa, and other developing countries, is the gap between policy and implementation of sustainable development, the Millennium Development Goals and other such globally driven initiatives. A central question is, therefore: what needs to be done in order for local economies and societies to realize mutual objectives of investing in natural capital, decarbonizing the economy and creating green jobs? Of major concern in this paper is how green economy policies and proposals can stimulate growth and development in rural areas and improve rural livelihoods. For the rural poor (and particularly women) to cope with environmental degradation and to reduce their vulnerabilities, they need to access capital assets, energy, good infrastructure, community support and functional institutions.

South Africa is vulnerable to climate change scenarios of increased frequency and magnitude of extreme events such as droughts and floods. Other environmental problems leading to human vulnerability include air and water pollution, the deterioration of rivers and land degradation. The country's path to a green economy is therefore a response to these looming threats. It is also influenced by international agendas that call for adaptation and mitigation strategies against climate change and the global financial crisis.

Unlike countries that show a strong urban bias in greening the economy, social equity components are key features of national plans in South Africa. The Limpopo province, for example, is committed to championing sustainable development through (among other things) the promotion of green economy and creation of green jobs. Limpopo is the most northerly province in South Africa and is significantly rural in character. From a developmental perspective, the key tenets of sustainable development, including environmental conservation, social development and economic progress with reduced impacts on the natural resource base, are still relevant in seeking solutions to rural development problems due to the importance of ecological systems for the survival of whole communities. Achieving sustainable rural livelihoods—through developing policies that take into account the developmental needs of local economies and societies—therefore remains a key objective in many initiatives in Africa. The concept of sustainable rural livelihoods is especially relevant to exploring gender and poverty issues in the emerging green economy policy.

In Limpopo province, providing jobs and addressing poverty issues will require interventions at both local and regional levels to bridge the gap between policy and implementation. For pro-poor policies to work there must be concerted efforts to direct resources to sectors where poor people are employed, locations where they live and to producing food which they consume. Unskilled labour needs to be valued and remunerated accordingly.

Green economy policy therefore needs to consider poverty reduction and women's empowerment in order to promote rural sustainable development. For this to occur, the following mix of strategies is recommended:

- link pro-poor policies such as land reform, rural development and social support to the overall green economy policy;
- address women's empowerment and gender equity issues by ensuring that women and men have equal access to resources such as land, technology information, extension services and decision making;
- ensure benefits accruing from the processing and sale of products are extended to both men and women equally;
- provide opportunities for livelihood diversification beyond agriculture;
- protect the rights of both men and women in green projects;
- ensure access to markets for products from green economy initiatives;
- ensure access to skills development of both men and women participants in green projects;
- improve participation and decision making by all stakeholders including beneficiaries of green projects;
- ensure long term provision of solar energy to poor rural communities at affordable prices; and
- incorporate communities into green economy plans and programmes.

In conclusion, the paper argues that social development issues are important for successful implementation of green economy policies that are able to transform rural livelihoods, alleviate poverty and ensure gender equality.

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Introduction

Climate change and the financial crisis are now recognized as presenting major threats to economic growth and development in the world. One of the key responses is what is now referred to as green economy, which involves “changes in the patterns of investments, technology, production and consumption taking into consideration sustainable development imperatives” (UNRISD 2011:1). At the centre of this new economic approach is the necessity to shift from high to low carbon footprints. There are many interpretations of how this is to be achieved, and various governments, scholars and civil society are in the process of developing policy, theories and concepts that would guide this process (Huberman 2010).

Using the sustainable rural livelihoods framework, this paper reviews emerging green economy policy in the Limpopo province in South Africa. The aim is to establish the impacts on women and poor rural communities, thus contributing to advancing a better understanding of equity as an important component of the emerging green economy. The research for this paper included a review of official plans, programmes, feasibility studies, and environmental and social impact studies of projects, complemented by project field visits and interviews with relevant key informants and authorities. To illustrate the advantages of actions taken by multiple stakeholders to achieve sustainable rural livelihoods, two projects are discussed: the Mapfura-Makhura Incubator (MMI), a biofuel project; and Solar Vision Limpopo, a solar energy public-private partnership providing electricity to the rural poor—the majority of whom are women. The empirical findings of this research show how community resilience, local level efforts and alliances contributing to green initiatives may promote rural livelihoods and reduce poverty and gender inequalities in an African context.

The paper begins by presenting a global view on the green economy. This is followed by a brief discussion of South Africa’s current path towards a green economy. Presented next are (i) the economic employment and growth plan; and (ii) the proposed green economy plan of Limpopo province showing how the green economy is being interpreted at the provincial level. Two models that may be adopted for transitioning to a green economy in rural areas are presented, evaluated and discussed. One involves farmers growing soya for biofuel production; the other involves a collaborative effort between local government, communities and the private sector to bring solar energy to poor rural communities. Opportunities and constraints are highlighted and discussed. The paper finally outlines key policy messages regarding social development derived from this research.

Green Economy: A Global View

Green economy refers to the holistic view that a new global economy is required in order to counteract the negative impacts of overexploitation of natural resources, poverty and inequality, the financial crisis, climate change and other global changes that are threatening human existence on planet earth (UNEP 2009, 2011). The United Nations has called for a reconceptualization of economic recovery through a Global Green New Deal (UNEP 2009), the key objectives of which include revival of the economy, job creation, sustainability of ecosystems and achievement of millennium development goals (Barbier, cited in UNEP 2009:5). The G20 countries (including South Africa), which contribute most to greenhouse gases through their production and consumption patterns, have committed themselves to green stimulus packages. Key areas of investment include: green buildings that are energy efficient; new renewable technologies such as solar, wind and geothermal; sustainable transport, such as bus and rail transit systems; and ecological and agricultural sustainability (UNEP 2009:1). Global policy statements clearly show the desire to consider environmental, economic and social dimensions of the green economy. Many of the emerging initiatives have an urban bias, although some (especially in Africa) articulate rural development objectives as well.

A transition to a green economy is underway in Rio+20 and beyond. Efficient management of natural resources and human capital should shape the wealth creation and direction of the world. The UN Millennium Development Goals and the Rio+20 process both aim to address poverty and deliver an economy based on low carbon pathways that catalyse economic activity (UNGA 2010). At the centre of the green economy debate is the need to develop policies globally, regionally and nationally. Of interest here is how these efforts translate into rural livelihood changes and their impacts on rural communities.

