

Environmental priorities in Mozambique

current status and future challenges



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Preface

This publication brings together seven papers prepared as “analytical notes” for the *Donor Working Group on Environment*. In 2005, Development Partners (DP) active in the field of the environment, agreed to meet on a monthly basis to share information and to participate in policy dialogues. This initiative led to the creation of the *Donor Working Group on Environment* as a platform for dialogue bringing together the Ministry for the Coordination of Environmental Action (MICOA) and other government institutions, together with development partners (DP), civil society and the private sector. The group has been instrumental to the integration of the environmental agenda into the current *Action Plan for the Reduction of Absolute Poverty* (PARPA-II).

In March 2009, the Working Group on Environment agreed to commission to various experts the production of “*analytical notes*” giving a synthesizing of the current status of Mozambique’s environmental policy as applied in various sectors. The aim was to get an overview of the *current status with regards to environmental legislation and policy and to assess the challenges ahead in order to contribute to the particular sectors phase with regards to environmental issues*.

By presenting evidence-based arguments for policy recommendations in a non-technical language the papers should be useful to the Government of Mozambique for directing its interventions and for directing further donor support. The issues and discussions brought forward are indeed intended for:

Government policy makers. To inform and catalyse long-term government planning both by providing syntheses on environmental issues pertaining to various sectors by assessing the sustainability of the country growth path. To indicate the keen interest of the development partners on the environmental and social implications in relation to the development challenges encountered in each of the sectors. As an ultimate result, it is hoped that environment issues will be adequately being taken into account in upcoming Action Plan for the Reduction of Absolute Poverty (PARPA 2010-‘15).

Donors. To provide rationale for donor support, and directions for future support, by reflecting on past donor involvement, and outlining the current stakes, possible gaps in financing and priorities for sustainable development.

Development Partners. These notes are meant to be an outcome of the environmental dialogue among development partners, and as such represent a common outlook of the development partners in relation to Mozambique's environmental policies, regulation and implementation strategies.

Hence the Donor Working Group on Environment agreed to produce analytical notes on the following priority issues: (1) agriculture production forestry, (2) climate change (3) nature conservation (4) forestry (5) mega-projects relating to mining and, energy production (6) environmental health, and (7) land use and territorial planning. The authors were given the tasks

- To produce a 10-15 paper to inform the dialogue with the government and stating clear recommendations and indicators in key areas that could be used in monitoring progress towards addressing environmental issues pertaining to the various sectors and how these should be taken into account during the preparation of the PARPA.
- To provide a consubstantiate and concise summary of the major policy issues highlighting key challenges and opportunities for ensuring that the contribution of the sector to the national economy is done within the framework of environmental sustainability; and
- To inform the Environment Donors Working Group on strategic issues and indicators related to the particular sectors relevant to the country context that can orientate the dialogue with the government and contribute to the formulation and monitoring of the next development plan.

They had to achieve this by

- Conducting a review of the existing policies, programmes and studies relating to the particular sector
- Assessing the extent to which environmental issues have adequately integrated into current strategies, policies and legislation, and
- Identifying main achievements and constraints and draw recommendations pertaining to environmental policies

The elaboration of this set of policy notes has been possible through the institutional coordination and contributions of all the members of the Development Partners Environment Working Group: (Worldbank, Norway , France, Sweden, Finland, European Union, Netherlands, Japan, Spain, UNDP, UNEP and DANIDA)

Financial support to this initiative has been provided by (Worldbank, France (Afd), Denmark (DANIDA), UNEP (Poverty Environment Initiative) and the Spain/UNDP MDG Achievement Fund (supporting the “UN Joint Programme on Environmental Mainstreaming and Adaptation to Climate Change in Mozambique”).

1. Introduction

By giving an updated summary of the current policies, legislation and related challenges with regards to environmental issues, the following seven notes are intended to contribute to a discussion amongst and between Government Institutions as well as Mozambique's Development Partners. It is particularly hoped that these notes will contribute to the preparation of the Government's next Five Year Plan and next Strategy Paper on Poverty Alleviation (PARPA).

In a February, 2010 speech, the Mozambican President *Armando Guebuza* recognized that **climate change** is bringing more frequent droughts, floods and cyclones to the country, and said that we "are victims of climate change since a long time ago." The message is clear from the highest political level in the country that immediate action on climate change is needed in Mozambique. Nevertheless, in the first note, *Juan Lopez Villar* argues that legislation related to climate change is scattered through several dozen primary and secondary legislative pieces mostly related to the sectors of environment and disaster management, as well as other sector areas like agriculture and water. The Ministry for the Coordination of Environmental Action (MICOA) and the National Institute for Disaster Management (INGC) are the two institutions most actively involved with issues relating to climate change. However there is no clear leadership over the climate change dossier in the country and hence roles and responsibilities need to be clearly defined. The World Bank estimates the impacts of climate change in a net value of damages of nearly US\$ 7 billion for the period 2011 to 2050 if public policy are not changed. This would be equivalent to an annual payment of US\$ 390 million. Mainstreaming of climate adaptation into development assistance is still in its early stage in Mozambique. While donors are financing specific projects reinforcing Mozambique institutional capacity, a main challenge for donors will be to integrate climate change adaptation into the broad range of projects and sectors which are climate sensitive, but which are not yet being treated through a climate lens.

In the second note, the authors argue that current policy in relation to **Environmental Health** is focussing on water supply and sanitation, and though to a lesser extent, also includes food safety and hygiene. The authors argue that it would be worth also taking other issues into account particularly giving also attention to air quality (indoor and outdoor). Because of the attention given to water supply and environmental health, there is a close relationship between the Department of Environmental Health (DSA) of the Ministry of Public Health (MISAU) as well as the local administrations and municipalities, which fall under the Ministry of State Administration. Links to other government institutions who have

environmental management as part of their mandate such as the Ministry for the Coordination of Environmental Action, is much weaker. The authors argue that decentralization, linked to strengthening of local capacity at the level of province, district and municipality, is of great to ensure long-term positive and sustainable impacts. To assess any progress on environmental health the authors suggest to assess the impact of water supply and sanitation intervention by looking at the incidence and mortality of three major (type of diseases) viz. diarrhoea, respiratory diseases and malaria

In a third note, authors give a review on the status and trends to “mega-projects” in relation to mining and the energy sector. The authors start by stating that Mozambique is well-endowed with natural capital, estimated at 4644 USD per capita be; increased exploitation of the natural resources, it is argued, will form a significant for attaining the Millennium Development Goals and Poverty reduction, but with minimal environmental impact. It is argued that mega-projects have contributed for 1/5th of economic growth over the last years, but still that tax brakes, particularly for new projects should be reconsidered. Expected changes in climate change, and how these may mega-projects, are already taken into account in the design, and economic evaluation of the large dam projects. Though Mozambique environmental legislation is comprehensive, enforcement and implementation of its policies remains weak largely because of weak capacity of the government institutions (both in number of staff as in terms of their qualifications and expertise/experiences). Overall there is also a need for better integration and coordination of varies government agencies.

In a fourth note, *Isilda Nhatumbo* gives an overview of the history and processes of the experiences on “community based natural resources management”, including the legal base being the land law and the forest and wildlife laws and regulations. The authors also raises the issue that timber is to a large extend being exploited under the “annual licences” arrangement; for securing the long term sustainable exploitation of course, this should be come much more under the full “concession management” format. The institutional weaknesses and the insufficient capacity to facilitate and enforce implementation can be considered the main causes of the failures to achieve environmental sustainability. To ensure the sustainable management of the forestry sector priority should be given to zoning and land use planning, controlling deforestation and degradation, payment for ecosystems services, and reforestation for production and for conservation. It is also very important to acknowledge the value, and to pay for the contribution of communities in biodiversity conservation and carbon sequestration. The author concludes that the threat posed by climate change and the related mitigation through REDD present a potential for revitalizing this approach and contributing to the conservation of woodlands and forests.

In a fifth note, *Alda Salomão* describes the role of Conservation Areas in the general development policy of Mozambique. The author argues that although 20% of tax revenues from tourism ought to be reverted to the local communities, so far communities got only a meagre fraction of this. The author links this to the lack of transparency on the income generated by Conservation Areas make. There is also a need to strengthen community involvement in conservation work. Private actors have in some instances, as in Gorongosa National Park, helped alleviating the weak national capacity in the management of conservation area. Overall the author pleads for improving the capacity of the national research institutions, and a stronger involvement from these in research and management of the Conservation Areas.

In a sixth note, *Emilio Tostão* starts his review of the **agricultural sector** with the observation that farming in Mozambique is largely done by small scale producers, at least in terms of numbers of people involved and as they use 97% of the current agricultural land. With regards to the environment governmental institutions are principally concerned about wild fires, land degradation, soil erosion and the pollution of air, water and soil due to the use of pesticides. To minimize the environmental impact of agriculture, Emilio Tostão argues that “sustainable agriculture” techniques such as conservation agriculture, minimum tillage, alley cropping and integrated pest management should be promoted. This can in part be done through taxes incentives and/or subsidies but will also require strengthening the extension services. Better extension services should be developed through fostering partnerships between MINAG, NGOs and the private sector. The legal framework in relation to agriculture and environmental management should be rationalized by drafting a regulation synthesizing the more than 40 existing legal instruments. The mandate and tasks of the Ministry for the Coordination of Environmental Action (MICOA) and the Ministry of Agriculture (MINAG) should be revisited for redefine their respective roles and responsibilities while CONDES coordination role should be strengthen.

In a seventh and final note, *Simon Norfolk* and *Paul de Wit*, give an interesting overview of the planning processes in relation to land and natural resources use in Mozambique. Though in Mozambique, the role of territorial planning in the development process is most often conceptualised along the narrow lines of “Territorial Planning” (“*Ordenamento Territorial*”, in Portuguese), they also pay attention, and clarify the relationship to other planning processes such as the Strategic District Development Planning. Most interestingly, the authors stress the importance of the “*process of land-use planning*”. Getting to a consensus on development priorities amongst a wide group of people – from local and communities leaders up to Provincial authorities - during the course of e.g. a District Land Use plan may actually be more important than to come to than to have a technical nice detailed plan, but hardly understood by the administration, who is supposed to implement

it; and may actually have another vision all together. The iterative and interactive process gives territorial planning a pivotal position in development and poverty reduction.

As a discussion, in a last chapter, recurrent themes and emerging issues which crop up from all the notes are presented.

Abbreviations

AAE	– Avaliação Ambiental Estratégica
CLGRN	– Comité Local de Gestão Comunitária dos Recursos Naturais
CONDES	– Conselho Nacional de Desenvolvimento Sustentável
DNTF	– Direcção Nacional de Terras e Florestas
DUAT	– Direito de Uso e Aproveitamento da Terra
EA	– Ecossistemas Agrícolas
EADS	– Estratégia Ambiental para Desenvolvimento Sustentável
EDR	– Estratégia de Desenvolvimento Rural
ESAN	– Estratégia de Segurança Alimentar e Nutricional
SETSAN	– Secretariado Técnico de Segurança Alimentar e Nutricional
ERVE	– Estratégia para a Revolução Verde
FDC	– Fundação para o Desenvolvimento da Comunidade
FVI	– Formas de Verificação dos Indicadores
GTA	– Grupo de Trabalho Ambiental
IIAM	– Instituto de Investigação Agrária de Moçambique
IAM	– Instituto de Algodão de Moçambique
IAF	– Inquérito aos Agregados Familiares
IUCN	– International Union for Conservation of Nature
MIC	– Ministério de Indústria e Comércio
MICOA	– Ministério para a Coordenação da Acção Ambiental
MINAG	– Ministério da Agricultura
MINE	– Ministério da Energia
MISAU	– Ministério da Saúde
MIREN	– Ministério dos Recursos Minerais e Energia
MITUR	– Ministério do Turismo
MPD	– Ministério da Planificação e Desenvolvimento
ONG	– Organização Não Governamental
PAEI	– Política Agrária e Estratégia de Implementação
PAPA	– Plano de Acção para Produção de Alimentos
PADEA	– Plano Director de Extensão Agrária
PAPCES	– Plano de Acção para Prevenção e Controle de Erosão do Solo
PAPCQD	– Plano de Acção para Prevenção e Controle de Queimadas descontroladas PNAMC
	– Plano nacional para Adaptação as Mudanças Climáticas

PEDSA – Plano Estratégico para de Desenvolvimento do Sector Agrário

PES – Plano Económico e Social

PIB – Produto Interno Bruto

PROAGRI – Programa de Investimento do Sector da Agricultura

PRONEA – Programa Nacional de Extensão Agrária

TEEB - The Economics of Ecosystems and Biodiversity

TIA – Trabalho de Inquérito Agrícola

UEM – Universidade Eduardo Mondlane

UN – Nações Unidas

WBCSD – World Business Council for Sustainable Development

2. Climate Change in Mozambique: risks and necessary responses

Juan Lopez Villar

Abstract

Increased occurrence of droughts, floods and cyclones as a consequence of climate change pose a direct and immediate threat to the development of Mozambique. Currently, there is no overall strategic vision on how to deal with these changes nor is there an adequate legal or institutional framework for coping with these challenges. So far the two institutions that have been most active in relation to climate changes issues have been the *Ministry for the Coordination of Environmental Action* (MICOA) and the National Institute for Disaster Management (INGC). There is however need for clarifying institutional responsibilities particularly for coming to a better coordination and implementation of complex donor funded projects related to climate change. The World Bank has estimated that in the case of no policy changes the impact of climate change on GDP would range, depending on the climate change scenarios, between 3.5% and 13.6% of the GDP. While donors are still investing in large projects in areas sensitive to climate change, at local level there are already some initiatives to mainstream climate change into the elaboration of District Strategic Development plans (*Plano Estratégico de Desenvolvimento Distrital* - PEDD). It is recommended that donors should mainstream climate adaptation into development assistance while the Government of Mozambique should make sure to integrate issues relating to climate change into the next five year plan Action Plan for the Reduction of Absolute Poverty (PARPA). Likewise, the Government should also develop a comprehensive national strategy on climate change.

Introduction

The impacts of climate change are already occurring in Mozambique. There is clear evidence that temperatures have increased and that the character of rainfall has changed appreciably¹. In the February 2010 speech of investiture, Mozambican President Armando Guebuza recognized that climate change is bringing more frequent droughts, floods and cyclones to the country. He lamented the failure of reaching a more comprehensive

¹ INGC. 2009. Study on the Impact of Climate Change on Disaster Risk in Mozambique: Synthesis Report, June.

agreement in Copenhagen and said that in Mozambique “we cannot wait for a global agreement to act, since we are victims of climate change since a long time ago.”² The message was clear from the highest political level in the country that immediate action on climate change is needed.

Climate change brings risks but also new opportunities to Mozambique. This thematic note will focus on the risks presented by climate change and the necessary responses to it (*adaptation* measures). However, it cannot be forgotten that opportunities come along with developing a climate change response (involving both *adaptation* and *mitigation* measures). Adaptation and mitigation initiatives should be fostered by new funds -additional to ODA flow- into programmes and projects to be developed in countries that provide clear plans and strategies to deal with climate change risks. In turn, the implementation of climate change strategies could lead to progress in key development priorities (e.g. better management of water and forest resources and better territorial planning.)

Climate change risk management is a complex, cross cutting field. The main responses to climate change are mitigation and adaptation. Mitigation refers most often to the set of activities intended to reduce green house gases (GHG) emissions or enhance the sinks thereof. This would include more efficient steps in the use fossil fuels for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings, and expanding forests and other “sinks” to remove greater amounts of carbon dioxide from the atmosphere.³ Adaptation refers to the adjustment in natural or human systems in response to actual or expected climate change impacts.⁴ Adaptation would encompass the practical steps to protect countries and communities from the likely disruption and damage that will result from the actual and projected effects of climate change (e.g. the construction of barriers to protect against rising sea levels, or conversion to crops capable of surviving high temperatures and drought).⁵ **Given the country’s vulnerability to the impact of climate change, the adaptation agenda has become a priority to Mozambique.** Thus, this thematic note will focus on the adaptation to climate change agenda. To some extent, the mitigation agenda will be addressed by other thematic notes (e.g. issues around the REDD initiative on mitigation are developed by the forestry sector note).

² Media fax. 2010.

³ See UNFCCC: http://unfccc.int/essential_background/glossary/items/3666.php#M

⁴ Levina, E. And Tirpak, D. 2006. Adaptation to Climate Change: Key terms. OECD. May.

⁵ See UNFCCC: http://unfccc.int/essential_background/feeling_the_heat/items/2911.php

This thematic note aims to provide an overview of the key issues related to climate change risks and management in the country. The first section will describe the main climate change risks Mozambique is facing. The second section will provide an overview of the legal, policy and institutional framework that deal with climate change. The third section will undertake an analysis of relevant challenges and gaps, assessing the costs of damages related to climate change, as well as the costs of adaptation. Adaptation to climate change is a necessity for Mozambique, hence it will give an assessment of how to mainstream climate adaptation at the national, sectoral, project and local levels. The fourth section briefly describes donor support in the field of climate change, and finally a set of recommendations is given to tackle the main challenges and gaps identified in the previous sections.

Climate risks

Climate change is expected to increase the variability of the climate but its overall impacts are still uncertain.⁶ The key impacts of climate change are related to sea level rise, changes in the intensity, timing and spatial distribution of precipitation, changes in temperature and the frequency, intensity, and duration of extreme climate events such as droughts, floods and tropical storms.⁷

Mozambique's current climate variability is defined by its seasonal patterns of precipitation and temperature and the frequency with which abnormal, or "extreme" weather events occur. Mozambique is prone to extreme weather events that can ultimately take the form of drought, flooding and tropical cyclones. **The country ranks third amongst the African countries most exposed to risks from multiple weather-related hazards⁸.** During the past 50 years, the country has suffered from 68 natural disasters, which have killed more than 100,000 people and affected up to 28 million. As much as 25 percent of the population is at risk from natural hazards. The country's economic performance is already highly affected by frequent drought and flood and rainfall variability.

⁶ Climate variability refers to variations in the mean state of climate on all temporal and spatial scales beyond that of individual weather events. Examples of climate variability include extended droughts, floods, and conditions that result from periodic El Niño and La Niña events. Climate change refers to shifts in the mean state of the climate or in its variability, persisting for an extended period (decades or longer). Climate change may be due to natural changes or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

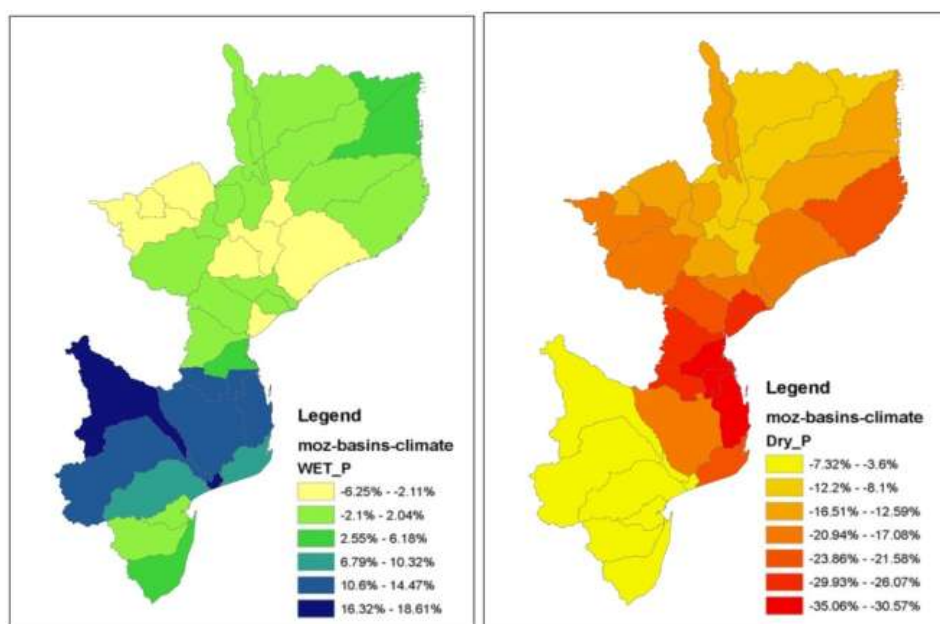
⁷ USAID. 2007. Adapting to climate change variability and change. A guidance manual for development planning.

⁸ 2009 Global Assessment Report on Disaster Risk Reduction, UNISDR, 2009.

Studies of recent historical changes in climate within Mozambique are complicated due to significant regional variations in climate, as well as natural variability on time scales of 10 years.⁹

General circulation models (GCMs) predict a wide range of potential climate scenarios for Mozambique with rainfall suspected to be extremely variable in the future. The 22 GCMs approved by the International Panel for Climate Change (IPCC) predicts potential climate futures anywhere from a decrease of 31 percent of the average rainfall over, to a 16 percent increase in rainfall by 2050 compared to historical averages (see figure 1 below). This means that potential surface water availability is difficult to predict now and likely to be highly variable in the future. In addition to the climate variability, changes in management of the upstream portions of the international basins may further exacerbate the variability and could seriously reduce cross-border flows. Inter-annual variability is predicted to increase dramatically as well which suggests that extreme weather events may become more common which translates into increased frequency of flood and drought periods.

Figure 1: "Wet" and "dry" Model Precipitation for South Eastern Africa and Mozambique



Source: World Bank

Temperature trends have a strong seasonal and spatial dependence in Mozambique as well. The period between October and April is characterized by hot temperatures coinciding with

⁹ INGC. Ibidem.

the rainy season and May through September has much cooler temperatures. Minimum average temperatures during the winter months range from 14°C to 22°C country wide with northern Mozambique recording the lowest temperatures. Maximum temperatures can range between 24°C and 32°C during the summer months with the central coast recording the highest temperatures.

The temperature of Mozambique is estimated to increase between 1°C and 2°C by 2050 and appears to be relatively consistent between all of the IPCC approved GCMs (see figure 3 and 4 above). This coupled with the narrowing of the seasonal and inter-annual variability will greatly increase the potential evapotranspiration leading to more rapid drying and hardening of soils, increased vulnerability of crops, and more damaging bushfires.

With a coastline of about 2.700 km and more than 60% of its population living in coastal areas, Mozambique is highly vulnerable to tropical cyclones and sea level rise. It is predicted that several areas of the country will be affected by sea level rises in the future. In the North, the port of Nacala might need more coastal defences to protect against extreme sea levels and the likely increase in intensity of the most intense tropical cyclones. In the Center, the city and population of Beira are under threat from extreme sea level events (under all 2030 scenarios), and will need to be adequately protected.

An analysis of the hydrology and river basin has concluded that Mozambique and surrounding countries will be facing several significant challenges. These include increased risk of drought and increased frequency of crop failure during the growing season from October to December in the area centered over Zimbabwe and covering parts of Zambia and central Mozambique. This will have a very severe impact on food security, as around 80% of the population is dependent on subsistence agriculture. The river basins in central Mozambique could see increases in magnitude and frequency of flooding. **Demographic pressures will cause further water stress, and current per capita water usage rates will not be sustainable in most basins in southern Mozambique.**¹⁰ Such situations could lead to conflicts related to water access and to the displacement of many communities, creating “climate refugees.”

A land use and food security analysis has listed some conclusions about the impacts of climate change in those sectors.¹¹ **In Mozambique, over 95% of food production is rain-fed, so climate variability exerts a strong impact over agricultural production.** The analysis shows that many vulnerable regions in Mozambique are likely to be negatively affected by climate change. These include the mixed arid and semiarid systems in Gaza and the semiarid systems in parts of northern Inhambane and southern Tete. Areas producing the most important food and cash crops will have to shift as a result of climate change. Overall, areas

¹⁰ INGC. Ibidem

¹¹ INGC. Ibidem

suitable for agriculture will increase in the centre of Northern Mozambique, but areas already prone to impacts of irregular or extreme climate events, such as the South and Central regions, will be most affected by loss of cultivable area. The impact of climate change over the next forty years would lead to a 2-4% decrease in yields of the major crops, with yield decreases especially in the Central region. Adapting crops to such climate conditions will be necessary to continue cultivation in those areas.

The abovementioned impacts are not exhaustive, as the impacts of climate change can also occur in other areas like health, fisheries, tourism, infrastructures etc. Changes in temperature and precipitation can influence maintenance requirements for infrastructure, particularly roads. Rainfall or temperature realizations outside of the band of design tolerances are likely to require more frequent or more expensive maintenance costs. Warming increases the incidence of insect-borne and water-borne diseases, and cases of malaria, cholera and other diseases can increase due to extreme weather events. With coastal areas at risk, the tourism infrastructure and its related activities may be endangered. In conclusion, **the impact of climate change will have serious consequences on the livelihoods of Mozambicans and in the overall development agenda of the country.**

Policy and institutional analysis

Mozambique's legal and policy framework on climate change

Legislation related to climate change is scattered through several dozen primary and secondary legislative pieces mostly related to the fields of environmental and disaster risk management and other sector areas like agriculture and water. **Most of the existing laws do not explicitly incorporate the concept of climate change**, and only a few of the newer policies, such as the Water Policy discussed below, mentions it specifically.¹²

The National Water Policy, revised in 2007, is the first sector-wide policy that provides adequate treatment to the problem of climate change by recognizing that, despite scientific uncertainty, climate change can bring “an increase of the frequency of droughts and rains, obliging Mozambique to make an exhaustive planning in order to be ready to tackle those extreme events.”¹³ The National Policy for Disaster Management does not yet make a clear and explicit reference to the problem of climate change; however, in terms of conceptualization, causes and effects, this instrument plays an important role. It recognizes

¹² INGC. 2009. Main Report: INGC Climate Change Report: Study on the impact of climate change on disaster risk in Mozambique. (Asante et al.)

¹³ IUCN. Ibidem.

the propensity of Mozambique to the cyclic occurrence of disasters such as droughts, floods, cyclones, pests, and epidemics and aims to put in place a legal framework focused on a more proactive disaster prevention and reversing the traditional more reactive trend of disaster response and recovery.

Climate change was barely mentioned in the Five Year Plan (2005-2009) of the Government and also in the Action Plan for Absolute Poverty Reduction (PARPA II). The Five Year Plan recognized that Mozambique is vulnerable to disasters originating from climatic anomalies in its section related to reduction of the impact of natural disasters.¹⁴ The PARPA II did not devote a specific section to climate change, but similarly as to the Five Year plan it makes a reference to it in its disaster section, which is an important crosscutting issue identified in the Government policy:

“Natural disasters resulting from climate change and seismic activities can worsen the situation of absolute poverty, due to the destructive impact to the human dimension and socioeconomic infrastructure. The geographical location of Mozambique makes the country vulnerable to climatic anomalies.”¹⁵

Both economic and planning instruments therefore recognize that climate change can be an important impediment to the development of the country and could worsen the situation of poverty of Mozambicans.

The new Government’s Five Year Plan (2010-2014) improves the treatment to climate change related issues in comparison to the previous plan commented above.¹⁶ The draft proposal for the Five Year Plan (2010-2014) contains several specific objectives and priority actions related to climate change, not only in the disaster management chapter. There are two priority actions included into sectors within the Economic development pillar: in the fisheries section and in the transport and communication. In the fisheries section, the Plan calls for a “reinforcement of the monitoring capacity of climate change, taking into account its impact in the exploitation of fishery resources”. In the transport and communications section, there is a subsection on meteorology where a priority action is established to “create a database of climate variability to monitor climate change”.¹⁷

¹⁴ Programa Quinquenal do Governo para 2005-2009. Boletim da Republica, 11 Maio 2005.

¹⁵ Plano de acção para a redução da pobreza absoluta 2006-2009. Versão final aprovada pelo Conselho de Ministros aos 2 de Maio de 2006.

¹⁶ Governo de Moçambique. 2010. Proposta do Programa Quinquenal do Governo para 2010-2014.

¹⁷ Idem

In the chapter of horizontal issues, the environmental section includes references to climate change in relation to the need to reduce vulnerability of communities. In the environmental section climate change is granted the first strategic objective: “to promote environmental quality, as well as policies and strategies of mitigation and adaptation to climate change”. In the section related to the reduction of the impact of vulnerabilities “strengthen the capacity of adaptation of farmers to climate change” is a priority for action.¹⁸

Table 1. Mozambique legal and policy framework related to climate change

- The Political Constitution of the Republic, 2004 - Law 18/97 of National Defense and Armed Forces, 1997 - The Environmental Law 20/97, 1997 - Presidential Decree n. 2/94 establishing the Ministry for the Coordination of Environmental Action (MICOA), 1994 - The National Environment Policy, 1995 - The National Policy for Disaster Management, 1999 - Presidential Decree 5/99 creating the Coordinating Council for Disaster Management, 1999 - Decree 38/99 establishing the National Institute of Disaster Management (INGC), 1999 - Decree 52/2007 approving the Organic Statute of INGC - The Forestry and Wildlife Law, 1999 - Law of Territorial Planning, 2007 - The National Land Policy, 1995 - The Erosion and Uncontrolled Fires Prevention and Control Action Plan, 2007 - The Land Law, 1997 - The Industrial Strategy, 1997 - The Energy Policy, 1998 - The Mine Law, 2002 - The Tourism Law, 2004 - The Oil Law, 2001 - The Urban Environment Management Action Plan (in preparation) - The Coastal Zone Integrated Management Strategy (in preparation) - The Pollution Prevention and Coastal and Marine Environment Protection Regulation, 2006 - The National Water Policy, 1995, revised in 2007 - The National Water Resources Management Strategy, 2007 - The Industrial Policy and Strategy, 1997 - Action Plan for Absolute Poverty Reduction (PARPA), 2006-2009
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Source: Based on INGC, 2009 and IUCN, 2009

Despite references to climate change in the current policy and legal framework, those are insufficient to give an adequate treatment to the issue and its importance for the

¹⁸ Idem

development agenda of the country. **The current legal and policy framework does not have an overall strategic vision on climate change that provides clarity about the objectives, roles and responsibilities to address the issue.** Acknowledging this deficit, an International Union for Nature Conservancy (IUCN) analysis of the legal framework on climate change in Mozambique concludes that “there is no tool addressing this specific issue (climate change), defining the vision, strategy, objectives, duties and functions of the different actors, monitoring mechanisms and other aspects.”¹⁹ This study analyzes how climate change is approached in the legal and policy framework in the country and how it is treated at an institutional level. The IUCN report aims to identify, analyze and understand the political-strategic, legal and institutional frameworks on climate change with the ultimate objective of providing a set of recommendations that would enable a better, more complete and integrated handling of this issue in the Mozambican legal system.

In the light of this situation, the IUCN and the INGC report previously cited concur that there is a need for a revision of both the existing legal framework and the secondary legislation.²⁰ **It is crucial that the legal framework is updated so adaptation and mitigation to climate change is incorporated and the institutional roles and responsibilities are clearly defined.** It is also highly recommended that the Government designs **an integrated strategy that addresses all the key components of climate change policy** including what needs to be done by the various sectors, namely: environment, fisheries, land/agriculture, forestry and flora, water, energy, land planning, etc.

The National Adaptation Programme of Action (NAPA) is the first policy document specifically addressing adaptation in Mozambique and politically endorsed at the level Council of Ministers in 2007. The NAPA lays the foundations for a multi-stakeholder adaptation agenda with four priorities: (i) strengthening of the early warning system; (ii) strengthening the capacities of agricultural producers to cope with climate change; (iii) reducing climate change impacts in coastal zones; and (iv) managing water resources under climate change. Four projects have been drafted/elaborated addressing each of the priority actions, with a budget of US\$ 9,200,000. The NAPA projects as such have not received any funding yet, but some of the proposed actions will be implemented in other programmes and projects under formulation. For instance, MICOA has applied to LDC-F funding to implement a programme to reduce the vulnerability of coastal communities. It has also been proposed that the Pilot Programme Climate Resilience (PPCR) Mozambique, to be implemented by the Government of Mozambique with the collaboration of the African Development Bank (AfDB) Group, the World Bank Group and other development partners,

¹⁹ IUCN. 2009. Analysis of the legal and institutional framework on climate change in Mozambique. February.

invest in the four NAPA priorities in three different pilot zones: the Zambezi basin, where the main risk is flood; the Limpopo watershed, where the main risk is drought; and the coastal town of Beira and its corridor, where the main risk is cyclones. **The process that led to the drafting and formulation of the NAPA was extremely valuable**, as it has put climate change on the development agenda and has attracted the high-level attention of stakeholders. **However, as an “Action Plan” might not have been as effective as it was initially expected.** The NAPA is also now somewhat outdated given the quick developments of the adaptation to climate change agenda in the last years.

Although there is no comprehensive national strategy to deal with climate change that covers all key issues (i.e. mitigation, adaptation) and all relevant sectors, the Government has already initiated a discussion about the possibility of preparing a national strategic plan specifically devoted to climate change.²¹ MICOA public officials have announced in public *fora* the intention to revisit the NAPA. In addition, a number of initiatives have led to the development of several strategies to address particular angles of the climate change issues. The National Institute for Disaster Management (INGC) is in the process of elaborating a national strategy of climate change from a disaster risk reduction perspective. It is expected that the strategy will produce a more comprehensive multisectoral climate risk vulnerability assessment that would lay out a set of recommendations to tackle the challenges that climate change presents to the country’s development.

At the request of Ministry for Coordination of the Environmental Action (MICOA), and with the support of the United Nations Development Fund for Women (UNIFEM) and IUCN, a Strategy on Gender and Climate Change is currently being elaborated. The overarching goal of the latter strategy is to incorporate gender mainstreaming in all areas of climate change activity undertaken by the Mozambican government and its partners, and to create an effective institutional basis for doing so. The draft strategy is currently in the process of being discussed at the Ministerial level, and one of its proposals is to establish an institutionalized gender and climate change unit (or “gender and environment”) within MICOA.²² This draft also proposes the establishment of an intersectoral taskforce on gender and climate change to coordinate climate change activities across sectors, including the external donor sector.

²⁰ INGC. 2009; IUCN. 2009. Ibidem.

²¹ Communication from Dr. Antonio Saide, Energy Ministry at the Energy Sector Working Group meeting on 26th March 2010.

²² Personal communication with Lorena Aguilar of IUCN on the 2nd of March 2010.

Institutional response to Climate Change

Climate change has not yet been addressed by the relevant institutions in a systematic, consistent, coherent or coordinated manner. As a consequence, from the Government's side, there are no clear enough roles and responsibilities defined in this area. While the current legal framework provides for inter-institutional coordination, **there is no institutional culture that focuses on adaptation to climate change as a crosscutting issue**, covering both the public and private sector.²³

At present in Mozambique, climate change has been more prominently addressed by the lead institutions in charge of the environmental and the disaster management portfolios: the Ministry for Coordination of Environmental Action (MICOA) and the Institute for Disaster Risk Management (INGC) under the Ministry for State Administration (MAE).

MICOA- has the overall coordination mandate for all environmental issues. MICOA is in charge of coordination, not implementation. It is not within its mandate to implement activities, rather to coordinate the environmental activities of other Line Ministries.²⁴ The National Directorate of Environmental Management (DNGA) is the key body within MICOA to deal with climate change. Some of its tasks are, inter-alia, the promotion of pilot projects of reforestation and fighting drought and desertification, as well as providing technical support to implement the United Nations Framework Convention on Climate Change (UNFCCC).

Mozambique became a party to the UNFCCC in 1995. The UNFCCC has been ratified by more than 190 countries and contains obligations for all countries. MICOA serves as the focal point for the UNFCCC. Within the framework of its international obligations under the UNFCCC, MICOA prepared a first communication on climate change in 2003,²⁵ and a National Adaptation Programme of Action in 2007.²⁶

The first communication recognizes that Mozambique, as a country with weak economic development and low institutional and reactive capacity, faces severe threats from the impact of climate change. It contains a national inventory of greenhouse gases emitted in

²³ INGC. 2009.

²⁴ Cabral & Francisco. 2008. Instituições, despesa publica e o papel dos parceiros do desenvolvimento no sector ambiental. Estudo do caso de Moçambique. Relatório Final. ODI.

²⁵ Government of Mozambique. 2003. Mozambique initial national communication to the UNFCCC. April.

²⁶ MICOA. 2007. National Adaptation Programme of Action. December.

Mozambique and lists a series of proposed measures to mitigate the emissions of GHG and the institutions involved. With regard to adaptation, it lists specific adaptation measures to tackle three main impacts related to flooding of low coastal areas and aggravation of coastal erosion; reduction of fresh water supplies; and reduction in agricultural production. At present the country is in the process of elaborating the second communication, under MICOA's leadership.²⁷

During 2009, MICOA promoted coping with drought and adaptation measures in semiarid zones of Mozambique involving the sectors of agriculture, water, forestry, meteorology, INGC, institutions from the government at the provincial and district level, academic institutions, organizations from civil society and cooperation partners. Some of the activities conducted included the establishment of systems to capture for rainwater harvesting, undertaking studies about expansion of practices of conservation agriculture, and the creation of water holes.²⁸

MICOA acts as a secretary body for the National Council for Sustainable Development (CONDES). CONDES is meant to ensure effective coordination and integration of the environmental principles and activities in the country's development process, and hence could play a more prominent role in the further development of the institutional framework to deal with climate change. The council functions as a consultative body to the Council of Ministers and a forum to hear public opinion on environmental issues. CONDES is chaired by the Prime Minister (Chairperson), and composed by the Minister of Environment (Vice-Chairperson), and the Ministers of Planning and Development, Finance, Transport and Communication, Agriculture, Public Works and Housing, Industry and Commerce, Mineral Resources, Energy, Tourism and Fisheries. Taking into consideration the duties and the structure, **CONDES could assume a prominent role with regard to climate change issues, in order to establish a common and integrated governmental approach to the topic.**²⁹

INGC - The National Institute for Disaster Management is a public institution with administrative autonomy, which is focused on prevention and mitigation of natural disasters and reports to the Ministry of State Administration (MAE). The INGC is involved in climate change issues from the perspective of protection, prevention and mitigation of natural disasters. The Institute has elaborated a groundbreaking report on the impacts of climate change in Mozambique called "Study on the Impacts of Climate Change for Disaster Risk

²⁷ Communication with Telma Manjate, MICOA focal point for UNFCCC.

