



FORESTS, RANGELANDS and CLIMATE CHANGE ADAPTATION in SOUTHERN AFRICA, Johannesburg, 17-19 June, 2013.

MOZAMBIQUE GENERAL OUTLINE OF COUNTRY REPORT

I. Introduction

Covering an area of about 799.388 km² Mozambique is located on the southeastern coastal of Africa. It is bounded by Tanzania to the north; the Mozambique Channel (Indian Ocean) in the east; on the south and southwest by South Africa and Swaziland; and West by Zambia, Zimbabwe and Malawi.

The country is generally low-lying, with only 13 percent of the country above 1.000m. The land ascends in a westward direction from the coast through a coastal lowland that is narrow in the north and broad in the south (~ 44% of total of land area), through a sub-plateau zone to an extensive low-lying plateau of moderate height, and finally up to a narrow higher-lying area on the western border.

The climate ranges from subtropical in the south to tropical in the center and north. Most of the country receives above 400mm of rainfall per year and the coastal zone receives up to 900 mm of rain per year. The mountain region in Niassa, Tete and Manica provinces the rainfall is more than 2.000 mm/year which are characterized by dense forests, showing a close relationship between ecological zones and precipitation. The precipitation gradient decreases from the humid savannah region to the arid savannah region.

Thirty- nine major rivers drain into the Indian Ocean along Mozambique 2.700 km coastline. Most of them have a torrential regime, with high flow during the rainy season and low flows the rest of the year. Of the 9 major river basins, seven are shared with the other countries, the most important river in the country is Zambezi Delta and covers about 18.000km².

Mozambique agro-climate is strongly differentiated by three zones:

1. The northern zone of the Zambezi river is humid, with a distinct rainy season. Generally, water is available for crops for a full growing season, with drought conditions occurring only twice every ten years.
2. The central region, between the south of the Zambezi River and the north of the Save River, experiences drought conditions approximately four years in every ten.
3. The southern region has a high risk of drought conditions, with drought conditions seven out of every ten years.

Agriculture, livestock and fisheries are the most important sectors of the economy, with agriculture representing 80 percent of the country labor force. The excellent agro-climatic conditions particularly in the country central and northern regions and accessible surface water provide ample opportunities for irrigation. These conditions are favorable for cash crops, namely cashew nuts, sugar-cane, cotton, tea, beans, tropical fruits, etc. Portions of the agricultural, timber and fisheries sectors contributed to 50 percent of the country total exports in 1998.

Due to our geographical location, Mozambique is extremely vulnerable to natural disasters. Floods, tropical cyclones, droughts, windstorms and subsequent epidemics and erosion hit hard and with increasing frequency. Other environmental problems that affect the country include epidemics, plagues, slash-and burn practices, industrial accidents and erosion. More than 60% of our people live below the poverty line. This severely limits their capacity to cope with such disasters.

More than 700 people died when on February 2000, the category 4 tropical cyclone “ELINE” and major floods hit Mozambique. Faced with the catastrophic consequences of floods and cyclones in the south and centre of the country.

Vulnerability

Despite significant advances in developing registered, Mozambique is considered the fifth most vulnerable country in the world, according to the Index of Vulnerability to Climate Change, due to two key factors, namely:

- **Exposure to risk:** This is the plated, a length of 2700 Km, the basin of the Indian Ocean which is an active region for tropical cyclones, It is located downstream of the nine river basins shared and The records in the country the sharp drop in altitude from the interior to the coast, which makes the river water runoff is high speed, causing floods in short time when there are high levels of rainfall upstream shared international basins.
- **Poor socio-economic development** - characterized by the existence of illiterate population (and 32% for men and 68% women), the degree of poverty, which fell from 69.4% in 1997 to 54.1% in 2003; weak infrastructure socio-economic structures such as roads, dams and reservoirs (for collection and storage of water in the rainy season, to be used in times of scarcity), silos where they can be stored agricultural crops to be consumed and / or sold later, low power purchase of agricultural inputs by farmers at household practicing rain fed agriculture and disabled access routes.