Both local and international debates question the appropriateness of the green economy concept, with some even describing it as the “next oxymoron” following sustainable development (Brand 2012). Despite arguments about the appropriateness, lack of clarity and failure of these two concepts, this paper argues that the central tenets of green economy and sustainable development have merit in a world seeking to address the multiple challenges of climate change, environmental degradation, poverty and inequality. The failure of international agreements does not negate the need to preserve the planet for future generations and to change production and consumption patterns, and examples abound of local level initiatives throughout the world that should inform international debates. In South Africa and other developing countries, green economy policy development and implementation are guided by the imperative for growth in the face of increasing inequalities and marginalization of whole communities. A South African green economy pathway is therefore concerned with how to balance natural resource use with economic development needs (Fitzgerald et al. 1999; Le Maitre et al. 2007), while also addressing equity issues and the persistent problems of poverty, gender inequality and sustainability of rural livelihoods.

South Africa’s Pathway to a Green Economy

South Africa is a middle-income country and an emerging market, with a well-developed modern infrastructure and dependency on mineral resources. The government has followed conservative fiscal policies since achieving democracy in 1994 (Government of the Republic of South Africa 2007), which both allowed the economy to grow and spared South Africa from the worst of the global financial crisis. However, inequalities persist among various population groups in the country, with women in rural areas constituting the most marginalized. There is pressure on the government to deliver basic services to low-income rural and urban areas and to address questions of land, unemployment, poverty, crime and educational opportunities. The South African government is committed to promoting the green economy as a means of lowering carbon emissions and providing new employment opportunities, is developing policies and plans, and has allocated funds to support these aims. The country is also working closely with international organizations and is a signatory to several treaties aimed at changing to a low carbon economy that supports environmental sustainability and social development.¹

South Africa, like other G20 countries, launched a stimulus package over a period of two years (from 2009–2011) amounting to the value of \$7.5 billion. The country has also developed a climate change response policy that aims to reduce CO₂ emissions in the country—which are very high considering that South Africa is still a developing country—with a target of generating 15 per cent of the country’s electricity from renewable sources by the year 2020 (DEA 2010). The climate change response policy also emphasizes the need to effectively adapt to and manage unavoidable and potentially damaging climate change impacts, through interventions that build and sustain South Africa’s social, economic and environmental resilience. It is based on the principles of common but differentiated responsibility, the precautionary principle, equity, the polluter pays principle and a people-centred approach based on uplifting the poor and vulnerable, informed participation and intergenerational rights (DEA 2010, DEA 2011). Climate change-resilient development is the strategic approach which will guide its response. Even though South Africa is influenced by international trends, the

¹ Winkler 2007; Mdluli and Vogel 2010; Zuma 2010; DEA 2011.

government also considers its unique conditions in policy formulation and is committed to risk and vulnerability reduction in both rural and urban areas. A key challenge, however, is the capacity to implement these goals, which need to be supported by relevant research, capacity and technology development, while responding to disaster risk reduction through integrated approaches in resource and development planning.

There are already various initiatives to support the green economy transition. For example, the Industrial Development Corporation (IDC) has committed about \$3 billion² (ZAR25 billion) to green economy investments over the next five years (2010–2015) (Financial Mail 2011) and is thus key in the transformation to a green economy. In conjunction with IDC, the Department of Economic Development is already undertaking green initiatives, and has installed about 25,000 units of solar water geysers in low-cost houses both in urban and rural areas. The IDC focuses on green industry projects that struggle to get funding from traditional sources, through the establishment of the Strategic Business Unit (SBU) which will target \$3 billion from 2010 to 2015. The green industry SBU will focus on different components of the green economy via companies that offer projects that enhance the environment, reduce carbon emissions, create jobs and uplift communities, such as projects in renewable energies, emission and pollution management, and fuel-based green energy and biofuels (Financial Mail 2011).

The government-sponsored invasive species management and water supply improvement programme, referred to as the Working for Water programme (WfW), is yet another initiative in support of green economy and community development. WfW employs members of local communities, the majority of whom are rural women, to clear alien trees and plant species. This initiative is in partnership with local authorities, government, conservation groups, environmental organizations and non-governmental organizations (NGOs) (Binns et al. 2001; WRI 2011). So far the programme has provided jobs and training to approximately 20,000 people per year from the most remote rural areas, of which 52 per cent are women. This initiative deliberately targets the most vulnerable groups in society, with the target of 60 per cent women, 20 per cent youth and 5 per cent disabled. This also leads to the creation of secondary jobs in rural areas, such as furniture manufacturing (LPG 2011:30).

The examples outlined above show South Africa's inclination towards seizing the opportunity provided by green economy to potentially contribute to economic development and promote sustainability of the environment while also creating new jobs and improving livelihoods for whole communities in both urban and rural areas. The problem is how to bridge the gap between these plans and policies, bringing about actual changes in behaviour, and including responses of all people from the national, provincial, municipal, community and individual levels. The remainder of this paper discusses how Limpopo province intends to implement the transition to green economy, by linking the empowerment of communities and eradication of poverty through green economy policies with other programmes for growth and development.

The Transition to Green Economy in Limpopo

Limpopo Employment Growth and Development Plan

The persistent problem of poverty and inequality is a major constraint to rural development in Limpopo. Limpopo's leading economic sectors are mining, tourism and agriculture, all of which are dependent on rural natural resources. Mining experienced most growth in the period between 1995 and 2002. In terms of social development, the province has recorded increased school attendance, although the pass rate for the National Senior Certificate examinations has remained below 60 per cent. The province aims at providing services to all, but the actual performance has not met expectations in rural areas where many dwellings have no access to water within their houses. Despite the high quality of water in the country, some municipalities

² Dollar figures refer to US dollars.

do not meet the rigorous standards. There also exists a gap in terms of affordability of electricity, with many rural dwellers only accessing limited electricity through government subsidies. There have been improvements in health delivery but many challenges—regarding HIV, tuberculosis, child and maternal mortality, governance and accountability—in public health remain (LPG 2009).

Social development policy implementation is hampered in countries where there are major inequalities in the economy. For example, the most pressing problem in Limpopo and many other predominantly rural provinces in the developing world is poverty (De Swardt 2003). Despite progress towards creating a stable multiracial society in South Africa, the distribution of resources remains critically imbalanced, and the emerging middle class is, in most cases, far removed from the realities of poverty and unsustainable livelihoods in rural areas. The only source of income for many poor women is the meagre government grants they share with their extended families. Others find jobs in commercial farms where they work for long hours and where their rights are often abused. The government tries to monitor and take action but many cases go unreported due to fear of losing one's only means of livelihood.

A review of the Limpopo Employment Growth and Development Plan (LEGDP), 2009–2014 (LPG 2009) shows the government's commitment to addressing poverty through improving economic growth, equitable access to resources and the provision of social services of a high quality to all. South Africa has some of the most advanced policies compared to other African countries; for example, the policy on gender equality requires 50 per cent representation in all government appointments, although the gap between policy and implementation remains a major problem. This is due to historical inequalities between races, genders, and urban and rural areas that have led to a lack of capital and skills and ongoing patriarchy. Governance issues have also been blamed for the lack of progress in implementation. Green economy is therefore seen as an opportunity to address some of these persistent problems.