²⁸ Draft note Environment Sector for the Joint Review 2009, version of 23rd of March 2010.

²⁹ IUCN. Ibidem

Management,” published in 2009 (under the so-called “INGC Phase I”). INGC study set the ground for further research in the area of impacts of climate change in the country development path, but most importantly, it has triggered off a national debate about the need for Government action and adequate responses in the light of the study compelling findings and conclusions.

At present, INGC is starting to implement Phase II of the project. The objectives of the second phase include: formulation of a national strategy to respond to climate change; development of a systematic focus on climate change for sector policies; revision of the legal framework and secondary legislation to adjust fiscal policies; engagement of the private sector in adaptation to climate change (through provision of guidelines for mandatory adaptation standards and requirements for investors); and raising awareness at national, provincial and district levels.

Within the area of disaster management there is another council that can also play an important role in dealing with climate change related aspects. The Disaster Management Coordinating Council (CCGC) is chaired by the Prime Minister and is composed of the Minister of State Administration (Vice-Chairperson), the Minister of Foreign Affairs and Cooperation, the Minister of Agriculture, the Minister of Environment, the Minister of Women and Social Action, the Minister of Defence, the Minister of Industry and Commerce, the Minister of Public Works and Housing, the Minister of Planning and Development, the Minister of Finance, the Minister of Health, and the Minister of Transport and Communications. This body is an appropriate forum to promote institutional coordination amongst the diverse entities having a mandate in the field of disaster management, including climate change and its impacts.³⁰

The role of other Ministries

The role of Line Ministries is crucial as climate change will impact a broad range of sectors including health, food security, infrastructure, fisheries, transport, decentralization, etc.

None of the Line Ministries have yet adopted a comprehensive and specific strategy to deal with climate change in their respective sectors; however, many of them are undertaking climate change related activities and implementing climate change adaptation projects in their portfolios. This section will provide an overview of the role of key sectors in climate change but is not meant to describe a comprehensive institutional analysis of all the relevant sectors, a task that is out of the scope of the present note.

³⁰ IUCN. Ibidem.

Agriculture is a key sector for Mozambique, where around 80% of the population is dependent on subsistence agriculture and where agriculture contributes to 30% of the Gross Domestic Product. One of the main objectives of the agriculture policy of the Government is to contribute to poverty alleviation poverty and to foster food security. The Technical Secretariat for Food Security and Nutrition (SETSAN), which includes representatives from public institutions and NGOs, is an important institution under the supervision of Ministry of Agriculture in charge of promoting food security and nutrition. The Ministry of Agriculture and Rural Development does not have any specific policy on climate change but is implementing numerous measures of adaptation to climate change. Some of those measures include, for instance, tackling drought through multiplication of sweet potato branches, cassava cuttings and material tolerant to drought, as well as intensive use of water resources through the construction and rehabilitation of irrigation systems dams and water sources.

The Water Sector is very relevant to climate change. The National Directorate of Water (DNA) under the Ministry of Public Works and Housing is “in charge of the integrated and strategic management of water resources, provision of drinking water and sanitation to the populations.”³¹ Among other duties, the DNA is in charge of the permanent inventory on water resources at a national and regional level, a function that is very important in the context of current climate change since it is fundamental for decision making purposes in relation to water resources management. The information gathered by the DNA is crucial in the light of increasing water shortages and other possible water conflicts.³² The DNA is also responsible for monitoring and issuing early warning for floods.

The fisheries sector is prone to be affected significantly by the impacts of climate change. The National Research Institute of Fisheries (IIP) under the Ministry of Fisheries is currently producing a database of the marine environment that can be very useful to identify adaptation activities related to fisheries in the future. Furthermore, the Ministry of Fisheries is currently drafting a National Plan of Fisheries in which climate change is reported to have been identified as a priority.³³

The National Meteorology Institute (INAM) under the Ministry of Transport and Communications is a very relevant institution to deal with climate change as it is responsible for weather forecast. It is in charge of issuing the rainfall forecast and early warning for

³¹ Article 1st of the DNA Rule of Procedures, approved by the Ministerial Diploma no. 78/2001, of 23 May.

³² IUCN. Ibidem.

³³ Communication from representative of IIP attending the African Adaptation Programme Workshop of UNDP in March 2010.

cyclones and storms. It has meteorological stations in all provinces and is also responsible for the national climate database and modelling.

There are in total more than a dozen other institutions that somehow deal with climate change related issues as part of their mandate however, in general the institutional capacity of the Line Ministries to deal with climate risks is inadequate. **Line Ministries do not yet fully recognize the climate change risk imposed to their sectors, do not yet realize the adaptation costs and have not yet developed contingency plans for adaptation nor climate-proofed their strategies.** A stakeholders consultation carried out in November 2008 by INGC at the level of heads of ministerial departments and at the technical level revealed a general lack of understanding of climate change, lack of understanding of their ministries' role and lack of thought about adaptation measures of relevance for their ministries.³⁴ The reasoning behind the latter is that as long as the impacts of climate change on Mozambique were unknown it was not possible to identify ways in which their ministries could start preparing for climate change.

Other key ministries that can play a crucial role in planning and financing for climate change adaptation, including the **Ministry of Planning and Development (MPD) and the Ministry of Finance, have no experience in mainstreaming climate change issues in government planning at the national and at the decentralized levels.** This situation can improve in the near future as the Africa Adaptation Programme (convened by UNDP) and Pilot Programme on Climate Resilience (implemented by the World Bank) both include training seminars on "budget and planning mainstreaming for climate change" mainly for representatives of the Ministry for Planning and Development and the Ministry of Finance. This type of seminar will help MPD discuss investment plans with Line Ministries on climate change.

Clear leadership, management, planning and budgeting skills amongst the technical ministries is needed in order to integrate climate risk related recommendations in their planning, budgeting and implementation activities.

The need for strengthening the institutional structure over the climate change portfolio

At present, there is no clear leadership from the Government's side while the climate change portfolio expands between the institutions dealing with the environmental and the disaster management. INGC has been very active on climate risk management related issues. MICOA is also very active on climate change issues and is involved in adaptation and mitigation initiatives in the country. An important challenge arising from this situation is that there is a potential overlap in policy coordination between the two, particularly in relation to climate change adaptation activities. Without institutional clarity and effective coordination

³⁴ INGC. 2009. Ibidem.

it will be very challenging to create a solid institutional structure that could effectively channel the large-scale and complex investments flowing into the country, and strategically direct climate change related initiatives upcoming from the donor community.

Various programmes are taking place right now in Mozambique to reinforce the institutional capacity of key institutions. **The Africa Adaptation Programme (AAP)** is a US\$ 3 million project convened by UNDP and funded by Japan that aims, inter alia, to improve the institutional structures to deal with climate change adaptation. Its first workshop took place on the 4th of March 2010 in Maputo, and one of the first objectives of the project is to recruit a Chief Technical Adviser on climate change issues that would assist MICOA in this area. The core objective of the AAP is to support the Government in the consolidation of an institutional framework to deal with climate change.

Challenges and gaps

Mozambique's development path is facing difficult challenges in light of climate risks. The cost of inaction over the predicted impacts of climate change can be very high, so mainstreaming climate change adaptation at different levels of development planning is vital.

The need for adaptation to climate change: the cost of inaction for Mozambique

All countries need to adapt to climate change. Even if global emissions of greenhouse gases would be significantly reduced and concentrations stabilized at 450 parts per million (ppm) of equivalent carbon dioxide (CO₂), the annual global mean average temperature would still be expected to be 2°C above pre-industrial levels by the middle of the century. A 2°C temperature increase will be accompanied by a higher incidence of intense rainfall events and a greater frequency and intensity of droughts, floods, heat waves, and other extreme weather events. Societies have a long record of managing the impacts of weather and climate related events; nevertheless, additional adaptation measures will be required in the years to come regardless of the scale of mitigation undertaken in the forthcoming decades. Not taking measures to adapt to climate change could have a great impact on the social and economic development of a country. The estimated overall impact of climate change on GDP for Mozambique would be substantial, averaging 3.5% of GDP even in the most conservative climate change models and as high as 13.6% in the most pessimistic scenarios.³⁵ In a report that will be released during 2010, the World Bank estimates that **if there are no public**

³⁵ World Bank. 2010. EACC country case study: Mozambique.

policy changes in Mozambique, the worst scenario of the impacts of climate change would result in a net present value of damages of nearly US\$ 7 billion for the period 2011 to 2050. This would be equivalent to an annual payment of US\$ 390 million.³⁶

Estimating the cost of adaptation

The global cost of adaptation to climate change is difficult to estimate, primarily due to the fact that climate change adaptation measures will be widespread and heterogeneous.³⁷ Nevertheless, it is clear that a large amount of new and additional investment and financial flows will be needed to address climate change adaptation. Several studies give different figures of the estimates of adaptation costs for developing countries that vary from US\$ 4 to over \$100 billion per year.³⁸ More specifically for Africa, the Intergovernmental Panel on Climate Change (IPCC) estimates that towards the end of the 21st century the cost of adaptation to the projected sea level rise in low-lying coastal areas with large populations in Africa could amount to at least 5 to 10% of Gross Domestic Product.³⁹ At present there are no comprehensive figures that estimate the costs of adaptation for Mozambique, but it is expected that the new World Bank study to be completed this year will include concrete figures on this particular topic.

Mainstreaming climate change adaptation into development planning

The OECD Guidelines - The Organisation for Economic Cooperation and Development (OECD) has published policy guidelines on integrating climate change adaptation into development cooperation. The guidelines led to the creation of the concept of a *climate lens*, an analytical tool to examine a strategy, policy, plan, programme or regulation. Using the lens involves examining the vulnerability of climate risks in such elements and sees the extent to which such risks have been taken into consideration in the formulation of a certain measure. It also involves assessing whether such measures can increase vulnerability or miss important opportunities arising from climate change. The lens is applied to new measures, but also can be used to evaluate pre-existing measures looking for needed amendments to

³⁶ World Bank. 2010. EACC country case study: Mozambique.

³⁷ UNFCCC. 2007. Investment and financial flows to address climate change.

³⁸ IIED. 2009. Assessing the costs of adaptation to climate change.

³⁹ IPCC. 2007. Summary for policy-makers

address climate risks and opportunities. Four levels for mainstreaming climate change adaptation are identified: the national, sectoral, project and local level.⁴⁰

In the following sections, the OECD guidelines will be contextualized in the Mozambican situation to examine the state of integration of climate change adaptation in the country, and steps forward will be recommended.

Integrating adaptation to climate change at the national level

Introduction

Integrating climate change adaptation at the national level is critical as the governments set the legislation and regulations and create the incentives that will address climate risks and opportunities. It is also at this level that the overall policy framework that will guide lower levels of the Government is provided. From the perspective of the international donors, the national level is the main interface with partner countries. Policy dialogue takes place at the national level, as well as budget support. Budget support, which is an aid modality largely supported by donors in Mozambique, offers important opportunities for promoting adaptation to climate change.

Integrating climate change adaptation at national level: international experience

In the majority of developing countries there has been little integration of adaptation to climate change into national policies. However, there is already some practice of countries integrating climate change concerns into their national policies or development strategies and poverty reduction strategies.

Mexico for example, has solidly included climate change adaptation in its National Plan for Development (PND) 2007-2012, which is the basic planning instrument of the Federal Government every six years.⁴¹ The PND acknowledges that climate change is an environmental and development problem, and some State Ministries integrated adaptation considerations and climate change scenarios in their work agendas and sector wide programmes. One of the objectives in the PND is to promote adaptation measures in the country development plans. Four strategies are presented: a) design and development of

⁴⁰ OECD. 2009. Policy Guidance on integrating climate change adaptation into development cooperation. April.

⁴¹ México. 2009. Cuarta Comunicación Nacional ante la Convención marco de las Naciones Unidas sobre el Cambio Climático.

national capacities of adaptation, b) development of regional climate scenarios for Mexico, c) evaluation of the impacts, vulnerability and adaptation of climate change in the different socioeconomic sectors and ecological systems and finally d) disseminating information about impacts, vulnerability and climate change adaptation measures. Mexico also developed a specific National Strategy for Climate Change presented by the Mexican President in 2007.

The Mexican example shows the relevance of to integrating considerations of adaptation within various stages of the policy cycle at the national level. Key processes at this stage include the national development strategies as well as national policies and poverty reduction strategies. Such documents show the government's policy priorities and constitute an important opportunity to place adaptation issues high in the government's agenda.

A first important mainstreaming exercise implies clearly recognising climate change risks and the need for adaptation to climate change within national policies. If these national policies and strategies approach adaptation to climate change as a development priority, then sectoral plans and sub-national level policies will have to integrate those concerns.⁴² In the case of Mozambique, climate change at present is not a priority in the main national development strategies and poverty reduction strategies. The situation could be reversed though if the final approval of the Five Year Plan (2010-2014) and the next poverty reduction and operational plan mainstreamed adaptation in a more consistent manner.

Mainstreaming climate change adaptation at the sector and project level

As seen in previous sections, at the sector level several Ministries are undertaking adaptation measures to climate change mostly related to their business-as-usual agendas, but in general there is not sector wide assessment of climate related risks and vulnerabilities. **More awareness raising and capacity development to address the climate risks faced by each sector would be required among sector-specific planners and their development partners.** Planners also need to receive better information on the actual impacts, the predicted ones, their costs and benefits of adaptation actions so they can factor such information into their decision-making. Through sector-level budget support and sector-wide approaches, development partners can support many of the above actions that can help integrate adaptation measures into sector specific strategies, plans and programmes.

To date, few project-based interventions aiming at adaptation, or integrating climate change coping measures, have been implemented in Mozambique. A recent World Bank study indicated that approximately US\$ 248 million of 2006 Overseas Development Assistance

⁴² OECD Guidelines. Ibidem.

(ODA) in Mozambique is invested in regions highly exposed to severe climate impacts, yet hardly any of the projects take into account either current or future climate change scenarios.⁴³ Virtually none of the ongoing ‘business as usual’ development projects incorporate dealing with the increasing risks of climate change. Apart from a few stand-alone projects in the agricultural and infrastructural sectors, current **climate risks have not yet been systematically integrated into the design of ODA projects**.⁴⁴ The project level is critical for integrating adaptation measures and a number of interventions, like incorporating considerations of climate risks and adaptation throughout the project cycle, developing pilots and implementing climate risk assessments, would be necessary.

There are several tools available that help mainstream adaptation at the project level.⁴⁵ For example:

- The **Community-Based Risk Screening Tool – Adaptation and Livelihoods (CRISTAL)** is a computer-based decision support tool that aims to help project designers and managers to integrate risk reduction and climate change into community-level projects. The tool has three objectives: first, to provide an understanding of how local livelihoods are faced with a reality increasingly compounded by the negative effects of climate variability and change; second, to assess how a project may impact on livelihood resources essential for coping, which are vulnerable to climate risks; and third, to modify project elements according to identified risks, in order to reinforce the project’s potential impact on the livelihood resources central to adaptive capacity.⁴⁶
- **ADAPT** is a screening tool developed by the World Bank. It is a software-based, multi-sectoral tool used to screen development projects for areas potentially sensitive to climate change. The tool brings together climate databases and expert assessments on the threats and opportunities arising from climate change, and focuses particularly on agriculture, biodiversity, rural infrastructure and coastal zones.
- **Opportunities and Risks from Climate Change and Disasters (ORCHID)** is a process and risk-based methodology, developed by the Institute of Development Studies with the support of DFID, that aims to enable a more systematic consideration of climate risks in designing and implementing development projects and programmes. The tool brings

⁴³ Sietz et al. 2008. Mainstreaming climate adaptation into development assistance in Mozambique: institutional barriers and opportunities. World Bank Policy research Working Paper 4711.

⁴⁴ Sietz et al. Ibidem.

⁴⁵ UNDP. 2010. Screening tools and guidelines to support the mainstreaming of climate change adaptation into development assistance – A stocktaking report.

⁴⁶ See <http://www.cristaltool.org/>

together issues related to adaptation to future climate change and disaster risk reduction. It is addressed to the donor community, project planners and managers.⁴⁷

Mainstreaming climate change adaptation at the local level: Integrating climate change at the district level in Mozambique

Mainstreaming climate change adaptation at the local level is very important as the impacts of climate change are manifested locally and directly affect local livelihood activities. Such mainstreaming is in its infancy; however, some experiences have already started in Mozambique at this level. The UN Joint Programme on Environmental Mainstreaming and Adaptation to Climate Change is at present assisting the Province of Gaza and the District of Chicualacuala in mainstreaming climate change adaptation into the District Strategic Development Plan (PEDD).⁴⁸ The PEDD is an instrument of management of the district government that defines the main economic and social objectives, indicating at the same time a precise list of actions that the district must do in order to achieve the objectives, as well as indicating the budgetary needs to achieve them.

The elaboration of the PEDD is a participatory process and the project in Chicualacuala District has involved:

1. Training the Provincial and District technical team on climate change and adaptation;
2. Direct consultations at the community level about the impact of climate change on their livelihood resources, their coping strategies, the enabling factors and constraints to adapt to climate change and helping them to identify the sustainable adaptation strategies;
3. Empowering the District Technical Team (supported by the Provincial Planning Team) to address climate change adaptation measures and integrate coping strategies identified in the District into development plans; and
4. Present the conclusions and recommendations ensuing the process to the District Consultative Council for endorsement and inclusion into the PEDD.

The current project is not completed as the PEDD of Chicualacuala is still being finalized by the two teams (District and Provincial planning teams), but some methodological guidelines and a set of recommendations from the experience in Chicualacuala is under production. Led by UNDP, this approach to integrate climate change adaptation into PEDD is expected to be replicated in two more provinces of Mozambique.

⁴⁷ IDS. 2007. Screening climate risks to development cooperation. IDS in Focus. Issue 02. November.

⁴⁸ UNJP. 2010. Inclusão de Adaptação as Mudanças climáticas nos PEDD's. Guião Metodológico – Proposta surgida da experiência em Chicualacuala. Marco.

Financing climate change adaptation activities

Current initiatives ongoing in Mozambique

Several initiatives have been set in Mozambique to support the Government in its efforts to address the impacts of climate change over the development path in a strategic manner. Some of those are the following the Pilot Programme on Climate Resilience (PPCR), the Africa Adaptation Programme (AAP), and the Least Developed Country Fund.

PPCR - Mozambique has been selected as one of three African countries for the implementation of the Pilot Program on Climate Resilience. The Pilot Program for Climate Resilience (PPCR) is the first Program under the Strategic Climate Fund (SCF) of the Climate Investment Funds (CIF). The objective of the PPCR is to provide incentives for scaled-up action and transformational change through pilot projects that demonstrate how to integrate climate risk and resilience into core development planning, while complementing other ongoing development activities in a given country. PPCR programs will be country-led, and will enable pilot countries to transform country-specific plans and investment programs to address climate risks and vulnerabilities, building on National Adaptation Programs of Action (NAPAs) and other relevant country studies and strategies.

The PPCR will be implemented in two phases: Phase I for the Formulation of Strategic Program for Climate Resilience and Phase II to integrate Climate Resilience into Core Development Plans, Budgets and Investments. The preparatory process includes a joint mission to assist the country in putting in place a clear process for Phase I (Formulating a Strategic Program for Climate Resilience). The mission will be led by the Ministry Planning and Development and the Ministry of Coordination of Environmental Affairs in order to ensure a country-driven process. The PPCR funds for Mozambique are estimated around 100 million \$US.

AAP - In March 2010, the Africa Adaptation Programme for Mozambique was launched in Maputo, with the endorsement of the Ministry for the Coordination of Environmental Affairs, the Ministry of State Administration and the Ministry of Foreign Affairs. Funded by Japan this programme will avail US\$ 3 million to foster the Government of Mozambique's institutional response to the challenges posed to the country's development by climate change. The project is now in its early implementation phase, with Annual Workplans being negotiated with several Government institutions. The main objective of the AAP is to contribute to the efforts of the Government in mainstreaming climate change adaptation mechanisms in policy, development and investment frameworks. Jointly implemented by several national institutions, the AAP will be articulated around five expected outputs: (a)

Dynamic, long-term planning mechanisms to cope with the inherent uncertainties of climate change in Mozambique strengthened; (b) Leadership and institutional frameworks to manage climate change risks and opportunities harmonized, coordinated and strengthened; (c) Climate-resilient policies and measures implemented in priority sectors and through demonstration projects; (d) Financing options to meet national adaptation costs expanded at the provincial and national level, and integrated into sectors; (e) Knowledge on adjusting national development processes to fully incorporate climate change risks and opportunities generated and shared, including through an advocacy strategy.⁴⁹

The Least Developed Country Fund - The LDCF, managed by the Global Environment Facility (GEF), was initiated by the UNFCCC as an instrument to identify, prioritize and begin to address urgent and immediate climate change adaptation needs within Least Developed Countries (LDC).

With technical support provided by UNDP, the Government of Mozambique has requested LDCF resources, currently estimated at \$5M (including for preparatory actions, implementation and oversight support) for a project targeting at the improvement of protection to vulnerable coastal communities, in alignment with priorities identified in the country's NAPA.

Financing climate change adaptation through new and additional funds

New and additional funding has been pledged by developed countries to assist developing countries in climate change mitigation and adaptation activities. The Conference of the Parties of the UNFCCC at its fifteen meeting in Copenhagen in December 2009 took note of the 'Copenhagen Accord', a political agreement on certain elements related to mitigation, adaptation, financing and technology transfer. The two-and-a-half page accord has been endorsed by more than 80 countries, and 30 non Annex I countries⁵⁰ have submitted their list of nationally appropriate mitigation actions. As of the 25th of March 2010, Mozambique has not yet formally associated to the accord, but the Ministry of Environment has already

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⁵⁰ Annex I countries are the 36 industrialised countries and Economies in Transition listed in Annex I of the UNFCCC. These countries have taken emission caps – regulatory devices that set a ceiling on emissions that can be released into the atmosphere from any one country within a designated timeframe. All countries that are not listed as Annex I parties, labelled “Non-Annex I Countries”, do not have binding emission reduction targets for the first period (2008-2012) of the Kyoto Protocol.

announced that a formal letter of association has been sent to the Ministry of Foreign Affairs in March.⁵¹

The Copenhagen Accord calls for a collective commitment by developed countries through new and additional resources of US\$ 30 billion for the period 2010-2012, with balanced allocation between adaptation and mitigation.⁵² For mitigation purposes, developed countries commit to a goal of jointly mobilizing US\$ 100 billion a year by 2020 to address the needs of developing countries. For adaptation, new multilateral funding would be delivered through “effective and efficient funds agreements,” and a new fund called the “Copenhagen Green Climate Fund” would be in charge of a portion of such funding. As it is a political accord not a legally binding agreement adopted by the parties, there are many questions that need to be addressed. “New and additional” funding needs to be defined, as well as the shape it will adopt (grants or loans), and which agencies will be making the key decisions.⁵³ Taking into account the pledge of immediate funding of US\$ 10 billion per year from 2010 until 2012, there is still a lot to be clarified in terms of how this will work in practice. In the meantime, non Annex I parties are already calling on developed countries to honour their pledge for immediate implementation of the US\$ 10 billion during 2010 as a way of “building confidence and trust in the multilateral climate change negotiations” on the road to COP 16 in Mexico at the end of this year, where a legally binding outcome is expected to be adopted.

Furthermore, the African Committee of Tenth, created during the meeting of African Finance Ministers and Central Bank Governors in 2008, met in February 2010 and welcomed the intention of new and additional funding for Africa, including for adaptation and deforestation, and called for a significant part of those additional funds to be channelled through the African Development Bank, consistent with the African position presented at the summit in Copenhagen by the Ethiopian Prime Minister Meles Zenawi.⁵⁴ The group also welcomed the formation of the High Level Advisory Group⁵⁵ to mobilise new and innovative resources for climate change and committed for the part of African countries to build up

⁵¹ Communication by Telma Manjate from MICOA and focal point of UNFCCC at the meeting of the Environmental Group hold at the Hotel Girassol, Maputo on the 23rd of March.

⁵² UNDP. 2009. Copenhagen UNFCCC Negotiations. Bureau for Development Policy environment and Energy group.

⁵³ IIED. 2010. Copenhagen’s climate finance promise: six key questions. Briefing, February. <http://www.iied.org/pubs/pdfs/17071IIED.pdf>

⁵⁴ African Development Bank Group. 2010. C10 calls on Non Regional Member Countries to support General Capital Increase. Communique of February 21st.

⁵⁵ UN Secretary General. 2010. Secretary-General names members of High-level Advisory Group on mobilizing climate change resources. <http://www.un.org/News/Press/docs/2010/sga1223.doc.htm>

institutional capacity, prepare National Action Plans, and develop and submit investment proposals.

Development partners' support

Mozambique is one of the major recipients of Official Development Assistance (ODA) in the world and is strongly dependent on donor investments. ODA constitutes around 40% of the Mozambican gross national income and acts therefore as an important development driver. Donor activities target all major development sectors, including agriculture, water, health, environment, energy and education. An examination of donor activities by the World Bank concludes that a high share of development assistance is invested in climate-sensitive sectors. The World Bank study reveals that the three provinces receiving most climate-sensitive ODA investments are Zambézia, Sofala and Maputo, and taking into account the exposure to current climate threats, the risk of ODA deliverables being adversely affected by droughts, floods and cyclones becomes evident⁵⁶. However, despite the investments in climate sensitive sectors, very few projects are being examined through a climate lens. Apart from a few stand-alone projects in the agricultural and infrastructural sectors, current climate risks have not yet been systematically integrated into the design of ODA projects.⁵⁷

Besides the business-as-usual projects with a direct or indirect relation to climate change, there are specific projects on climate change currently being implemented in Mozambique. Main donors funding specific climate change projects are, inter alia, DANIDA, Japan, Spain and DFID. DANIDA is providing specific support for the Environment Sector, including climate change.⁵⁸ Japan is funding the Africa Adaptation Programme, which aims to strengthen the institutional framework of Mozambique to deal with climate change, and is also supporting other bilateral aid initiatives. The Spain/UNDP MDG achievement Fund is supporting with 7 million dollars the UN Joint Programme that supports adaptation to climate change activities in the Gaza Province. DFID has recently approved a specific strategy on climate change for Mozambique and is one of the supporters of the Study on the Economics of Adaptation to Climate Change together with other donors including France.⁵⁹

⁵⁶ Sietz et al. 2008. Mainstreaming climate adaptation into development assistance in Mozambique: institutional barriers and opportunities. World Bank Policy research Working Paper 4711.

⁵⁷ Sietz et al. Ibidem.

⁵⁸ Government of Mozambique & Danish Ministry of Foreign Affairs. 2010. Danida Environment Sector Programme Support. Programme II, ESPS II. Programme Document. March.

⁵⁹ DFID. 2009. UK Climate change strategy for Mozambique. Opportunities and Challenges in a Changing Climate. November.

While donors are currently financing specific projects to reinforce the overall institutional capacity of Mozambique to deal with climate change, the main challenge for donors is to integrate climate change adaptation into the broad range of projects and sectors which are climate sensitive. The majority of recommendations for adaptation to climate change for Mozambique are still too general or vague to allow policy makers to clearly understand their implications and cost, let alone decide on implementation. To improve this situation, donor support for the integration of adaptation at the national, sectoral and project levels is key.

In line with the 2005 Paris Declaration on Aid Effectiveness, at the national level the role of donors is mainly to provide support to partner countries' own priorities and national processes through the partners' own systems. Since the Paris Declaration, there has been significant attention to the harmonisation of different donor programmes, and as a consequence aid delivery has shifted from project interventions to more programmatic forms, including General Budget Support.⁶⁰ Budget support is an important platform for policy dialogue between donors and partner countries' national governments and may contribute directly to raising the profile of adaptation in the context of national development plans.

At the sector level, donors also play an important role through modalities of funding like sector budget support and sector-wide approaches (SWAp). The sector budget support provides untied funds that are earmarked for the respective sector and provides a platform for high-level policy dialogue with senior government officials from the sector ministries as well as the Ministry of Finance. Through these mechanisms, donors have the opportunity to raise the attention of the government to climate risks and opportunities in sector development. Adaptation strategies can be also integrated into sector budget support Performance Assessment Frameworks (PAF) in order to make adaptation stay high on the policy agenda. SWAp is another modality prominent in sectors very relevant to adaptation like health, water, agriculture and forestry. Where SWAp exist, they can provide opportunities for tackling important aspects of the adaptation agenda at the sector level, particularly those requiring government leadership and donor coordination, dialogue and sharing of information.

At the project level, development partners can play two key roles to facilitate the integration of climate change adaptation. First, donors can integrate adaptation within the projects already in place, and secondly, they can contribute to the adaptation efforts of other stakeholders by developing and sharing relevant assessments, frameworks and tools that can be useful for the adaptation activities of other partners.

⁶⁰ OECD Guidelines.

Policy recommendations

- **The Government of Mozambique should address climate change in a more integrated way and should mainstream adaptation to climate change** at the national, sector, project and local levels. All the relevant sectors need to be examined through a climate lens and available tools that incorporate climate risks at the project level need to be used, so climate risks are taken into consideration and mainstreamed into action. For such mainstreaming to take place, significant capacity building needs to be created at all levels. Development partners also will have to examine all of their climate sensitive activities to start applying the climate lens in all relevant areas.
- The current legal and policy framework in Mozambique does not address climate change issues adequately and the main economic and planning instruments, the Five Year Plan (2005-2009) and the PARPA II, did not identify climate change as a priority. **Climate Change needs to be prioritized in the next Five Year Plan (2010-2014) and the future poverty reduction strategy.** At the same time, other primary and secondary legal and policy instruments in Mozambique need to be revised and updated to respond to the climate risks identified in the country. It is also crucial **to design a comprehensive national strategy on climate change that addresses all the key components of climate change policy** including what needs to be done at the various sectors, namely: environment, forestry and wildlife, land/agriculture, water, energy, land planning, health, fisheries, food security, infrastructure, etc.
- The current institutional situation can lead to overlaps in the coordination of climate change related activities, particularly in the area of adaptation. Such a situation does not provide an adequate institutional response for Mozambique to deal with complex donor funding on climate change issues. There is a **need to clarify the institutional responsibilities and strengthen coordination mechanisms at the Government level to deal with the topic of climate change in Mozambique.**
- There is a need to **expand the impact assessments on climate change to all relevant sectors** and to provide adequate institutional response according to such assessments. Once the impacts are better known for each of the relevant sectors there will be a **need for mainstreaming climate change into planning and budgeting at national, sectoral and decentralized levels.**

3. Environmental Health: shortcomings, challenges and recommendations

Abstract

Environmental degradation has been estimated to cost USD 370 million annually, of which 48% is due to unsafe water supply, hygiene and sanitation; 18% to indoor air pollution and 3.5% to outdoor air pollution. It is recommended that the Mozambican government would dedicate more time to intersectoral coordination including issues as policy, establishing and monitoring norms and regulations rather than being involved in planning and implementation of specific actions related to environmental health. Whereas currently most attention is devoted to water and sanitation, indoor and outdoor air pollution as well as water contamination should also receive attention. Decentralisation of authorities to district, municipality and provincial level needs to lead to increasing skills and capacity in relation to territorial planning, and project planning, implementation, monitoring and evaluation of factors impacting environmental health. To assess the impact of actions aiming at improving conditions which are likely to pose a risk to public health, the list of indicators needs to be expanded covering key areas as water, air, soil, biotic environment, sanitation, poverty, decentralisation and participation. Water supply and sanitation need to remain high on the agenda of environmental health and both aspects need to be balanced. Different incentive models need to be developed to increase people capacity and willingness to pay for these services besides external assistance to carry out long-term investments need to be sought.

Introduction

This Sector Analysis Note on Environmental Health identifies the main shortcomings and challenges as well as presenting key recommendations for better organization and management of the country's Environmental Health issues. To a large extent, this Note fits in the framework of the evaluation of PARPA II (2006-2009) and the preparation of PARPA III (2010-2014) and describes the progress made with integrating environmental health issues into the strategy to fight poverty, as well as identifying the main challenges to be faced. In addition to the Note on Environmental Health, other notes are being prepared to address a number of crucial matters relating to environment and poverty. The Terms of Reference for this note is included in Annex 1, which also addresses the subject of other notes.

This Note has been influenced by a recent study, “Natural Resources, Environment and Sustainable Growth in Mozambique”⁶¹, which highlights the impact of environmental degradation on the different forms of capital constituting the country’s wealth, i.e., natural capital⁶², physical capital⁶³ and intangible capital.⁶⁴

The negative impact of indoor and outdoor air pollution and water contamination, among others, on intangible capital and in particular on human capital, hence on human health, constitutes the centerpiece of this Note. The Note looks at ways in which measures addressing key environmental health factors can contribute to a reduction in this impact.

Importance of the Environmental Health sector

Environment refers to factors which define the context in which certain aspects of life occur and are reflected in the health of individuals. The health of individuals (or their robustness, strength and mental health) are strongly related to the environment in which people live. Healthy individuals constitute one of the most important assets for socio-economic development of communities and countries. Sustainable socio-economic development is assured not only through the creation of material wealth, but also the accumulation of other types of wealth, including human capital:

“....The contribution a country provides to the future is measured by means of its gross national savings... Gross National Savings, however, could say little about sustainable development, considering that over time, assets depreciate. Net national savings (real savings)⁶⁵ are equal to gross national savings minus the depreciation of fixed capital, providing an approximate measurement of sustainability. The next step for measuring sustainability consists in adjusting net savings to the accumulation of other wealth – human capital, environment and natural resources – sustaining development...”

⁶¹ Ollivier, T *et al*, French Development Agency (AFD) in collaboration with the World Bank, April 2009.

⁶² Natural capital – limited resources (mineral wealth), renewable resources (forests, land) and environmental services;

⁶³ Physical capital: buildings, machinery, equipment and infrastructure.

⁶⁴ Intangible capital involves gross work, human capital (stock of human skills and know-how) and social capital (the quality of institutions).

⁶⁵ Real savings – broad indicator for sustainability which permits an evaluation of changes in natural resources, environment quality and human capital. A -14.5 value was obtained for 2005.

Using both primary and secondary sources, the Ollivier *et al.* (2009) estimated the cost of the impact of environmental degradation on the Mozambican economy total nearly USD 370 million annually. This is more than 6% of Mozambique's GDP. Of that amount, about USD 260 million annually are due to water and air pollution, which has a strong impact on the country's human capital. Thus, investment in water, sanitation and the reduction of indoor pollution can be highly beneficial from a socio-economic standpoint.

The total cost of pollution (including impact on health), amounting to USD 260 million, can be broken down to:

• Relatively unsafe water supply, hygiene and sanitation	USD180 million
• Indoor air pollution	USD 68 million ⁶⁶
• Outdoor air pollution	USD 13 million

Thus, water, sanitation and hygiene are the most important factors affecting Mozambique's Environmental Health

The importance of EH also stems from the fact that it focuses on the above-mentioned factors as well as others contributing to the propagation of vector-transmitted diseases, *zoonoses*, intoxication, diseases caused by vermin, occupational diseases, accidents, etc.

The principal causes of death due to environmental factors internationally are: perinatal diseases; respiratory diseases, diarrheal diseases, vector-transmitted diseases, physical wounds; nutritional diseases and cancer (Briggs, 2003). The World Health Organisation estimates that worldwide, "1/3 of diseases affecting children are related to changeable environmental factors". Other studies show that the availability of and access to water in adequate quantity and quality so as to maintain and improve human sanitation and hygiene conditions as well as the practice of hand washing with soap have a major impact on the health of the population. This is important for a country with limited resources like Mozambique, which has to cope with a variety of environmental factors impacting human health, thereby underlining the need to prioritise and to put preventative measures in place.

⁶⁶ Internal pollution was looked at from a broader perspective in this study. Given the favorable climatic conditions in Mozambique the use of solid fuels (biomass, animal dung and crop waste) and coal) for cooking and heating from inside the houses is certainly low and occurs mainly during the short dry and cold season (May-August).

Even if one disregards all other health risk factors, improved sanitation conditions, and especially promotion of personal hygiene, represent an investment in the country's future given their contribution to economic growth. Hutton et al (2006) show that 900%⁶⁷ rate of return for sanitation investments in view of its impact on reducing major diseases (diarrhoea, pneumonia, malaria, etc) affecting the poor. These studies reveal that investing in hygiene promotion is three times more effective than investing in sanitation in general.⁶⁸

Below is an in-depth description and analysis of Mozambique's approach to the problem of water, sanitation and solid waste management from a policy, programmatic and institutional point of view. Relevant development assistance is identified, and existing challenges are described, followed by a presentation of key recommendations.