Limpopo Green Economy Plan

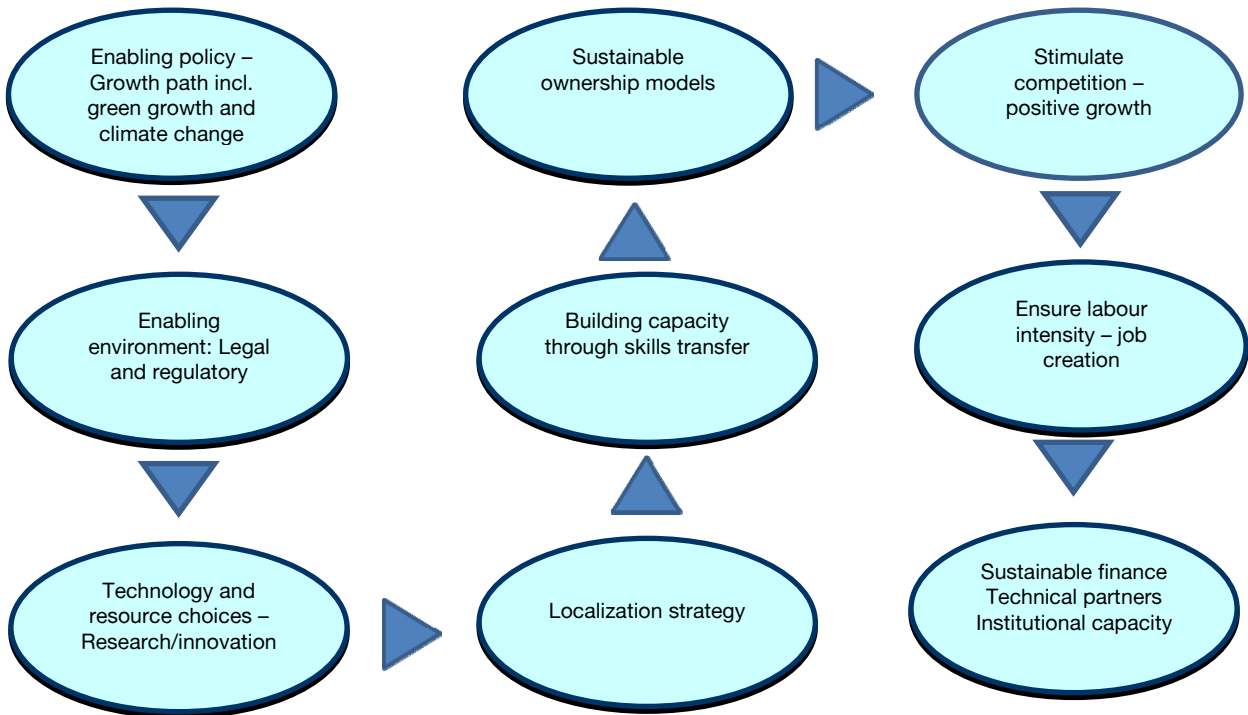
The Limpopo Green Economy Plan (LGEP) aims to create jobs through the green economy. The opening statement of the LGEP is optimistic and notes that “it is an exciting time in the history of the province—there is an opportunity for all members of society to participate in credible economic activities” (LPG 2011:1).

Limpopo is in the process of developing policies and projects aimed at increasing employment and growing the economy via the creation of green jobs (LPG 2011). It envisages a green economy in agriculture, construction, manufacturing, infrastructure, science and technology, and services. As indicated in the plan:

this includes activities that help to protect and restore ecosystems and biodiversity; reduce energy, materials, and water consumption through high-efficiency and avoidance strategies; de-carbonize the economy; and minimize or altogether avoid degeneration of all forms of waste and pollution (LPG 2010:69).

Figure 1 illustrates the proposed Limpopo province pathway to a green economy.

Figure 1: Limpopo pathway to a green economy



Source: Limpopo Green Economy Plan (draft plan) (LPG 2011:4).

The proposed Limpopo province “pathway to a green economy” starts with enabling policy formulation within the context of national priorities for growth and development; that is, green economic growth as a necessary response to climate change. Policy formulation is currently taking place in the province with the LGEP having been circulated to various stakeholders for discussion. The implementation of this plan must, however, be guided by relevant regulatory measures and legislation. The province has to make technological choices based on relevant research in order to design innovations that would drive the process. These choices will be guided by a localization strategy that takes into consideration social, economic and environmental factors in Limpopo. Of great importance is the need to develop human capacity through training and retraining. The pathway seeks to promote changes in production and consumption at the individual levels while creating competition and positive growth of the economy. The pathway is based on the creation of labour intensive activities which would promote growth and ensure job creation. Finally, green economy in Limpopo can only be achieved if there is adequate capital injection from government and other sources at the initial stage, and through collaboration and partnerships (LPG 2011). Gender and poverty issues must, however, be given priority from the policy formulation level all the way to implementation.

At the centre of development efforts of the Limpopo province and its emerging green economy is the need to provide for its largely rural and marginalized communities. Two sectors in particular (agriculture and energy), which are discussed next, are expected to contribute to job creation, poverty alleviation, service provision to communities and promoting rural development.

Green economy and agriculture

Agriculture, food production and forestry are key focus areas of Limpopo’s green plan, and are envisaged by the provincial government to play an increasingly important role in creating jobs, ensuring food sufficiency in the province and for export while improving the livelihoods of

rural communities, the majority of whom are women. Because of its tropical location relative to the rest of the country, Limpopo province is a major producer of tropical fruits and vegetables. Most of the production, however, takes place in commercial farms where many black people work earning negligible salaries as farm labourers with precarious rights despite new legislation (DEAT 2006). Former black homeland areas practice mainly subsistence farming and contribute only marginally to the agricultural production in the province. The province has experienced out-migration to other provinces and hopes to stem this trend through linking agriculture to the new green economy, which is expected to bring about growth in these lagging areas. Despite the potential, agriculture and the forest sectors only contributed 3.7 per cent to regional gross domestic product (GDP-R) in 2010. Agriculture nonetheless remains important for national exports and overall household food security (LPG 2010, 2011).

Agriculture and forestry are major exploiters of land resources, leading to land degradation, especially in some areas in the former homelands, due to land use levels that exceed productive capacities (DEAT 2006). Furthermore, invasive alien plants are destroying whole ecosystems and require urgent intervention. Climate change further affects the sustainability of rural resources. Key institutional challenges in agriculture include: extension services not keeping up to date with latest innovations, inadequate infrastructure, failure of land reform projects, lack of relevant policies and legislation, slow pace in processing land claims, and lack of access to markets. Despite these concerns, reports show that 14 per cent of productive land in the former homeland areas of South Africa is underutilized and may be available for production of biofuels.³

Initiatives to overcome these challenges in Limpopo currently target four categories of farmers for support and development: households that are food insecure, subsistence and emerging farmers and both small-scale and large-scale farmers (LPG 2011). Poverty in Limpopo is most prevalent among the old, the young and women. As indicated earlier, most people migrate to seek employment in commercial farms, mines and in towns, leaving behind women, the old and unemployed youth in rural areas. The plan therefore targets these categories to ensure food security and provide employment in these rural areas. The plan identifies various strategies, but the five identified below are particularly relevant to addressing challenges faced by the rural poor, women and youth. The government in Limpopo is supporting and encouraging green projects in organic farming, water efficiency in agriculture, growing of appropriate crops, feedlot regulation and production of biofuel resources, among other initiatives.

³ From written responses from MMI officials on questions mailed to them, 2012.

Table 1: Selected strategies for agriculture and green economy

Initiative	Potential impact on women	Potential impact on youth	Challenges	Opportunities
Organic and local production projects	Jobs, income, financial independence, self-actualization, household food security	Income and financial stability, being a productive member of society, acceptability, self esteem	Access to land, markets, inputs	Government support, local development
Water efficiency	Acquire water management skills	Training opportunities in water management	Access to water, climate change, lack of skills	Irrigation, rain water harvesting, government support
Appropriate crops	Better nutrition at the household level	Healthy youth	Changing food preferences	Indigenous knowledge systems
Feedlot regulation	Environmental education, conservation skills, rangeland management skills	Environmental education and conservation skills	Degraded communal lands	Extension services, government support, new proposed land reform
Production of biofuel resources	Jobs, income, group participation and business skills	Jobs, income, skills development	Access to land, capital, markets	Government support, public-private sector collaboration, research

Source: Adapted from LPG 2011.

The Limpopo Employment Growth and Development Plan (LEGDP), the Limpopo Green Economy Plan (LGEP) and various initiatives at the national and local government levels therefore show positive signals toward incorporating social dimensions in green economy. But it is too early in the process to definitively conclude the extent to which these initiatives will achieve sustainable rural livelihoods and bring about poverty alleviation and gender equity. Linking green economy and greening of rural livelihoods is still a pipe dream. Important questions about land and markets remain, for example. Land has been an important development issue for years; well-functioning land policy and institutions underpin rural livelihoods. Green economy policies must ensure access to land and protect the land rights of women (DFID 2002). Another major constraint is access to markets for commodities produced in community projects, as many resource-poor farmers in Africa are unable to compete with established business and supermarkets. Furthermore, emerging green economy policies and initiatives should incorporate indigenous mechanisms of withstanding shocks, internal and external threats, and rural resilience strategies. Many rural communities have very good knowledge of their environments, developed over centuries, which should be incorporated in resource/development planning and implementation of green economy projects (Masoga and Musyoki 2004).

Green economy and energy

Energy is the most important sector in the emerging global green economy. In conjunction with the Department of Science and Technology (DST), NGOs and other sectors, the energy sector in South Africa is currently engaged in researching bioethanol, biodiesel and methane gas from waste and renewable resources. New sets of national guidelines have also shifted the emphasis towards finding fuel from crops that are less likely to affect food security, such as sugar cane, sugar beet, canola and sunflower seeds (Lerner et al. 2010).

Limpopo is well placed to exploit these crops, as this province largely depends on primary production activities, so has the potential to contribute at the production level in the new green economy. The province has comparative advantages including: thousands of hectares of open space that could be used in the low carbon market; high solar intensity, which can be used in solar energy generation; relevant mineral deposits, such as silica, which can be used to make

products needed in the solar energy sector; and a viable agricultural sector, capable of producing crops for use as biofuel. However, the key challenge facing policy makers is to ensure that such projects do not further disadvantage vulnerable groups—particularly women and the poor—especially in the implementation stage (LPG 2011).

This issue is explored in more depth below in relation to two projects in Limpopo: biodiesel production by small-scale farmers (the Mapfura Makhura Incubator) and Solar Vision, a project that incorporates gender and poverty into low-carbon strategies to improve livelihoods via community and household asset holding. These case studies illustrate how rural development and gender equality may be achieved as part of green economy. The case studies also show how diverse actors at different levels contribute to changes in beliefs and behaviour, leading to cooperation and shared responsibilities. Together, these two projects illustrate how green economy may contribute to the sustainability of rural livelihoods and respond to global environmental and social development concerns.

Case study: Mapfura-Makhura Incubator

The role of biofuels in a future green economy has become increasingly important in the context of global warming and its negative consequences on both the environment and humanity. South Africa is the only African country involved in biofuel production in a significant way (Edje 2010), and it represents an opportunity to increase rural incomes and reduce poverty, and so improve rural livelihoods. However, key concerns relate to the role of this industry in ensuring food security, availability of land, and equitable distribution of benefits from such projects.⁴ In South Africa, the government has banned the growing of maize for the purpose of producing biodiesel, even though commercial farmers disagree with this move, arguing that it is possible to divert some of the maize grown without jeopardizing food security in the country. The main concern regarding food security revolves around the use of maize for ethanol production. It is for this reason that it has been proposed by government and the Mapfura-Makhura Incubator project that maize for the production of bioethanol should be excluded in the initial phases of the strategy implementation. MMI also processes biodiesel from waste cooking oil so that food security is not compromised. The idea of incubation is accepted in small, medium and micro enterprise (SMME) development and refers to a situation where subsistence farmers or unemployed people, including youth and women, are supported in becoming men and women entrepreneurs. In this case, local farmers are transitioning to growing soya and sunflower for biofuel production and are referred to in the project as “incubatees”/farmers.

The MMI project was established in 2006 and operates as a section 21 company (a non-profit organization). MMI is situated 35 km outside of Marble Hall inside the grounds of Tompi Seleka Agricultural Training Centre. It trains small-scale black farmers within Limpopo province to become commercial farmers (Maluleke 2008). The farmers grow soya and sunflower for the production of biodiesel. It is important to note that these farmers also engage in other activities for the purpose of meeting their food needs, creating a win-win situation. According to MMI,⁵ the development of a modest biofuels sector targeting underutilized land in former homelands should have a minimal impact on both food security and prices. Currently 14 per cent of arable land in South Africa is underutilized, and most of it is in the former homelands. Access to this land is, however, differentiated according to gender with men having easier access than women (due to persisting patriarchy). MMI therefore assists the landless to access land, since this is a requirement to participate in the project. These areas also lack market access (which biofuels plants will provide) and infrastructure (that agricultural and infrastructural support programmes should provide). Specifically, the 2 per cent level of biofuels production proposed for the incubation phase will not compromise existing food markets, as this target can be achieved with about 300,000 hectares of land or about 1.4 per cent of national arable land.