Policy and institutional analysis

The constitution and environment's role in development

The WHO defines Environmental Health (EH) as "the aspects of human health, including quality of life, which are determined by chemical, physical, biological, social and psychosocial factors related to the environment." (PEP/JAP, 2008[SD1]). The Mozambican constitution recognizes that the environment is a fundamental right as embodied in Article 90 (1), stating that, "*every citizen has the right to live in a balanced environment and the duty to defend it*". It also views the protection of the environment as being in the public interest, as stated in Article 90 (2) and Article 117.

Environmental management became also part of the Government's agenda in the fight against poverty. In PARPA II (2006-2009), efforts were made to expand inter-institutional coordination through the creation of working groups on Environment, Health, Water and Sanitation with the participation of state agencies, donors and civil society. Although several challenges remain: adoption of common definitions, harmonization of various sectors and planning instruments, consistency in planning, budgeting, monitoring and evaluation, as well as decentralization, regulation, control and surveillance, research, extension and the recognition and treatment of these areas. One very important issue is the development of indicators to objectively measure and evaluate progress by various sectors and the country as a whole in implementing the environmental agenda. In the past 2 to 3 years, climate

⁶⁷ Hutton et al, (2006) 'Economic and health effects of increasing coverage of low cost sanitation interventions', Human Development Report Office occasional paper, UNDP.

⁶⁸ Health impact can be measured in DALY (Disability Adjusted Life Years). If invested in Sanitation Promotion 1000 dollars pays for 91 DALYs. Invested in Hygiene promotion 1000 dollars pays for 333 DALYs. (World Bank, (2006) Disease control in Developing Countries (Second Edition))

change⁶⁹ has become an important theme. MICOA is currently working on a national strategy and action plan in this area.

Many actors representing a number of sectors (e.g. health, water and sanitation, state and local administration, among others) are involved in the environment in general and environmental health in particular. Each actor's involvement varies, whether it be planning, research, investment in infrastructure, regulation, surveillance, education/awareness, or other. Achieving results, therefore, requires sound inter-institutional coordination, harmonization and alignment among different actors/sectors, and many other interventions. Developments in these areas are a major challenge to the Environmental Health sub-sector. Decentralization is also key to addressing problems and creating long-term positive and sustainable impacts due to the fact that conditions (institutional and human) are created so that at local level, (district, municipality and other state institutions closer to the actual beneficiaries and users of resources) the entire development planning cycle can be implemented.

Macroeconomic Policies on Environmental Health.

At the macroeconomic level, PARPA II defines the main policy guidelines for integrating environment and environmental health issues into the fight against poverty. As part of PARPA II's priorities for the environment, sanitation ranks first, highlighting the *direct relationship between conditions of access to water and sanitation, poverty and the health status of the population*. Diseases and poverty are viewed as being closely linked, forming a vicious cycle. Under "sanitation", as addressed in PARPA II, health and the environmental health subsector have been placed at the top of the agenda in the fight against poverty.

Environment, Public Health, Water and Sanitation

Environment. According to current environmental priorities, in addition to the coordinating institutions (MICOA/MPD/MF), the main environmental actors/sectors identified include primarily the sectors⁷⁰ of Energy; Agriculture; Health; Mines/Mineral Resources; Public Works and Housing; Tourism; and Fisheries. These sectors are responsible for creating a

⁶⁹ Recently a Plan of Action for Climate Change Adaptation and of Soil Erosion and Control and Combat of Wildfires was adopted

⁷⁰ "Sector" is here defined in its limited sense, which is equivalent to a ministry. This is not always the case. Broader functional analyses (e.g. CIRESP (2003b), Basic Methodology for Functional Analysis and Restructuring of the Ministries, Inter-ministerial Commission for the Public Sector Reform, Maputo, February) indicate that sector can include more than one ministry.

healthy environment through establishment and development of sector strategies and policies,⁷¹ action plans, laws and regulations⁷², as well as promoting investment, research/extension and other interventions in each priority area. The private sector and civil society also have a role to play.

Public Health. The health sector's policies on EH have been defined as the overall goal of the Ministry of Health's Environmental Health Department (DSA):

*"To improve environmental health conditions through the control of environmental factors which are likely to pose a risk to public health: contaminants, pollutants, toxic products and behaviours endangering water quality, foodstuffs, air and soil; and to promote sustainable lifestyles among the people."*⁷³

Publications, programs and action plans, assessments and other sources of information show that in Mozambique, EH tends to focus primarily on water and sanitation and to a certain extent on food safety and hygiene in general. Very little is said about other environmental elements (air, soil and biotic), except when these are directly related to either water or sanitation. This explains the close relationship (despite the shortcomings discussed below) between EH and public works and housing, including municipal and local administrations, and the distant relationship between EH and sectors that affect the environment, such as agriculture, fisheries, industry, mining, and tourism. These sectors tend to have sanitation measures of their own, which are somewhat separate from EH.

The DSA fits within the framework of MISAU's organizational structure.⁷⁴ The DSA is part of the National Directorate of Public Health and falls under the Deputy National Director for the "Prevention and Control of Diseases". At provincial level, the DSA is a unit under the Department of Community Health within the DPS and at the district level, the activities are undertaken by the Community Health Unit forming part of the SDMAS. By definition, EH is a priority area within the context of activities undertaken by the health sector. The main activities carried out by the DSA are designed to strengthen sanitation, to promote hygiene and food safety, to implement the International Sanitation Regulations, and to improve the capacity to analyse water and food.

⁷¹ O MISAU is initiating a process to prepare a National HE Strategy as well as a Sanitation Strategy.

⁷² For example at MISAU the National Plan for the Management of Biomedical Waste and its regulation have been approved.

⁷³ HE has its own Terms of Reference.

⁷⁴ Although not yet approved in practice DAS operates as described above.

Other areas covered by the DSA include the “Promotion of Health and Community Participation”. Except for biomedical waste, MISAU’s plans and programs make no reference to joint actions involving actors responsible for water and sanitation programs and solid waste management. Given the manner in which it is structured and its institutional subordination, Environmental Health faces limitations in trying to fulfil its role and in discharging its duties in a way that is compatible with its multisectoral mandate. Environmental Health should be positioned differently within institutions that manage health and environmental factors (water, sanitation and other environmental elements). The same applies to responsibilities for Environmental Health, which should focus on defining policies and norms, promotion and regulation/surveillance than on implementation.

Water and Sanitation. _The water and sanitation policy is elaborated in the National Water Policy (PNA), adopted in August 2007. It covers the 2015-2025 timeframe, providing specific targets for the period. The policy’s goals fall into two main areas: a) Water: meeting the basic needs of humans, based on the supply of safe and reliable water in urban, peri-urban and rural areas; b) Sanitation: improved sanitation as an essential tool for preventing water-related diseases (malaria, cholera, diarrhoea), improved quality of life and environmental conservation. It focuses on different areas and aims at ensuring access to sanitation services (ranging from improved latrines to connection to an urban sewerage system and improvement of storm water and drainage systems.

The PNA also addresses the following water and water use issues: (a) Economics: in relation to economic development (irrigation, hydroelectric power, industry, tourism, fisheries, reforestation, livestock, navigation, among others). (b) Conservation: ecological flows for rivers and estuaries, water quality standards for effluent discharge into water bodies, intakes and catchments, and measures to prevent and mitigate the impact of pollution. (b) Disaster risk reduction: reduction of vulnerability to floods and drought by better coordination and planning, use of structural and non-structural measures and consultation with and training of people, communities and institutions in affected areas.

The MOPH’s National Directorate of Water (DNA) is responsible for implementing PNA which includes:

Water. The main areas of intervention include urban and rural water supply and water resource management. Water resource management includes all aspects of water management, i.e. precipitation, surface and sub-surface run-off, water quality, evaporation, sediment transport in rivers and water storage infrastructure, etc.

Urban Water Supply sub-sector operates on the basis of a delegated management framework or public-private partnership whereby assets are in government hands and operations are managed by the private sector in a concession arrangement, lease or management contract. The Investment and Asset Fund for Water Supply (FIPAG) holds the water supply assets as part of a management scheme of 14 cities. In the remaining cities, water supply systems are managed by municipal water companies. As they gradually meet the basic conditions, notably those related to the ability to cover costs, other towns and cities will be placed under the delegated management scheme. Through the AIAS and in coordination with municipalities, DNA is responsible for the interim management of systems in these cities and towns. Water supply coverage (including different levels of services⁷⁵) for cities managed by FIPAG and those which are not is 70%⁷⁶ of the population. In 2004, it was 66% (QUIBB). To make up for water supply shortcomings, people use other sources of water, including unsafe sources (wells, rivers, lakes, etc). A coverage of 100% has been set as a target by 2025. The current low coverage is due both to the lack of capacity of the systems (water sources, treatment and distribution systems), the low ability and relative unwillingness to pay for water, which directly correlates to poverty and low-income among potential beneficiaries. The Water Regulatory Board (CRA) oversees the sub-sector and sets the tariffs and service quality targets, monitors compliance with targets, reviews investment programs and attends complaints lodged by users and municipalities. CRA has no power to regulate sanitation services, and aims at ensuring a balance between service quality, interests of the consumer and financial sustainability.

About USD 96 million was invested in the sub-sector, more specifically in infrastructure, institutional development and operating subsidies, between 2000 and 2007, and that USD 362 million has been secured for the 2007-2015 period⁷⁷. A total of USD 499 million and USD 1,295 million are required for investments for the 2009-2015 period with a view to guaranteeing access to potable water by 100% of urban residents in the country.

The Rural Water Supply sub-sector is characterized by a decentralized structure with greater executive powers being delegated to provinces and districts. Since 2007, there has been an increase in the amount of funds channelled from the State Budget to provinces and districts for implementing new systems and rehabilitation of others. It is estimated that water supply

⁷⁵ It includes levels of services such as (i) household connections, (ii) yard connections, (iii) neighbour's taps, (iv) public stand-pipe, (v) private manual pump, (vi) public manual pump, etc.

⁷⁶ MICS, 2008. Data seems to refer to Cement City only and derives from samples obtained in 4 provinces, which entails a significant sampling error.

⁷⁷ Combines data from a number of sources, including DNA, BAD, CFMP, FIPAG, projections based on MICS data, etc. These are approximate values.

infrastructure currently serves nearly 30%⁷⁸ of the population. The goal is to reach 70% of the population by 2015 in accordance with the MDG, and 100% by 2025. The extension of the water supply network to the rural population has been affected by:

- Management deficiencies and lack of local markets catering for water supply spare parts. Up to 35% of rural water installations in many provinces are faulty, requiring rehabilitation.⁷⁹ A 2007/08 study of the breakdown of water and sanitation costs revealed that most actors, and financial institutions in particular, tend to focus their attention on capital costs, while ignoring other costs, either partially or totally, especially maintenance costs. This could be one of the main reasons for the systems' deficient sustainability;
- A weak sense of "ownership" of the systems among beneficiaries, coupled with a failure by the entities investing in the systems to promote it effectively;
- Beneficiaries' inability to pay for water supply;
- Inadequate choice of technologies (i.e. technical, cultural, economic);
- Lack of properly trained managers and service engineers, including retraining and assistance after construction;
- Lack of an effective monitoring system to measure performance of completed installations and to provide a prompt diagnosis of operating problems.

About USD 15 million was invested annually between 2006 and 2009 in this sub-sector. About USD 23 million are required between 2010 and 2015 to meet the 70% coverage target. It has not been possible to obtain data for the period from 2015 to 2025 during which a coverage target of 100% is to be achieved. By 2014, however, funding is expected to drop to about USD 20 million annually following a peak during 2011-2013 when investment will be an average of USD 26 million annually.

Sanitation. Water and sanitation are formally dealt with in a unified fashion. Development of policies, strategies and programs for these two sub-sectors feature in the same documents and there is a call for their increased unification. The 43-page National Water Policy document, however, addresses sanitation in two and a half pages only, with three paragraphs dedicated to rural sanitation. This is an indication of the relatively secondary role assigned to the sanitation sub-sector. This sub-sector relies on a variety of role players. The sub-sector has a series of players with DNA and its provincial (DPOPH/DAS) and district

⁷⁸ MICS, 2008.

⁷⁹ Project Appraisal Document, Water Services and Institutional Support Project (WASIS), World Bank, 2007.

(SDPI) representatives being responsible for policy formulation, promotion and regulation. Implementation of these activities rests with city councils and towns with municipal status. Where this status is still to be put in place, the responsibility has been assigned to local governments with the backing of NGOs and other non-state actors.

Similarly, sanitation is dealt with separately as urban and rural sanitation. Urban sanitation includes peri-urban and semi-rural sanitation⁸⁰. Peri-urban sanitation covers people from Mozambique's urban centres who live in peripheral areas.⁸¹ The relevant aspects of the urban sanitation policy may be summed up as follows:

- MOPH's DNA is responsible for promoting the construction of latrines;⁸²
- The Ministry of Health (MISAU) is responsible for the health status of the population, including hygiene and promotion of sanitation conditions, hand-washing, amongst others. These measures are implemented as promotional campaigns and initiatives.

The Ministry for the Coordination of Environmental Affairs (MICOA) has overall responsibility for protecting the environment. Responsibility for urban and peri-urban sanitation rests with local authorities under the Ministry of State Administration. In addition to solid waste management, urban and peri-urban sanitation includes construction and maintenance of drainage and sewerage systems, septic tanks and latrines.

Many actors play a role in sanitation, each with their own area of responsibility. A brief overview of sanitation is presented below.

Sanitation in urban areas covers a variety of services, the following being the most important:

- The existing 23 cities tend to have two distinct areas. The "cement city" or core area, is served either by conventional public systems for wastewater and stormwater or by local systems consisting mainly of septic tanks, some of which are connected to public systems. "Peri-urban" and semi-rural areas around the urban core area typically have traditional sanitation facilities, mainly pit latrines (improved or otherwise), as well as septic tanks whose design depends on the resources of property owners and users.

⁸⁰ The majority of Mozambican cities include these three zones, often with poorly defined boundaries.

⁸¹ It is estimated that peri-urban areas accommodate just over 80% of the urban population (Seminar on Peri-urban Sanitation in Mozambique, November 2009)

⁸² Mozambique Government, "Política Nacional de Águas", 21 August 2007.

- In the 68 towns, sanitation in most permanent houses consists of septic tanks. However, in general, improved or traditional pit latrines are the most common type of sanitation. With the exception of the town of Songo (Tete), there are no reticulated sewerage systems for household wastewater. In Songo, there is a treatment plant using the activated sludge process.

The coverage of domestic sewerage services is low. As with water supply, services vary, consisting of (i) toilet connected to a septic tank, (ii) improved pit latrine, (iii) improved traditional pit latrine, (iv) simple traditional pit latrine, and (v) no sewerage service. In 2008 (MICS), there was 47% coverage, compared to 34% in 2004 (QUIBB). Simple pit latrines, which do not comply with minimum standards laid down in the National Water Policy, tend to take more space. At present (2010), the country's sole wastewater treatment system is in Infulene (Maputo). In the remaining cities and towns, effluent is discharged directly into water courses or the sea.

Besides being a problem, this is yet another aspect of imbalances and poor integration between water supply and sanitation (mainly in urban areas). Normally, expansion of water supply systems (which are in progress) and the gradual increase in number of people switching from latrines to central sewerage systems or septic tanks connected to sewers should take place simultaneously with construction of wastewater treatment plants. This includes aeration and sedimentation basins to reduce organic and physical loads and examining environmental solutions, namely basic sedimentation basins and oxidation ponds prior to discharging waste into water courses. However, currently faecal matter collected from latrines is discarded along with other waste into municipal landfills, which poses a public health hazard.

Urban sanitation includes Solid Waste Management (GRSU), which in cities and towns with municipal status, is under the jurisdiction of town councils, and of local governments (districts, administration areas and locations) in towns which are not as yet part of the municipal system. Except for Maputo and Beira, no other municipality or town (district capital) has annual GRSU plans and programs. Although waste is collected in a number of cities and towns, the general scenario of solid waste management in the country shows that waste collection is very low, not exceeding 30%. Moreover, collection takes place mostly in urban core areas; while the majority of the population living in peri-urban and suburban areas lack GRSU collection services, resorting instead to either burying or burning waste, and in some instances dumping it into watercourses and ravines.

According to the National Water Policy, sanitation coverage in peri-urban areas in 2015 should be 67%, improved pit latrines being the required minimum standard.

Sanitary conditions vary considerably in peri-urban areas where the inner city poses additional space problems. A relevant example is the replacement of pit latrines (to a large extent a problem related to physical planning). In semi-rural areas, capacity to pay for sanitation services and awareness of sanitation problems are sensitive issues.

Sanitation in peri-urban areas has been largely neglected since the National Low Cost Sanitation Program was transferred from DNA's Sanitation Department to municipalities in 1998. The transfer was within the framework of decentralization and creation of municipalities. There was only a marginal transfer of personnel, know-how and logistical resources. The promotional programme has been weak or non-existent. This has been translated into a lack of incentives for mobilizing the required capacity, thereby leading to a reduction in demand for services .

There has been much discussion about the integration of water and sanitation, with some arguing that "when one mixes water with sanitation, everything is transformed into water". From a financial standpoint, however, it would be advantageous if the two sectors were to be merged because incentives/subsidies for improved sanitation could be recovered through cross subsidization whereby sanitation tariffs would be included in water bills. Nonetheless, it appears to be absolutely necessary to separate sanitation funding programmes from water supply programmes. Similarly, the assignment of human and logistical resources should be separate.

An interesting experience is in progress in a ward in Maputo, *Urbanization*, which involves an integrated approach to management of drainage, sanitation, water and electricity. This experience should be followed up with a view to gathering evidence about options to adopt.

The integration of sanitation management in the "cement city" (core) and "peri-urban" areas, raises the question of the balance that would be required, considering that people in peri-urban areas, who represent more than 80% of the urban population, should be entitled to the same proportion of investments (more than 80%)⁸³. For urban sanitation programs, the prevailing practice has been to benefit the "richer" and those with greater lobbying "power" living in "cement areas", to the detriment of those living in the periphery. The equation showing that investment in sanitation, rather than water investment, has greater impact on health and that sanitation in peri-urban areas has an even greater impact, including lower costs, should be translated into more and/or same level of investment in sanitation as in water, and into the allocation of additional resources to sanitation in peri-urban areas by government and donors.

⁸³ Paulo Óscar at the Seminar on Peri-urban Sanitation, 26 November 2009

Data forecasts that between 2009 and 2015 about USD 80 million will be invested in the sub-sector, and USD 179 million between 2015 and 2025, excluding investment in stormwater drainage systems. In any event, it is far below the investment forecast for the urban water supply sub-sector, although it involves systems and processes which are more costly.

Compared to the water sub-sector, sanitation in rural areas is under funded and it is the least structured. The situation is even worse in the rural sanitation sub-sector, not only in terms of funding and structuring, but also in areas such as defining roles and responsibilities, policy compliance and overall management.

The country's rural sanitation policy is based on: (i) Minimum level of services, i.e. improved pit latrines (using local materials) and (ii) Hygiene promotion and sanitary education at family and community levels.

Standards to be followed are provided in the manual on improve pit latrines⁸⁴. The rate of coverage is reported to be close to 50% (PRONASAR, 2008). As with urban sanitation, the target for 2015 has been set at 70%, and at 100% for 2025, based on different levels of service. Presently, the most common levels are below the acceptable standards (simple pit latrines).

It is even more difficult to assess investment trends in rural sanitation for the following reasons: (i) some rural water projects include rural sanitation which is implemented in an undifferentiated manner; and (ii) owing to lack of data, the 1995 PNA did not assess investments in sensitization campaigns and creating provincial sanitation groups. The MTEF for 2006-2010 says that USD 7.46 million is required to provide improved rural sanitation services to an additional population of 3.55 million people at a per capita cost of USD 2.1, which is half of what is allocated to improved pit latrines in peri-urban areas.

Multisectoral Coordination

Water supply and sanitation are considered to be important elements of environmental health, sometimes to the detriment of other aspects of the environment and environmental health. Water and sanitation include a wide variety of actors and interventions (investment in infrastructure, preventative/rehabilitation measures, etc.); laws and regulations; research, production and availability/transfer of technology⁸⁵; institutional capacity building and

⁸⁴ National Low Cost Sanitation Programme, INDER, Maputo, 1994.

⁸⁵ Although in practice research and transfer of technology are at a very incipient stage.

coordination; and development of human resources, which includes capacity building, education and sensitization of users of resources, and implementation at various levels). The public works sector is primarily responsible for managing water and sanitation. It is the entity responsible for provision of hardware, and some of its functions have been transferred to local bodies. The health sector takes care mainly of software and to a large extent is a second level actor.

Currently, there is no formal coordination at central level between the Water and Sanitation and Health sectors. The ad hoc coordination between these two sectors at various levels has not been effective. There have been coordinating initiatives aimed at minimizing constraints. Worth mentioning is the fact that PRONASAR has created a Management Committee and implementing teams at national, provincial and district levels, including representatives from sanitary units. As for provincial, district or municipal/ward projects with Management Committee(s) which include cooperation between water and health sectors, there has been a tendency for coordination. A number of projects implemented by NGOs (e.g. WaterAid and CARE) include this type of coordination at district and municipal levels.

Indicators

The definition of monitoring and evaluation indicators for interventions in environmental management, including Environmental Health, is generally weak or almost nonexistent in every sector, save for a few cases, dealing either with an activity or a set of somewhat isolated activities. Data is available on the use and exploitation of resources like forests, fisheries, mining, among others, and including the level of input that these sectors give to the economy as a whole. If treated in a specific manner, this data could allow one to assess the relationship between environment and development, but this has yet to be done consistently. Entities like INE, which conduct regular studies and evaluations on development, tend to generate data which can be used to measure and evaluate progress, using specific indicators for matters being addressed. Nonetheless, given the relatively isolated manner in which it is done, one cannot see every angle of the equation and the multiple relationships that each sector develops with other sectors, especially in measuring cause and effect. Thus, each entity tends to use its own system to define indicators. This hinders communication between actors who are active in the same areas. One can give the following examples:

- **Public Health:** MISAU's monitoring and evaluation system includes 38 indicators related to medical care, preparation of national policies and plans, equal access to health care, quality of services, and efficient use of resources. There is no indicator for Environmental Health. It has been reported that a draft proposal for EH indicators is pending approval by the Minister of Health. During the preparation of this note it was

not possible to obtain further information from MISAU about this document, which is not yet in the public domain.

- **Water and Sanitation**: PARPA II includes a general indicator for coverage, which has since become a benchmark. The indicator is based on the principle that people should have “access to drinking water within a radius of 500 metres”.⁸⁶ As regards water and sanitation, and based on Millennium Development Goal targets for 2015, reference is made to the “proportion of people using an improved source of drinking water” and to the proportion of people with access to improved sanitation (that is, improved pit latrine, which, in theory, is the minimum standard). WHO and UNICEF's Joint Monitoring Programme adds another indicator which relies more on time than on distance, and makes reference to the “proportion of people using an improved drinking water source at a distance of more than 30 minutes”.

GRSU: The GRSU Master Plan for the city of Maputo includes a matrix of 18 indicators as part of the monitoring system to gauge how coverage of the RSU's collection and transportation service will expand within a period of 5 years.⁸⁷

On the one hand, it would be useful to try to harmonize monitoring and evaluation instruments. On the other hand, attention should also be focused on a combination of factors that have an impact ON WHAT ????. This would allow one to assess the final/real effect of the various measures, using as a reference incidence of the three major diseases associated with supply and use of goods and services like water, sanitation and others, which, in the case of Mozambique are diarrhoea, respiratory diseases and malaria. This would likely be translated into indicators such as: (i) incidence and mortality caused by diarrhoea; (ii) malnutrition in children under 5 years old; (iii) incidence of acute respiratory infections and bronchitis; (iv) infant/child mortality rate, IDS; (v) incidence of malaria in children under 5 years old; (vi) malaria mortality rate; and (vii) % of health units where water supply and sanitation services are available.

⁸⁶ Some criticism claims that the indicator should focus more on the actual number of people who have access to water. (PAASR, 2008)

⁸⁷ See “Plano Director de Gestão RSU, Cidade de Maputo”, chapters 6 and 7.

Technical and financial assistance: the role of cooperation partners

Several partners provide assistance to strengthen technical and financial capacity of the public sector in the fields of environment, health, water and sanitation. Despite progress with the alignment of budget processes and systems with the State Budget, there are still a number of organizations (government, donors, NGOs, among others) and budget lines which are not aligned with the State Budget, as well as common funds, funding at various levels (central, provincial, district), projects, and so on. There are several funds, each with their own time frame,⁸⁸ procedures and accountability mechanisms. A number of sectors, e.g. water and sanitation, which have used medium-term planning instruments (e.g. MTEFs) more consistently, have a clearer picture of their resources and capacity requirements. As a result, they are aware of shortcomings that can be addressed by donors and by technical assistance, whereas other sectors, e.g. the environment, do not seem to be as developed.

Partners in the health sector include 19 donors who are part of the Sector Wide Approach (SWAP) mechanism (2009). The Environmental Health sub-sector receives regular financial assistance from UNICEF, WHO, USAID and CDC. It has not been possible to obtain information from DSA about the type of assistance and funding received from partners. In the ODAMOZ database, however, it has been possible to identify a project estimated at just over USD 1 million, assistance to Beira's environmental health sub-sector. Given the lack of a consistent EH strategy that identifies actors and their *modus operandi*, as well as coordination and allocation of resources, it is difficult to evaluate the relevance of this type of assistance.

The main donors in the Water and Sanitation sector include: the World Bank, the African Development Bank (AfDB), the Dutch Government, UNICEF, DfID, the European Union, Swiss Cooperation and CIDA. The overall amount that has been mobilized so far stands at about USD 827 million. This refers to different cycles of donor funding pledges. In 2006, the AfDB and the World Bank made available 40% and 35% of the total aid to the sector, respectively. It should be noted that from MCC/MCA alone, water and sanitation will receive about USD 203.6 million over a five-year period (2008-2013), focusing on the provinces of Cabo Delgado, Nampula and Zambézia. The investments include improvement of urban and rural water supply infrastructure, sanitation and drainage as well as institutional capacity building. The ODAMOZ.org database provides more details about assistance to this sector.

⁸⁸ There are more than 20 donors in the environmental sector in areas such as: institutional strengthening, poverty and environment, natural resources management including management of special areas (protected and other), land use plans (coastal zone, urban and rural), prevention of natural disasters including climate change, development of technologies, etc.

Shortcomings and challenges in the Environmental Health sector

EH's key tasks includes factors that affect the present and future robustness of individuals. These includes evolving strategies which determine the way in which aspects of the environment which affect human capital are to be addressed. Some elements to be included in this process are presented below.

Intersectoral coordination: The EH sub-sector should be more actively involved in coordinating the various sectors and sub-sectors affecting the environment. Presently, EH plays a hybrid role in coordination and implementation of activities, which inhibits the fulfilment of its role and the way it influences resource allocation. A key challenge for EH is to occupy a position where it can establish, coordinate and oversee norms, standards, regulations as well as to promote activities.

Expansion of EH coverage: The current conception of EH is that it is close to water and sanitation and to a certain extent to food and general hygiene. Other aspects of the environment, namely air, soil, biotic environment, and territorial planning tend to be neglected. This explains that while EH is closely associated with the public works sector, there is very little or no linkage to other “environmental” sectors like agriculture, fisheries, industry, mining, and tourism. The priority EH gives to water and sanitation may be justified in the short and medium term, but it should not be at the expense of other elements. Now – and more so as the country’s industrial sector expands and resources in other sectors are exploited more intensively – these elements will impose increasing constraints on the environment, hence the need for laws and regulations to prevent their harmful effects on human health.

Decentralization and deconcentration: A significant portion of planning, implementation, monitoring and evaluation for the development of factors impacting environmental health, including planning and territorial planning, should be effectively undertaken in provinces, districts, municipalities. These tasks should also be undertaken by other actors at local level. This entails involving the private sector and the creation of local markets and supply chains, as well as capacity building of relevant actors. “Decentralization and deconcentration are underway with a view to reaching that goal, but this is still in its early stages.” (WASHCost, 2008). Districts, in particular, remain fragile in terms of capacity.

Monitoring and evaluation indicators: Shortcomings remain in indicators and systems for monitoring and evaluating EH in basic areas (water, air, soil, biotic environment, sanitation,

poverty, decentralization, participation, etc.). The impact of activities on aspects of EH should be the principal focus in reducing diseases associated with poverty and the environment, i.e. diarrhoea, respiratory diseases and malaria, as these reflect levels of pollution and contamination of environmental components (air, water and soil).

Water and sanitation: In the short and medium term, water and sanitation will continue to be high on the EH agenda, which justifies their special treatment in this Note. Specifically: (i) Integration of water and sanitation and a balanced allocation of resources to the two sub-sectors (i.e. water and sanitation): the relative separation in which these two sub-sectors are treated is contrary to official policy. This hinders the response to sanitation problems that should evolve along with expansion of water supply systems and the balanced allocation of resources to the two sub-sectors in urban, peri-urban and rural areas. Present progress in water supply could have a boomerang effect, and imbalances could contribute to perpetuating the poverty cycle; (ii) Increase in coverage and incentives: As the economy and society are currently structured, the "ability and willingness to pay" for water and sanitation services are considerably low, and for lack of mechanisms and given the policy on cost recovery, the poorer are prevented from adequately accessing these services. This poses a threat to achieving the MDG (2015) and the 100% coverage target for 2025. There is a lack of incentives (e.g. cross subsidization of basic services like water, sanitation, electricity and drainage) and of dedicated external assistance which can be seen as an investment that will repay itself in the long term.

4. Mega-projects in Mozambique: social and environmental impacts

Abstract

Mozambique is well-endowed with natural capital, estimated at 4644 USD per capita; increased exploitation of the natural resources, it is argued, will form a significant factor for attaining the MDG and poverty reduction, but with minimal environmental impact. It is argued that mega-projects have contributed for 1/5th of economic growth over the last years, but still that tax breaks, particularly for new projects should be reconsidered. Expected changes in climate change, and how these may affect mega-projects, are already taken into account in the design, and economic evaluation of the large dam projects. Though Mozambique environmental legislation is comprehensive, enforcement and implementation of its policies remains weak largely because of weak capacity of the government institutions (both in number of staff as in terms of their qualifications and expertise/experiences). Overall there is also a need for better integration and coordination of various government agencies.

Natural resources and the importance of energy mega-projects

Mozambique contains vast reserves of natural resources that could be used to produce energy but that are currently under-utilized. Energy mega-projects that would develop these abundant natural resources are presently under consideration and are expected to play a role in allowing the country to reach its Millennium Development Goals (MDGs) by 2015. The following summaries provide insight into the types and amounts of available natural resources that are the subject of mega-projects.⁸⁹

Water infrastructure. Mozambique has 39 major rivers, many of which rise outside the country, with high variability in discharge during the year in response to rainy seasons.

⁸⁹ Country Environmental Profile for Mozambique. Final Report. July 2006 (Agrifor Consult SA was contracted by the European Commission (EC) to assist the Government of Mozambique in preparing a country environmental profile (CEP)).

Providing an adequate freshwater supply for irrigation and domestic and industrial users poses an important challenge. This is due to several factors, including: the country's downstream geographic location, a substantial lack of water resources infrastructure, extremely low efficiency and rapid deterioration of existing systems, and serious equity issues with regard to the poor. With respect to the first point, serious concerns exist that development in neighboring countries could dramatically limit flows for domestic and agricultural use, which would be particularly critical in southern and central Mozambique. Significant progress has been made in improving access to clean water supplies in urban and rural areas, but water shocks from droughts and floods remain a real issue. A total of 12,500 MW of hydro-electric potential exists in Mozambique (up to 15,000 MW for hydro alone by some estimates⁹⁰); currently, approximately 2000 MW from hydro are being explored (primarily through Cahora Bassa)⁹¹ and estimates peg total generating capacity potential from all sources at up to 16,000 MW.⁹²

Fuelwood consumption. The use and management of forest resources is covered by the note on forestry (Chapter 4); of relevance to energy projects, however, is the use of firewood as a primary source of energy. Wood consumption for fuel is considerably greater than that accounted for by logging, amounting to approximately 31 million m³ per annum. Fuel wood consumption in Mozambique is reported to be the highest in the SADC region and is the most important source of domestic energy in the country (accounting for 85% of total household energy requirements) given the lack of alternatives.

Agricultural land. There is a major dependency on agriculture for livelihoods in Mozambique, and food security remains a chief concern—only 12% of available arable land grows crops. Shifting agriculture using slash and burn technique are prevalent and yields are very low.

Mozambique boasts abundant resources of fossil fuels, including natural gas (estimated at 5M TJ), thermal and coking coal (6 billion tonnes), and important reserves of non-fuel minerals, in particular mineral/heavy sands deposits.⁹³ The presence of on-shore and off-

90 Report covering comments made by Energy Minister Salvador Namburete regarding dams on the Zambezi and other energy initiatives in Mozambique. Available at www.namnewsnetwork.org/v2/read.php?id=94424

91 Bucuane, Aurelio and Mulder, Peter. "Exploring Natural Resources in Mozambique, Will it be a Blessing or a curse?" Conference Paper No. 4, Conferencia Inugural do IESE, September 19, 2007.

92 ""Invest in Mozambique" Investment Promotion Centre. Available at www.mozbusiness.gov.mz/index.php/energy

93 Bucuane and Mulder. Supra 4. According to Bucuane and Mulder's estimates, there are 299 million tonnes at Moma (Ilmenite, Zircon and Rutile) and at least 157 million tonnes at Chibuto (Titanium slag, Zircon, Rutile, Leucosene and high-purity pig iron).

shore oil is being investigated but has yet to be proven through drilling. The following excerpt provides some context to the mineral wealth of the country:

“Mozambique is blessed with a relatively high endowment in natural capital,⁹⁴ representing 49% of total wealth (4.644 USD per capita), remarkably higher than the average observed in Sub-Saharan Africa (24%), showing an even higher dependence on its natural assets. Physical capital represents only a small share of total wealth, and intangible capital is an important part of total wealth. The natural capital decomposition shows that: mineral resources constitute a very important part of the Mozambican natural capital (heavy sands constitute about 50% of this capital, coal about 31% and natural gas around 19%).”⁹⁵

Most natural resources are (and will continue to be) exported; a proportion of the coal from Tete Province, however, is destined for use in domestic power plants (Moatize and Benga coal-fired plants) as is the gas in the combined cycle gas turbines in the south at Moamba. Using figures from SADC, a study by Bucuane and Mulder (2007)⁹⁶ estimates the value of natural resource exports at \$6.5 billion by 2020 (includes \$1.8 billion in non-natural resource exports assuming a 10% growth rate during that period). A large part of primary exports will be derived from aluminum smelting at the to-be-expanded Mozal plant. The same study reported \$365 million in natural resource exports in 2000.

Therefore, natural resource exploitation—along with the required infrastructure development (including the new north-south electrical transmission line, railroads, and ports)—can generate huge growth and may be a catalyst to achieving MDGs. Associated general budget support from corporate taxes, royalties and overseas sale of commodities, direct and indirect employment, and direct and indirect associated SME activity, can all play a role. The keys to success are numerous. How these mega-projects are conceived, designed and built is vital, as is the degree to which they are subject to enforced laws, regulations, and fiscal regimes (and whether these are sufficient and appropriate to generate positive benefits). The correct combination will promote development, but this cannot come at “any cost” to existing environmental and social functions and services. The desired outcome must support economic development and poverty reduction while minimizing environmental impact and contributing to social welfare.

94 Natural capital is defined as finite resources (mineral assets), renewable ones (forests, lands) and environmental services. Resources valued at the present value of their rents earned over a twenty five year period (2005 – 2030).

95 Natural Resources, Environment and Sustainable growth in Mozambique. Draft Paper No.2 for Discussion. Agence Française de Développement (AFD) with World Bank’s Technical Assistance.

Table 4.1 below provides details on existing and proposed mega-projects. As can be seen from the table, Mozambique is on the cusp of intense natural resource development underpinned by an unprecedented scale of mega-project investment.

Table 4.1 - Energy Mega-Projects in Mozambique

Designation	Area of activity	Investment (current US\$)	Construction started
Cahora Bassa (HCB)	Hydroelectric power		1969
Mozal 1	Aluminum smelter	\$1 billion	1997
Mozal II	Aluminum smelter	\$665 million	2001
Moma Heavy Sands	Titanium mining	\$450 million ⁹⁷	2003
ProCana	Sugar cane to ethanol, Massingir	\$500 million	2007
Corridor Sands Project	Titanium mining & smelting		2009?
PETROMOC pipeline	Petroleum product pipeline to S.A.	> \$500 million	?
COFAMOSA biofuels	Sugar cane to ethanol	\$500 million	?
Petrobuzi	Sugar cane to ethanol	\$550 million	?
Rio Lurio	Sugar cane to ethanol, Cabo Delgado	unknown	?
CVRD/Moatize	Coal mining and export	\$2 billion ⁹⁸	?
CVRD/Moatize power	Coal-fired power plant	\$2 billion including transmission	?
Riversdale/Benga	Coal mining and export (Phase I)	\$270 million	
Riversdale/Benga Power	Coal-fired power plant (Phase I)	\$1.3 billion	
Temane power	Gas-fired electricity power		?
Cahora Bassa II	Hydroelectric power		?
Mphanda Nkuwa	Hydroelectric power	\$1.6 billion	2013
Transmission line for Temane + Mphanda Nkuwa + Moatize	Transmission line to S. Africa	\$3 billion	?
Mozal III	Aluminum smelter		Postponed <i>sine die</i>

96 Bucuane and Mulder. Supra 4.

97 "Moma titanium mineral sands project", Creamer Media's Mining Weekly, 3 March 2008.