⁴ FAO 2008; Maltitz et al. 2009; Edje 2010.

⁵ From written responses from MMI officials on questions mailed to them, 2012.

Various stakeholders have contributed to the establishment and success of this model. MMI came into being as a result of collaboration among public institutions and NGOs. The founding members include SEDA Technology Programme (STP); Council for Scientific and Industrial Research (CSIR); Agricultural Research Council (ARC); University of Limpopo (UNIL); National African Farmers Union (NAFU); University of Venda (UNIVEN); Trade and Investment Limpopo (TIL) and Limpopo Department of Agriculture (LDA) (Banda 2009; Lerner et al. 2010).

The MMI programme aims to empower small-scale farmers to create SMMEs that would exploit the biodiesel value chain. MMI was expected to create more than 2,000 jobs in the first two years (2006–2007) and started with 32 small-scale farmers planting on 1,886 ha of land. The programme trained its first group of farmers in 2008 to enter the biofuel market, and it was anticipated that by 2010, some 2,100 jobs would be created on 10,000 ha of land (Moodley 2008). MMI thus far has managed to recruit 150 incubatees/farmers into its incubation programme and so far 51 (out of 150) farmers have successfully completed three years of the incubation (training and support) process, while 124 (out of 150) are considered SMMEs. 2,100 jobs have been created to date, covering both direct jobs (that is, starting with the farmer and those employees who are hired for a period longer than three months) and indirect jobs (casual workers or employees who are hired for a period less than three months) since the inception of MMI in 2006.⁶ Currently the participants come from Sekhukhune, Capricorn and Waterberg districts of Limpopo, with an aim to spread to other districts within and outside Limpopo province. Small-scale farmers are provided with technical and management skills in farming soya beans and sunflowers. Sunflower seeds are a very popular crop, but the company wants to see development down the value chain to also encompass activities such as fertilizer, seed production and feed manufacture (Moodley 2008).

The farmers were already active before the project—and practised some form of agriculture, planting crops such as green maize, green pepper and spinach—but most of these farmers were not making much profit, and their incomes were low. When they joined MMI they did not abandon their other activities; they practiced mixed farming. Biofuel production is, however, their main source of income while the other activities provide them with food.

As one of the participants, Choma, notes, “I was struggling before this project, I am now able to pay school fees for my children, have money for Christmas, and I also have some money left to buy some inputs for the next planting season. My family is happy and I am very committed to this project and my farm.”

Participants have also been trained in business management, financial management and record keeping. Key informants further indicate that the farmers’ incomes are above the poverty line, thus suggesting that the green economy has potential for job creation and poverty alleviation.⁷

The empowerment of women through the green economy is possible if women and men participate equally. In terms of gender equity and green initiatives, MMI registered 47 female farmers as its participants at the beginning of the project. Currently, out of 150 total participants in the project, 72 are women farmers. MMI serves to build the capacities of both men and women farmers by offering technical skills for producing targeted crops (that is, sunflower and soya bean) and where possible assisting to secure production inputs, thus enabling farmers to fully explore opportunities within the biodiesel value chain. Participants are expected to transport their produce to already identified markets (MMI markets for edible oil, seed cake and biodiesel) after harvesting for processing into crude oil and ultimately into biodiesel. Farmers have full control of the processed by-products. Currently MMI has contracts with its

⁶ From written responses from MMI officials on questions mailed to them, 2012.

⁷ From personal interview with MMI Business Development Manager, Nakampe Seoka, 10 August 2011.

incubatees/farmers that require farmers to pay 3.5 per cent of the gross income generated for royalty fees for processing and maintenance.

A study by Banda (2009) showed that at inception only 30 per cent women participated in the project and that this was associated with women not owning land and problems of information flow. There has been progress since then, with almost 50 per cent women currently participating. Biofuel production has provided women with opportunities to diversify their assets and empowered them economically, since most of them are sole breadwinners in their families. Some women have also reported changes in their social relations at the household level since engaging in the project (Limpopo Business 2007). Women are able to provide pocket money and better uniforms for their children and better nutrition for the whole family. Women in the project have their own income which provides them with better opportunities in decision making regarding financial matters and maintaining social relations at the household level. Women are also involved in community issues and have become part of the decisions and changes that affect their community.

MMI is therefore providing opportunities through commercialization of emerging farmers and creating opportunities for men and women to participate in productive activities in a sector that also supports the lowering of carbon emissions. This is achieved through crop production in the former homeland rural areas where other opportunities are minimal. This programme is also significant because of its mentoring and coaching elements, through which new technologies are provided for farming that would otherwise be inaccessible to poor rural farmers. MMI also plays a significant role in business and value chain development in terms of enterprise development, marketing, communications, fundraising, business planning, advisory and information services and training; and activities that contribute to empowering community members. Emerging farmers in this project have an opportunity to participate not only in biodiesel activities but also in spin-offs from processing edible oils, seedcake, glycerol candles, margarine and cleaning chemicals. All these activities inject a new vibrancy to a lagging area and bring hope to economically marginalized communities. Men and women in Sekhukhune are not only being employed but are entrepreneurs who are also providing employment to others.

This case of local farmers growing soya and sunflower for biofuel production represents a good model for ensuring sustainable rural livelihoods and transitioning to a green economy, and has potential to bring poor women and men into productive work in rural areas. The emerging green economy policy formulation therefore needs to include participation of various stakeholders and encourage experimentation and learning from diverse policies adopted at multiple scales (Ostrom 2010). This may include policies pertaining to individuals, households, communities, institutions, the private sector and local, regional and national government. Rural communities, in particular, have intimate knowledge about their environments and have developed coping mechanisms that can be harnessed to bring about sustainable rural livelihoods.

Case study: Solar Vision

As the previous case study has shown, the involvement of multiple actors and stakeholders in developing green economy projects is important in achieving success. Similarly, in the Solar Vision project, providing electricity to poor, rural communities empowers them to participate in other productive activities, and incorporates gender and poverty issues. Solar Vision is a company that provides Solar Home Systems (SHS) as a non-grid energy service. Established in 2000, it is one of four concessionaires that provide off-grid electricity to rural areas around South Africa,⁸ and is currently operational in Vhembe, Capricorn and Sekhukhune (that is, in three of the five municipalities in the province). The main supplier of energy is Eskom, but solar projects are playing an important role in areas not reached by the national grid.