98 "Mozambique too reliant upon mega-projects – critics" in Tralac, 8 September 2006. Available at: www.tralac.org/scripts/content.php?id=5248

Source: After Draft Chapter on Energy/Mega-Projects, Country Economic Memorandum, May 16, 2008, World Bank.

Those mega-projects currently in operation have contributed one-fifth of the growth experienced in Mozambique in recent years, according to the World Bank.⁹⁹ Innovative approaches to creating economic opportunities around these projects have been developed and undertaken.¹⁰⁰ Despite such estimates and programs, other sources report that the economic impact to date has been marginal, or at best varied, due to the provision of major tax breaks and the creation of economic development zones (e.g. avoidance or minimization of corporate taxes to 1% at the Mozal smelter). Such measures were seen as necessary to attract the first of the mega-projects to post-conflict Mozambique. Many agreements from that period were negotiated bilaterally between project proponents and GoM; some observers express the opinion that such incentives are no longer necessary (at least for new projects) as the investment climate is now much improved. It is worth considering whether laws will need to be amended in order to remove such incentives (e.g., Article 29 of the FBC) and allow mega-projects to fully contribute to macro-economic development in Mozambique in a fully transparent manner. In this vein, GOM now uses a model mining agreement in its negotiations. Employment stemming from mega-projects varies depending on the nature of the project; heavily industrialized projects often require a minimal labour force.¹⁰¹ Indirect employment and supply chain effects also vary. New mining operations in Tete Province may set a new trend as they are expected to provide several thousand direct jobs per operation, particularly during construction (e.g. Vale¹⁰² and Riversdale projects). The impact on SMEs in the area may also be similarly positive.

99 World Bank, Mozambique Country Economic Memorandum, 2008.

100 See for example the Mozlink program which promotes the integration of SMEs into large projects' supply chain. www.mozlink.co.mz/en/o_que_e_o_mozlink. Collaboration between large companies in Mozambique, development agency partners, The Centre for Promotion of Investment, IFC and PODECAT.

101 Virtanen and Ehrenpreis in Growth, Poverty and Inequality in Mozambique, Country Study No10, International Poverty Center, September 2007.

102 Global miner Vale's (VALE5.SA) "Moatize coal mine in Mozambique could produce up to 12.7 million tonnes of hard coking coal per year in the first phase of the project. (...) The company had previously forecast an annual production of 8.5 million tonnes of hard coking coal." Johannesburg, Sept 7, 2009 (Reuters). Total investment in the project, expected to generate more than 3,000 jobs in the construction stage and 1,500 during operational phase, is \$1.3 billion; production is expected to start in December 2010.



Figure 4.1 - Approximate locations of selected energy mega-projects in Mozambique

Given the type of mega-projects currently in operation, and those proposed for development, it is important to consider the environmental and social impacts that Mozambique should avoid, manage and mitigate. By the same token, it is also important to consider some positive social effects that may be associated with projects and that should be promoted. Table 4.2 presents a general summary of both negative and positive impacts.

Table 4.2 - Summary of actual and potential environmental and social impacts typically associated with mega-projects¹⁰³

Type of mega-project	Expected/potential environmental impacts	Expected/potential social impacts
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¹⁰³ Note: this is not an exhaustive list of actual and potential positive and negative environmental and social impacts associated with mega-projects. It is provided in the sector note for illustrative purposes only; actual impacts will vary depending on the exact nature, setting, design, operation and management of the mega-project.

Mega-projects

Type of mega-project	Expected/potential environmental impacts	Expected/potential social impacts
Hydro-power dams	Local – loss of land based biodiversity, impact to fish species; Regional – alteration of flow regime leading to possible impacts to estuarine ecology, alteration of flow regime giving rise to prevention of downstream flooding; National – provision of clean energy (GHG-free/minimal after construction) avoiding GHG emissions.	Local – livelihoods (loss of agricultural land, loss of wood for burning/charcoal production, routes to markets and other road/transport options made unavailable preventing or limiting commerce) is a negative, provision of power to help alleviate poverty ; Regional – provision of power to help alleviate poverty; National – provision of power to help alleviate poverty and provide for macro-economic development.
Electrical power generation (coal-fired)	Local – air emissions from combustion impacts ambient air quality, ground water (for cooling) degradation and/or depletion, likewise surface water degradation and/or depletion ; land loss/biodiversity loss due to project footprint; Regional – potential contribution to cumulative air and water impacts, increased pressure on water resources, provision of power/energy for economic development; National – increases overall percentage of electricity generated from fossil fuels , International – coal plants contribute CO₂ driving climate change, increases percentage of electricity generated by fossil fuels in SADC region .	Local – in-migration of workers during construction bringing health impacts , inflationary pressures due to higher wages paid to project workers, health impacts from degraded air-sheds during construction and operation, reduces overall health of populations and strains health care system, increased industrial activity (traffic), loss of actual and potential agricultural land, wood for burning; Regional – existence of power draws in-migration, economic stimulus leads to new business; National – increased electrical power generation stimulates economic activity in Mozambique and SADC region.
Electrical power generation (gas-fired)	Local – air emissions from combustion impact ambient air quality, ground water (for cooling) degradation and/or depletion, likewise surface water degradation and/or depletion; land	Local – in-migration of workers during construction bringing health issues, inflationary pressures due to higher wages than local prevailing rates, health impacts from degraded air-sheds during construction and

Type of mega-project	Expected/potential environmental impacts	Expected/potential social impacts
	loss/biodiversity loss due to project footprint; Regional – potential contribution to cumulative air and water impacts, increased pressure on water resources; National – increases overall percentage of electricity generated from fossil fuels; International – gas fired plants contribute CO₂ driving climate change, increases percentage of electricity generated by fossil fuels in SADC region.	operation, reduces overall health of populations and strains health care system, increased industrial activity (traffic), loss of actual and potential agricultural land, wood for burning; Regional – existence of power draws in-migration, economic stimulus leads to new business (positive and negative); National – increased electrical power generation stimulates economic activity in Mozambique and SADC region.
Electrical power transmission (backbone, associated networks)	Local – loss of land to transmission right of ways leading to habitat fragmentation, visual impacts; + enhanced deforestation as the lines are used as access corridors Regional – possible impact on bird species during migrations; National – nominal to minimal impacts.	Local – loss of agricultural land , loss of woodland for fuel, increase network of roads to access ROW may provide greater access to markets and other economic activity; Regional – greater access to electrical power drives economic activity and poverty reduction; National – greater access to electrical power drives economic activity and poverty reduction.
Mining (underground and open pit)	Local – loss of biodiversity, alteration of groundwater flows , tailings dam and waste rock piles, air pollution (dust, emissions from process, on-site beneficiation, etc.); Regional – groundwater depletion and degradation, contribution to cumulative impacts (e.g. air-shed degradation) – negative; National – export of coal, ores, cathodes, concentrates, etc. generates foreign exchange.	Local – livelihoods (loss of agricultural land, loss of wood for burning/charcoal production, routes to markets and other road/transport options made unavailable preventing or limiting commerce) if concession footprint lays over top of such, physical relocation, increased density/pressure on resources in recipient community, cultural impacts, provision of employment;

Type of mega-project	Expected/potential environmental impacts	Expected/potential social impacts
Sugar cane to ethanol	Local – loss of biodiversity to mono-cultural agriculture , provision of local source of bio-fuel to avoid use of wood; Regional – cumulative impacts on habitat and overall land loss to alternative uses/biodiversity; National – bio-fuels reduce overall GHG emissions; International – use of bio-fuels in destination countries lessens GHG emissions.	Local – provision of employment, alteration of traditional way of life, food security issues if small scale agriculture replaced by mono-culture destined for fuel production; Regional – availability of new fuel source may stimulate economic activity and in-migration of associated industries and supporting services; National – enhanced reputation as ‘green’ country may place Mozambique at an advantage of attracting more investment.

To date, the performance of mega-projects, from an environmental and social perspective, has received significant critical attention.^{104,105} For example, mining projects reviewed in a 2003 study were seen to embody the full range of expected environmental and social impacts, though to a lesser extent than the present given the smaller magnitude of mining taking place at that time. Unsurprisingly, the 2003 study comments that this is expected to increase as more mining activity is undertaken.¹⁰⁶ Current and future coal and mineral sands projects are considered to be of a ‘world class’ scale; many other projects are being considered or are close to starting.¹⁰⁷ Social issues have arisen in conjunction with other types of mega-projects, such as expansion of power transmission.¹⁰⁸

As illustrate in Table 4.2, there are those impacts that extend far beyond the fence line of individual projects. These impacts can contribute to a different set of issues if they are

104 Browne, Pete. “Debate over dams on Africa’s Zambezi River.” “Green Inc” New York Times. Oct 2009. Available at <http://greeninc.blogs.nytimes.com/2009/10/19/debate-over-dams-on-africas-zambezi-river/?pagemode=print>

105 “The Mphanda Nkuwa Dam project: Is it the best option for Mozambique’s energy needs?” Final Report for WWF. Intermediate Technology Consultants Ltd. June 2004.

106 Country Environmental Profile for Mozambique. Page 34-38. Final Report. July 2006.

107 Thompson, Richard. “Mozambique builds a mining future” *Mining Journal Online*. Oct 2009. Available at www.mining-journal.com/reports/mozambique-builds-a-mining-future

108 Energy Reform and Access Project, Project Appraisal Document on a proposed loan to the GoM for a Mz-Energy Development and Access Project, November 2009. Paragraph 87, Page 37 describes improper implementation of the WB OP 4.12 (Involuntary Resettlement) during the erection of power poles, cutting of trees with economic values and brush clearing, associated with the Energy Reform and Access Project.

combined with those from other projects, regardless of whether those other projects are of the same kind or different. The issue is the capacity of the receiving environment and/or social setting. So-called cumulative environmental and social impacts—often unevenly shared among provinces—are expected to become a major issue as mega-projects are developed. Of particular interest to the subject of this sector note is the capacity of government to carry out positive and timely interventions, both at the provincial and national levels. Bilateral donor efforts to date have focused on creating capacity in conducting impact assessments (at the least reviewing regulatory-required EIAs and/or ESIAs conducted by EPFI-funded projects). Additional efforts are now focusing on providing capacity to undertake Strategic Environmental Assessments (SEAs). SEAs are a means to put environmental and social issues on an even footing with economic considerations when projects are being considered for approval in a broader planning context. For example, Tete Province is seen to be a key area with both current and many proposed mega-projects that would require an SEA to play a role in planning and development.¹⁰⁹ There is a sizeable need for a coordinated approach to development. For example, resettlement alone is becoming a major issue; finding land for those people who have been displaced by one project may be problematic if appropriate potential lands/recipient communities within the region are themselves slated for potential new projects

Keeping pace with the needs of ever-expanding large scale and complex projects—and assessing them in a timely manner for actual and potential environmental and social impacts¹¹⁰—will be one of the key challenges facing those charged with oversight, permitting and managing development from an environmental and social perspective.

109 The GOM has applied for funding to undertake a Strategic Regional Environmental and Social Assessment (SRESA) related to the Mozambique Regional Transmission Development Program (RTDP). A SRESA is seen to be needed with respect to the proposed transmission backbone, power generation plants, and other major new developments (e.g. industrial, mining, tourism, transport) that would be concurrent with, or stimulated by the power projects in Tete and along the (to be developed) transmission line.

110 E.g., mine development, mine-mouth power station, rail line refurbishment or rail line development on a to-be-determined route, refurbishment of existing and/or development of new port handling facilities, etc.

Hydropower generation and coal-fired plant projects in the context of climate change debate

Climate change is going to have an impact on energy megaprojects in two ways: it will have an impact on water availability for hydropower projects and it will affect the investment decision regarding coal-fired plants because of their CO₂ emissions.

Water availability for hydro power generation

Mozambique has relatively abundant surface water availability. An average of 217 km³ of surface water runs through Mozambique each year with more than half originating outside the country. Rainfall is also substantial overall though there are substantial variations. Rainfall in the highlands of central Mozambique is the highest in the country with 1000 mm to 2000 mm of annual rainfall, which is partially why the Zambezi Valley is responsible for over half of Mozambique's total renewable water resources. The area is home to Africa's 4th largest hydropower dam, Cahora Bassa, which produces 66% of the total ground water withdrawals and contains 60% of the irrigable agricultural area.

General circulation models (GCMs) predict a wide range of potential climate futures for Mozambique, with rainfall suspected to be extremely variable in the future. The 22 GCMs approved by the International Panel for Climate Change (IPCC) used to predict potential climate futures predict anywhere from a decrease of 31% of the average rainfall to a 16% increase in rainfall by 2050, compared to historical averages. This means that potential surface water availability will be highly variable as well. In addition to the climate variability, changes in management of the upstream portions of the international basins may further exacerbate this variability and could seriously reduce cross-border flows.

Climate predictions suggest that regional climate characteristics are going to change as well. The Zambezi Valley could see as much as a 24% reduction in rainfall by 2050, which would dramatically change the hydrology of the lower portion of the basin and impact rainfed agriculture, woodlands and grazing areas as well as riverine and delta ecosystems. Rainfall potential in northern Mozambique is predicted to decrease in all scenarios with decreases as high as 21% in 2050 (relative to historical averages). Southern Mozambique is expected to see substantial increases in rainfall, even as high as 16% by 2050, presenting opportunities for new water storage and a change in agricultural cropping patterns. Evaporation potential in the entire country is expected to rise as well, as most of the country should expect to see a 1°-2° increase in average temperature and therefore further exacerbate surface water runoff changes.

Substantial development of hydropower generation has been planned in Mozambique, especially in the lower Zambezi, but it has all been designed according to historical flows.¹¹¹ Preliminary modeling from the Economics of Adaptation to Climate Change (EACC) study suggests that climate effects on hydropower might be quite small in Mozambique. The potential energy deficit due to climate change relative to the baseline's generation potential, from 2005 – 2050, will be of approximately 110,000 GWh (or 1.4% less electricity generated than “without” climate change). This is because the plans for new plants have largely already taken into account changing patterns of temperature and precipitation. The most significant impact would be from increased evapo-transpiration (and hence less water available for electricity) from the reservoirs. Although the EACC study did not model this, the operators of the plants will need to pay particular attention to the timing of water releases to ensure sufficient downstream flow at times of low water and to avoid interference with port activities.

Emissions from coal fired plants

Coal-fired power plants are being carefully scrutinized with respect to their emissions, particularly those GHG that can contribute to climate change. Minimizing emissions by increasing the performance of power plants, such as designing for greater thermal efficiency utilizing supercritical and ultra-supercritical steam cycles and Integrated Gasification Combined Cycle (IGCC) plants, can reduce the impact of coal fired plants. Plants can also be designed to be carbon capture and storage (CCS) ready to take advantage of CCS technology when it becomes commercially available. Such measures are capital intensive, however, and may prove prohibitively expensive in some markets.

New projects must, however, properly and fully account for the emissions they will generate; such accounting requires a level of sophistication from both those behind the analysis and those charged with its review, such as MICOA. Investors and/or donors will very likely require such an appropriate consideration of design alternatives with lower emissions as part of their overall risk mitigation strategy. Any environmental and social impact analysis will be reviewed in light of country priorities and the overall energy strategy within Mozambique.

111 Generation master plan.

Environmental policy and institutional analysis

This section summarizes existing laws and regulations related to the environmental and social impacts expected from mega-projects. Studies report that Mozambique has relatively comprehensive legislative instruments in place with regard to environmental management.¹¹²

Table 4.3 - Main environmental legislation and regulation pertaining to environmental management in Mozambique

Legislation	Focus	Date Promulgated
National Environmental Policy (NEP)	Primary stated objective was to secure sustainable development of the country, taking into account its specific conditions, through acceptable and realistic commitment between socio-economic progress and environmental protection.	1995
NEP led to: National Environmental Management Program (NEMP) supported by the Environmental Framework Act and EIA Regulations National Conservation Strategy	National Conservation Strategy used to develop an institutional and legal framework concerning most relevant (natural resource) sectors and sub-sectors. Thus control over natural resource use is exercised through key sectoral legislation (fisheries, agriculture, forestry and water laws); environmental impacts from other sources (e.g. transportation and energy sectors) are controlled through legislation developed under the National Environmental Programme (NEMP) which includes Framework Environmental Act and the EIA Regulations. The 1997 law provides for the participation of local communities in the development of policy and laws for natural resource management, management of protected areas and policing environmental norms and regulations.	1996 (NEMP), 1997 (EFA), 1998 (EIA)
Water Law	Water management governed by Ministry of Public Works and Housing	1991
Mining Law	Includes provisions for environmental impact assessments, environmental management plans, environmental management programmes, environmental monitoring programme, mine closure programmes, emergency risk assessment and control programmes, and environmental audits. Not always seen to be consistent with Environmental Law of 1997.	2002
Overarching GOM Policy	Public environment policy is primarily defined by three planning instruments: the five-year Government Programme, the PARPA, and the annual Economic and Social Plan (PES). Each has a dedicated environment chapter or section, which specifies policy objectives, priority areas of intervention, and, in the case of PARPA and PES, monitoring indicators and corresponding targets.	Ongoing

112 See, for example, Mozambique Rapid Country Environmental Analysis, Sergio Margulis and Melanie Eltz, 10/10/2006.

Legislation	Focus	Date Promulgated
	Poverty Reduction Strategy Paper aims to reach MDGs by 2015. ¹¹³ PARPA II is derived from the Five-Year Plan and integrates the Millennium Declaration principles and goals. Its main targets are to reduce poverty from 54% in 2005 to 45% by 2009 and achieve an average real annual growth rate of 8%. PARPA II has three pillars: (i) Governance; (ii) Economic development; and (iii) Human capital, and eight cross-cutting issues of HIV & AIDS, gender, environment, science and technology, food security and nutrition, de-mining, disaster management and rural development. PARPA II is the reference framework for design of sector and provincial strategies, policies and plans such as the Economic and Social Plan (PES) and the State Budget. ¹¹⁴	

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Two agencies, the Ministry for the Coordination of Environmental Action (MICOA) and the National Council for Sustainable Development (CONDES), have mandates centered on issues of environmental management. MICOA, in particular, reviews and passes judgment on the efficacy of EIAs for large projects, including energy mega-projects. Sectoral agencies have developed their own environmental unit/departmental functions.¹¹⁵ These and other agencies involved in managing the environmental aspects of mega-projects are shown in Table 4.4 below.

Table 4.4 - Governmental organizations whose mandates/operations include actual or potential activities related to energy mega-projects

Body	Responsibility
MICOA	Responsible for coordinating environmental management issues. Created from the National Environmental Council (public institution composed of the Ministries of Agriculture and Fisheries; Industry, Commerce and Tourism; Transport and Communications; Public Works and Housing; Health; the National Institutes of Physical Planning, Rural Development; and the State Secretariat for Civil Aeronautics). Developed the Framework Environmental Act and the EIA regulations (see Table 4.1), the basic framework for managing impacts of developments on the environment. Licensing of any activities liable to cause significant environmental damage is required; issuance contingent on the appropriate level of EIA being completed and accepted by MICOA. Act also requires all sectoral legislation be revised to conform to the Act.

113 Cabral, Lúcia and Francisco, Dulcídio. "Environmental Institutions, Public Expenditure and the Role for Development Partners" Mozambique Case Study. Final Report. Overseas Development Institute. February 2008.

114 Executive Board of the UNDP and the UNFP, March 2006.

115 There are five known environmental units (in some cases called departments) in operation in the Ministry of Agriculture (MINAG), Ministry of Energy, Ministry of Mineral Resources, Ministry of Public Works (Roads Section) and Ministry of Health. Cabral and Francisco, 2008.

Body	Responsibility
Ministry of Public Works and Housing	Cross-sectoral coordination regarding water issues ensured by the National Water Council. National Directorate of Water resides in the Ministry; has specific task of water management (Water Resources and Water Supply & Sanitation). Following the National Water Policy (1995) decentralisation of authority began with all but the major policy decisions being devolved to five Regional Water Administrations.
Ministry of Energy	Responsible for national energy planning and policy formulation and for overseeing the operation and development of the energy sector. ME is composed of three main thematic areas (Power Sector, Renewables and Liquid Fuels) and a central services management group. ME is represented in the provinces through Provincial Directorates of Mineral Resources and Energy. 'The Ministry of Energy (ME) has an existing Environmental Management Unit; the unit is responsible for various activities (e.g., overseeing compliance of the safeguards framework of the Energy Development and Access Project (APL-2) project. In addition to advising Electricidade de Mocambique's (EdM) management on social and environmental safeguards issues and undertaking internal capacity building and safeguards oversight for all EdM operations, that unit will be specifically responsible for the monitoring, evaluation and enforcement of the safeguards framework related to EDAP (APL-2)'s Component 1: "Reinforcement of the Primary Network and Grid Extension," as specified within the project's ESMF and RPF.' ¹¹⁶
Ministry of Mineral Resources	Responsible for exploration, licensing, etc of mining and oil/gas projects; includes the National Directorate of Mining and National Petroleum Institute. Just as the Ministry of Energy, this ministry also has a unit/department responsible for environmental issues

Commentators familiar with the state of national environmental management in Mozambique recognize that shortcomings originate not from a lack of legislation and regulation but from issues associated with its full implementation. Existing capacity within MICOA and CONDES is limited; for example, there are 332 national-level staff in MICOA,¹¹⁷ with an overall budget for the agency of nearly \$9 million in 2007. Increasing the numbers of staff alone is not sufficient to address issues of implementation; qualified and competent individuals, trained in ever more sophisticated review and analysis of projects for example, are needed to ensure that law and regulations on the books translate into tangible and appropriate governance driving sustainable projects in keeping with regional and national strategies.

Challenges and gaps

The main challenges to integrating the environmental and social initiatives contained within the World Bank Group Safeguard Policies are not so much a question of whether the current body of law and its associated regulation can handle the environmental and social implications of mega-project development, but rather whether the human and political capital exists within MICOA and CONDES to sufficiently implement the requirements. A

116 Project Appraisal Document on a Proposed Loan to the GoM for a Mz-Energy Development and Access Project, November 2009.

117 DANIDA. "Institutional Strengthening of MICOA" Environmental Programme Support 2006-2010. Component Description Document. October 2005. Staff data are for 2003.

related challenge is whether those two entities can suitably influence the path of economic development in an environmentally and socially sustainable manner while working alongside sector-specific agencies mandated to develop natural resources. When one considers that the estimated costs of environmental degradation, from sources *other* than energy mega-projects total almost \$370 million (which represents more than 6% of Mozambique's GDP), the scale of the problem about to be faced becomes clear.¹¹⁸

PARPA II charts a path for development over the period 2006-2009; the next PARPA will do the same on a similar timescale. Having the necessary capacity to appropriately assess potential impacts and provide input to the planning process, through the use of institutional SEA for example, (along with having the political clout to make such input heard, valued and implemented) is a challenge for MICOA. MICOA must focus on being able to monitor, evaluate and, where necessary, correct policy decisions and influence sector-specific Ministries accordingly (whose mandates differ greatly and are seen as core to economic development as laid out in PARPA).

Development Partner Support

In the period 1997-2003, net Official Development Assistance (ODA) averaged \$1.1 billion, around 31.4% of GNI or \$61.8 per capita. Around three-quarters of ODA were provided under bilateral programmes, whilst the balance originated from multilaterals such as the World Bank, the African Development Bank (AfDB) and the European Commission (EC).¹¹⁹

The following table describes international donors active in environmental affairs in Mozambique and their areas of focus.

Table 4.5 - International donors and areas of focus in Mozambique

Donor	Area of focus
World Bank	Governed by Country Assistance Strategy (CAS), which covered the period from 2004-2007; primary aim is to support GOM's PARPA focusing on three areas: (i) improving the investment climate; (ii) expanding service delivery; and (iii) building public-sector capacity and accountability structures. Key projects include the Beira Railway project, the Southern Africa Regional Gas project, and Phase 2 of the Roads and Bridges project, a Sustainable Rural Development project designed to build on PROAGRI I and the Trans-frontier Conservation Areas and Tourism Development and Coastal and Marine

118 Agence Française de Développement (AFD) with World Bank's Technical Assistance "Natural Resources, Environment and Sustainable growth in Mozambique." Draft Paper No.2 for Discussion. Pollutions and water shocks constitute the main environmental degradation costs (climate change not accounted for).

119 Executive Board of the UNDP and the UNFP, March 2006.

Mega-projects

Donor	Area of focus
	Biodiversity Management project as well as the existing project portfolio of projects (IDA's ongoing Energy Reform project, IDA's Communications Reform project, NWDP2, the privatization Petromoc, and the Railways and Ports project).
EC	Cooperation governed by Cotonou Agreement for the period March 2000 to February 2020; provision for update every five years. EC provides greater financial support than any other donor. Overarching objective of Agreement is reduction of poverty by tackling political, economic and social issues. Funds allocated primarily to three sectors: macro-economic budgetary support 45-55%, transport 25-35%, food security and agriculture 0-15%. In addition, 10-15% of the envelope was allocated to health-HIV/AIDS, good governance and capacity building for civil society. Major interventions foreseen within the transport sector, capacity building within the public sector, and rehabilitation of rural roads; and, establishment of sustainable food security within a market economy through a multi-annual food security programme. In respect of the macro-economic budgetary allocation, support was foreseen for the GOM's macroeconomic reform programme, with special attention to be given to poverty reduction objective. Support for Health and HIV/AIDS be implemented within the Framework of the National Strategic Plan and National Action Plan to Fight HIV/AIDS, support for good governance in the preparation of a programme to reinforce the judiciary sector.
AfDB	The AfDB has a large portfolio in infrastructure (transport, power, water support and sanitation) and agriculture. The Bank has financed two private sector operations, (Sasol Gas and Moma Titanium Mines). These mega-project investments in aluminum smelting, gas and minerals are adding 1.5% a year to GDP growth. AfDB's current portfolio in Mozambique comprises 22 ongoing investment projects (including the budget support) for an amount of UA 408.610 million, approx US\$670 million. ¹²⁰
UN	UNEP – manages Poverty and Environment Initiative (PEI), focuses on capacity building and awareness raising activities on the links between poverty and environment and on the mainstreaming of environment into PARPA-implementation at the provincial level. PEI partners include both governmental (MICOA and MPD) and non-governmental (Centro Terra Viva) agencies. UN-HABITAT – active in the areas of sanitation, waste management and erosion at municipal level. UNIDO – initiated a pilot project (covering seven other sub-Saharan African countries) aiming to address the negative impacts of coastal tourism on the coastal and marine environment and promote the development of sustainable tourism policies and strategies. FAO – supports Forestry and Wildlife Component of the National Agriculture Development Programme (PROAGRI), which focuses on local community participation in the use, conservation and benefits generation from natural resources management.
Danida	DANIDA (a major, if not primary, environmental program support donor) authored an Environmental Program Support Document. A second phase of the Environmental Program Support (EPS) 2006-2010 (funded up to \$5.5M), started implementation in January 2006. Overall objective of EPS is to assist government with addressing challenge of integration of environmental concerns into the economic and social development, and to assist local governments and communities with addressing environmentally related health problems in urban areas and problems related to uncoordinated exploitation of natural resources. EPS has five independent components (funded up to \$29M), the responsibility of local authorities and/or various sector ministries: (i) Institutional Strengthening of MICOA; (i) Coastal Development; (iii) Natural Resources Management; (iv) Support to Environmental Management in 7 Municipalities; and, (v) Support to Environmental Management Strategy for the Greater Maputo Area. Budgets

¹²⁰ African Development Bank and Mozambique, Building Together a Better Africa.

Donor	Area of focus
	and work-plans of components are decided and implemented under responsibility of relevant local institution. MICOA has been coordinating yearly Program meetings. ¹²¹
DfID	DFID uses Country Assistance Plans (CAP) to govern aid; current plan is for the period 2008-2012. The CAP is organized around a 'poverty reduction triangle' of three key areas of intervention that address (i) capable government, (ii) effective civil society and (iii) an enabling environment for growth, private sector engagement and trade. Support involved a move to General Budget Support (BS). ¹²²
MCC	In June 2007, the Millennium Challenge Corporation signed a five-year, \$506.9 million compact with the Republic of Mozambique aimed to increase the productive capacity of the population in the Northern districts, with the intended impact of reducing the poverty rate, increasing household income and reducing chronic malnutrition in the targeted districts. The four projects are designed to foster investment and increase economic opportunities for Mozambicans. The MCC Compact in Mozambique entered into force in September 2008, formally initiating the five-year timeline for project implementation. ¹²³ Projects areas are focused on the following: water supply and sanitation, roads, land tenure services, and farmer income support. Projects are reviewed, evaluated and monitored for E&S issues against international standards, e.g., OECD Impact Assessment, IFC PS, and MCC enabling legislation.
Netherlands	For many years (and until recently) was MICOA's main source of bilateral support; played an important role in the creation of MICOA, the legislation on Environment Impact Assessment and the Environment Strategy for Sustainable Development. Now uses GBS as means of support and maintains a strong engagement in the environment sector.
SIDA	Through budgetary support, SIDA is improving the country's administrative systems and raising the general public's insight into state finances as an initiative in the fight against widespread corruption. Supporting democracy, economic development with a focus on farming (ProAgri reform programme and improving the capacity of the ministry of agriculture) and energy (expanding generating and connectivity to electrical power), and research cooperation (support to Eduardo Mondlane University). ¹²⁴ SIDA is also financing the Integrated watershed management project of the Pungue – is that not worth mentioning here ?
USAID	USAID has the following priorities in Mozambique: strengthen democratic governance, improve competitiveness of key economic sectors (agriculture, green growth, etc.), improve the health of Mozambicans, expand opportunities for quality education and training, enhance capabilities of Mozambican security forces. ¹²⁵
Others	Finland (CDS - natural resources), France (National Parks), Germany (trans-frontier conservation and waste management), Japan (obsolete pesticides and sanitation), Portugal (National Parks, sanitation and climate change), Spain (spatial planning), the EC

121 Summarized from Mozambique Rapid Country Environmental Analysis, Sergio Margulis and Melanie Eltz, 10/10/2006 and "Environmental Institutions, Public Expenditure and the Role for Development Partners," Cabral and Francisco, 2008.

122 Summarized from DfID's Mozambique CAP 2008-2012.

123 Millenium Challenge Corporation. Available at:

<http://www.mcc.gov/mcc/countries/mozambique/index.shtml> and

<http://www.mcc.gov/mcc/bm.doc/compact-summary-executive-mozambique.pdf>

124 Sida. "Our Work in Mozambique" June 22, 2009. Available at

<http://www.sida.se/English/Countries-and-regions/Africa/Mozambique/Our-work-in-Mozambique/>

125 USAID, Mozambique Country Assistance Strategy 2009-2014.

Donor	Area of focus
	(sustainable natural resource management and sanitation), and the African Development Bank (National Parks and sanitation). ¹²⁶

As can be seen, issues are well known and much targeted progress has occurred to date. It is essential to build on that success and ensure that progress in one sector (e.g. governance capacity) is leveraged to reap rewards in others (e.g. regional planning) can lead to better mega-project environmental and social assessment, oversight, and ultimately performance. Understanding the different roles of ODA recipients and areas where synergies can be explored, and where conflict can be avoided, should be central to future ODA. “Soft” capacity building (such as developing political capital within responsible agencies and ensuring their message is clearly understood by all parties) may be as important as technical capacity building within the agencies themselves.

Policy discussion and recommendations

Based on the information presented above, what can be concluded about the current state of assessment and management of the environmental and social impacts of energy mega-projects in Mozambique? And, if mega-projects are not being adequately assessed and/or their environmental and social impacts are not being avoided, managed, or mitigated, what new direction must be suggested? And what are the implications for development partners?

Mega-projects are subject to assessment. This assessment—and the resulting avoidance, management or mitigation of impacts during the construction and operation¹²⁷—may appear to be based on international standards; however, it occurs as much a result of private sector initiative than systematic government oversight. Projects applying for EPFI financing, for example, are fulfilling their requirement for an impact assessment to meet the standards contained within the EPs (e.g., IFC Performance Standard or Safeguard Policy-equivalent). Other projects however, especially those that have emanated from the previously less internationally-scrutinized extractive industry sector, may have been able to submit an EIA that meets national law alone as part of an application to operate. Experience has shown in many countries that reliance solely upon national regulation is not sufficient to capture the complexities of large-scale industrial projects. Often these proposed projects are in sectors that have not previously existed in these countries. Government agencies, through no fault of their own, lack the experience to place projects in their proper context as well as

126 Environmental Institutions, Public Expenditure and the Role for Development Partners, Cabral and Francisco, 2008.

127 There were no examples of energy mega-projects at the decommissioning stage to draw upon.

the sector-specific knowledge to make appropriate demands of project proponents in order to avoid, manage or mitigate project-related impacts.

How private initiative ESIA reviews—and appropriate additional requirements made when seen to be inadequate—is of concern in Mozambique given the lack of capacity at both the national and provincial level within environmental agencies. The prospect of sector-specific agencies approving an EIA, only for it to be found lacking by MICOA at a later date, is worrisome; since environmental departments exist within sector agencies, however, this is a very real possibility. The issue may then rest on the respective political clout of the two agencies and not on objective reviews based on qualified (and independent) environmental and social specialists.

An important aspect of improving the ESIA process is to strengthen its participative components. This would largely depend upon a change in the current practices of the government ESIA reviewers, whether in MICOA or the environmental departments of line ministries. These reviewers would need to demand proof that adequate affected community participation has accompanied the evolution of a given mega-project from pre-feasibility onward, without which a project would be stalled. In turn, this change in practice would require an increase in political and human capital within MICOA.

Donor intervention (especially bilateral support) has targeted increasing capacity to carry out defensible ESIA reviews of mega-projects, such as the work of DANIDA and the Netherlands in conjunction with MICOA. It is imperative that this capacity development continue, as the volume and complexity of projects will only increase. Directly related to this issue is the similar need to increase capacity in the monitoring and evaluation (M&E) of individual project performance, i.e. to assess that the project proponent is making good on the promises made at the feasibility stage and that objective results support their choice of management options to avoid, manage or mitigate impacts. As many practitioners within and outside government are learning, M&E is an evolving practice and involves not only more straightforward comparison of emissions and effluent data to international standards but a review and determination of the efficacy of much more complex relationships with respect to social/socio-economic interventions. Even just having sufficient numbers of personnel to carry out inspections, audits, or reviews is taxing to any agency charged with oversight, let alone one in the process of growing to meet ever-increasing challenges associated with a burgeoning mega-project development scenario.

In conjunction with continuing to develop project-specific capacity (both initial assessment and review and continued M&E), however, capacity should be developed to conduct

regional-scale Strategic Environmental (and Social) Assessments, known as SEAs. Consideration should not only be given to the conduct of SEAs but also to the greater context in which they are conceived, integrated and their results incorporated into overall developmental planning efforts.¹²⁸ Given the often-observed reluctance of individual projects to consider cumulative impacts (i.e., those beyond the fence line of their projects), government agencies need to understand how multiple projects will impact natural resources, ecological services, and the socio-economic condition of affected peoples within a greater area. It is also important for these agencies to consider the role these mega-projects might play in climate change adaptation and mitigation. The need to collect complex and often disparate data, professionally analyze them, and determine trends with respect to development and its associated impacts, demands a different set of skills and experience from that required to comprehend project-specific impacts. Shaping conclusions so as to provide suitable input into the planning process to maximize benefits and mitigate negative impacts of development (the ultimate goal with respect to SEAs) is at best a nascent practice in many countries of the world, developing and developed. Given the expected pace of mega-project development in regions of Mozambique (Tete Province, for example), however, the need to develop and apply such complex and mature assessment skills is pressing. The proposed SEA for Tete is a good step forward; consideration should be given to other areas subject to intense levels of development. Given the nature and size of mega-projects and their potential and actual impacts, any (if not most) mega-project proposed for development could be trigger enough to require a regional-type SEA. Involvement of provincial governments will be important to the success of any such process.

That last point speaks directly to the need to increase the overall coordination between sector ministries and MICOA, both vertically and horizontally. That coordination can only be achieved by developing rigorous mechanisms to promote inter- and intra-agency dialogue so as to produce (and ultimately implement and review) actionable outcomes. How can cross-sectoral coordination be made a reality? Linking the MIREM database platform with MICOA is a good basis for example. How will it be measured overall to ensure it is happening and in an effective manner? Suggestions include the use of the Performance Assessment Framework (PAF), which is the General Budget Support (GBS) monitoring tool (includes priority indicators and targets on government policy). It is thought limited, specific PAFs (the environment is currently not well represented) focused upon poor supervision capacity and

128 SEA and planning: 'ownership' of strategic environmental assessment by the planners is the key to its effectiveness Gernot Stoeglehner, A.L. Brown and Lone B. Kjørnø, *Impact Assessment and Project Appraisal*, June 2009.

uncontrolled licensing of natural resource exploitation would be a good approach.¹²⁹ This could be promoted, for example, through use of the Environment Working Group (EWG) as supported by the Government of Netherlands.¹³⁰

All of the above need funding; whether that should be a continuation of existing funding trends involving development partners or new sources of funding is a matter for debate. One way to put the environment on a more sound footing (financially and politically) is to review the current situation regarding deriving revenues from mega-projects. Several studies have questioned the status quo, be it at the level of taxes and royalties derived from projects or the overall use of received income within government budgets. The lack of adequate regulatory arrangements for obtaining and enforcing bonds or their equivalents (e.g., for mine restoration/rehabilitation post-operation) is a concern in some quarters.¹³¹ Overall the financial benefit from the development of natural resources is still acutely debated. An example again focuses on the extractive industries in that

“Depletion of gas and coal resources represents the most important share of natural capital depletion. The fact that genuine saving is negative seems to indicate that the rent derived from the depletion of these resources is not reinvested enough in other types of capital so as to maintain the same level of wealth. Then, several issues can be tackled: Is the rent sharing between the state and the project proponent optimal? And what about the efficiency of the management and allocation of this rent?”¹³²

Clearly this issue requires further analysis to determine the optimal conditions to promote development while continuing (or beginning?) to fund appropriate measure to provide for sustainability.

129 Environmental Institutions, Public Expenditure and the Role for Development Partners, Mozambique Case Study. Final Report. Overseas Development Institute. Lídia Cabral and Dulcídio Francisco, February 2008. Page 42.

130 Ibid. Page 15.

131 Country Environmental Profile for Mozambique. Final Report. July 2006. Page 62.

132 Genuine saving (formerly known as adjusted net saving) first derived in Pearce and Atkinson (1993) and Hamilton (1994). Genuine saving provides a much broader indicator of sustainability by valuing changes in natural resources, environmental quality, and human capital, in addition to the traditional measure of changes in produced assets provided by net saving. Negative genuine saving rates imply that total wealth is in decline; policies leading to persistently negative genuine saving are unsustainable. Source: Natural Resources, Environment and Sustainable Growth in Mozambique. Draft Paper No.2 for Discussion. Agence Française de Développement (AFD) with World Bank's Technical Assistance.

The way forward, timelines, and indicators

As stated in the introduction, the objective of this sector note is to provide actionable policy recommendations to government. A summary list is presented below in order to meet that objective.

- Increase capacity in MICOA to affect positive, timely and continual interventions in the review of environmental and social impacts associated with mega-projects. *Indicators: number of competent staff (i.e., those with a balance of training, experience, education, etc.) within MICOA employed to carry out assessment (including SEA), M&E activities.*
- Increase provincial capacity to a similar extent in support of the overall movement of decentralization of power and decision making away from Maputo. *Indicators: number of competent staff (i.e., those with a balance of training, experience, education, etc.) staff within provincial agencies employed to carry out environmental and social, M&E activities of projects.*
- Ensure project impact assessment reviews are based on national and international standards (e.g., WB Safeguard Policies or IFC's Performance Standards); the more stringent of the two must apply. *Indicators: number of publicly disclosed assessments.*
- Ensure that both horizontal (e.g., MICOA to sector specific agencies) and vertical (e.g. national and provincial environmental agencies) coordination occurs. *Indicators: published minutes of coordination meetings.*
- Bolster existing (or if ineffective, create new) mechanisms (e.g. technical and political) to ensure environmental and social issues figure in mega project-specific and regional analysis, assessment and planning. *Indicators: published agenda, minutes and documented outcomes showing environmental and social considerations were included as part of government decision making.*
- Review GOM tax and associated royalty structure to ensure mega-projects are levied appropriate impact fees, in order to support increased oversight. *Indicators: transparent financial accounting of contribution of mega-projects, published agreements on structures (i.e., no new bilaterally (non-publicly) negotiated agreements).*
- Development partners must continue to play a role in all of the above activities. *Indicators: Published outcomes of meetings to demonstrate DPs are coordinating their efforts accordingly.*
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Forest sector analytical note: policy, challenges and future priorities¹³³

I. INTRODUCTION

In the mid to late 90's, the Government of Mozambique embarked in a process of policy development particularly in the natural resources management sector. The Rio Summit and deliberations acted as a catalyst for ensuring that policies are conducive to sustainable development. As such in 1997 the Policy for the Development of the Forestry and Wildlife Sector was approved, followed by the Forestry and Wildlife Law in 1999 and the Regulation of this law in 2002. Since then other operative instruments including decrees and diploma have been issued to respond to specific provisions such as the case of clarifying what the requirement of national processing actually meant more than roughly squared logs; and the distribution of the 20% of the royalties to communities.

This note on the forestry sector highlights the key issues faced in the implementation of Mozambique's forestry policy and the emerging challenges. These include: (i) the extent to which the forestry policy's implementation has contributed to **poverty reduction, economic growth and environmental sustainability**; (ii) the role of forests in meeting energy demands and investments in infrastructure to reduce pressure on resources and contribute to containing the increase of emissions from deforestation and degradation of forests; (iii) the opportunity to capitalize on payments for ecosystem services (PES) to ensure conservation and sustainable management of forests; (v) the role of plantations in sustainable development given the renewed interest in establishing them in the country; and (vi) the extent to which the forestry sector in Mozambique influences related regional and global policies.

The paper resulted from extensive review of various documents as well as discussions with the National Directorate of Forestry and Wildlife staff, review and written comments by the World Bank, Finland, the EU and independent reviewer of the detailed analytical report.

The paper provides a brief overview of the forestry sector in terms of resources and demand of the main products (timber); then analysis the policy challenges and suggests indicators as well as pointing into the priority areas or entry points for the support from the development agencies.

II. FOREST RESOURCES

Mozambique's productive forests, which cover a quarter of the country's landmass, contribute significantly to the national economy as a source of income and employment and provide environmental services of local and global significance. The Table 1 shows the distribution of the native forests and potential for plantations in the three regions of the country. Maps of forest cover are included in appendices 1-3.

¹³³ Written by Isilda Nhantumbo, 2009; Independent Consultant in Natural Resources Management and Policy Analysis; For: Environmental Sector Working Group Sector Analytical Notes Series

Table 1 the distribution of natural forests and potential for plantations

Region	Characteristics						Plantation Potential				
	Dense and Open Forest area (ha)	Average annual growth (m ³ /ha)	Volume m ³	Annual allowable cut (precious and 1 st class species) - m ³ /yr	Deforestation ha/yr	Avail. land for agriculture - ha	Potential for reforestation - ha	Conservation	Community	Energy	Commercial
North	15,360,200	6	87,115,430	315 000	101 000	2,817,630	3,062,411	2,713	13,566	63,465	663,000
Centre	16,865,500	5	69,689,050	209,000	79,000	2,198,960	3,976,831	3,818	19,092	54,140	337,000
South	6,891,700	2	16,446,160	158 000	40,000	1,949,440	-	3,469	17,343	103 858	-

Forest growth in Mozambique in most of the forests is rather small, varying between 0.5 and 1.5 m³/ha/annum. Therefore, harvesting the maximum annual quota of 500 m³ of timber in a sustainable manner would require annual allocation of 333 - 1000 ha for each annual license holder. There are about 20 million m³ of standing commercial wood, 10-15% of which are high commercial value species. The annual allowable cut (AAC) is estimated at 500 thousand m³ of the total 134 volume. However, **the miombo woodlands**, although predominant, have low productivity. This is very important to note, as this resource supports the livelihoods of the majority of the rural population, meets the energy demands of the urban population, and face threats from agriculture and hunting practices such as the use of uncontrolled fires. 219 thousand ha of forest are annually converted into other uses.

A zoning exercise conducted about five years ago revealed the existence of more than 6 million ha of land with potential for forest plantations; however, to date, fewer than 50 thousand ha have been planted. Furthermore, the agriculture zoning and identification of land suitable for commercial plantations, particularly focusing on rainfall

(more than 1000 mm), the central region shows availability of nearly 3 million ha in each case. This suggests possible land competition not only for food production, but also in conservation of forest services such as biodiversity and carbon sequestration. The largest potential for commercial timber is in the centre and north while the South has more potential for plantations to supply energy needs of Maputo province. Forest plantations in this regions with high demand for firewood can contribute towards implementation of REDD+. Payments for enhanced carbon sequestration can be beneficial for the engagement of communities in forest plantation and restoration of degraded forests.

Forests are also important for the livelihoods of the rural and urban population. Over 15 million m³ of firewood is consumed every year in the country. The value chain involves numerous rural producers, a limited number of intermediaries (with and without licenses) and a large number of retailers around the urban areas. Despite the effort of electrifying the country, 80-100 % of urban population still consumes firewood.

There are about 3.2 million families in the rural areas most of whom depend on natural resources for their livelihoods be it conversion for agriculture or extraction of products for direct consumption and/or commercialization. It would not be an overstatement to assume that at least 1.5-2 million people, particularly heads of the families maybe engaged in harvesting wood products for commercial purposes at least during the dry season. A study undertaken in the central region of the country showed that a typical household engaged in charcoal production and agriculture activities generate an annual gross margin¹³⁵ of between USD 143 and 264 in the miombo region (Nhantumbo *at al*, 2003). This can roughly amount to USD 215-286 Million of income a year that is not reflected in the System of National Accounts.

There are nearly 70 CBNRM initiatives implemented since mid 1990's aiming to provide security of resources tenure and above all organize the community towards development and implementation of sustainable forest management practices and exploration of alternative enterprises. Analysis of the viability of implementation of initiatives in Maputo and Niassa provinces indicated that five years was the minimum investment period before the enterprises could generate positive net benefits. Valuation of ecosystems services and provision of payment could possibly give an incentive for communities to invest such a long¹³⁶ time. However, the short term technical and financial supports do not often permit the consolidation of the enterprises.

The Table 2 also indicates the level of operators and volume extracted in the three regions. It is clear that the centre suffers high pressure of timber harvesting. Therefore, this zone is particularly important for REDD+ implementation,

134 Different classes of commercial species.

¹³⁵ Determined using multipleobjective Goal Programming. The value corresponds to the surplus income after meeting food requirements.

¹³⁶ Communities in the rural areas are concerned with their daily wellbeing, have a short planning horizon future and as such have a short time preference

particularly the monitoring of the degradation of forests in terms of commercial value, but also in terms of the carbon stocks.

Table 2 Timber operators in the different regions (2009)

Region	Annual licenses		Concessionaires				
	Operators	Volume	Effective	With MP	Operational	Volume	Industries
South	119	10 795	15	9	6	1 931	15
Centre	250	81 532	71	54	40	43 273	72
North	110	14 375	40	22	17	9 064	39

The existence of concessions with management plans which are not operational calls for even more for the need of monitoring the harvesting activities and make timely corrections.

The undervaluation of forest resources, reflected in the very low royalties, was the subject of discussions prior to the development of the new forestry policy and legal framework. The 2002 regulation sets the royalties for harvesting timber products at 2 000 MZN/m³ for precious¹³⁷ species, 500 MZN/m³ for first-class¹³⁸ and 300 MZN/m³ for second-class¹³⁹ species. To this royalty 15% is added for reforestation. The revenues generated are allocated to the now *Fundo de Desenvolvimento Agrário*. **Table 3** shows the trends in revenue collection from forests, the total contribution from the agriculture sector to this fund, and the allocation to the forestry activities.

Sofala, Zambézia and Cabo Delgado contributed an annual average¹⁴⁰ of, respectively, MZM 37.6 million (25%), MZN 27.4 (19%) and MZN 24 million (16%). The sharp increase in revenue from 2003 onwards is mainly explained by the adjustment of the royalties,¹⁴¹ which had been kept very low since the 1960s. This increase can also be

¹³⁷ Can be exported as logs

¹³⁸ Need to be processed locally

¹³⁹ Need to be processed locally

¹⁴⁰ Since 2005.

¹⁴¹ Regulation of Forestry and Wildlife approved in 2002.

explained by the higher demand of logs from precious species, particularly from the Far East market, and also by the slight improvement¹⁴² in revenue collection, particularly from fines and sale of apprehended timber products.

Table 3: Forest sector revenues and financing from FDA

Year	Sector revenues (Million MZM)	FDA Collected	FDA allocated to Forestry Act	% of FDA Allocated
2002	20			
2003	61			
2004	73			
2005	149	98	13	13%
2006	177	101	42	41%
2007	185	90	45	50%
2008	131	129	12	9%
2009*	23	39	6	15%

*This corresponds to only the first quarter

FDA indicated that 70-80% of its annual budget comes from the forestry sector. However, only an average of 26% of this amount finances forest activities like reforestation,¹⁴³ law enforcement (capacity building and equipment), forest industry,¹⁴⁴ and the allocation of 20% of revenue to the local communities. FDA explains this low level of funding for forestry activities by pointing to the long-term nature of forestry activities and the risk involved, as well as the lack¹⁴⁵ of a clear strategy for the reforestation programmes at the provincial level. In addition, the procedures for transferring funds from the Provincial Directorates (DPA) to FDA and vice-versa are complex and lengthy. **In order to speed up the allocation of funds to communities, the government decided that the 20% should be retained at the source, that is, the DPA.** This minimizes transaction costs and explains the high percentage of allocation of funds in 2006 and 2007.

¹⁴² The private sector claimed to be unduly fined due to the introduction of the 50% of the value of fines given to law enforcement officers as incentive for detection and reporting of transgressions of the law.

¹⁴³ Mostly production of seedlings for conservation purposes,

¹⁴⁴ Reimbursement of 40% of the royalties for each cubic processed, e.g. as veneer sheets, plywood.

¹⁴⁵ The Reforestation Strategy has just (February 2010) been approved by the Ministry of Agriculture

The operational budget of DNTF (central only) out of about 58 million MT (nearly USD 2 million) made available from external sources almost a quarter of a million (25%) was not used. The low expending capacity is a result of the management systems put in place to reduce misallocation, but it also reflects the limited human resources capacity to undertake the planned activities. This means that the government among other interventions needs to recruit additional capacity.

III. THE SECTORAL AND EXTRASECTORAL POLICIES: CHALLENGES TO ENVIRONMENTAL SUSTAINABILITY The sectoral policies and priorities impact the achievement of the government's forestry policy objectives. However, as shown before the high dependence of the population on low input agriculture and biomass energy for the natural forest, make the policies of these sectors (Figure 1) ever more important for the sustainable use and management of the natural forests.

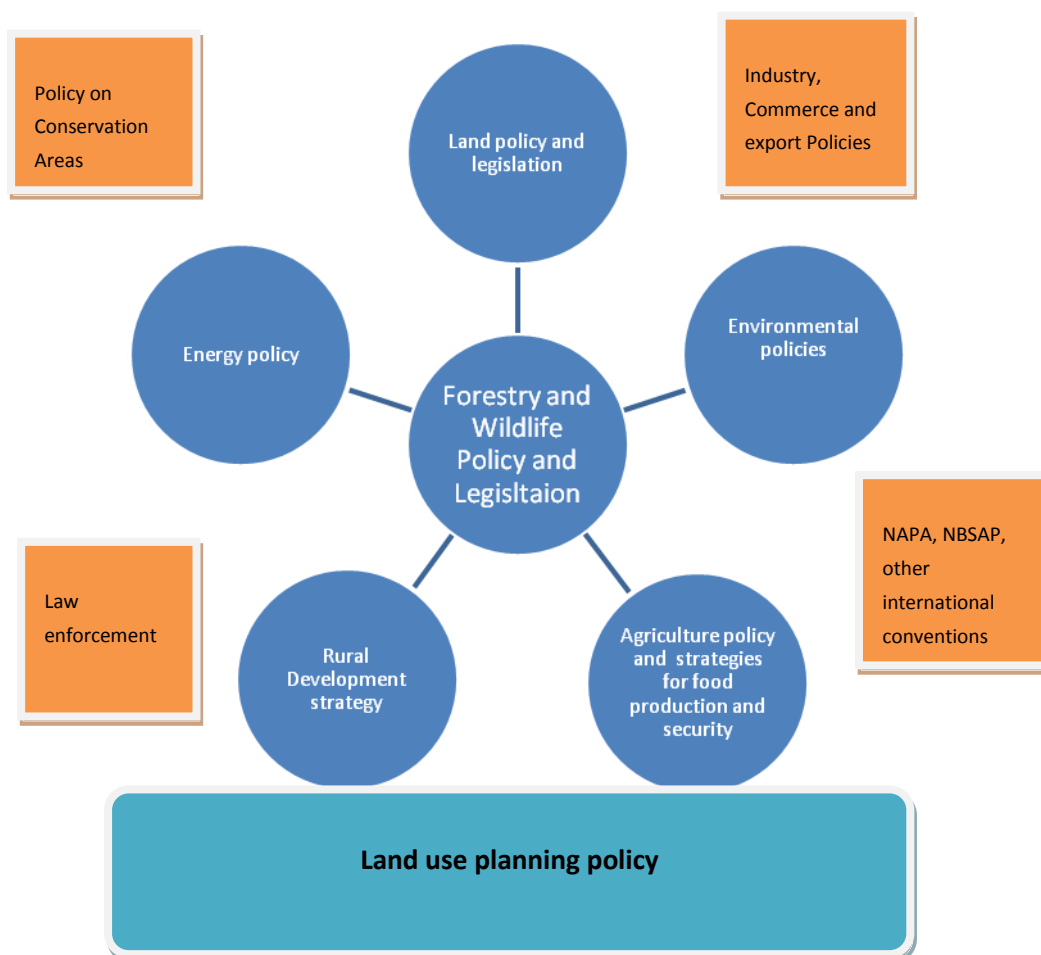


Figure 1 Extra-sectoral policies that affect the sustainability of the forestry sector

The land use planning is a cross-cutting policy issue that can potentially address most of the problems of allocation of land to areas with high potential, hence high possibility of returns or gains (both tangible and non-tangible).

Overall there is a need to address a number of issues to ensure the sustainable forest management. These include: zoning and land use planning, controlling deforestation and degradation, payment for ecosystems services, and reforestation for production and for conservation or for rehabilitation of degraded areas. The institutional weaknesses and the insufficient capacity to facilitate and enforce implementation can be considered the main causes of the failures to achieve environmental sustainability.

The challenges for sustainable management of natural forests

- (i) competing uses and users within protected areas and in the multiple use forest areas;
- (ii) the numerous zonings for coastal areas, for management of specific areas under CBNRM and a myriad of other purposes defeat the opportunity for addressing the complexities of land potential and development priorities and consequent assessment of the tradeoffs. Therefore, the challenge is to undertake a comprehensive zoning integrating the potential for various utilizations of land and to establish the opportunity cost of allocating forest land into lower rent and less environmentally enhancing options;

In 2008 the government produced a 1:1 000 000 agriculture zoning map and is currently working on a detailed 1:250 000 integrated zoning.

- (iii) the central region is endowed with forest resources but it is under pressure for harvesting commercial timber, suggesting that this should be a priority area to address issues of forest degradation and seek mechanisms to contain it; the northern region has large are of dense forests, yet also has the highest potential for commercial reforestation. **Although this may contribute to addressing the option of REDD+¹⁴⁶**, the qualification for the payments requires an objective assessment of the opportunity cost associated with loss of the carbon stocks from native forests.
- (iv) The southern region has potential for community engagement in reforestation mainly for energy and conservation, hence potentially eligible to **claim carbon credits**.
- (v) The majority of urban and all rural population are equally forest dependent as consumers, vendors and producers;
- (vi) **the contribution of forestry to poverty reduction is not adequately reflected in the macroeconomic indicators such as the GDP, food security among others.**

Institutions

¹⁴⁶ Reduction of emissions from deforestation and forest degradation including enhancing (+) the capacity of carbon sequestration through activities such as reforestation and agroforestry systems

- a) Address the issue of double subordination of the Provincial Services of Forestry and Wildlife. These services are accountable to the Ministry of Agriculture in particular the National Directorate of Lands and Forests (DNTF) and also to the Provincial Governor and governing councils. This often affected the priority setting in regards forest allocation and use of the revenues in particular the 20% royalties. While acknowledging the need to take into account the Law of Local Government (LOLE) and the role of local institutions in addressing natural resources management, it is also essential to ensure that the policy and legal framework of forestry and wildlife is applied uniformly in the country.
- b) The institution of a local development fund (FIL) should also serve as an opportunity to support forest-based enterprises, encouraging value addition, reduce pressure on the natural forests while generating employment and revenue for the local economy.
- c) Improve information gathering and analysis coupled with promotion of integration of relevant topics in the curricula at various levels, and promote research to address the challenges encountered by government in the delivery of sustainable forest management. The current gathering of information is limited to harvesting of timber and there are critical elements for establishing the contribution of the forestry sector to the economy and to poverty reduction that are not collected. For example, the sector lacks information on a basic indicator which is the number of employees in the harvesting, processing and commercialization of products. The activities of the informal sector still go unreported. Information on enterprises created under CBNRM, the income generated and the costs associated are not subject of any regular report. The annual allocation of forest resources to concessions and simple licensing need to be mapped in order to facilitate the monitoring of changes in forest use and conversion to lower commercial value forests or lower carbon sink. The government cannot produce all this information but it needs to be proactive and engage research to provide key information for strategic planning.
- *It is necessary to conduct an institutional analysis of the forestry research centers in the government and private sector and present options of institutions that can conduct credible and opportune research to respond to the dynamic nature of the challenges facing the forestry sector.*
- d) The definition of indicators (see boxes at the end of the summary) is key to monitor the performance of the sector. The sector should strive to integrate those indicators into its plans. This area needs to be strengthened as emerging challenges such as potential REDD payments will certainly require stringent provincial and central level monitoring systems.

The Plan and Strategy for Sustainable Development of Agriculture (PEDSA) also include the definition of Indicators and a monitoring process.

- e) All policy reviews done for more than a decade indicate limited capacity as one of the bottlenecks to policy implementation. Once more, this issue will be restated: there is a need to provide capacity, particularly to the Forest Department of the DNTF, which has the responsibility of delivering on the economic objective of the forestry policy as well as contributing to shaping the implementation of the REDD strategy. The quantity and quality of this capacity, as well as training in specialized subjects like resources assessment, management planning, and carbon assessment, are key. An independent monitoring body can bring the best talent available from academia, NGOs and government to conduct research, and monitor the concessions and industry, among other tasks.

- *The government has been considering outsourcing the monitoring to an existing or created institution. The government is introducing an information management system (SISTOF) which and availability of information on the sector's performance.*
- f) Institutional coordination between the agriculture, forest, energy and environment sectors is of crucial importance to properly seize the opportunity brought by the emerging debate around climate change and sustainable development
- g) Adopt the multistakeholder and multisector forum created under the Growing Forest Partnership Initiative to address all the challenges and set priorities for sustainable forest management. Civil society has a double role of facilitating implementation and being a watchdog. It has to develop evidence-based policy advocacy to credibly challenge the government to deliver results
- *Alternatively, the existing Forest Forum (created in 2002) can be strengthened to include extrasectoral stakeholders such as bringing the agriculture, extension, rural development, the finance, the planning, the commerce and enterprise development government sectors, the academia and private sector representatives. There is also need to develop clear functional links with the forum such as GFP, the CBNRM Forum, REDD working group, research networks among others.*
- h) Closely examine the capacity of service providers (notably in conducting inventory and designing management plans)
- i) Capacity of the approving officers needs to be strengthened while introducing an independent monitoring system. The government needs to outsource this task and use the findings to take timely decisions.
- j) The government (MICOA-MINAG) should be more communicative about the approved strategies and action plans for implementation of conventions as well as important resolutions of the various fora in which Mozambique is party to. The reports to the COPs and other fora should follow a systematic process in which key partners are identified to deliver on the actions and commit to report accordingly. The government should also encourage the academia and research to develop evidence based positions on the different issues tackled at the regional and international level. For example, the methodologies for assessing the carbon stocks, the determination of the opportunity cost of different land use systems vis a vis sustainable use of forests and gains from the payment of environmental services including carbon.

Extra-sectoral policies and impact on forests

- k) There is a need for coherent agriculture and energy policies in order to ensure the environmental sustainability of the forestry sector investments. Currently, meeting energy demand for households, industrial use, and low-input agriculture are done at the expense of Mozambique's forests, as they result in deforestation. The root causes are the absence of appropriate technologies for efficient charcoal production as well as domestic usage and the low availability of affordable agriculture inputs.

The forest policy objectives and progress

- l) The forestry policy has defined objectives and overall strategies that are still relevant and up-to-date. However, this policy operates in a dynamic environment. Therefore, the policy reviews should be used to inform progress in implementation and allow timely amendments or improved implementation strategies

as necessary. For example, the emerging issues of carbon sequestration require clarity on rights to land, forest product, and services.

- The concession regime is not yielding the sustainability nor the economic benefits aimed for in the forestry policy. The management plans when designed are solely used for bureaucratic processes, in other words, ensuring compliance with the requirements for obtaining the concession license. Similarly the requisite of developing a processing industry with the aim of adding value, create more employment and ensure higher state revenue is defeated by the establishment of an industry only for primary processing. The annual licenses are not diminishing as rapidly as planned. This system aims at ensuring that nationals (with low capital to invest) also have access to forest harvesting. However, the system is abused as foreigners are de facto holders of the licenses as they finance this type of harvesting using the Mozambique citizens. The otherwise good policy provisions fail to achieve the objectives.
- The adjudication of concessions should follow a rigorous and transparent process.
 - *The government is planning the introduction of a bidding/tendering process based on prior identification of concession areas and management plan drawn by government.*
- Ten years after the approval of the law is a long enough grace period to allow serious concessionaires to fulfil the basic requirements of having and implementing management plans. It is time to revoke the concessions not using this instrument.
- Requirements for accessing concessions should include a minimum training of personnel to secure sustainable harvesting and management. Forest concessions cannot be managed without qualified foresters.
 - *An agreement between the Ministry of Agriculture and the Ministry of Work may have to be drawn in order to ensure enforceability of such requirement, including discussion on meeting minimum safety standards for the field workers.*
- The FSC certification, for example represents a shared responsibility between the concessionaire, the consumers and the state. It further provides independent monitoring of the activities undertaken to ensure sustainable harvesting of forest resources and As such, including this as one of the requisites that ought to be achieved may encourage corporate social responsibility in the medium term and bring a monetary premium to the private entity in the long term, while simultaneously bringing gains to the country in terms of biodiversity conservation and maintenance of other ecosystems services.
 - *The government is developing the national criteria and indicators in order to promote the adherence to certification and cultivate responsible forest businesses.*

m) Develop partnership contracts between communities and the timber operators to reduce conflicts and manage the relationship between these two stakeholders.

- *Develop guidelines for negotiations and ensure that legal bidding contracts are issued.*

- n) Ideally a zoning of reforestation areas and the formulation of a Strategic Environmental Assessment should be undertaken in order to assess impacts and identify broad environmental priorities and indicators to be monitored. In addition, Environmental Impact Assessments and subsequent designs in compliance with environmental management plans should be mandatory for all forms of processing of the products from plantations.

Sector revenues and budget

- o) Royalties should be levied for companies that have high recovery of processed timber per cubic meter– not simply for those processing with over 50% losses. What is the government rewarding in this case? The export of logs may be more profitable. Incentives should be given for efficient industries in secondary and tertiary processing and not for primary.
- *Establish industries that allow integral use of the wood for different purposes such as sawnwood, plywood, among others.*
- p) *Whether through Agrariculture Development Fund (Fundo de Desenvolvimento Agrario) or another mechanism, there is a need for the forest revenues to be reinvested in the sector to address several long-standing issues. There seems to be a dilemma between funding activities linked with food production, whose results can be seen within a season or two and the risk of investing in crops with rotations as forest. Investment in this sector constitutes a very high risk for commercial banks but the State is and should fill the gap in funding these activities. The criteria for funding needs to be revised as a matter of urgency. Indeed, the revenue generated from the forestry sector should support the undertaking of sampled inventories in productive forests where timber concessions operate, support monitoring of management plans fund zoning, creating monitoring capacity (training of personnel and equipment and other means for systematic work), and supporting community in developing alternative livelihoods including reforestation and forestation as well as (native) forest enrichment to meet energy demands, contributing to overall law enforcement and supporting restoration of degraded areas.*
- *It is important that the sector budget support or under the agriculture investment program (PROAGRI) is informed by the revenues generated by the sector and indication of where such funds will be used. The development partners support should be a complement of government endeavours to funds its activities.*
- q) *The sector needs to develop a clear vision and implementation mechanisms aiming at ensuring sustainable forest management in the country. There is to be a national forest program that guides the implementation of the vision. Having a consolidated¹⁴⁷ forest sector budget is one step in that direction. The development agencies' support to the sector should contribute to achieving the priorities and not the other way round.*
- r) *The budget adequacy in terms of amount approved and made available is as important as the need to secure capacity to absorb the resources and be accountable. There is need to have a robust yet a working disbursement process to ensure that annual plans are implemented.*

¹⁴⁷147 DNTF and SPFFB budgets (+ SPGC)

- Apparently the bureaucracy associated with the existing financial management system (SISTAF), in particular, the process of adjudication of contracts is the major culprit to the lower capacity of using the funds. There is need to balance stringent measures of resources (financial and human) use, transparency and accountability with allocation of resources to undertake the planned activities.

Community participation in natural resources management and reduction of emissions

- s) Community-based natural resource management can contribute to reducing shifting cultivation and intensive harvesting of wood products for energy. However, it is essential to support implementation of viable and diverse enterprises including new markets such as oil extracts for the cosmetic industry, medicinal plants, or the processing of non-timber forest products. Collaboration with SAFIRE and national research institutions is paramount to establishing the adequate technology as well as the properties of the products. Such information is key to interest specialized and high premium markets.
- t) It is also very important to acknowledge, value, and pay for the contribution of CBNRM to biodiversity conservation and carbon sequestration. **Only the total sum of economic benefits from products and services can lower the opportunity cost of change in land use.** The threat of climate change and REDD present a significant potential for revitalizing this approach and contributing to the conservation of miombo woodland, which house the majority of the people and meet most of the energy and food needs of the rural and urban population.
- u) The current policies on sustainable management of forests in multiple use areas, productive areas and also in the forest reserves and wildlife protected areas will certainly provide a sizable contribution to reducing emissions.
- v) The conservation of forest reserves requires integration of the communities as part of the solution to deforestation. It is of fundamental importance to increase agricultural productivity, identify alternative sources of energy and income, own the resources, and provide explicit compensation for maintaining the resources. Carbon credits under REDD+ should be an opportunity to support communities to reduce pressure on forest reserves.
- w) Existing national resources should be used wisely to contribute to carbon sequestration and facilitate implementation of REDD and CDM initiatives. The support could include the establishment of pilot projects to test methodologies and thereby derive baseline indicators in order to monitor the gains. It is important to acknowledge that encouraging the support of communities to engage in sustainable natural resource management should be done in the context of rural development interventions, jointly addressing all intervention to equip the communities with means and livelihood alternatives. For instance, a piecemeal support was tested in implementing CBNRM and failed.

Development partners and commitments to long term support CBNRM and promote Corporate Social and Environmental Responsibility

- x)** Development partners should seek as much as possible to complement their sources of funding to address all four objectives of the forestry policy and the priorities being set in the national forestry programme. It is

important to acknowledge that encouraging the support of communities to engage in sustainable natural resource management should be done in the context of rural development interventions, jointly addressing all intervention to equip the communities with means and livelihood alternatives. For instance, a piecemeal support was tested in implementing CBNRM and failed. The role of forests in mitigating climate change reconfirm the need for long term support to address the drivers of deforestation and also to support the private sector in conducting sustainable and responsible businesses in the forestry sector. In addition, support to independent monitoring should be coupled with contributing to capacity building, particularly in training the forestry sector staff to respond to emerging challenges.

IV. RECOMMENDATIONS: PRIORITIES AND INDICATORS

Overall:

- Align forestry (native and plantation) objectives with other, related sectoral policies, especially agriculture and energy policies.
- Use the Growing Forest Partnership (multisector and multidisciplinary stakeholders) Forum to discuss relevant and opportune policy analysis and determine follow-up actions by government, civil society and other development agencies. The existing fora on forests, CBNRM, the REDD working group, friends of forests should constitute subunits focusing on specific issues but all feeding to GFP forum.
- Establish mechanisms for transparent decision-making processes on how forests are allocated to different uses and users as well as on revenue reporting. The land use planning process and the district plan with spatial component should be used as decision tools to maximize the returns on land use including conservation of biodiversity and fragile ecosystems.
- FDA should establish clearly the contribution of various sectors and should take the *risk* of investing in the forest sector with the revenue generated by this sector. If the State does not make investments which will yield benefits in a long term, commercial banks can hardly be expected to do so.
- The government should ensure implementation of the PROAGRI II's Strategic Environment Assessment (2005) provisions, as they are still relevant to the current challenges. The range of indicators listed can be mainstreamed to monitor activities at central, provincial and district levels.

Institutional:

- Government
 - Coordinate within the sector and with other sectors
 - Rationalize the local level institutions such as the Community Management Committees and the Councils of Natural Resources Management (COGEP), clarify their mandate and align with Law of Local Government.
 - Reinforce the Inventory Unit with additional technical expertise to (i) ensure the implementation of guidelines and (ii) conduct field-based sampled reviews of implementation of management plans within the next two years. REDD implementation and the introduction of other payment for ecosystems services require a different skills mix.
 - Establish a national independent monitoring institution for lands and forests whose functions would include (i) review of management plans prior to approval and during implementation and (ii)

auditing the use of the revenue in compliance with FLEG and EITI. The existing institutions such as agriculture research institute (IIAM) in particular the Centre for Forest Research (CIF) should be used to enhance the DNTF capacity in setting standards for the management plans, revision and internal review. The independent institutions should add value to this effort.

- The DNTF and the research institutions such as IIAM, UEM, private universities, the MICOA Centres for Sustainable Development of the Coastal Zones and for Natural Resources Management based in Gaza and Manica among others should establish research contracts to produce information to help monitor progress in policy implementation. There has to be an aligned and shared vision and priority setting on research agenda that respond to the needs of the sector.
- The civil society in particular the NGOs should use research findings using sound quantitative and qualitative methodologies and base its advocacy on evidence to build credibility as a valid interlocutor with government and development partners.
- The Government and development agencies should objectively evaluate the length of the support needed to support community based sustainable management initiatives and develop a clear exit strategy with the beneficiaries. Community support (technical and financial) is a long term undertaking and needs commitment from all involved in its facilitation.

Economic:

1. Priority and funding given to zoning and SEA of the sector program
2. Revoke concessions without management plans or using obsolete equipment in their industry.
3. Support associations of timber operators to access concessions (access to credit, training and other incentives).
4. Establish an independent monitoring body to certify the quality of management plans and monitor implementation.

Social:

- **Support CBNRM as an integrated rural development strategy focusing on value addition of natural products and access to emerging markets; capitalize on payment for ecosystem services schemes.**
- Support establishment and revitalization of existing CBNRM initiatives and strengthen their capacity to function as business enterprises, following conventional business models.
- **Improve mechanisms and rapidity of allocation of the 20% revenues to local communities.** Financial sustainability of this revenue can be ensured only if the villagers put at least a part of this revenue, back to sustain the forest as their source of income. Given the wide application of this fund into extra-sectoral areas such as health and education there is need for reflection of the purpose of this policy tool and make the necessary amendments.

- Facilitate the development of financing instrument for tree growing by local communities and individual families in association with plantations being established by large scale investors.

Ecological:

- Development of the REDD strategy for implementation in multiple use and protected areas.
- Support the establishment of the baseline on carbon stocks as well as the socio-economic indicators to monitor the net benefits of the climate change related funding mechanisms.
- Develop payment mechanisms for the funds generated from conservation of the natural forests and even for enhancing the capacity of carbon sequestration through reforestation and forestation.
- The private sector needs to improve its capacity and awareness of the trends in the international markets not only in terms of prices of products but also the emerging opportunities of marketing forest services.
- Facilitate the implementation of the National Strategy for Fire Control.
- Monitor the forest biodiversity and services.

Priorities and Indicators for the environmental sustainability of the forestry sector

Institutional

- Establish an independent monitoring body and support training of government staff at provincial level charged with this task
 - Comprehensive and analytical annual report on the status of the forestry sector
 - Training of personnel at central and provincial level
 - Number and area of training of forest sector staff
- Establish a think tank to support the forestry sector in research and strategic positioning of the country on the regional and global agenda
 - Research and one publication a year on state of forest biodiversity – and other services
 - A research institutions trusted with forest research to inform government decisions
 - Research agenda and strategic position on regional and global issues
 - Applied research – e.g. forest services
 - Influence regional and global agenda

Priorities and Indicators for the environmental sustainability of the forestry sector

Economic

- Support the development and application of a robust system of information collection, compilation and analysis in the formal and informal sector, for wood and non-wood forest products and, for products and services.
 - Information system established and functional
 - Employment and revenues of the informal sector reported
 - Number of concessions monitored and sanctions applied
 - Annual reports of concessionaires produced and made public

Social

- Approval of the CBNRM strategy design under the coordination of the CBNRM Forum
 - Number of CBNRM initiatives
 - CBNRM SMFE with MP and viable enterprises
 - Number of REDD pilot initiatives established
 - Level of carbon credits realized by communities
 - Financial and human resources allocated to address drivers of deforestation using the CBNRM as an operational platform

Ecological

- Legal provisions clarifying the ownership of forest services in particular carbon
- REDD Strategy approved
- REDD- PP implemented
- Forest cover including mangroves
- Biodiversity assessment in a 3 forest concessions (degradation) and 3 forest reserves
- Volume harvested under concession supersede annual licenses
- Number of fire hotspots in the country
-

The priorities and indicators of the forestry sector are several, however, their implementation should go beyond setting the entry areas for the donors supporting the forestry sector, should go beyond the introduction of priorities for the next development plan and even for DNTF. The indicators can also inform the PEDSA, the central planning and even provincial planning processes. Apparently, from environmental point of view, the ecological indicators have prime importance, hence with the highest priority at local, national and more so at international level due to the consequences of land use change on the emissions.