⁸ Three other concessionaires that provide solar energy are RAPS (Rural Area Power Solutions) in Northern KwaZulu-Natal, Kwazulu Energy Services and NuRa in Southern KwaZulu-Natal and Kreditanstalt Fu Wiederaufbau in the Eastern Cape.

As of January 2012, 7,701 connections had been achieved across the three municipalities, where the majority of the households connected are headed by women.⁹ The delivery of this service involves the installation of SHS on a capital subsidy basis. In addition, Solar Vision provides ongoing maintenance for a 20-year period on a fee-for-service basis. The main aim of the company is to provide basic electricity to mainly poor people living in the remote and rural areas of Limpopo province.¹⁰ The company came about as a result of a government tender to supply non-grid energy to off-grid areas where the national electricity provider (Eskom) is not going to supply energy in the next three to five years. They are monitored by the Department of Minerals and Energy (DME) and also work with Eskom, local municipalities and traditional leaders.

Solar energy is a renewable energy that not only contributes to the reduction of greenhouse gases but also ensures people's protection from the harmful effects of using coal and wood in living quarters with limited ventilation. Solar Vision therefore provides renewable solar energy products that are reliable and affordable to home owners, hotels and companies throughout the Limpopo province and surrounding areas. These products and services include solar water systems (heating water with the free energy from the sun), SHS (providing electricity to disadvantaged people in off-grid areas) and natural gas. Initially they started by supplying a 50 watt solar panel, and are now providing a 75 watt solar system as well. The solar panel is a four light system, which can also charge cell phones and play portable radios and black and white televisions.

The green economy at its initial stage requires participation of various stakeholders; in this case study, this has meant a role for local municipalities, electricity companies, traditional authorities and the private sector. The financial collaboration between these various actors and community members enables the effective provision of electricity to the poor in rural areas. This is carried out through municipalities who identify villages without electricity. They work in collaboration with ward councillors, chiefs and local representatives. Solar Vision holds meetings with community members before installation to explain the use of solar energy and its role in promoting sustainable development (Clark 2005). Since connection of the solar energy is optional to anyone who is interested in the service, those who are interested are required to pay a one-off connection fee of ZAR110 (\$16) in return for a solar panel and its components. Solar Vision is paid a monthly fee of ZAR68 (\$10). From the ZAR68 (\$10), the municipality will subsidize an amount of ZAR40 (\$6) and the customer will pay only ZAR28 (\$4).¹¹

Initially, the same proportion of women and men were hired to work on the project. These workers were hired to maintain the solar panels. But, as soon as the project started, most women quit the project. Reasons cited included that the batteries used on the solar panels were too heavy and climbing on top of houses to get to solar panels was a challenge. Due to these challenges, certain positions are now reserved for women so as to create posts that do not require such manual labour. Cultural considerations also do not allow women to do certain activities like climbing to the top of houses. Therefore, in every community that Solar Vision is operating, a community liaison officer is employed. Currently there are 10 women working in this capacity. In addition, Solar Vision currently employs 17 permanent staff of whom five are women; and 12 non-permanent staff, seven of whom are women. These experiences have reinforced the need to carefully consider gender in policy development for green economy; otherwise women will be left out, and it will be "business as usual" where women fail to participate for gender-specific reasons. While other ways of carrying the heavy equipment could have been provided, and despite the lack of employment in certain jobs flowing to women, they have received other benefits related to consumption of electricity.

⁹ From interview with and written responses from the director of Solar Vision, Jakes Jacobs, 2011.

¹⁰ Prasad 2007; Jacobs 2004; Interview with and written responses from the director of Solar Vision, Jakes Jacobs, 2011.

¹¹ From interview with and written responses from the director of Solar Vision, Jakes Jacobs, 2011.

Local communities are responding positively to this initiative. To quote Mrs Sambo, “since using the solar, I no longer have to buy candles and paraffin and I can also move around in the night because the outside light is bright. It feels good to be able to have lights”. Another woman informant, Mikateko said, “I feel happy because with the job [community liaison officer] that I have as a representative of Solar Vision in the community, I will use this job as a stepping stone, because I want to further my studies”. Bongani, a young man commented, “I am now able to read in the night without worrying that the lights might go off and also these lights are bright as compared to the paraffin lamp which I used previously, and I am not even worried of finishing the paraffin as the lights can be on for the whole night”.

The demand for solar energy is expected to continue despite expansion by the national electricity supplier (Eskom) due to the continuous development of new settlements in rural areas. The main challenge experienced by Solar Vision, however, includes keeping the project as a viable business, since previous local and international partners dropped out when they realized not much money would be made. The government and local municipalities are instead subsidizing solar energy for community members, most of whom are poor women. The traditional energy sector is also contributing to the transition by ensuring changes in technology while at the same time beginning to consider social development issues.

This case illustrates efforts toward incorporating gender and poverty issues in the planning and implementation of green projects. Solar Vision operates mainly in rural areas and targets poor communities where, given the migration trends in the country, most of these are women. Gender is a central policy consideration of the project and targets women for employment in its offices as well as at project sites. Challenges have been experienced, but are being addressed by finding alternative employment opportunities for women while providing energy, which both improve the everyday life of these women. Many women feel more secure because the homesteads are lighted at night. Poor people are also able to engage in small businesses because of this energy source, uplifting themselves and their families. A few have television sets, cell phones and radios, which keep them abreast of changes and opportunities locally, nationally and internationally. Education of the youth is crucial; this source of energy provides lighting for study and for undertaking economic activities. This case study shows that, as the green economy gets underway, gender and poverty monitoring is crucial due to its potential to improve lives within rural communities.

Policy Considerations

The paper suggests key considerations for policy in the emerging green economy, which could contribute to social development, specifically addressing gender and poverty issues. First, it is important to keep data that are disaggregated according to gender so as to monitor changes that occur over time. This kind of data is often missing in projects, since some consider it unimportant. In the two cases discussed above, gender disaggregated data were not readily available in a user-friendly manner. Second, biofuels production requires that land be available for cultivation, but this should not jeopardize food security. MMI participants practice mixed agriculture, growing crops for food as well as for the biofuel industry. Even though 14 per cent of productive land in former black homeland areas is not in productive use, this does not necessarily mean all people have access to this land. Third, access to sustainable technology will be crucial in green economy. In the case studies presented above, women and men are being provided with technology for farming at MMI and solar technology through Solar Vision. Fourth, access to information is crucial and is being promoted in both cases, even though, at the initial stage, Banda (2009) found this to be a main constraint with MMI. In both cases, however, gender dynamics and constraints imposed by patriarchy interplay to deny women access to resources.