However, ignoring the inter-linkages between social and economic aspects and their effect on the environmental sustainability of the forestry sector would be a fallacy. Therefore, the government and the development partners need to find a formula to progressively address the various priorities. The support to communities in terms increasing land productivity, alternative livelihoods and sources of energy will go a long way in ensuring the achievement of environmental sustainability. The private sector also has a critical role to play in complying with the requisites of the policy, i.e. diligent design of forest management plans and subsequent implementation.

Appendix 1 Forest cover map – Northern Region

Appendix 2 Forest cover map – Central Region

Appendix 3 Forest cover map – Southern Region

6. Environmental Conservation in Mozambique

Alda Salomão

Abstract

Still to be provided

Introduction

These notes were put together to provide a clear and concise summary on the main policy recommendations for the environmental conservation sector, highlighting the relevant challenges and opportunities to foster the sector's contribution to the national economy. These notes were also prepared to inform working groups on environment and conservation and related strategic issues and environmental indicators which may feed dialogue with the government e contribute for the formulation and monitoring of the next Action Plan for Absolute Poverty Reduction (PARPA III), to be implemented in the period 2010-2014.

According with the Terms of Reference, we selected key issues which guided documental reviewing and interviews with different stakeholders, including government institutions, private sector, civil society and donors. It was not, unfortunately, possible to respond to all of the questions, but these notes cover, direct and indirectly, the main issues proposed.

It must be noted that, as requested, these notes, do not represent a new study. It is only a summary compilation of already existing data from various documents. These notes also reflect the perception of technical staff involved with the sector, including government institutions, private sector, civil society and scholars.

The Importance of Conservation for Fighting Poverty

The great dependence of the majority of Mozambicans on natural resources for their livelihood and income generation implies a recognition that the success and relevance of poverty alleviation plans depend, at large, on the way the country's available natural resources are managed and kept. It is also dependant upon the direct

relationship between the use and exploration of natural resources and income generation for the direct benefit of the poor.

It is on these grounds that the importance of environmental conservation has been expressly recognized by Mozambique's Constitution and by different policies and legislation approved since 1995 for use in the various sectors related to natural resources management.

This importance has also been recognized and highlighted on Action Plans for Absolute Poverty Reduction (PARPA) adopted since 2000, in which environmental issues are treated as crosscutting issues¹⁴⁸. All economic sectors must, thus, integrate environmental sustainability considerations in planning and implementation of their activities.

Based on this recognition the Policy and Strategy for Forests and Wild Life adopted the social objective of promoting rural community participation in the planning and implementation of forest and wildlife resources sustainable management programs, as well as the equitable sharing of benefits resulting from their exploration. On its turn, and on the same sense, the Tourism Policy and Strategy fosters the promotion of tourism activities which may contribute for developing local communities living in natural parks, official game reserves and game farms.

Biodiversity conservation activities have been mainly focusing on parks and national reserves, in official game reserves, and on historical and cultural value sites, corresponding to the categories of conservation areas foreseen on the Forests and Wildlife Law. These areas are currently under the management of the Ministry of Tourism¹⁴⁹ since 2000, when they were transferred from the Ministry of Agriculture, where they have ever been. So far Mozambique counts with 6 Natural Parks, 7 National Reserves, 12 Official Game Parks, and 14 Forest Reserves¹⁵⁰ which cover an approximate area of 130,000 km², the equivalent to 16% of Mozambique's total area. There are also a few natural resources community management programs namely, amongst other, Chipanje Chetu and Tchuma Tchato programs, in Niassa and Tete, respectively. Four of the areas above outlined integrate cross border conservation areas, namely TFCA on the Great Limpopo, TFCA of Chimanimani, TFCA of Lubombo and TFCA of ZIMOZA. The latter is still on a preparation phase.

In order to guide Mozambique's interventions on the grounds of the Convention on Biodiversity, the Government of Mozambique approved in 2003 a Biodiversity Protection Action Plan¹⁵¹ and, more recently it approved the Strategy

¹⁴⁸ PARPA I (2000-2004); PARPA II (2005-2009)

¹⁴⁹ Presidential Decree No. 9/2000 23 May.

¹⁵⁰ As per the Conservation Policy and Strategy.

¹⁵¹ Approved in the 18th Ordinary Session of the Council of Ministers on 22 July 2003.

for the Implementation of the Conservation Policy¹⁵². Both documents recognize the role of natural resources conservation in fighting poverty, with highlights to the general objective of the implementation strategy bellow:

“Develop and consolidate a national conservation system for the biological natural resources and their water and land Biodiversity, contributing for livelihood, economic growth and eradication of absolute poverty.”

In spite of a clear political positioning relatively to the role of conservation in fighting poverty, assessments to the conservation sector and specifically regarding its contribution for fostering local communities development, show that the sector still has many weaknesses. The findings presented bellow were extracted from assessments contained on the first versions of the Strategy for Integrated Community Management of Natural Resources¹⁵³, from the preliminary report on the Assessment of Hunting in Mozambique¹⁵⁴, as well as from the 2007 annual report of the Department of Lands and Forests:

- Need to readjust categorization of conservation areas and to redefine the respective legal regime in order to adjust these areas to the current conservation needs and to the prevailing social reality which is characterized by human settlements within Conservation Areas (CAs) and surrounding areas;
- Need to share profits made by CAs through more equitable ways and to facilitate access to benefiting communities. The allocation to local communities of 20% of exploration fees is seen as a good start, but issues have been raised with relation to the criteria regarding the determination of such percentage and the bureaucratic procedures imposed regarding community access to these funds.
- Need to institutionalize natural resources community management programs and community areas for conservation and ecotourism, through the definition of a legal regime regarding public domain community areas, as foreseen by the Constitution and by the Forests and Wildlife legislation;
- Need of a broader involvement and more adequate compensation of local communities in the context of inspection activities;
- Need of a larger community involvement in income generating activities within and in the surrounding areas of the CAs, as the number of communities receiving government funding to spear tourism activities in their areas is still insignificant. A few known cases include the community of Mpunga on the buffer zone of the National Chimanimani Reserve and the community of Canhane, on the buffer zone of the National Limpopo Park.

¹⁵² Resolution No.63/2009, of 2 November.

¹⁵³ Process started out in late 2008, headed by the Fórum de Maneio Comunitário de Recursos Naturais.

¹⁵⁴ Document prepared by IGF Foundation for the Ministry of Tourism (2009).

In 2001, direct estimated revenues¹⁵⁵ by the National Bazaruto Archipelago were of 6,126,600.00 U\$D paid by about 6,400 visitors /year. Of this amount, only 1,912,000.00 U\$ were spent at local level and the remaining value was pre-paid.

Out of the total entry fees charged between 1997-2000 only 21,176.00 U\$D were paid to local communities, contrasting with a management potential 19,200.00 U\$D per year, considering that each tourist pays a 10 U\$D entry fee. On the other hand, employment generated to locals has been reduced. Only 10% of the 283 full time jobs benefited local people. These data require an update considering that tourism facilities and beds have increased within the park's boundaries since 2001. Quirimbas National Parks has also disbursed, during public ceremonies, amounts to communities on the context of the 20% of entry fee charges totaling up to 1,000,000.00 MT between 2007-2009¹⁵⁶.

In general, the lack of systematic data on the recent revenues generated by activities developed within CAs, namely synergetic tourism (parks and reserves) and game hunting (game parks and community management areas of Chipange Chetu and Tchuma Tchato) and their use in local development programs makes it difficult to assess the sector's impact on poverty reduction. The above outlined studies^{6, 7} indicate the existence of very little transparency in granting operational licenses and in the management of revenues these generate.

At macro-economic level, the Strategy and Action Plan for Biodiversity Conservation establish the need to assess the sector's contribution for socioeconomic development, through environmental accountability. However, very little progress has been made towards its effective introduction within the State's accountability system. Besides environmental accountability there are also budget allocation issues regarding the conservation sector. Concerning the latter issue findings also reflect that government efforts, especially regarding financial allocation, have not been sufficient to turn intentions into reality.¹⁵⁷

Opinions from the Conservation Working Group (a multisectoral consultation forum on biodiversity conservation matters) on the issue highlight the need to account benefits being produced by CAs both for promoting related activities and income generating potential, as it is the case with tourism. A reflection on the 20%'s impact and on the need to have this fund associated to other locally existing funds was suggested, like the 7 billion Meticaís made available to district governments to support local economic projects.

¹⁵⁵ Engdahl, S., Bjerner, M. and Enosse, C. 2001. Perspective of local community participation and economic contribution from tourism: the case of the Bazaruto Archipelago, Mozambique. Maputo, UNESCO/WWF. 14 pp.

¹⁵⁶ Costa, A. (2010, personal communication). WWF Mozambique.

¹⁵⁷ Cabral, L. and Francisco, D. 2008. Environmental Institutions, Public Expenditure and the Role of Development Partners. ODI.

The group also recommends that, on the context of reflections on the correlation between poverty and the environment, a decision has to be made on how much needs to be sacrificed, in terms of natural resources conservation, to combat poverty and to promote development, highlighting zoning and territorial planning as crucial decision-making tools.

Policy-Legal Framework and Institutional Organization

Policy and Legal Framework

In summary the main assessment to the natural resources policy and legal framework, including biodiversity conservation, is that the country has a reasonable set of legal tools, both in terms of quantity and comprehensiveness of issues and sectors. The framework contains the required base for an integrated and sustainable natural resources management (please refer to Annex 4). However, there is a general finding that, so far, the country failed for not having created the required conditions in terms of qualified human resources, sufficient financial resources, adequate institutional organization and coordination, rigorous application of legal rules and rapid filling of gaps in policies and legislation. In what specifically concerns the sector's legislation, the analysis recently included in Conservation Policy indicates that:

- Current legislation is still based on a rigorous separation of ecological and human components and does not allow for sufficient flexibility on the definition and management of conservation areas;
- The legislation that protects flora and fauna species in conservation areas does not provide sufficient warranties regarding their preservation nor reflects current knowledge on Biodiversity and its conservation status.

In other words, a review of relevant legislation pertaining to the conservation sector, specially provisions contained in the Land Law and in the Forest and Wildlife Laws, revealed a need to redefine and adequate the categories of CAs to the social and cultural reality and the current conservation needs and, consequently, to proceed to the reassessment and readjustment of the conservation areas' legal framework. Amongst other, a gap long detected concerns the legal treatment to give to natural resources community management programs, especially conservation and ecotourism community programs, foreseen on Article 87 of the Forests and Wildlife Regulations. The lack of clarification on this issue is greatly responsible for the confusion which exists within conservation areas management and for the poor impact produced both regarding the objective of community participation in conservation activities, as well as for the community access to benefits resulting from the exploration of resources in these areas. The government's delay in dealing with the institutionalization of Chipange Chetu and Tchuma Tchato programs has raised doubts on its commitment to the social responsibility reflected within land and forests policies.

There is a package of political and legal tools, namely the policy and law on territorial zoning and planning, of which very little is said regarding the conservation sector. The referred package is however fundamental for the mitigation

of problems faced by the sector, not only with relation to the existing Man-Animal Conflict (MAC), but also regarding intersectoral conflicts.

Disordered human settlements and the absence of mechanisms for the separation of human and animal communities are in the centre of the Man-Animal conflict (MAC), which is generally dealt with through palliative measures that address symptoms and not the root of the issue.

The implementation of a territorial policy and law is fundamental for the elimination or, at least, the minimization of conflicts and competition between conservation and economic interests. It is fundamental mainly for the planning and promotion of a harmonious and integrated rural development, based on the use of appropriate management tools, of which CAs are an integral component.

In general, studies recommend a broader government engagement on the creation of conditions for a larger observation of the legislation and to incentivize compliance with policies and legislation in all sectors. Furthermore, Mozambique needs to complement its specific conservation legal framework. On this context, the approval of a Conservation Policy and Strategy offers a very good opportunity for the approval of a specific law on the establishment and management of CAs, including rules on the different categories and respective legal regimes, which will allow a clear understanding on the activities which may or not be carried out inside various CAs, on the main actors and their responsibilities and the necessary human and financial resources required for their operationalization. This opportunity shall be equally be used for the definition of rules referent to conservation activities which shall be necessarily implemented also outside CAs, reflecting a broader and more integrated conservation model.

Institutional Framework and intersectoral coordination

The Environment Sector Strategic Plan 2005-2015 defines the sector mission as “*to coordinate the implementation of the Environmental Strategy for Sustainable Development in Mozambique in order to reduce absolute poverty, promoting sustainable use of natural resources, improving environmental quality, economic growth and social equity.*”

Thus, and under the referred plan, environmental management in Mozambique involves a diversity of government sectors, headed by the Ministry for the Coordination of Environmental Action (MICOA). An environmental component within the government’s program reflects, thus, not only MICOA’s responsibilities (being a coordinating body), but also the responsibilities of each of socioeconomic priority sectors, including the private sector and civil society.

The plan also indicates that given its crosscutting nature, addressing environmental issues should reflect a harmonized articulation of the principles from both general and sectoral environmental policies and highlight priority activities to be developed by all sectors of society based on a common vision and harmonized objectives. However, despite progresses made at institutionalizing Mozambique’s environmental management, there is still a

great fragility in terms of organization, capacity building and institutional coordination, mainly on the public sector. The institutional Framework adopted so far on natural resources management, is characterized by a great dispersion of responsibilities by different ministries and this hinders concentration and maximization of efforts and resources for the prosecution of conservation objectives. On the other hand, the use of essential good governance tools, such as territorial planning, strategic environmental assessment, amongst other indispensable tools for firmly combating poverty and promoting a sustainable and harmonized development, still requires improvement and consolidation efforts.

The fact that natural resources management attributions are spread across various ministries (Agriculture, Fisheries, Mineral Resources, Energy, Tourism, Public Works and Housing, Planning and Development) and that MICOA's coordination of powers concept were not sufficiently made clear and strengthened during the years hindered MICOA to adequately fulfill its mission.

CONDES has a coordination mandate, in order to ensure, at highest executive level, an integrated coordination and vision in planning the country's sustainable development. On one hand, CONDES removed the general coordination rules and the related necessary powers from MICOA. Actually the creation of CONDES (as provided by Article 6 of the Environment Law) should have suggested the need to design a different mandate for MICOA, as both institutions ended up receiving practically the same responsibilities. On the other hand, the almost total inability of CONDES in the past years has deprived MICOA of the required political support to affirm and impose a national environmental agenda.

Besides the issues specifically related to MICOA, there are issues related with the general institutional framework which need to be submitted to an urgent reflection, namely:

Conflicts of interests between conservation and economic exploration

The management of national parks and reserves, as well as game reserves and natural resources community management programs, was assigned to the Ministry of Tourism, the government's body responsible for the management, planning and execution of tourism activities, hotels and restaurants, and which has equally received the responsibility for the management of conservation areas. The transfer of CAs to MITUR was accompanied by a controversial decision to alter the conservation objectives behind the establishment of CAs. This highlighted a concerning prevalence of economic objectives upon strict biodiversity conservation objectives. The main goal behind CAs is not to make Money and this need has been disfigured away from the current institutional structure. If one looks at the different compared experiences, especially from neighboring countries, supervision and management of conservation areas is under the responsibilities of the government body which oversees environmental issues through an administratively and financially autonomous para-state entity. The recommendations provided by people and institutions interviewed suggest this model, in line with the Conservation Policy and Strategy.

The Ministry of Agriculture remains responsible for the management of forest reserves, raising doubts around the institution's capacity to ensure the protection and conservation of forests and wild fauna, and of biodiversity outside conservation areas in general. MINAG is simultaneously responsible for licensing forest and fauna exploration activities. The fact that the majority of forest reserves is completed abandoned and that, in some cases, agricultural activities are being incentivized without consideration to forest reserves, as it is the case, for instance, with the Moribane Forest Reserve in Manica, raises a conflict of interests issue between protection and exploration of natural resources.

Overlaying functions

The environmental management institutional Framework reflects the existence of various institutions with similar, if not identical, attributions namely, for instance, the National Directorate for Environmental Management (MICOA), the National Directorate of Lands and Forests (Ministry of Agriculture) and the Directorate for Dry and Semi-Dry Lands Development (National Institute for Disasters Management, overseen by the Ministry of State Administration) and the National Directorate for Rural Development (DNPDR). All these sectors have environmental management responsibilities, including resources protection.

Na issue for reflection here is if it would be more sustainable to keep identical functions in different bodies or if the possibility of integrating these functions in a single body should be considered, concentrating adequate means and human resources in order to achieve results more successfully and efficiently. Our understanding is that the second option should prevail, implying, as outlined above, the establishment of an actual Ministry for the Coordination of Environmental Action, with the structure, means, human resources, strength and technical and financial capacity required to allow a proper intervention for environmental protection, preservation and conservation, and in the prevention and mitigation of global and local impacts and threats to ecological balance.

Dispersion of sectors

There is a need to rethink the current separation of social and economic planning functions exercised by the Ministry of Planning and Development (MPD), and the territorial planning responsibilities (which integrates physical planning, but also important economic, social and environmental planning functions), under the responsibility of the Ministry for the Coordination of Environmental Action (MICOA), through the National Directorate for Territorial Planning and Zoning (DINAPOT).

One must revisit the territorial planning concept as a set of principles, guidelines and rules aiming to ensure the organization of national space through a dynamic, continuous, flexible and participative process seeking balance between man, the physical environment and natural resources, in order to promote sustainable development. Thus, territorial planning should not be seen as a separate form of economic and financial planning, and vice-versa. Their common objective is common –the prosecution of a sustainable development, which will only be achieved with efficacy and success through the integration of both exercises. In this case a suggestion would be to transfer DINAPOT from MICOA into MPD, where it would be logically and systemically integrated.

On the climate changes chapter, MICOA is the institution with the mandate for preventing, adapting and mitigating climate changes. However, it is the National Institute for Disasters Management (INGC), overseen by the Ministry of State Administration, which is affirming itself as the main technical and scientific authority on the issue. Rather, one would expect to see that function being carried out by MICOA. Climate changes are environmental problems, directly and indirectly caused by human actions, or as a result of natural phenomena, hence, logically, there is a need to rethink who should, on the first line, be responsible for such theme.

Poor technical capacity and working conditions

There is still a lot to be done in what concerns natural resources management technical capacity, and in particular, for the management of CAS'. The different existing government institutions with an environmental conservation mandate, including MICOA, MITUR and MINAG, significantly lack expert and essential staff for the prosecution of their attributions. There is a lack of technical and specialist staff accredited and experimented in the various technical areas, without whom it will be difficult to achieve a reasonable and acceptable performance within the areas currently assigned to these institutions.

On this context, technicians from these institutions recommend the adoption of urgent measures to stop the exiting of public employees to other sectors. Despite the urgent need to create incentives in terms of remuneration, they refer to the need to improve their technical capacity and the establishment of minimum working conditions for the undertaking of their functions and responsibilities.

Intra – inter institutional coordination

The issue of institutional coordination shall be extended to all levels of public administration, namely central, provincial and district, as well as between the various government sectors at these levels, as conservation efforts will not be effective if these only take place at central or single sector levels.

There are a number of cases in which the agendas of the various existing ministries are completely contradictory and incompatible, clearly reflecting the lack of a common vision regarding the strategies and principles for national development sustainability. The approval by the government (in 2007) of the sugar cane biofuels project in the District of de Massingir (PROCANA), in a frontal collision with the interests of the Limpopo National Park and of communities, raised the issue of lack of coordination, mainly the political fragility of the institutions responsible for environmental management and conservation. The license granted to PROCANA was called off by the government late 2009, due to non-fulfillment of contract obligations by the investor and incompatibility with conservation objectives or with the social and economic interests of local communities.

In summary, the main conclusion is that, for the next five years, Mozambique needs, amongst other, a Government whose national development sustainability pillars are equally perceived and defended by all ministries, and where the links between the environmental conservation sector and economic development are significantly maximized

and strengthened in order to respond to the challenges ahead. Mozambique also needs a government whose institutional mandates and competencies are clearly defined, where conflicts of interest are minimal and institutions are adequately equipped with human resources and funds to fulfill their role and secure the country's sustainable development.

Main actors and level of engagement

In line with the participative environmental management, for the past ten years the government has made efforts to create room and opportunities for the involvement of all sectors of society in natural resources management. On this context, as of today, and as an environmental policy principle, all decision making and strategy implementation processes and plans of action count on the active involvement of both private sector and civil society. Of particular importance is the involvement of local communities, whom are considered as key actors for the assurance of a sustainable natural resources management, including conservation, but also promotion of a rural socioeconomic development.

Besides government institutions, the other sectors participate in a differentiate way on environmental conservation activities, highlighting the following actors and interventions, per sector:

Civil society:

NGOs

This component highlights international non-government organizations, with special reference to WWF which has been involved for many years in the support to the management of Bazaruto National Park and, more recently, in the establishment of the Quirimbas National Park. In these processes WWF was supported, being the implementing agent, by the National Forum of NGOs for Endangered Nature (FNP), Community Management of Natural Resources (GECORENA) and the Environment Association of Cabo Delgado (AMA).

Other international and national NGOs involved in supporting the conservation sector in recent years include African Wildlife Foundation (AWF), Peace Parks Foundation (PPF), IUCN (International Union for Nature Conservation), Association for Coastal and Marine Research (AICM), and IGF Foundation.

NGOs have assumed a great involvement on initiatives for the provision of room for dialogue on environmental government in general. In this context, their participation on the activities of the National Forum for Community Management of Natural Resources is to be highlighted.

Local communities:

Mozambique has been implementing community management of natural resources for more than a decade. The Tchuma Tchatu Program, initiated in 1995 in Tete represented the starting point for the development of legal

instruments which regulate the access and security of rights, the implementation of measures for sustainable management and sharing of revenues with local communities.

The forests and wildlife sectors were the pioneers on this process, followed by the promotion of community participation in the management of other resources, amongst which fishery resources.

According to the Proposed Integrated Natural Resources Management Strategy, a participative approach in natural resources management contributed for the licensing and registration of more than 4 million hectares until 2007, and the implementation of about 70 community management projects.

Under the implementation of the National Strategy for Development Promotion, local communities' involvement in conservation and natural resources sustainable management activities, as previewed on Strategic Objective 2, represents a fundamental pillar. For that reason it is proposed that Ministry of Planning and Development (MPD) is appointed the institution responsible for the implementation of the Strategy for Natural Resources Community Management.

Local communities have also been involved in CAs and they participate in management and conservation of resources activities with special highlight to their participation in management bodies of some CAs, as in the case of the Consultation Committee of the Quirimbas National Park, as well as in income generation activities, such as the fruit drying project in the Gorongosa National Park, and the ecotourism project in the Community of Mpunga, in the Crossborder Conservation Area of Chimanimani.

Academics and research sector

Universidade Eduardo Mondlane is one of the most important education and research institutions, along with research departments (institutes) of some ministries such as agriculture and fisheries. One of the issues being raised is the relationship between academic curricula and economic sectors, in order to achieve a greater approximation between what is thought in universities and the technical abilities and knowledge required by the market. In the context of conservation, UEM has been undertaking studies and research works on forest reserves, to where it regularly sends students. However, the impact of these activities is still unknown, especially in what concerns their contribution for decision making processes on CAs' management. For instance, the issues around man-animal conflict (CHA) could yield benefits for research works.

Accordingly with technical staff from MITUR, there is a partnership between MITUR/DNAC, MWEKA College (Tanzania) and South Africa Wildlife College (South Africa), where sector technical staff has been receiving training.

Private sector

The country has been implementing models for delegating CAs management to the private sector. At present there are two concessions on park management, Sociedade de Gestão da Reserva do Niassa, in the Niassa Reserve, and Carr Foundation at the Gorongosa National Park. The private sector is also involved in the management of game reserves. Most of the entities interviewed is in favor of this management model in CAs and considers that it has the potential to minimize the great problems faced by the conservation sector, namely technical capacity for CAs management and the capacity to mobilize financial resources.

The main issues raised by this sector have to do with the need for more clear conservation objectives, namely concerning compatibility of conservation interests with interests of other economic sectors, at central, provincial and local levels. This sector is of the opinion that the environmental conservation component hasn't been duly considered in national planning and development processes, especially in the construction of infra-structure such as roads and bridges, landing fields, etc. Specifically the following has been suggested:

- Adoption of a conservation culture in which the conservation concept is comprehensive and covers resources both in and outside CAs;
- Clarification of rules and procedures for the licensing of different resources management and conservation activities;
- Supervision of different conservation activities by a single sector;
- Need to control population density and to establish incentives for populations to settle outside CAs.
- Need of a CAs' management institution which well equipped both technically and financially, to oversee all conservation activities, in and outside CAs, with a clear mandate and effective autonomy with relation to sector Ministries. For this reason, this institution shall respond directly to the Council of Ministers.
- Better dissemination and implementation of existing legislation.
- Channeling of donor funds for the creation and reinforcement of the national capacity for the implementation of conservation activities, including management of CAs.
- Creation of incentives to stop qualified personnel from leaving the public sector;
- Integration of resources conservation activities in and outside CAs, especially wildlife, and identification of natural resources management activities which are actually profitable for communities;
- Exploration of other activities with potential for income generation in order to complement eventual tourism related profits, for the involvement and benefit of communities;

It is important to underline the existence of a consultative body established in 2007, the Conservation Group, which integrates representatives from cooperation partners, from government, from national and international non-government organizations and private sector. The group was formed under the preparation of the Conservation Policy and Strategy, and carried out regular meetings for the discussion of issues related with the process, resulting

on the Policy's approval in 2009. At the moment the group maintains their meetings for following-up the implementation process and other relevant issues.

Role and level of support from development partners

Development partners have been playing an important role in the facilitation of implementation of policies, legislation and conservation programs through the provision of financial resources. In the past 10 years, the main sector funding partners include World Bank, French Development Agency, German Cooperation Agencies, Danish Cooperation Agency and Global Environment Facility.

Despite the importance of the funding received (the table included in Annex 3, for instance, indicates some of the amounts made available by these institutions and their respective intervention areas), opinions external to the group indicate that donors have been spending a lot of Money in areas that are not necessarily a priority, downgrading the effective creation and consolidation of the national technical capacity for the management of CAs. It is noted that too much funds have been allocated to office activities rather than field activities, where reside the greater challenges, especially in the inspection component, illustrating, thus, the lack of strategic investment plans for the CAs. For this reason, these sources conclude that despite the large amount of funding for the sector in the past decade, their impact in the establishment and consolidation of CAs' management capacity is still very poor. The conservation sector still suffers from a high lack of technical capacity to participate and the lack of financial resources to create adequate working conditions, especially for research, monitoring and inspection.

On the other hand, it is said that donors assume an attitude of unlimited tolerance against the government poor performance, misuse of funding opportunities made available and misuse of funds. In this context, it is recommended that donors act and clearly and firmly require the government to be more accountable for the use and impact of their support.

The lack of systematic information sharing between government and donors was also referred hindering a better planning and channeling of support to national priorities. On the other hand, there is a need to rethink the institutional mandates as many resources for conservation activities were channeled to MICOA, which is, so far, a coordination institution and not an implementing one.

Donors consider that poor progress and impact of their funding initiatives may be a result of existing conflicts of interests between the conservation sector and different economic sectors, being the most cited cases tourism, fisheries and mining.

Donors also recognize a lack of direct support in the management of CAs, as well as the existence of differing interests amongst various donors.

In the context of an integrated environmental management, some partners indicate the need to address poverty as an issue with cross-cutting impacts, namely the Access to power resources, such as wood collection and coal production, which endanger forest resources; the preparation of farming fields by slash and burn. Other issues such as the contamination of soils and water by mining activity and air pollution by the industrial sector are also factors that should be considered within biodiversity conservation.

Existing /in progress studies and research and knowledge gaps

Besides UEM, various other state institutions have been involved in relevant research activities in the conservation sector. These institutions include Mozambique's Institute for Agronomic Investigation (IIAM), the Institute for Fisheries Investigation (IIP) and the National Institute for Disasters Management (INGC). According to the national report on the Convention on Biodiversity, besides other Sustainable Development Centers (CDS) under MICOA's oversight, a Community Investigation Centre was created in Madjadjane and a Botanic Investigation Centre is under creation in Namaacha. CDSs were established with the objective of steering environmental investigation activities in three fundamental areas, namely marine and coastal management (CDS- Coastal Areas in Xai-Xai), Natural Resources Management (CDS-Natural resources in Chimoio) and Urban Environmental Management (CDS-Urban Areas in Nampula).

Some studies were carried out in some conservation areas, as it is the case of the Quirimbas National Park, the Bazaruto National Park, the Niassa National Reserve, the National Reserve of Gilé, the Gorongosa National Park, and the Partial Marine Reserve of Ponta do Ouro, amongst other CAs. Despite some of the studies carried out, most of CAs do not have an adequate inventory of the existing Biodiversity. Another gap identified is the lack of ecologic indicators, including CAs efficiency indicators¹⁵⁸.

The main recommendation for this component is the establishment of an institution responsible for the collection and systematization of all the information produced with relevance for the environmental conservation sector.

The assessment conducted by sector technicians, both from public institutions and from NGOs, indicates a high lack of updated information and knowledge on the status of Biodiversity in Mozambique. Furthermore, the scarce information produced during recent years is not easily made accessible for it is dispersed amongst the various existing institutions. Despite the fact that MITUR is currently responsible for CAs it doesn't have a database with systematic information produced by the research works for and in the various areas.

International institutions and organizations, as well as the private sector involved in the management of CAs, also have considerable information and studies carried out in Mozambique which should also be on the State's possession.

Main problems and recommendations

The National Conservation Policy, the most recent instrument approved to guide the sector, contains an updated analysis of the main strengths, opportunities, weaknesses and threats to the conservation sector, including its policy and legal framework, as well as recommendations and guidelines on specific actions which should be implemented by the government and its partners for the next three years.

Based on the Conservation Policy and in the analysis of various affirmations, reference studies and documents, we present a list of priority interventions for the next 3 /5 years, as follows. Due to their complexity, this table will not include an indication of the required budget for the implementation of recommended activities, such information shall be produced and added *a posteriori*.

Priority Interventions for the conservation sector (2010-2014)

	Problems and Impacts	Priority Actions	Objectives	Specific Activities	Institutional Leadership	Indicators
1	Lack of a common government vision on national development sustainability pillars and poor institutional coordination, leading in great conflicts of interest between conservation objectives and economic objectives	National territorial planning and zoning, and provincial and district strategic development planning	Integrate protection and environmental conservation issues within development planning through an adequate territorial planning and zoning at all levels	1. Revisit existing CAs and review their limitations; 2. Identify new areas for conservation purposes; 3. Organize human settlements; 4. Establish public land reserves; 5. Produce steering plans for sectoral economic development; 6 Undertake strategic environmental and social evaluations for development programs and strategies	Council of Ministers CONDES MPD	1. National Territorial Planning Plan prepared ; 2. Strategic Provincial and District Development Plans prepared based on territorial planning and zoning

¹⁵⁸ Pereira, M. A. M., Videira, E. J. S. and Narane, D. A. Análise à representatividade e efectividade das áreas marinhas protegidas em moçambique: recifes de coral e tartarugas marinhas. Apresentado no Seminário sobre Áreas Protegidas na Comunidade dos Países de Língua Oficial Portuguesa. Maputo, 3-4 November 2008.

	Problems and Impacts	Priority Actions	Objectives	Specific Activities	Institutional Leadership	Indicators
2	Dispersion of institutional mandates and responsibilities, resulting in an inefficient public intervention and in sectoral conflicts of interests	Institutional reform for a more integrated, efficient and effective environmental management	1. Ensure the existence of an institution with executive powers in the environmental conservation sector and the existence of clear environmental guidelines for the different economic sectors 2. Ensure planning and undertaking of natural resources conservation activities, away from commercial exploration action and interests.	1. Review and redefine ministries' mandates and competencies to ensure interventions agreed by all government sectors 2. Concentrate the mandate and competencies for environmental protection and conservation, including management of conservation areas, within a Ministry for Coordination of Environmental Action 3. Establish an autonomous para-state entity for the management of conservation areas, under the Ministry for Coordination of Environmental Action, as prescribed by the Conservation Policy and Strategy (National Administration for Conservation Areas)	Council of Ministers CONDES MPD	1. Statutes of MICOA, MITUR and MINAG reviewed and mandate on Conservation Areas transferred from the Ministry of Tourism to the Ministry for Coordination of Environmental Action 2. Established an autonomous entity for the management of CAs
3	Incomplete and unadjusted legal framework, causing violations of sustainability principles	Review and matching the political-legal Framework for environmental management and conservation	1. Filling of existing gaps in the legislation and matching of legal rules to the current country's reality and needs. 2. Preparation of the required legislation for the implementation	1. Harmonize the lands' legislation with the legislation on forests and wildlife, tourism, fisheries, mining, etc. 2. Harmonize national legislation with environmental conventions. 3. Redefine categories of CAs	Parliament, Council of Ministers Ministry for Coordination of Environmental Action	Legislation for the implementation of Conservation Policy and Strategy approved.

	Problems and Impacts	Priority Actions	Objectives	Specific Activities	Institutional Leadership	Indicators
			of the Conservation Policy and Strategy	and clearly define their legal framework, including that of areas under community management 4. Create a database on relevant studies related to the conservation sector		
4	Lack of harmonization between government priorities and development partners' interests, causing an improper channeling of funds	Coordination of public sector's donors and civil society interventions and harmonization the priorities of the Five-Years Government Plan	Ensure an effective and efficient contribution from cooperation partners through the support to priority sectors in order to ensure the production of impacts and sustainability	1. Production of clear and coherent government plans, 2. Mapping and harmonization of donor initiatives with government plans; 3. Permanent and independent assessment of the disbursement level, use and impacts of the support provided by development partners.	MPD	Financial priorities indicated by the Government and fulfilled by donors and funds adequately used and causing impact
5	Insufficient human and financial resources for priority actions causing a poor national technical capacity for environmental conservation in general, and management of CAs in particular);	Institutional capacity building and refurbishment in the public sector	1. Increase and consolidate national technical capacity for natural resources conservation and management of CAs 2. Mobilize and channel financial resources for interventions of public institutions	1. Establish a database of national personnel qualified (or with qualification in progress) in relevant areas for the conservation sector 2. Identify numerical and technical specialty needs for the conservation sector; 3. Design and implement a capacity-building and staff retention strategy for the conservation sector;	Ministry for Coordination of Environmental Action	Public sector staff qualified in sufficient number and with proper working conditions to respond to the requirements of the Conservation Strategy
6	Lack of	Establishment	Assess	1. Establish general	MITUR,	1.

Problems and Impacts	Priority Actions	Objectives	Specific Activities	Institutional Leadership	Indicators
performance and efficiency indicators for the conservation sector	and monitoring of indicators	efficiency and general performance of the conservation sector, including that of CAs	indicators for conservation in the Country; 2. Establish and monitor, at the level of each CA, ecological efficiency indicators, operational and management indicators for CAs; 3. Include indicators in the Management and Operational Plans within CAs 4. Feedback management actions based on indicators	MICOA	Created general indicators 2. CAs indicators established and included in Management Plans

7. Environmental Assessment of the Agricultural Sector

Emílio Tostão

Abstract

Still to be provided

Summary

The growing need for food, fiber and fuel demand an increase in production and productivity in agriculture in Mozambique. More production land, water and inputs will inevitably be used to achieve this goal, and this may result in environmental degradation if measures to reduce agricultural impacts on the environment are not observed. In the long term, combined with possible climate changes effects, environmental degradation from agriculture may significantly reduce agricultural production. Furthermore, this is the sector in which the majority of Mozambique's population depends for food, income and employment.

The vision of the agriculture sector is "an integrated, prosperous, competitive and sustainable agrarian sector" (Government of Mozambique - PEDSA, 2010), however, the realization of this vision will largely depend on the way through which the sector will be able to face current challenges, such as the need to reduce malnutrition and increase food availability, balancing social, economic and environmental interests, the exposure of the sector to influences caused by climate changes, health and environmental effects resulting from the use of agrochemicals and damages caused by uncontrolled forest fires, to name some examples.

An extensive row of natural resources (for instance, land, water, air, biological diversity, including forest, fisheries) supplies the indispensable basis for agricultural production. Given the multifunctional nature of agriculture it is fundamental to consider the links between

ecosystems in which agricultural systems are integrated, as these have important implications for resilience or vulnerability of these systems. However, there is global evidence that sustainable agricultural production system, present feasible alternatives with relation to the existing unsustainable agricultural practices.

Sustainable agricultural practices may help the sector face these challenges, bringing evident environmental, social and economic benefits. Sustainable agricultural techniques are more resistant to adverse situations, including climate changes and natural disasters.