Development projects are often impacted negatively by mismanagement, but the MMI example shows how good management, policy implementation, processing and the sale of products can

benefit participants. In the case of Solar Vision, subsidies provided by the municipality enable all community members to have access to solar energy. Hence, there is a need to recognize the role of multiple stakeholders at the initial stage. The two case studies show how, through proper policy implementation, sustainable livelihoods may be achieved for both men and women as they realize control over resources, generate income, access markets and other assets, thus making them productive members of their communities. Policy development must recognize the critical role played by rural communities and value their participation as the green economy emerges.

Conclusion

For the emerging green economy to bring about social development in rural areas, equity issues—especially the persistent problems of poverty, gender inequality and attainment of sustainable rural livelihoods—need to be adequately problematized and targeted by policy formulation and implementation. The sustainable livelihoods approach is useful in understanding rural realities (Scoones 1998, 2009; Ellis 2000). The paper shows that for the green economy to succeed, there is a need for regionally specific research and scenario modelling. Both MMI and Solar Vision illustrate how green projects based on local models and involvement of multiple stakeholders can effectively be implemented. The sustainability of these rural livelihoods is demonstrated as human capital is developed through skills received in working with solar technology and farming; relationships and networks emerge among community members and with various stakeholders; and there is improved access to natural capital, infrastructure and energy. Communities are also able to withstand vulnerability through diversification of farming, local knowledge about their environments and mixed farming. They are able to cope with threats because of the safety nets provided within the project policy implementation.

The paper further illustrates how South Africa's emerging green economy policy seeks to incorporate social development issues. Studies show, however, that despite women being the majority dwellers and household heads in rural South Africa, many women are not able to take advantage of new opportunities because of lack of resources leading to gender inequalities. For example, studies show that women's benefits in land reform projects are minimal.¹² In fact, a key indicator of poverty in Africa is being a rural woman. This study recommends policy formulation that takes into consideration the multiple roles of women in rural communities and incorporates strategies that empower women economically and socially. For example, women may abandon the growing of subsistence crops in favour of cash crops for the biodiesel sector leading to food security issues. The above studies in Limpopo show how women are excited about their involvement in these projects due to improvements in asset holding. Solar energy gives poor women and men more time to complete their chores and engage in other productive activities, thus alleviating poverty. MMI and Solar Vision both target women and the poor, many of whom are benefitting from skills training and income generation. They also contribute to rural livelihoods through engaging men and women in activities that reduce CO₂ emissions and support sustainable rural livelihoods. Plans and projects discussed in this paper indicate the desire to bring social dimensions into the green economy. This is achievable in Limpopo, the rest of South Africa and elsewhere if appropriate models are developed taking into consideration the diversity of our societies, economies and environments.

¹² Hall 2007; Tshatsinde 2005; Khuluvhe 2004.

Bibliography

- African Centre for Biosafety. 2008. *Agrofuels in South Africa: Projects, Players and Poverty*. www.energia.org/fileadmin/files/media/pubs/biofuelsbook_southafrica.pdf, accessed on 25 September 2011.
- African Development Bank. 2009. *Medupi Power Project: Project Appraisal Report*. www.eskom.co.za/eia, accessed on 15 November 2011.
- Banda, K. 2009. "Growing sunflowers and soya in Limpopo Province for biodiesel production." In G. Karlsson and K. Banda (eds.) *Biofuels for Sustainable Rural Development and Empowerment of Women. Case Studies from Africa and Asia*. Energia, Leusden.
- Binns, J.A., P.M. Illgner and E.L. Nel. 2001. "Water shortage, deforestation and development: South Africa's working for water program." *Land Degradation and Development*, Vol. 12, pp. 341–345. <http://planet.uwc.ac.za/nisl/invasives/Assignment1/Binns.pdf>, accessed on 28 August 2011.
- Brand, Ulrich. 2012. "The green economy – the next oxymoron? No lessons learnt from failures of implementing Sustainable Development". *GAIA – Ecological Perspectives for Science and Society*, Vol. 21, No. 1, pp. 28–32, March.
- Clark, A. 2005. *Resource-based Technology Innovation in South Africa: Innovations in South Africa's Off-grid Concession Programme*. Human Sciences Resource Council (HSRC), Pretoria.
- DEA (Department of Environmental Affairs). 2011. *National Climate Change Response White Paper of the Republic of South Africa*. DEA, Government of the Republic of South Africa, Pretoria.
- . 2010. *National Climate Change Response Green Paper of the Republic of South Africa*. DEA, Government of the Republic of South Africa, Pretoria.
- DEAT (Department of Environmental Affairs and Tourism). 2006. *South African Environment Outlook: A Report on the State of the Environment*. DEAT, Government of the Republic of South Africa, Pretoria.
- De Swardt, C. 2003. *The Shadow of the Rainbow Nation: Chronic Poverty After a Decade of Liberalization*. Chronic Poverty Research Centre report, University of Western Cape, Cape Town.
- DME (Department of Minerals and Energy). 2002. 2007. *Bio-Fuels Industrial Strategy of the Republic of South Africa*. DME, Government of the Republic of South Africa, Pretoria.
- . *Capacity Building in Energy Efficiency and Renewable Energy: Baseline Study-Solar Energy in South Africa*. Department of Minerals and Energy Report, No. 2.3, pp. 4–13.
- DFID (Department for International Development). 2002. *Better Livelihoods for Poor People: The Role of Land Policy*. Consultation document, DFID, London.
- Edje, O.T. 2010. "Biofuels: What lessons can Swaziland learn from the experiences of other countries." In D.S. Tevera and J.I. Matondo (eds.), *Socio-Economic Development and the Environment in Swaziland*. University of Swaziland, Kwaluseni.
- Ellis, F. 2000. *Rural Livelihoods and Diversity Implications in Developing Countries: Evidence and Policy*. Oxford University Press, London.
- EU (European Union). 2010. *The Macro-Economic and Financial Framework of the Green New Deal*. Policy paper adopted by the EU Greens, 13th EGP Council, 8–10 October, Tallinn.
- FAO (Food and Agriculture Organization). 2008. *The State of Food and Agriculture. Biofuels: Prospects, Risks and Opportunities*. FAO, Rome.
- Financial Mail. 2011. "Greening South Africa's economy: The IDC funds green industry development". 2 May.
- Fitzgerald, Patrick, Anne McLennan and Barry Munslow. 1999. *Managing Sustainable Development in South Africa*. Oxford University Press, Cape Town.
- Government of the Republic of South Africa. 2010. *Reducing Greenhouse Gas Emissions: The Carbon Tax Option*. Discussion Paper for Public Comment, Government of the Republic of South Africa, Pretoria.
- . 2007. *Accelerated and Shared Growth Initiative for South Africa (AsgiSA)*. Government of the Republic of South Africa, Pretoria.
- Hall, R. 2007. *The Impact of Land Restitution and Land Reform on Livelihoods*. PLAAS, University of Western Cape, Bellville.
- Huberman, David, 2010. *A Guidebook for IUCN Thematic Programme Area on Greening the World Economy (TPA5)*. IUCN, Gland.