In order to face these challenges it will be necessary to introduce a series of measures aiming to reinforce intersectoral collaboration and the capacity of the Ministry of Agriculture (MINAG), research institutions, civil society and private sector as to improve the sector's environmental performance and to facilitate application of environmental favorable practices by farmers. These measures include, amongst other:

- Reconsider the process of designing agriculture plans and programs to ensure the inclusion of agricultural impact indicators which are consistent with the Agricultural Policy and Implementation Strategy (PAEI) and with the Strategic Environmental Assessment of PROAGRI II (AAE)
- Review the coordination mechanism between the Ministry for the Coordination of Environmental Action (MICOA) and MINAG and establish a clear separation of tasks and competencies, considering the autonomy of the Environmental Unit;
- Development of means to verify AAE's environmental indicators and for data collection;
- Development and implementation of research, strategies and promotion of practices for adaptation to climate changes and of sustainable agricultural technologies which are sufficiently profitable.
- Create mechanisms to take the most out of existing private extension networks, and increase the provision of extension services by MINAG to producers, including the preparation and use of specific training kits for extension agents in order to allow that extension services support farmers in the introduction of sustainable and economically feasible agricultural techniques;
- Create financial mechanisms and instruments to allow long term investments in order to improve productivity through a sustainable management of natural resources, for instance, through the introduction of sustainable agricultural practices and irrigation techniques and making available seasonal loan at low interest rates for smallholders;
- Strengthen the agrochemical management component (fertilizers, pesticides, antibiotics, vaccines) in Mozambique, including: undertake a study to assess loans to the acquisition of pesticides used in treating cashew trees; training of planners on the importance and increase of management efficiency in the agrochemical supply chain;

- Assessment of the effect of loans which may cause damages to the environment, as it is the case with the potency rate for irrigation and subsidy for agro-chemical used in the pulverization of cashew trees;
- Create incentives to increase participation of producers/communities in the sustainable management of natural resources.

Importance of the agricultural sector¹⁵⁹

The majority of the population depends on agriculture for livelihood, employment and income and agriculture generates about 35 % of export revenues in Mozambique. However, the negative impacts over agricultural ecosystems, such as erosion, loss of fertility, water and soil pollution may affect the economic performance of the sector.

The agriculture sector represents the backbone of Mozambique's economy. The sector employs more than 90% of the population in rural areas and 40% in urban areas, and contributes for more than 22 % of the GDP, and generates about 35 % of export revenues in Mozambique (Government of Mozambique, 2007).

The performance of the agriculture sector is crucial for reducing poverty in Mozambique as most of its population depends largely on agriculture for livelihood, employment and income. Incidence of poverty decreased from 69 % in 1996-97 to 54 % in 2002-03 but the prevalence rate of chronic malnutrition (low height versus age) has aggravated from 36% in 1997 to 41% in 2003 (Government of Mozambique - ESAN, 2007 citing IAF, 2002/03). Despite the progress registered in fighting poverty, it is less likely that Mozambique is capable of achieving the first of the Millennium Development Goals (UN Millennium Project, 2005). At the same time, the increase of productivity and agricultural production is vital to revert the current poverty and food insecurity scenario as the majority of the population depends on agriculture for livelihood, employment and monetary income.

The agriculture sector comprises small, medium and large producers. Smallholders represent the prevailing class of producers and they use about 97% of the 5 million arable land being currently used for agriculture (Government of Mozambique-PAPA, 2008). The production system for this class of producers is subsistence farming, characterized by a low productivity (about 500kg of corn/ha), intensive household labor, low capital use, fertilizers, and other agrochemicals, and limited market access.

¹⁵⁹ Agriculture is defined as the cultivation of land for the creation of advantages for certain agricultural, animal, tree and pasture species (WBCSD and IUCN, 2008).

Large producers practice a commercial agriculture, characterized by the intensive use of acquired inputs and capital. Commercial agriculture has been expanding in recent years with the establishment of new farming companies, particularly those that produce biomass for fuels.

Despite its low productivity, the existing potential is huge:

- There are approximately 31 million hectares arable land that aren't currently being used by agriculture (Government of Mozambique-PAPA, 2008)¹⁶⁰,
- Mozambique has about 10 agro ecologic areas which may be used to produce a diversity of agricultural products and livestock.
- There is a large irrigation potential from rivers, lakes and water from floods.

It is fundamental that sector policies are designed in such a way that allows this potential to benefit the poor.

The vision of the agriculture sector is "an integrated, prosperous, competitive and sustainable agrarian sector" (Government of Mozambique - PEDSA, 2010) and the need for sustainable management of natural resources is recognized by the PEDSA. It is, thus, important to secure the balance economic, social and environmental interests and their integration within decision making, planning and budgeting processes.

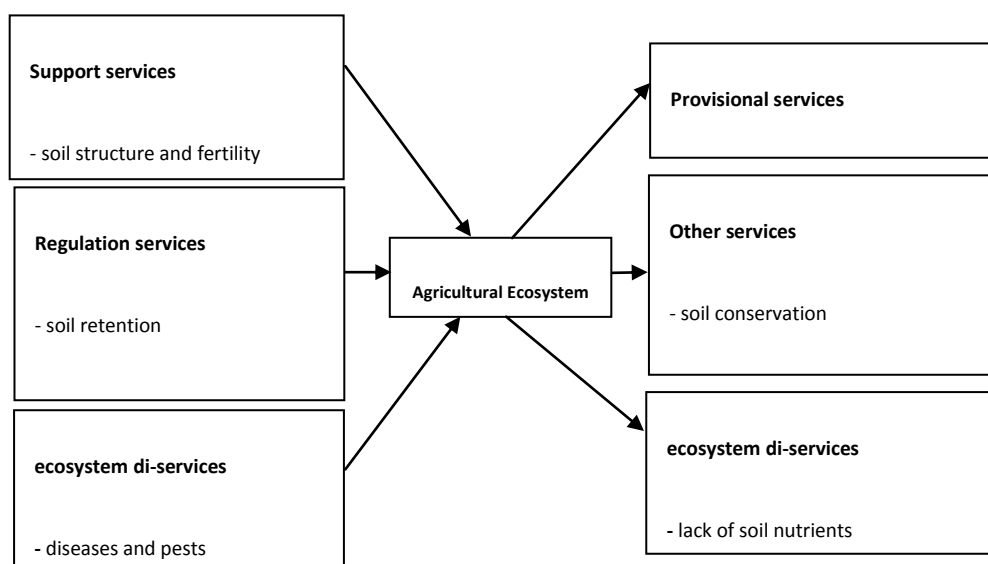
The growing need for food, fiber and fuel requires an increase of agricultural production and productivity. More production land, water and inputs will need to inevitably be used to achieve that goal, and hence result in environmental damages, if measures are not adopted to minimize environmental agricultural impacts. Combined with the possible climate changes effects (INGC, 2009), environmental degradation caused by agriculture will lower its productive capacity (Robertson and Switon, 2005).

Agriculture and livestock production transforms natural ecosystems into *agricultural ecosystems* (EA), which favor the production of selected agricultural crops and animals. As an integral part of the global natural ecosystem, AE affect adjacent ecosystems and are affected by the same. However, besides producing biomass for feeding, fiber and fuel, AEs produce other services such as soil conservation, habitat for wildlife, mitigation of climate changes, aesthetics, carbon sequestration (TEEB, 2009). These services are important for both human health and adjacent ecosystems, and also for the sector's sustainability

¹⁶⁰Literature differs in the amount of arable land and land being cultivated. TIA (2007) and World Bank (2006) suggest that the area not being currently used by the agriculture sector is of 27 million de hectares. PEDSA indicates that less than 3.6 million hectares are being cultivated.

(Swinton *et al.*, 2007). For instance, uncontrolled burning may destroy habitat and exterminate insects that carry out pollination of crop flowers causing a decrease in crop yield and unbalancing of the food chain (insects represent food for other animals). On the other hand, farming in mangrove areas may destroy the cover that supports marine life. Figure 1 summarizes agri-ecosystems services and di-services

Figure 1. Agricultural services and di-services (Source: Adapted from Zang *et al.* (2007).



Besides biomass production for food, fiber and energy, the agriculture sector produces other essential environmental services for the people. Hence it is recommended to design agriculture sector policies and strategies that stimulate increase of productivity and production which do not incur costs to the ecosystem services. Ollivier *et al* (2009) estimate that in Mozambique environmental degradation due to soil erosion caused by agriculture cost an approximate annual amount of 17 million dollars, suggesting the erosion of natural capital for crop production. If the necessary re-investment is not undertaken to replace productive capacity, crop productivity will decrease in the long term. Thus, sector policies must consider not only the economic dimension of agriculture, but also its social and ecologic dimensions.

Political and legal framework

There is a comprehensive legal Framework which regulates the environmental action of agriculture in Mozambique, which demonstrates a policy that is favorable to the practice of

sustainable agriculture in Mozambique. What is lacking to a certain extent is the inclusion of prescribed guidelines in strategic plans; some of these operational plans at micro level fail for not incorporating indicators which allow for monitoring the sector's environmental performance

Recommendation: Preparation of the Master Regulations for the Agricultural Sector's Environmental Action summarizing the existing more than 40 legal instruments (laws, regulations, decrees, dispatches) which regulate the agriculture sector's environmental action, in order to harmonize diverse instruments and to facilitate their consultation and implementation.

Recommendation: (i) definition of priority environmental indicators, (ii) preparation of Indicator Verification Means, and (iii) commencement of the data collection process for, at least, the three most important indicators in the agriculture sector.

The majority of the instruments which regulate environmental action in the agriculture sector, including the Agriculture Policy and Implementation Strategy (PAEI), was approved in the past 20 years. Though the PAEI was approved more than two decades ago, it does address agricultural environmental issues in Mozambique in a sufficient basis. As a policy instrument, PAEI is not restrictive with relation to the sector's environmental issues. On the contrary, it opens room for other instruments of the legal framework to integrate environmental and productivity issue. What is still missing is, to an extent, the inclusion of the PAEI guidelines into its operational plans.

Following to PAEI, various formal instruments were approved namely PROAGRI, which resulted in the preparation of the Strategic Environmental Assessment (AAE); the Land Law, the Forest and Wild Life Law¹⁶¹ and the regulations (dispatches or decrees) for lands, forests and wildlife, pesticides, seeds, vegetative sanitation, registration of varieties, and more recently the PRONEA¹⁶², Strategy for the Green Revolution (ERVE), PAPA, and the Action Plan for the Prevention and Control of Soil Erosion. All these instruments integrate conservation measures to minimize the agricultural negative effects upon the environment (see Table 1).

The environmental issues integrated into various formal instruments of the sector such as PAEI, PROAGRI, etc., include (i) the prevention of soil degradation, (ii) natural resources

¹⁶¹ Regulations include dispatches and decrees.

¹⁶² PRONEA is the program for PROAGRI II's extension subsector.

management, including control of burning, (iii) reduction of air, water and soil pollution, and (iv) legal and institutional aspects including environmental education, and compliance with the legislation and institutional capacity-building. As we look into the PESs of the environment and agriculture sectors, their environmental actions for 2005 to 2009 are substantial, especially in the reduction of soil degradation and land management. However, despite the efforts, it is less likely that Mozambique will be able to achieve its environmental objectives prescribed in the Millennium Development book (Government of Mozambique and United Nations System, 2008). Although a series of interventions may be considered as adaptation / mitigation alternatives, agricultural plans implemented so far are not solving the issues related to climate and environmental changes in a strategic way.

Table 1: Legal Instruments which address environmental issues in the agriculture sector

		Addresses the conservation of				
		Land/soil	Water	Atmosphere	Biodiversity	NR in general
Policy	PAEI	YES	YES	YES	YES	YES
	Lands	YES	-	-	-	YES
LAW	Environment	YES	YES	YES	YES	YES
	Lands	YES	-	-	-	YES
	Forests and wildlife	-	-	-	YES	YES
Programs	PROAGRI I					YES
	PROAGRI II	YES	YES	YES	YES	YES
	(AAE)					
Strategies	ERV	-	-	-	-	YES

	Livestock Production				YES	YES
	ESAN II	-	-	-	-	YES -
	EADS	YES	YES	YES	YES	YES
	EDR	-	-	-	-	YES
Plans	PADEA	YES				YES
	PARPA	YES	YES	YES	YES	YES
	PAPA	-	-	-	-	-
	PEDSA	YES	YES		YES	YES
	PAPCQD	YES			YES	YES
	PAPCES	YES	-	-	-	-
	PNAMC	YES	YES		YES	YES

Table 1 shows that there is an extensive legal Framework which regulates the agricultural environmental action in Mozambique, demonstrating a favorable policy intention for the adoption of sustainable agricultural practices in the country. Both PAEI, the Environment Law and other related laws and regulations, development plans and programs (medium and long term) such as, for instance, PARPA and PROAGRI, include measures aimed at increasing agricultural and livestock productivity considering bearing in mind the conservation of natural resources, at least a macro level. However, some of these programs' operational plans – at micro level – fail for not incorporating indicators that allow the monitoring of the agriculture sector's environmental impact during the productive process. For instance, the Action Plan for Food Production (PAPA) does not include a single chapter on the sector's environmental component. Clearly, long term environmental objectives cannot be achieved if short-term actions are not consistent with such objectives.

AAE represents a great advancement on the agricultural sector environmental agenda, but it has two important limitations. The first is the high number of indicators which are proposed

without due definition of priorities, making their implementation a hard task¹⁶³. Another limitation is the absence of data collection, as well as the non indication of some Indicators Verification Means (FVI) which could make it possible to collect data on the sector's environmental performance.

Key actors and mandates

Besides the public sector, the main actors involved in the agricultural environmental management include civil society, research and investigation sector, and the private sector.

Public Sector

Recommendation: establishment of a clear division of roles, and a review of the coordination mechanisms: MICOA shall focus in (i) intersectoral coordination of the environmental action, (ii) environmental licensing, and (iii) monitoring of project/program implementation based on environmental indicators¹⁶⁴ produced by the various sectors. MINAG should focus in the implementation of projects/programs and on the integration of environmental sustainability principles within all main functions with emphasis on planning, constructions, extension, research, M&E;

Recommendation: formal establishment of the division of responsibilities between MICOA and MINAG, with duly established Terms of Reference and coordination mechanisms.

Recommendation: institution of coordination mechanisms between the environmental unit at Directorate of Economy and other National and Provincial Directorates.

Recommendation: transformation of the environmental unit into an autonomous entity within MINAG (budget autonomy).

The public sector is responsible for both the production and the implementation of environmental management instruments within the agriculture sector. Its main actors include MINAG, MICOA, and the Ministry of Planning and Development (MPD).

¹⁶³ One of the participants in one of the meetings indicated that if MINAG produced indicators suggested by AAE then would still be doing nothing as the number of indicators is still high.

¹⁶⁴ O MICOA shall begin a process for the definition of priority environmental indicators to be agreed with various production sectors. For agriculture, the AAE may be used as a starting point. Once agreed MICOA should focus on the indicators produced by the various sectors.

Legally, MICOA is the state with the mandate for coordinating, advising, controlling and assessing the degree of utilization of natural resources (Government of Mozambique, Environment Policy, 1995). However, MICOA's mandate is hardened by the (i) scarcity of human resources and funds, (ii) reluctance of sector's ministries in accepting MICOA as a steering institution, and (iii) by MICOA tendency in performing a project manager role at the same time it undertakes a sector regulator role (Adams, 2008).

Although there is no clear formal mandate or a delegation of competencies by MICOA, MINAG coordinates the environmental action within the agriculture sector. MINAG's environmental action is carried out through the National Directorate of Lands and Forests (DNTF) and the Environmental Unit (UA) which sits at the Directorate of Economy. The attributions of the UA are not formally known and it is comprised by a single person whom also performs the functions of Head of the Department of Policies Analysis in MINAG.¹⁶⁵ Hence UA does not have any budget autonomy making it difficult to plan and implement activities specifically designed to facilitate environmental integration. The coordination mechanism between DNTF and UA is not formally known, and there is no link between these two sectoral units within MINAG and MICOA (Cabral and Francisco, 2008; Adams, 2008). Hence one is never sure of who coordinates environmental action within MINAG and between MINAG and other institutions like MICOA, DNPDR, and UNGC.

MPD has the responsibility of securing the integration of environmental issues related to priorities and key sectors for Mozambique's development through the planning and of cross-cutting management of environmental issues. In addition, MPD undertakes capacity-building and reflection actions in coordination with MICOA.

Interaction with other public actors, such as MIREM, MINED, MISAU, may greatly influence the sector's environmental performance.

Civil Society

Recommendation: Local Committees which participate in natural resources management at local level (such as, for instance, the CLGRN) are involved in the planning of the activities of

¹⁶⁵ There is some divergence of opinions on the matter. One of the participants in the discussion group affirmed that UA is the institution that coordinates all environmental action within MINAG. However there is no documentation to support this assertion. Some sectors suggest that even if UA and DNTF work completely in parallel, there is no significant coordination (Cabral and Francisco, 2008; Adams, 2008).

the District Economic Activities Services in order to strengthen the communication between communities and local organizations, and MINAG.

Recommendation: creation of a permanent seat for civil society representatives within MINAG's steering committees, and the enlargement of MINAG's consultative committees to include civil society representatives working in the agriculture sector and natural resources management.

Civil society participates in the agricultural environmental management through non-government organizations (NGOs) and local communities. NGOs have been playing a key role in the formulation de policies, legal counseling, training, promotion of community rights and advocacy in environmental issues related to agriculture. For instance, the Centro de Terra (Earths Centre) participated in the preparation of PARPA II and has been frequently collaborating with MICOA and MITUR on training and legal assistance issues (Cabral and Francisco, 2008). The Forum Natureza em Perigo (Forum for Endangered Nature) and Livaningo work fundamentally as advocacy agents for environmental conduct and government policies; FDC includes environmental management issues and HIV in their community development messages.

Local communities also participate in the environmental management of the sector both in the production of legislation and as natural resources users. For instance, communities participate in Local Committees for Community Management of Natural Resources (CLGRN), and are actively involved in the process for the attribution of Land Tenure Rights (DUAT). However, the participation and awareness of the population in general on their rights, is not sufficient (RAP, 2006).

Research Sector

The great limitation in the research sector is the lack of funding for the undertaking of research on cropping fields, particularly regarding environmental issues; and the lack of research on climate changes impacts for the sector and food security, and their respective adaptation and mitigation means for specific regions in the country.

Recommendation: creation of incentives for research in cropping fields, and research on impacts at sectoral level (including research on climate changes impacts on agriculture and food security, including, for instance, the institution of competitive research programs and other mechanism in the area of agriculture, environment and climate changes aimed at the development of strategies for adaption to climate changes and sustainable agricultural technologies that are sufficiently profitable.

Research is carried out by higher education institutions and by the Mozambican Agricultural Investigation Institute (IIAM). As an example, in addition to dissertation thesis on environmental issues related to agriculture, Universidade Eduardo Mondlane (UEM) has participated in the updating forest inventory, and in the preparation of various research works such as, for instance the Management Plan and Environmental Monitoring Framework for Cotton Production Regions in Mozambique (IAM, 2007), the implementation of the biologic control program in the provinces of Tete and Manica, pesticides trials. Recently a team from UEM carried out a research in crop fields on the use of integrated pest management in order to reduce the application of pesticides in cotton farming in Murrombala.

IIAM has also been active. Its set of research work includes (i) inventory, characterization and assessment of natural resources (vegetation, climate, including expenses, fauna, livestock, soils and water), (ii) conservation of natural resources *in- e ex-situ* (genetic bank through the collection and import of germplasm), and (iii) management and planning of natural resources (water, soil, climate, pasture and forage, flora and fauna). IIAM and teaching and research institutions have been working in a coordinated manner.

The great limitation of the research sector is the lack of funding for the undertaking of research activities in cropping fields, particularly regarding environmental issues and the limited capacity for investigating climate changes impacts into the agriculture sector and food security.

Private sector

Recommendation: consideration of the establishment of incentives as tax credits for private companies which adopt natural resources conservation principles, finance public research, and develop local extension networks that disseminate messages on natural resources sustainable management.

Private sector participates in the direct management of agricultural ecosystems during the agricultural production process. One must highlight the role of private companies¹⁶⁶ in the sustainable management of natural resources either through decisions on the use of natural resources during the productive process, or indirectly through the training of smallholders

¹⁶⁶ For example, in 2009, cotton companies (Pexus, SANAM, FONPA, SAN/JFS, SAAM, CNA and DUNAVANT) installed Results Demonstration Fields on the integrated cotton pest management (Verdade, 2009).

using their private extension networks. Private extension networks provide a great contribution as they fill an important gap in the provision of extension services by the public sector (MINAG). Hence a broader coordination between the public sector and the private sector is recommended in order to take the most out of existence of private extension networks. The private sector also offers partial support in terms of free accommodation, transport, etc. for students and researchers undertaking applied research with farmers. A clear example is the support for the undertaking of January and July activities by students from the Faculty of Agronomy and Forestal Engineering.

Development partners

The role of development partners is outstanding. Besides financing various projects, DPs have been engaging the government in a dialogue for the establishment of the related environmental agenda, not restricted to agriculture.

Na example of involvement of development partners was the constitution of the Environmental Reflection Group during the preparation of PARPA II, which was steered by MICOA, and it included representatives from various ministries including MINAG, development partners, NGO and Civil Society Organizations (OSC). After the engagement on the context of PROGRI the group started being designated Environmental Working Group (GTA).

It is difficult to point out the largest partner in the development of sustainable agriculture (partner's priorities change over time), but the list of agriculture partners includes Austria, Belgium, World Bank, African Development Bank, Brazil, Canada, China, European Community, Spain, Denmark, United States of America, FAO, Finland, India, Italy, IFAD, Netherlands, Japan, Switzerland, United Nations and Vietnam. According to informal data development partners disburse, at least, about a million American dollars to be used in projects that include at least, an aspect of sustainable agriculture. Environmental issues in the agriculture sector and the growing recognition of the need to mitigate agricultural climate effects open room and funding opportunities by development partners.

Main challenges and opportunities

The Mozambican agricultural sector faces a series of challenges: the need to reduce malnutrition and to increase food availability, balancing social, economic and environmental interests, the sector's exposure to influences caused by climate changes, health and environmental effects resulting from the use of agro-chemicals and progressive damages caused by uncontrolled forest fires, only to name some.

Sustainable agricultural practices may help the sector to face these challenges, bringing about evident environmental, social and economic benefits. Agricultural sustainability techniques are more resilient to adverse situations, including climate changes and natural disasters.

Challenges

The main challenges faced by the agricultural sector in terms of natural resources sustainability and the country's exposure to climate changes effects are:

Need to reduce malnutrition and increase food availability, balancing socio-economic interests.

In general, smallholders productivity, representing the majority of agricultural producers, is low, and hence, their access to extension services is minimum (varying between 13% and 4% at province level (TIA 2008)), as it is the case of improved seeds (between 2% and 10% (TIA 2008)), fertilizers, irrigation.

Hence, the challenge is to find ways to increase smallholder's productivity, facing challenges in terms of access to inputs and extension services, lack of financial means which allow a long term investment in irrigation and mechanization, and lack of seasonal loans for agricultural production at low interest rates.

Urgent identification and implementation of adaptation measures and mitigation of climate changes' impacts.

Mozambique is one of the countries most exposed to the natural disasters effects and to variability and climate changes. The analysis indicates that Mozambican farmers are highly vulnerable to natural disasters. For example, 58% of households suffered the effect of floods, excessive rainfall or lack of rain for at least a crop in 2008 (TIA, 2008). It is expected that this vulnerability increases due to climate changes effects in no adaptation measure is introduced. In general climate will be more extreme, with hotter and longer dry periods, with more unpredictable rainfall, more flooding events equally unpredictable and uncontrolled fires. It is also expected that Mozambique will go through changes in terms of water availability, and that, until 2050, most of the country will suffer more pressure for water scarcity. This will affect the agricultural sector's performance, if the right responses are not adopted (INGC 2009).

Application of adequate measures for the reduction of uncontrolled fires

The slash and burn technique is accessible and inexpensive for smallholders but it may spear enormous environmental losses if it results in uncontrolled fires. For instance, in 2007 500 thousand cashew trees were destroyed. In 2008, arson destroyed 218 thousand hectares of forest, caused the death of 30 people and destroyed 1580 houses, 307 granaries, 15 power transmission poles, nine churches, three schools and four classrooms (AFRCA21, 2008; LUSA, 2008). The use of slash and burn for clearing new areas for agriculture is believed to be one of the causes of uncontrolled burning in Mozambique, although other reasons such as renovation of pastures, hunting, coal production and honey collection may also play an important role.

Despite the introduction of control measures by MINAG, MICOA and the non-governmental sector - in line with the Forest and Wildlife Law and with the Plano f Action for the Prevention and Control of Uncontrolled Burning (PAPCDQ) - civil society states that a significant percentage of the population perceives that uncontrolled fires have not decreased and tend to increase (RAP 2006).

Correct management of agro-chemicals to avoid damages to health and increasing of production costs

The non-controlled and/or excessive use of pesticides and fertilizers may result in the contamination of surface and underground water due to washing off nutrients or pesticides, causing the contamination of drinking water, loss of biodiversity, and reduction of oxygen levels in lakes, rivers and sea (with subsequent impacts on other sectors such as tourism and fisheries). For instance, about 26% of household cotton producers wash their equipment off pulverization in river or lagoons margins, 6% near a well, and 14% at home (MINAG-IAM, 2007).

The level of compliance with hygiene and safety measures in the workplace has a significant impact on workers' health. In 2007, a concerning part of the about 92% (out of 164) of cotton producers referred that they have not protective equipment during the application of pesticides (MINAG-IAM, 2007). Respiratory diseases reports in the high agro-chemicals use areas in Nampula may imply the lack of compliance with health and safety measures in agriculture.

There are clearly two gaps. The first is the lack of sufficient personnel (at both MICOA and MINAG) for monitoring conditions of use and management of agro-chemicals in agriculture. The other gap is technical: there are no scientific technical recommendations on the ceilings

for agro-chemicals use in technologic packages for food and livestock production given the agro-ecologic conditions in Mozambique and this makes it difficult to monitor compliance levels and safety periods.

Opportunities offered by sustainable agriculture

Sustainable agriculture practices may help the sector face the challenge related to increase of production and food availability, bringing at the same time environmental, social and economic benefits. Sustainable agriculture techniques are more resilient to adverse conditions, including climate changes and natural disasters.

Recommendation: development and implementation of research, strategies and promotion of adaptation to climate changes and sustainable agricultural technologies that are sufficiently profitable, like the use of wind breakers, strip cropping, crop rotation, integrated pest management, more efficient water use both for rainfed agriculture and for irrigated agriculture, improvement in the accumulation of organic matter and carbon sequestration, amongst other aspects.

Recommendation: facilitate the implementation of sustainable agriculture through incentives, such as: extension services to help farmers introduce locally adapted and economically feasible sustainable agriculture techniques, a financial tool that allows for a long term investment in irrigation and mechanization and availability of low interest rates seasonal loans, for agricultural production.

Recommendation: strengthen the agro-chemicals management component (fertilizers, pesticides, and antibiotics, vaccines) in agriculture in Mozambique, including: undertake an assessment study to analyze the effect of subsidies to pesticides used for treating cashew trees; training of planning officers on the importance and how to increase the efficiency of the agro-chemicals supply chain.

Sustainable agriculture may bring evident environmental and social benefits. This way, there is growing evidence that sustainable agricultural practices have been able to increment productivity and reduce agricultural production costs, with reduced environmental damage, when comparing with conventional agriculture. In this context, conservation agriculture ¹⁶⁷ is currently on the global spot due to its potential for carbon sequestration. Furthermore, the rise of credit schemes for conservation agriculture is being

¹⁶⁷ Conservation agriculture is one of the sustainable agriculture practices and it is characterized by three principles linked to each other, namely: 1) continuous soil disturbance. 2) Permanent soil organic cover. 3) Diversification of cropped species in **sequence or association**. (FAO)

seriously studied and may result on a additional financial benefit, as a result of sustainable agricultural practices.

Economic Feasibility of Cultivation Areas

Sustainable agriculture may improve the economic feasibility of a cropping land in various ways. Thus, in a short term period, in one hand, the improvement of soil management and rotation of crops may **increase yield and reduce the cost** of inputs, although in the medium and long term, on the other hand, the **improvement of soil quality and water availability**, as well as other benefits resulting from sustainable practices, **may increase the value of agricultural land**, make **production more resilient to climate conditions**, and create conditions for the **payment of environmental services**. Besides that, the economic feasibility may also be achieved, for instance, through the reduction costs of equipment, pesticides and other agrochemicals (for those farmers who have the financial capacity to acquire such inputs), depending on the specific characteristics of the production system (Kassie M. and Zikhali P. 2009).

Country examples (Kassie M. and Zikhali P. 2009):

- Soil and water conservation in the dry lands of **Burkina Faso** fought solid degradation, **resulting, thus, in the change of deficit in grains from 650 kg per year, at household level, to the production of an annual surplus of 150 kg.**
- Soil fertility management, using a series of biologic pest management methods, precisely with legumes, skin crops and green manure, **duplicated production of beans and groundnuts from 300 to 600 kg / ha, in west Kenya.**
- Farmers in Kenya, Tanzania and Uganda were able to duplicate their productivity and ensure their food security, transferring their production to use organic or almost organic methods (Scialabba N. 2007).
- For small scale production, in southern and western dry areas in Zimbabwe, corn fields went from 15-72%, that is, 36% more using zai planting, with relation to conventional cropping.

Increase in production

Scientific evidence in countries from Africa, Asia and Latin America shows that **farmers have significantly increased productivity, based on the adoption of sustainable agricultural practices**. For example, the balance of 286 sustainable agriculture projects, undertaken between 1999 and 2000, in eight categories of production systems, in 57 developing countries, from Africa, Asia and Latin America, shows that **farmers registered an average increase in production of 79%, as a result of the adoption of sustainable agricultural practices**. Thus, the increase on the production of rainfed crops, which are

predominant in small-scale Mozambican agriculture, was in average, of more than 100%. (Pretty, J.N., Morison, J.I.L. e Hine, R.E. 2003).

The technical improvements which normally play important roles in the increase of crop yield include: 1) more efficient water use, both in dry-land areas, as well in irrigated land: 2) improvements in the accumulation of organic matter in soils and carbon sequestration, and 3) pest control, weeds and diseases, with emphasis on soil biodiversity and reduction of pesticides, through an integrated pest management or other techniques.

Reduction of inputs¹⁶⁸

Usually conservation agriculture enables significant savings for farmers, through labor costs and time savings, saving costs in land preparation and costs inherent to irrigation, fertilizers and pesticides.

In the majority of cropping lands where conservation agriculture is practiced, very few operations carried out, and, hence, farmers require less equipment, and the costs of both labor and fuel are reduced. Besides, the amount of inputs may also be reduced.

Conservation agriculture has a positive impact in the allocation of labor during the production cycle due to: 1) reduction of the actual time required, 2) reduction of the number of activities required for the production cycle (FAO) and 3) equitable distribution of time (reducing demand during maximum activity periods). In the case of **animal driven, the reduction of labor may reach up to 86%** using conservation agriculture practices.

Therefore, in areas where household subsistence labor becomes limited, due to migration, HIV/SIDA, etc., conservation agriculture may be a good option for farmers. This way, the reduction of the need for agricultural labor allows farmers to:

- Expand their cultivated area.
- Be hired to work outside the agricultural environment,
- Diversify their activities, including processing of agricultural products,
- Reduce cultivated areas as a result of the increase in productivity, allowing that more marginal areas are recovered.

Conservation agriculture may also help reduce costs inherent to the use of equipment and fuel. Allied to this, an estimate of conservation agriculture in Brazil indicates that **costs equipment and fuel for soya production may reduce in more than 40%, in the case of**

¹⁶⁸ This subsection was prepared based in information from FAO's website on Conservation Agriculture: <http://www.fao.org/ag/ca/5.html>.

conservation agriculture (in comparison with conventional agriculture), although that in the case of corn production it increased in more than 25%.

Indirect environmental services

In fact, sustainable agriculture brings many environmental benefits which may not be of direct interest to farmers, but are very important for the national economy, such as:

- 1) Streams and rivers free of soil solid particles as a result of erosion. This will avoid the obstruction of reservoirs and dams or causing damage to hydropower production turbines. For instance, in Ruanda, the cost resulting from the generating capacity in hidroenergia plants due to increase of obstruction is estimated in US\$65.000 per day.
- 2) Reduction of road damages, due to reduction of runoff and erosion;
- 3) Reduction of damages to marine environment due to the reduction of;
- 4) Reduction of water purification costs for domestic use, or the necessary time for fetching clear water.

Another important advantage from sustainable agricultural techniques is the fact that these are more resilient to climate conditions, such as floods and droughts, including pests and diseases. Besides that, they offer more resistance as they recover more rapidly from the above referred climate conditions. **Hence, these qualities make them ideal for adaptation to climate changes and improving food security.**

Conservation agriculture is currently on the global spot due to its carbon sequestration potential. However, it is estimated that the total potential for carbon sequestration in soils, through agriculture, may compensate for more than 40% of the annual increase of CO₂ emission (Robbins, M. 2004). **Thus, the rise of carbon credit systems for farmers practicing conservation agriculture is being seriously studies and may bring additional financial benefits, as a result of sustainable agricultural practices.**

Priority actions

Action	Responsibility	time frame	Indicators
Reconsider the process of designing agricultural plans and programs to ensure the inclusion of agricultural environmental impact indicators consistent with PAEI and AAE (PROAGRI II)	MINAG & other ministries with representation in CONDES	1 year	▪ Meeting minutes with CONDES's deliberations on environmental issues ▪ Number of plans and programs which include agricultural environmental impact indicators

Review coordination mechanism between MICOA and MINAG; establish a clear division of roles and competencies; UA's autonomy; agree on at least three environmental indicators	Government, MINAG and MICOA	1 year	▪ Number of projects implemented by MICOA; ▪ Number of joint environmental actions ▪ Number of performance indicators agreed between MICOA and MINAG; ▪ MINAG with an autonomous environmental unit with clear Terms of Reference;
Development of AAE environmental indicators verification means and following data collection	MINAG, Research Institutions	1-2 years	▪ Report including indicators verification means ▪ Database developed
Development and implementation of research, strategies and promotion of adaptation to climate changes and sustainable agricultural technologies which are sufficiently profitable.	MINAG/IIAM Higher Education Institutions, Development Partners	4 - 5 years	▪ % of funds increase for the adaptive investigation on environmental issues and climate changes ▪ Number of sustainable and adaptation technologies and practices tested in practice and published; ▪ % of extension agents with the capacity to transfer knowledge on adaptation and sustainable practices ▪ Number of producers which adopt sustainable production and adaptation practices.
Create mechanisms to take the most out of existing private extension networks and increase the provision of extension services to producers, including the preparation and use of specific training kits for extension agents to allow extension services to support farmers in the introduction of locally adapted sustainable and economically feasible agricultural techniques.	MINAG/IIAM Higher Education Institutions, Private Actors Local Producers	3-5 years	▪ Number of public-private partnerships established between MINAG and the private sector/NGOs ▪ Number of training campaigns for farmers ▪ Number of producers benefiting from extension services
Create financial mechanisms and instruments to allow long term investments in order to improve productivity through natural resources sustainable management, for instance, the introduction of sustainable cropping practices and irrigation technique, availability of seasonal loans at low interest rates for smallholders	MINAG/finance / banking sector	3-5 years	▪ % of small and medium holders with access to loans and other financial instruments for investments in irrigation and agricultural mechanization, ▪ % small and medium holders with access to seasonal loans at low interest rates
Strengthen the agro-chemicals management component (fertilizers, pesticides, antibiotics, vaccines) in Mozambique's agriculture, including: undertaking of a study to assess the	MINAG / MISAU	3-5 years	▪ Occurrence of professional diseases amongst farm workers who use agro-chemicals including obsolete agro-chemicals

effect of subsidies for pesticides acquisition for treating cashew trees; training of planners on the importance and how to increase efficiency in agrochemicals supply chain.			
Create incentives to increase participation of producers/communities in the sustainable management of natural resources	MINAG/MDP MoF, Development Partners	4-5 year s	▪ Number of incentive instruments (approved and implemented) ▪ Creation of community accounts for natural resources management
Assessment of the effect of subsidies which may cause environmental damages, as it is the case with the potency rate for irrigation and subsidy for agro-chemicals used for the pulverization of cashew tress.	MINAG/IIAM Higher Education Institutions	1 year	▪ Recommendation report produced ▪ Number of recommendations adopted and implemented by the government and included in subsequent legislation instruments

8. Challenges for Territorial Planning in Mozambique

Simon Norfolk & Paul de Wit

Abstract

Describes how territorial planning in Mozambique embraces a wide range of governance objectives well beyond the territorial planning policy. Highlights how iterative and interactive processes give territorial planning a pivotal position in development and poverty reduction. Describes the opposing visions within the sector and shows how a territorial perspective is necessary in order to promote integrated, rural-urban, sustainable development. Looks at the institutional context, with all its ambiguities and describes the specific and general tools provided for in the legislation. Underlines how respect for present forms of territorial occupation and existing land use rights are at the heart of territorial planning and makes the point that the approach so far has concentrated only on the “hard” technical tools, in contrast to development planning processes which are buttressed by “soft” approaches, such as participation in decision making. Territorial planning also needs a “soft” toolkit to be developed, recognized and used. Examines budget allocations for territorial planning. Suggests that a much stronger link between national strategic planning, local development and district development planning is needed and that the process of territorial and land use planning should focus more on the strategic use of available information. Concludes that the planning process should be valued, and necessary time and resources for effective planning need to be duly allocated. There should be more of a focus on planning, rather than on plans. The land use plans should become dynamic processes, involving not only development but also implementation, review and monitoring.

Importance of the sector

Well beyond the territorial planning policy

A wide range of governance objectives well beyond the territorial planning policy

Territorial planning is about influencing the occupation of space. It covers all aspects of land use, including habitation, industry, agriculture, forest, mining and tourism. It is an overarching cross-sector issue, which needs to consider a variety of sector policies and approaches, but which also sets out broad (spatial) lines for developments in these sectors. This iterative and interactive process gives territorial planning a pivotal position in development and poverty reduction.

The role of territorial planning in the development process of Mozambique is, however, most often conceptualised along the narrow lines implied by its literal translation from the Portuguese “*Ordenamento Territorial*”, meaning “*Putting spatial order in territories*”, despite its broader definition in the Law.

But is the contribution of territorial planning to poverty reduction restricted to the technical exercise of identifying and fencing in key resources or spatial units, and subsequently promoting isolated development in these units? Or is it not that distinct spatial units, with or without fences, are a product of, rather than a pre-condition for, development?

Similarly, in the urban and municipality areas, will territorial planning offer solutions to the very real and immediate problems and challenges thrown up by high rates of urbanisation, alarming levels of spontaneous settlement and chaotic land allocation procedures?

Mozambican policies give a much broader task to planning in general and territorial planning in particular, and intentionally link these processes with a number of basic virtues that characterize an emerging democratic African state, including: (i) good governance, (ii) citizen participation and decentralised decision-making, (iii) ownership of processes and responsiveness to real local needs and (iv) resource allocations reflecting local needs and the encouragement of wealth sharing.

These overarching development and poverty reduction policies therefore take (territorial) planning out of a merely technical, prescriptive dimension and link it to objectives that go well beyond the territorial planning policy itself; in addition, a number of specific sector

initiatives and policy guidelines consider territorial planning as an important tool for policy development and implementation:

- Recent efforts of the Government of Mozambique (GoM), under the leadership of the Ministry of Agriculture (MINAG), to identify (zone) areas which may be potentially available for large-scale investment in the agricultural sector give territorial planning a dimension which is not directly covered in the territorial planning policy.
- Land use and territorial planning are also considered as a tool to prevent and mitigate conflict over land use and occupation.
- Mitigating disaster impacts and reducing vulnerability also relies heavily on territorial planning, as demonstrated in the Limpopo and Zambézia valleys.
- State and non-State actors are also increasingly aware of the fact that the context set by the land and forestry laws depends heavily on the establishing of a territorial land use vision at a local level.

Sector development scenarios: opposing visions

Mozambique continues to be faced with territorial planning scenarios that are antagonistic to each other and which support different developmental visions. Predominating at the moment is the scenario of a technical process, driven by centrally-based elites and foreign interests, embracing conceptual approaches that support some form of dual development model aimed at clearly drawing economic and spatial boundaries between big investment and small-scale (including community) development.

The other end of the scale holds a scenario which emphasises locally-driven participatory approaches, based on the recognition of existing rights and the safeguarding of present natural resource use patterns. This approach promotes an integrationist development model, where different actors jointly identify and build consensus on economic development opportunities and environmental threats. It acknowledges the importance and need for serious investment at all scales, including large scale national and foreign investment, but tries to legitimize it at the local level and to create direct mutual benefits through different mechanisms.

This approach does not discard the technical analysis of opportunities, potentials and threats, but rather uses the results from this as instruments for decision-making, not as decisions in themselves. The elements of local participation in decision-making, negotiation, consensus and respect between highly diversified social groups all contribute to good governance.

In municipalities, the drivers are different from those in the rural areas; urban growth is a result of patterns of rural-urban migration, rather than commercial interest in natural resource exploitation. But here too there are dichotomies and antagonistic forces at play. At one end of the scale lies a technical process aimed at delivering high value residential land parcels for middle and upper class urban residents and commercial interests, whilst at the other lies the challenge to planning presented by increasingly densely populated informal settlements, housing 80% of the urban population, living in situations which present environmental hazards and immense obstacles to improved service delivery.

Issues being faced

Territorial planning is a 'new' sector in Mozambique, and has only recently been underpinned by a legislative framework. It is a generally progressive framework, in the sense that it translates into practice most recent international thinking on planning.

It is partly the recent character of the framework, combined with a lack of implementing experience, that has focussed territorial and land use planning efforts on completing the narrow legislative obligations of the new framework, rather than on responding to the bigger picture of economic development and governance expressed in other policies and laws.

The institutional hosting of the policy and law in the Ministry for Environmental Coordination (MICOA), and the legacy of this institution in physical planning (MICOA has partly its origins in the former National Institute of Physical Planning - INPF) gives it a significant infrastructural and environmental signature. The public institutions are also imbued with a strong legacy of centralised socialist planning, dating back to the seventies and early eighties, with the present cadre of senior public officers being a product of this school.

It is also worth noting that the history of Mozambique has contributed to an emphasis on the development of rural areas, often with the result that urban development and strategic and spatial planning for sustainable development in urban areas is not taken as seriously as it should be, given the importance of urban areas to the overall economic and political structure of the country. Proper planning, land management, improved infrastructure and local economic development have to be designed from a territorial perspective in order to promote integrated, rural-urban, sustainable development.

The recent character of the sector and its currently narrow focus results in a number of gaps and weaknesses that constitute major challenges.

- Serious policy gaps and inconsistencies between policies; the absence of an overarching National Land Use Policy¹⁶⁹ is the most salient example.
- Lack of formal and non-formal institutional capacity to implement the territorial planning law and policies in its present context, let alone in its broader context;
- Lack of practical and tested tools; the Law provides specific and general tools, but the regulations fall short of providing more precise and practical guidance on how to use these tools to achieve a series of objectives;
- A chronic lack of capacity at local level, which invariably results in outsiders shifting from a facilitating to an executive planning role, using technical approaches that are mostly alien to local stakeholders and over which they are unable to exert influence or take ownership.

There is also considerable political and bureaucratic resistance towards a departure from the centralized and strongly technical approach. Indeed, some form and level of chaos provides rent-seeking opportunities that motivate some decision makers to maintain the status quo.

Trends and Concerns

It is difficult to discern official policy in respect to medium and long-term territorial planning trends. On the one hand, the policies and legislation underscore the main international trends: of decentralization, multi-sector and civil society participation on an informed basis, respect for existing patterns of land use. On the other hand, the “real politick” seems to be hesitant to turn these trends and principles into action, as illustrated by the following examples:

- The failure to initiate a coherent land use planning process, on the basis of already existing elements of land use policy, continues to fuel the speculative behaviour of investment initiatives, which are allowed to occupy space and engage in land or natural resources exploitation more or less as they see fit.

¹⁶⁹ Land use policy is different from land policy. In Mozambique the land policy and law deal with the recognition of different rights in lands, how these land rights can be acquired, as well as institutional responsibilities and procedures to handle these rights. A land use policy is normally a vision of the state and its citizens on a future desired use of the land for different purposes.

- Political expediency seems to override strategic planning in a number of instances, and causes tension between technical staff and politicians, and between the different spheres of government.
- The failure to prevent the further densification and ultimately dangerous settlement patterns of many informal settlement areas, even where adequate preventative measures and alternatives have been made available.
- The very gradual and hesitant transfer of functions and resources from districts to already existing municipalities, as well as the transformation of district centres and villages into autonomous municipalities.
- Finally, there exist a series of parallel and related processes that are driven by institutional imperatives and which may threaten or downgrade the raft of generally sound planning principles. These include:
 - the recent zoning exercises for the purpose of identifying rural areas available for investment in the agricultural sector, which may be used as a substitute for proper planning;
 - a circular from the National Directorate of Lands and Forestry (DNTF) that refers to the need for communities to present some kind of local land use plan as part of their request for community land registration; 170
 - draft proposals for discussion that posit land use planning as a possible substitute for the community consultation process.

Evaluation of sector progress

The district of Guro, in Manica Province, became famous for being the first-ever district in Mozambique to produce a District Strategic Development Plan, in the second half of the nineties. Since then, progress in the sector is mainly measured against quantitative indicators. The *Quadro de Avaliacao do Desempenho* (QAD-PAF) uses as an indicator “the cumulative number of strategic district development plans with a spatial component integrated” and puts the expected output at 40 District Strategic Development Strategies (PEDDs) for 2009.

The measurement of progress can be seen from another perspective, which mainly deals with the accountability of the government to its citizens. This perspective calls for different indicators, including levels of citizen participation in decision-making, access to information, rights of appeal and fair compensation in the case of expropriation. There is also a need to consider mechanisms at the local level to monitor and evaluate not only the qualitative

aspects of the planning processes, but also the progress made on the implementation of their outcomes.

Policy and institutional analysis

Concepts and principles

The territorial planning policies and legal instruments, as we note above, need to be conceptually located within the broader framework of decentralised planning processes.

Notwithstanding the explicit call for specific approaches, provided for in the policy and law, the implementation of territorial and land use planning is presently providing only a narrow view of their contribution.

The legislative instruments also contain important safeguards for access to information, participation and democratic oversight, although there are varying approaches to this last issue in the municipal and district contexts. In addition, there are limitations imposed by current conditions, capacities and mentalities, which severely constrain the realisation of the benefits envisaged from these safeguards.

The Policy and Law also advance principles in respect to the rule of law. Land use plans, through the legislation, have the force of law once ratified and may only be altered through the legislated processes that developed them in the first place. This may be having unintended consequences, as resistance from entrenched political and elite interests leads to a sustained failure to approve or ratify the plans.

Institutional architecture & issues

The institutional set up for territorial planning, in the formal and informal spheres, is reasonably clear and the legislative basis and mandates for these are provided in a raft of legislation in respect to decentralised planning.

An early controversial issue was introduced in 2000, through a Council of Ministers Decree¹⁷¹ which sought to articulate the relationship between Community Authorities (introduced through this legislation) and the state. This legislation recognises community authorities and

¹⁷⁰ Circular 009/DNTF/07 dated 16 October 2007

¹⁷¹ Decree 15/2000

identifies several “areas of articulation” between these individuals and state entities, but introduces incompatibilities and conflicts of interest.

In June 2003, the GoM produced guidelines on Institutions of Community Participation and Consultation (IPCC)¹⁷². However, from the perspective of both the state and the informal bodies, the key piece of legislation affecting the institutional architecture is the Law on Local State Organs (Lei dos Órgãos Locais do Estado –LOLE)¹⁷³.

The LOLE introduced reforms in institutional structuring of the state at a local level which provides some breathing space for provinces and districts to organise themselves towards more efficient and effective service delivery. It aimed at addressing the strong sectoral verticality in the organization of the public administration, which was complicating the cooperation and coordination in planning and budgeting at local levels. It has not managed to fully address these problems, however.

It was also this legislation that gave a legal basis to the “*Conselhos Locais*” (CLs), and institutionalised the consultation with and participation of local communities in the planning process. However, there is a level of ambiguity in the Decree 11 of 2005, which sees these bodies oscillating between the ‘consultative’ and the ‘deliberative’.

A further guide on the organisation and functioning of the *conselhos locais*, , revoking the 2003 guide, was issued in November of 2008¹⁷⁴. This sought to remove the ambiguity and reduces the *conselhos locais* to mere consultative bodies; it omits any reference to 122(2)(g) of the LOLE regulations, which had attributed approval powers to these bodies.

The introduction in 2006 of a district level *Orçamento de Investimentos de Iniciativas Locais* (OIIL) effectively meant the extension of decentralised planning approaches to all districts in the country, but provided an impetus and context to these processes which was notably different to the areas where decentralised district planning had been in progress for some time.

Municipalities face different issues. The 44 municipalities are highly dependent on governmental funding for their activities. Most wealth generated within municipalities is

¹⁷² “Participação e Consulta Comunitária na Planificação Distrital: Guião Para Organização e Funcionamento”, MAE/MADER/MPF, 2003.

¹⁷³ Law 8/2003. Decree 11/2005 introduced detailed regulations to this law.

transferred directly to the state, with funds then channelled back through the annual budget. The state keeps close control of the activities of the municipal councils by appointing a representative with limited but executive roles.

Territorial planning will be implemented within this institutional context, with all its ambiguities.

Continuing with a focus at the local level, it is Grupos de Trabalho Provincial do Desenvolvimento Económico Local and Conselhos Técnicos Provinciais, working with District staff, which takes the lead in economic planning processes. For territorial planning they are replaced by technical teams drawn from the Provincial Directorates of Environmental Coordination (DPCAs) and the districts. LOLE is relevant again, since it has failed to entirely remove the dual subordination of sector staff at provincial and district level. This can lead to a lack of ownership and integration at district level.

In the municipalities, apart from the assistance provided through the Centre for Sustainable Development for Urban Areas (CDS-Zonas Urbanas), it is their own technicians that are responsible, but in many municipalities there is no separate planning department, and planning is done on an ad hoc basis.

At a national level, there are serious constraints in intersectoral coordination. From an institutional perspective, various bodies have relevant coordinating functions, including MICOA, the National Council on Sustainable Development (CONDES), the new coordination body established to oversee the zoning process and the National Directorate for the Promotion of Rural Development (DNPDR). Institutional competition is high.

Centrally MICOA is the indicated institution for providing technical guidance. However, the Ministry of Planning & Development (MPD), through the DNPDR, are also moving into this arena and have recently commissioned 3 district land use plans in the Zambezi Valley.¹⁷⁵

In addition to the technical guidance under the purview of MICOA, the National Centre of Mapping & Tele-Detection (CENACARTA) and the DNTF have important roles to play in providing access to tools (base maps and imagery) and as providers of spatial information in

¹⁷⁴ “Guião para a Organização e Funcionamento dos Conselhos Locais”, MAE/MPD, 2008

¹⁷⁵ “ToR for the Elaboration of District-level Participatory Land Use Plans (LUPs): Production of a Guide, Implementation of a Training Program, and Elaboration of LUPs for 3 districts”, National Directorate for the Promotion of Rural Development, November 2009.

respect to resource rights (forest, water, minerals), public rights of way, conservation areas (including public servitudes along roads, near water courses, etc).

Policy and legal tools for territorial planning

The territorial planning law provides both specific and general tools. The specific tools cover a series of different plan types that are recognized for

- different levels (national, provincial, inter-provincial, district, inter-district) and
- different planning environments (rural and municipal).

The general tools prescribed by law include soil qualification and classification, the national cadastre, environmental inventories and zoning.

Other tools that are not specifically included in the territorial planning legislation (but which may appear in other legislation, or are used because they have de facto merit in support of planning) include Strategic Environmental Assessments (see below), community land use plans, strategic territorial plans and community action plans, and management plans of protected areas and their buffer zones.

There is also a set of guidelines and methodologies that have been developed for specific purposes (such as the Guidelines for the Elaboration of District Land Use Plans, the Guide for Phased Municipal Physical Planning and the Manual of Basic Techniques for Physical Planning).

District land use plans are mainly developed according to a prescriptive methodology which considers different phases, including: (i) inventory, diagnostic and analysis, (ii) zoning and (iii) a set of maps.

Looking at how these have been done in the existing plans reveals a number of problems:

- the relevance of specific datasets is sometimes highly questionable; (geomorphology)
- some essential datasets are ignored (existing land rights retrieved from the cadastre);
- some data is misleading (present land use from 10 years ago);
- some data extrapolation is technically doubtful (climate, soils);
- some derived secondary products from the datasets may be much more relevant, but require real analysis (land suitability), and

- issues of scale are not respected (the “blow up” approach).
- The general tools identified in the territorial planning law and regulations all have an element of ambiguity about them which requires further clarification; they include the following:
 - Soil Qualification
 - Soil Classification
 - Cadastre
 - Environmental social and economic inventories
 - Zoning

Strategic Environmental Assessments (SEAs) have been used as inputs to spatial planning processes, with mixed results.

In the urban context, the tools envisaged include urban structure plans, general and partial urbanisation plans and detailed plans. These too rely upon the compilation of vast and detailed inventories and reports regarding existing urban infrastructure. These planning frameworks are complex, cumbersome and unlikely to respond to the needs of the rapidly-growing urban areas. A number of guidelines on urban planning, some of which seem to be very practical, have been produced, although their formal status is unclear.

Some comments in respect to the proposed tools are:

- There is a need for planners and facilitators to better understand the basics of some tools, their possible uses and limitations.
- There are challenges thrown up by the inappropriate use of existing, small-scale data such as that on climate, soils and vegetation at the district level.
- Several tools need further clarification, through the production of simple technical notes, guidelines or similar practical documents.
- Other tools need development, and new technologies need to be appropriately harnessed.
- Respect for present forms of territorial occupation and existing land use rights are at the heart of territorial planning. Tools to assess both these themes exist (respectively present land use and the national cadastre) but these are not used, or are used to less than their optimal potential.
- When time and financial resources are limited (US\$20,000 for a district land use plan), planners must choose different tools and information layers strategically.

- Similarly, are all the listed inventories required for the entire (national, provincial or district) territory? If these could be rationalized and targeted to specific areas, the limited available resources could eventually be spent more efficiently.
- Well-trained and experienced users can adopt creative and flexible uses for tools and information in responding to opportunities that arise. There is a danger that too much in the way of 'guidelines' may constrain these qualities.
- It is striking that the territorial planning legislation suggests only the "hard" technical tools, whilst the development planning process is buttressed, to some extent, by "soft" approaches, such as participation in decision making. Territorial planning also needs a "soft" toolkit to be developed, recognized and used.
- District actors very rarely know what information is available at higher levels (most often located only in Maputo).

In sum, success in the implementation of policy and law largely depends on how these can be turned effectively into practice through tools that are appropriate and readily available to practitioners, public sector staff and stakeholders. If these can be used and assimilated as day-to-day instruments, much can be achieved.

Budget allocations for territorial planning

The commitment of the GoM (and the development partners providing central budget support) to engage and proceed with territorial planning can be monitored by the annual amounts allocated within the State Budget for the Environmental Sector. A review of the budget allocations (2007, 2008 and 2009) that have a connection (however tenuous) with territorial planning is not encouraging:

- In 2007, only about 4% of the central investment budget of MICOA and 8% of that of its provincial directorates seem to have been allocated. By 2009, this had increased to approximately 17% at central level, but a large proportion of these allocations over the period was in fact allocated for the "Reactivation of the Course on Physical and Environmental Planning", rather than for any planning activities as such.
- Most of the funding from 2007-2008 was provided through the Decentralised Planning and Financing Programme (PPFD) managed by the MPD. This funding was no longer available in the 2009 budget, but has not been offset by an increased allocation in MICOA's budget.

- Provincial level allocations dipped in 2008 and then increased again in 2009. However, a substantial part of this expenditure was for the acquisition of topographic instruments, which cannot be seen as of much assistance in territorial planning.
- Not one single allocation for territorial planning by a district could be identified in the 2007 and 2008 budgets. Only 4 districts made allocations in 2009, one of these through the inclusion of external funds.

The allocation of financial and human resources has not reflected the undeniable prominence of spatial planning in GoM policy documents.

Challenges and Gaps

Institutionalising the law: linkages and synergies

Presently there is emphasis on three levels of planning in rural areas, each driven and implemented by different stakeholders, each with their own objectives, each the product of particular sector and institutional interests.

- The Council of Ministers, through the MINAG (the Mozambique Institute of Agronomic Research - IIAM, CENACARTA, and DNTF), is driving the development of two new planning and management tools: the 1:1,000,000 and 1:250,000 national zoning exercises.
- The MPD, the Ministry of State Administration (MAE), the Ministry of Finance (MF) and MICOA are supporting district economic and land use planning as part of a general local governance policy.
- There are ongoing efforts to support communities in obtaining direct benefits from land and natural resource use. These are derived from the “open border” model, which builds on the acquired rights of communities over land and natural resources delimited and registered in accordance with the Land Law.

There are many obvious linkages between these three major initiatives, which, when well coordinated, could create impressive synergies and outcomes.

The scene is therefore set for a profound inter-sector debate on instituting an approach to planning that makes a much stronger link between national strategic planning, local development and district development planning.

Elements of this approach can be simply stated along the following lines:

- The national zoning exercise is used as an informative tool to identify and prioritize priority areas for possible future investment;
- Local land use planning is implemented in these priority areas to concretely test these investment opportunities against field reality; at the same time, other development needs and investment opportunities are identified at the local level as the outcome of a negotiation process with local actors;
- The outcomes of local planning and decision-making are fed into district development planning and are pro-actively marketed as a means towards realising the outcomes of local decision-making processes;
- Community lands are delimited and registered, to establish tenure security and the legal basis on which local communities can occupy the driving seat in promoting local development and derive real benefits from natural resource exploitation.

Challenges of approach, ownership and capacity building

The following, deliberately provocative, statement on the quality of existing district land use plans and processes illustrates the extent of the challenge in terms of approach:¹⁷⁶

Plans include encyclopaedically correct but sometimes, redundant information, presented in a foreign technical language, with the spatial elements displayed as an atlas, with some information, but no analytical character. Access to all this is not easy in the absence of high-end laptops, broadband internet links and an understanding of pdf, shapefiles and ArcGis. Plans are produced, not facilitated, by external service providers, and are considered as alien by a majority of district stakeholders and citizens. Major investments in districts are the result of centrally concluded agreements with private companies, concluded in ignorance of any guidelines in the district plans. A lack of financial resources restrains the implementation of activities in the plans that could be dealt with locally. Monitoring and evaluation of plan implementation is difficult in the systematic absence of information sharing.

The elaboration of district land use plans is being approached mainly as a legal necessity, rather than a genuine tool for inducing and achieving the set of broader objectives discussed above. The compilation of a technical dataset (the 'plan') seems to be an end product in itself, rather than a tool for decision-making.

¹⁷⁶ This statement is drawn from an assessment of a series of district land use plans produced in Cabo Delgado, including Pemba Metuge, Montepuez and Mecufi.

The technical exactness, which facilitators, technical teams and the writers of manuals and guides seem to aim for, can only be achieved by outsiders (i.e. well-trained nationals, with the occasional involvement of international experts and NGOs). It results in a product that is strange and foreign to the people who have to administer its implementation, and who are intended to have a stake in it.

This is in sharp contrast with an approach in which data collection and initial technical analysis is viewed as an essential element to create ownership, build confidence, involve people, and support overall capacity building. This approach can be characterised as an “optimal ignorance” model, and stands in stark contrast to the “encyclopaedically correct and complete atlas” model of Mozambique.

The term “optimal ignorance” is meant to imply that the model is well-informed, contains just enough information to be a credible platform for further discussions, but not so much information that there is no obvious room for improvement through participation by the stakeholders.

Attaining the proper balance is not easy, but if achieved can produce a powerful tool for advancing the process and for creating ownership.

Challenges of participation and local representation – “Not About Us Without Us”¹⁷⁷

The concept of participation in decision-making and planning has been debated for years in Mozambique and has resulted in the incorporation of this basic value into the present territorial planning law as an integral part of the process.

Important issues, arising from an analysis of both the legal instruments and a number of completed plans, include:

- Local representation for participation in planning is institutionalized at different levels up to the district; these provide, in principle, good opportunities for local leaders and civil society to make their voices heard and to express local needs and opportunities for investment and development;

¹⁷⁷ “Not About Us Without Us: Working with Grass Roots Organisations in the Land Field” is a 2009 UN-Habitat/Global Land Tool Network publication that sets out initial thinking on how effective and genuine grass roots participation can be a fundamental element for the development of land tools at scale.

- Territorial planning legislation recognizes the provision of other legislation, although MICOA was never directly involved in its elaboration;
- The territorial planning legislation does not provide any additional practical guidance on participation; it is curious to see that the regulations do not include a section that specifically deals with additional tools of participation in territorial planning.
- Effective participation of local leaders, authorities and civil society in plan development is generally ill-documented, and rather limited.

The brief analysis demonstrates that participation and territorial planning are not yet organically interwoven, with participation still being something of a 'prescriptive obligation' rather than a 'guiding basis'.

What is still missing is (i) a better comprehension of what participation means in planning, and (ii) better practical tools to make participation a more genuine and efficient process.

Challenges of up-scaling

The context of territorial planning as a new sector poses serious questions regarding the capacity to cover a nation of 128 districts and 44 municipalities. Over the last years, a total of over 40 district land use plans have been produced, and the pressure is on to produce at the same speed in the future given the present QAD-PAF indicator.

Plans are in fact initiated and produced by the district and municipal administrations, with support from local technical services and outsider service providers. Other public institutions such as DNTF, the Provincial Geographic & Cadastral Services (SPGCs), CENACARTA and IIAM are less directly involved, but mainly provide secondary information.

Clearly, we are suggesting that Mozambique does not yet have the kind of facilitation capacity required to satisfactorily implement territorial planning at the scale, and in the manner, envisaged by the law. The more important issue, however, is whether the conditions for building this capacity exist, and here there are encouraging signs.

Firstly, the process of land use planning in and of itself provides excellent opportunities for building the capacity of facilitators and practitioners (mainly in the administrative services and mainly at the district level).

The opportunities for formal training of facilitators and practitioners require careful and coordinated nurturing. The GoM response so far is somewhat confusing. Different public

training institutions (the Physical Planning & Environment School for medium level technicians - IMPFA, the Land Administration and Mapping Training Institute – INFATEC, the CDS for Natural Resources and CDS for Urban Zones) appear to have overlapping mandates, there are questions regarding the adequacy of the curricula and the fragmentation of scarce resources is being driven by diverging national and donor interests.

Challenges of plan implementation

There is overwhelming international and Mozambican evidence that one of the major challenges of planning is the low percentage of plans that are effectively implemented after being conceived.

There appear to be two dimensions to this challenge:

- a lack of implementation of specific development needs and opportunities included in plans, through a lack of locally available funds;
- activities being implemented which are often conceived outside the plan, and which may ignore or contradict the plan's proposals, norms, prescriptions and proscriptions.

Funding for the functioning of the local institutions involved in planning, including the CLs, the District Technical Teams (ETDs) and the Provincial Planning Support Teams (EPAPs) requires a sustainable solution. District administrations guarantee the costs incurred for the participation of the Local Councils in planning sessions, which are covered by its operational budget.

In contrast to the implementation of the PEDDs, where funding is secured through the state budget under the annual Economic & Social Plan (PES), there is no single mechanism for the costing of activities included in land use plans. Mozambique has, though, a variety of possibilities for the resource and budget allocations needed for implementing land use plans:

- Primarily, the costing of activities, investment needs and opportunities included in land use plans can be integrated into the existing economic planning tools, such as the PEDD.
- District administrations have access to the OIIL, which can be used to promote small scale investment projects included in the land use plans.
- The Regulations to the LOLE include a provision (art 114) for communities to create a Community Development Fund to implement land management activities through the community committee (art 113.2).

- The existing Community Land Initiative (iTC) fund (in fact now two funds, managed by the Department for International Development - DFID and the Millennium Challenge Account - MCA) is a facility that can be easily accessed to finance activities that relate to a wide range of land management activities.

It is a major challenge, however, to make these mechanisms more operational. And this challenge is greater for the urban areas. Districts are the central planning and implementation unit for development in Mozambique. As a result, it is the districts – and not the municipalities – that receive the greatest share of the national budget.

Compliance with plans, the provision of guidance and M&E

This challenge is, of course, strongly embedded in the political economy of the sector, which remains characterized by competing and often conflicting interests, both in scope and in level of decision making.

The GoM also continues to adopt the position of ‘passive’ land and natural resources manager, responding to demands from outside, rather than taking on the role of an active manager, where land use planning and the implementation of plans plays an essential role.

In the rural context, land use planning is set within a much-increased demand for land for agricultural and biofuel production, mineral exploitation and investment in tourism. There are recognized issues with respect to food security, environmental degradation and alternative uses, but negotiated land use planning is not used to address these.

The monitoring and evaluation of the success of planning depends on the dissemination and sharing of information. This does not only include information on plan contents, but also on implementation progress. It is also important to monitor the changes in land use that are envisaged by land use plans, and to confront responsible actors and decision makers on a regular basis with these changes.

Environmental issues

The potential costs to the environment accruing from a failure to address integrated territorial planning processes include:

- increased marginalisation of communities through restriction of access to resources and access to the development process, leading to conflicts between conservation authorities, communities and the private sector, both in the urban and rural settings;

- widespread erosion in urban and peri-urban areas as a result of disordered development in sensitive areas;
- a high level of poorly planned developments, including tourism facilities and holiday homes in inappropriate coastal areas;
- the degradation of coral reef, dune habitats, mangrove and coastal forests, resulting from conflicting resource use;
- the deforestation of dunes as a result of inappropriate urban expansion, through agriculture or as a result of inappropriate and unmitigated development of some industries (e.g. salt);
- impacts from pollution in sensitive areas (fecal, hydrocarbon, industrial effluent) and the contamination of marine organisms;
- loss of habitat for important species (e.g. important turtle nesting beaches under threat from tourist developments);
- a diminishing potable groundwater supply, leading to saltwater intrusion into groundwater reserves and wetlands.

Pro poor gains derived from investment in the sector

Spatial planning is one of the GoM top priority areas of interventions according to both the five-year Government Programme 2005-09 and Action Plan for the Reduction of Absolute Poverty (PARPA II), notwithstanding the low budget allocations of recent years (see above). Many pro-poor gains are likely to come from related improvements in local governance and participation.

The key to success is the engagement with and empowerment of the local state and its stakeholders (district administrations, communities, private sector, etc.), in planning, budgeting and capacity building within a territorial perspective, coupled with the provision of additional financial resources.

Recommendations

Law, Policy, Guidelines and Data

- The GoM should develop a National Land Use Policy, using various already-developed principles from sector legislation as a basis. The policy should be aimed at encapsulating the principles for environmentally sustainable land use and management in the country.

- The GoM should refine the territorial planning regulations in order to improve and extend these so that they become more operational, user friendly and normative and to ensure that they secure the participatory process.
- The GoM should evaluate the effectiveness of the various guidelines developed to orient land use planning processes, particularly from the perspective of user friendliness.
- The process of territorial and land use planning should focus more on the strategic use of available information.
- There remains a need to clarify roles and responsibilities, or powers and functions, of all parties, and to make sure that local government is provided with the necessary resources to develop the capacity needed to perform its mandate.

Implementation and Prioritisation

- In both rural and urban areas it is important to initiate processes, to keep them simple and to make them visible. Flexible and adaptable forms of physical planning in the municipalities must be found; these should incorporate minimum standards of urbanisation and land occupation and respect, as far as possible, existing occupation, but the insistence on standards which are too onerous will make any concrete interventions impossible.
- It is important not to rush these processes. The planning process should be valued, and necessary time and resources for effective planning need to be duly allocated. Related to this, the national process should not be output-driven.
- More use must be made of new technologies, and there should be attention turned towards developing new methodological tools. This includes, for example, the possible use of SEAs at district level as an adjunct to other processes.
- The appropriate use of satellite imagery should also be promoted. The purchase (where necessary) of imagery should be rationalised, but other free sources of imagery should be tapped. Effective spatial planning requires maps and cadastre systems that are still underdeveloped in many municipalities. Imagery can be used for the purposes of land parcel identification and registration.
- There should be more of a focus on planning, rather than on plans. The land use plans should become dynamic processes, involving not only development but also implementation, review and monitoring.

- There should be a focus on prevention rather than prescription. Land use regulation should be approached from the perspective of appropriate taxation and incentives rather than ordinances.
- The provision of formal training should be rationalised between various institutions. The content of training needs to be much more firmly rooted in Mozambican realities and less dominated by theory and technical processes.
- Districts and municipalities should be encouraged and supported in making budget allocations in their own budgets for the purpose of planning processes, with incentives in the form of further financial support and technical assistance from the provincial and national levels.
- Priority communities can also be identified; those under threat as a result of climate change impacts, or who live in disaster prone-areas, and those that are close to big investments, should be strategically targeted for land use planning processes.

More attention should be paid to capturing the lessons from case studies, best practice and lessons learned from experiences.

9. Discussion: recurrent themes and emerging issues

Stefaan Dondeyne

Recurrent themes

Interestingly, some themes are recurrent across the various notes, though of course each in their own sectoral context. Analysing them across the notes may lead to new ideas or at least some interesting insights. Surely, if a wider consensus would be reached on some of these ideas, they could be incorporated in some future plans, policy strategies and if needed could also benefit from support of some of the donors.

First, almost all of the authors agree that the **legal framework**, i.e. laws, regulations and policies are all adequate and general comprehensive enough for dealing with the environmental issues at stake. The only discordance is the paper on *climate change*, but which can be explained, as it is fairly recent that this theme is gaining interest at policy level.

The Government of Mozambique faces however great difficulties when it comes to implementing the policies and enforcing the laws. Hence a second general observation is that most government institutions are under equipped both in terms of **human capacity** and **financial resources**: particularly the number of staff is too low, while their qualifications and their expertise are too weak to take adequately care of the tasks at hand.

The overall need for **strengthening participatory process**, is a third recurrent theme, mentioned e.g. in relation to forestry management, but just as well as in relation to environmental and social impact assessment of mega-projects. Wider participation and consultation is an important dimension in the process of decentralisation and democratisation, what the Government of Mozambique is striving for. Participation of rural communities is mentioned in relation to forestry, for them having better control over their natural resources and benefiting of the 20% of the taxes which should be reverted to them; up to the importance of participation and consultation in the process of environmental and social impact assessment when dealing mega-projects. Participatory approaches, inevitably places a lot of emphasize on development processes and hence gives a lot of room, or opportunities, to strengthen local actors and government staff skills and expertise.

The potential of generating more and better **economic benefits** is also a recurrent theme through the various notes. Improvements on this aspect may be attained by better organising tax collections (e.g. in relation to forestry concession) and even by revising legislation in relation to tax breaks and incentive particularly in the mining sector, but also in the agricultural sector. Better control and more direct participation of rural communities would also lead to more economic benefits to the rural communities. Better organisation, and implementation of the legislation, which foresees that 20% of the taxes levied on natural resources, agriculture and tourism, would be reverted to the local communities.

The authors of the various notes all point to the need for more **integration and better coordination** between the various line ministries. How this should be attained is less clear, though better definition of the role and responsibilities of MICOA is often mentioned and also the need for elaborating explicit Memorandum's of Understanding between the different units. The important and prominent role of CONDES is also almost always mentioned; some authors go as far as suggesting that MICOA should be changed into a full competent Ministry for Environmental Affairs while CONDES would then have the full coordinating role.

Various notes also hint to the need of better **territorial and strategic planning** which, if done well would of course also help to get to a better coordination of the various sectors. In the paper on forestry for example, it is argued that the current number of timber exploitation under the "simple licence regime" is too high to guarantee the sustainable exploitation of the forest; the author argues that these should be substitute in favour of the full concession regime. The authors of the paper on territorial planning argue that the planning processes as such should get more attention. They emphasize that local ownership of the plan, by the people who will be responsible for the implementation of the plan, is of higher importance than the production of a technical nice plan.

The authors had in their terms of reference to suggest **environmental indicators** in relation to their policy recommendations. Most of the authors suggest some environmental monitoring indicators, but without making clear what the information is required for; the paper on *environmental sanitation* is the noteworthy exception. To be able to determine the kind of indicators that should be monitored, one should define clearly what kind of information is actually need; and if possible, what it may be used for and by whom. It is only after defining **what the information is needed for**, that one can start defining the **type of data which need to be collected** to get that information. It could be that the required information is actually already available, from secondary sources, or from surveys the sector is already anyway (e.g. the "agricultural surveys" (TIA) for the agricultural sector). I just feel

that given the scope of these notes, it is impossible to get beyond some generic principals on how this may be done, and possible who should be doing such a work.

Emerging issues

As outlined above, the **weak capacity** in many of the Government institutions is one of the recurrent themes. The obvious solution, at first sight, would be to increase training programmes and, if means allow, to recruit more and better trained staff. Alternatively, some important tasks can also be commissioned to “external”, or private agents. This strategy is actually already being used in the processes of territorial planning, where the regulation on district land-use planning implies that the territorial planning has to be done by licensed consultancy companies or consultants. As the authors of the notes of territorial planning observe, this approach however bears the risk that the production of a technical well looking document becomes the dominant concern to both the consultants and the funding agency. Danger are real that the persons who will have to implement the plan, are actually alienated in the process, as concepts and techniques are used which they may not be familiar with, and hence that the ownership of the plan may be very low. The authors make the point that the **process of land-use planning is actually of greater importance than the production of a technical sound plan**. Creating a wide consensus, amongst local stakeholders and communities, on the future directions the development of an area should take - and hence a common understanding of the development potential and constraints of the area, is the key for assuring that any development plan will be implemented. Giving sufficient attention to the planning process is hence an ideal opportunity for strengthening, and even building, capacity amongst government staff and within government institutions. Very much linked to this aspect is the recurrent theme of the need for strengthening **participatory processes**, particularly when it comes to the role of rural communities.

The author of note on the forestry sector highlights that for securing a sustainable exploitation of the forest resources, exploitation under the “**full concessions regime**” should be favoured of the “**simple licences**” regime. I would argue that “**simple licences**” should preferentially be given to areas intended to be converted from forest (or woodland) into agricultural land. The full concession regime should be given for areas intended to remain forest, and hence where one wants a sustainable exploitation of these resources. Logging under the “simple licence regime” s would hence be used as a “salvage logging” strategy of forests, which in any case, would else disappear as it would be slashed-and-burned to become agricultural land. This strategy of course presuppose that there exist a clear development vision on which areas should remain as forests, and which will be developed as agricultural land. The recently adopted law and regulation for **territorial planning**, timely provides the basis for such a strategy. It will however imply a new vision on the use of these

two forest management regimes; currently simple licences (valid for one year, albeit renewable) are given out to companies that are deemed to lack the capacity for elaborating the laborious management plans required for the “forest concession regime”. To alleviate this problem it would indeed be worth analysing whether the requirements for elaborating the management could not be simplified and adjusted to the particular circumstances of Mozambique