- Jacobs, J. 2010. *Presentation for Kenya Delegation on Off-grid Electricity*. Polokwane. Mimeo.
- Jacobs, Susie. 2004. "Livelihoods, security and needs: Gender relations and land reform in South Africa." *Journal of International Women's Studies*, Vol. 6, November, pp. 1–19.
- Khuluvhe, K. A. 2004. *The South African Government Land Reform Policy and its Impact on Youth Livelihoods in Vhembe District*. Masters Thesis, School of Environmental Sciences, University of Venda. Mimeo.
- Le Maitre, D.C., P.J. O'Farrell and B. Reyers. 2007. "Ecosystems services in South Africa: A research theme that can engage environmental, economic and social scientists in the development of sustainability science?" *South African Journal of Science*, Vol. 103, October, pp. 367–376.
- Lerner, Anna, Odala Matupa, Freddie Mothlathledi, Geoff Stiles and Rex Brown. 2010. *An Assessment of the Biofuel Sector Development in the Southern African Development Community*. Southern African Development Community (SADC) Bio-Fuels State of Play Study, SADC. www.probec.org/fileuploads/fl10192010025321_SADC_BIOFUELS_STATE_OF_PLAY_STUDY.pdf, accessed in May 2012.
- Limpopo Business. 2007. *Alternative Energy: Limpopo Wants to go Green*. www.limpopobusiness.co.za/pls/cms/ti_secout.secout_prov?p_sid=135&p_site_id=129, accessed on 20 July 2011.
- LPG (Limpopo Provincial Government). 2011. *Limpopo Green Economy Draft Plan (LGEP)*. LPG, Polokwane.
- . 2009 *Limpopo Economic Growth and Development Plan (LEGDP) 2009–2014*. LPG, Polokwane.
- Maltitz, Graham von, Lorren Haywood, Maxwell Mapako and Alan Brent. 2009. *Analysis of Opportunities for Biofuel Production in Sub-Saharan Africa*. Natural Resources and the Environment, Council for Scientific and Industrial Research (CSIR), Pretoria.
- Maluleke, N. 2010a. "MMI incubatee with a purpose and barriers to rural youth development in agriculture." *MMI News*, 21 May, pp. 1–2.
- . 2010b. "Land availability in South Africa for bio-diesel and why sunflower for bio-diesel." *MMI News*, 6 September, pp. 1–3.
- . 2009a. "MMI empowers women farmers and Tubatse soybean farmers affected by crime." *MMI News*, 4 May, pp. 1–2.
- . 2009b. "MMI-LADA mentorship programme in Limpopo." *MMI News*, 4 May, p. 4.
- . 2009c. "Capacity building of mentors." *MMI News*, 13 September, p. 3.
- . 2008. "To be an MMI incubatee changed my life." *MMI News*, No. 1, 14 December, p. 2.
- Masoga, M. and A. Musyoki. (Eds). 2004. *Building on the Indigenous – An African Perspective*. Proceedings of the International Conference on Indigenous Knowledge Systems, University of Venda, 12–15 September 2001. National Research Foundation and University of Venda for Science and Technology, Pretoria.
- Mdluli, Thuli N. and Coleen H. Vogel. 2010. "Challenges to achieving a successful transition to a low carbon economy in South Africa: Examples from poor urban communities". *Mitigation and Adaptation Strategies for Global Change*, Vol. 12, 23 March, pp. 205–222.
- Moodley, N. 2008. "Biofuels incubator plans to create over 2,000 jobs by 2009". *Engineering News*. www.engineeringnews.co.za/article.php?a_id=132342, accessed on 28 July 2011.
- Ostrom, E. 2010. "Polycentric systems for coping with collective action and global environmental change". *Global Environmental Change*, Vol. 20, pp. 550–557.
- Prasad, G. 2007. *Electricity from Solar Home Systems in South Africa*. Energy Research Centre, University of Cape Town, Cape Town.
- Ramasunga, P. 2011. *Land Restitution and Sustainability of Women's Rural Livelihoods in Tshitwani, Limpopo Province, South Africa*. Honours research dissertation. School of Environmental Sciences, University of Venda. Mimeo.
- Scoones, I. 2009. "Livelihood perspectives and rural development". *Journal of Peasant Studies*, Vol. 36, No.1, January 2009.
- . 1998. *Sustainable Rural Livelihoods: Framework for Analysis*. IDS Working Paper 72. Institute of Development Studies, Brighton.
- Tshatsinde, T. M. 2005. *An Evaluation of Land Tenure Systems: Towards Sustainable Rural Livelihoods in Vhembe District, Limpopo Province, South Africa*. Master's thesis. School of Environmental Sciences, University of Venda. Mimeo.
- UNEP (United Nations Environment Programme). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. A Synthesis for Policy Makers*. UNEP, Nairobi.

- 2011. 2009. *Green Jobs for the Poor: A Public Employment Approach*. Poverty Reduction Discussion Paper, UNEP, Nairobi.
- UNGA (United Nations General Assembly). 2010. *Objectives and Themes of the United Nations Conference on Sustainable Development: Report of the Secretary-General*. UNGA.
- UNRISD (United Nations Research Institute for Social Development). 2011. *Green Economy and Sustainable Development: Bringing Back the Social Dimensions*. Call for Papers and Conference. www.unrisd.org/events/call-for-papers-2011, accessed on 16 May 2011.
- Winkler, H. 2007. *Renewable Energy Policy in South Africa: Policy Options for Renewable Electricity*. Energy Research Centre, University of Cape Town, Cape Town.
- WRI (World Resource Institute). 2011. *A Compilation of Green Economy Policies, Programs and Initiatives from Around the World*. Prepared for Interactive Workshop No. 1, 11 February 2011, WRI.
- Yunus, Muhammad with Alan Jolis. 1998. *Banker to the Poor: The Autobiography of Muhammad Yunus, Founder of Grameen Bank*. University Press, Dhaka.
- Zuma, Jacob. 2010. *Key Note Address*. Green Economy Summit, hosted by the Republic of South Africa, 18 May 2010, Sandton Convention Centre, Johannesburg.
www.info.gov.za/speeches/2010/10051909251001.htm, accessed on 28 May 2012.

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