Impacts projected

Projections INGC (2009) anticipate that the Climate Change manifest in Mozambique, mainly in:

- ***Patterns of temperature:*** the atmosphere - with an average increase of 1.5⁰C to 3.0⁰C over the period 2046-2065 and recording more hot days and less cold days with higher maximum and minimum temperature the oceans - with rising average levels and changes in the distribution and availability of fish stocks and the effects on marine ecosystems (eg, corals)
- ***Patterns of precipitation:*** erratic behavior of rainfall in terms of start time and end time, and duration of load rainfall rainy season (phenomena of intense precipitation in a short time, drought), disfiguring the notions of "official start" and "real" agricultural campaign may result in some regions in decreased yields potential current by 25% the increasing reduction in potential crop yield levels up to 20% on the main crops that constitute the basis for food security and condition for the improvement of per capita incomes of Mozambican families
- Increased frequency and intensity of extreme events (droughts, floods and tropical cyclones) the persistence of extraordinary flood situation in the country and identifiable locations that may refer to as "local" or "risk areas" the cyclones and other strong winds the prolonged drought
- Increase the level of the sea: (15cm, 30cm and 45cm as a result of thermal expansion and 15cm, 110cm and 415cm as a consequence of the reduction of continental ice sheets in the years 2030, 2060 and 2100 respectively). The identified areas with potential increased risk for the emergence of other adverse natural phenomena such as loss and coastal erosion, saltwater intrusion, desertification, the reduction of areas available for agricultural practice in the green zones or low. Many of the major urban centers of the country, including Maputo, Beira and Quelimane, are in a critical situation in terms of vulnerability (human lives, properties, social infrastructure, etc.) before the effects of Climate Change.

II. National priority actions for addressing climate change in forestry

Forestry area

According to data from the Forest Inventory (Marzoli, 2007), forests and other woody formations occupy an area of 54.8 million hectares, which account for 70% of the total area of the country.

The area covered by forests is estimated at 40.1 million hectares (51%), of which 26.9 million are suitable for the production of commercially valuable timber, and 13.2 million acres are conservation areas. Other formations woody (shrubs, bushes and forests are subject to shifting cultivation) covering 14.7 million hectares (19%).

The national deforestation rate was estimated to be 0.21% per year between 1972-1990 (Saket, 1994) and 0.58% per year between 1990-2002 (Marzoli, 2007). The total loss forests in the period 1990-2002 was 219 thousand hectares nationwide.

The causes of deforestation and forest degradation in Mozambique are multiple and complex. However, Marzoli 2008 reports farming (itinerant), harvesting of firewood and charcoal, and the expansion of residential areas as the main reasons use change and forest cover. In addition, poorly documented and is forest degradation as a result of operation of commercial timbers and other forms of selective cutting of trees. These findings indicate clearly how deforestation has roots in sectors such as agriculture and energy, where local practices do not contributing to the conservation of forests.

Within the forestry sector, it is noted as causes of deforestation and forest degradation to poor implementation of the law, demand for wood log and building materials, and wildfires associated with open fields and hunting.

The baseline scenario was made taking into account the strategy of reforestation of the Ministry of Agriculture which provides for the reforestation of an area of 1.281.464 ha by the year 2030. For the mitigation scenario took into account an increase in the areas planted 1.922.196 ha by the year 2030.

The baseline setting the amount of CO₂ that will be absorbed into the atmosphere will increase to 10.5 million tons in 2011 to 2030, while the mitigation scenario the amount of CO₂ that will be absorbed by plants will be 26.3 million tons 2011 to 2030.

The maximum difference between the baseline scenario and the mitigation scenario is 17 million tons of CO₂ that will occur in 2030 and the lowest is 1.2 million tons of CO₂ observed in 2011. For the proposed mitigation measures in the forestry sector can consider the following:

- Use mechanisms of Reducing Emissions from Deforestation and Forest Degradation, such as reforestation, conservation and management of forests,
- Use of Clean Development Mechanism projects also based on reforestation, conservation and management of forests.

Under the REDD + Mozambique is developing a national strategy that aims to:

- ✓ To create favorable conditions for the gradual reduction of the levels of deforestation to zero in the period subsequent to the effective date of this EN-REDD +.
- ✓ Reducing the rate of deforestation to historical levels recorded between 1972-1990 until 2025.
- ✓ Reduce the rate of degradation of forests and other woody formations.
- ✓ Increase the capacity of terrestrial natural and artificial kidnap 30 million tonnes of carbon by 2025.

Rangeland management

Adaptation measures suggested in national communication consist of management strategies that requiring assessment and adjustment locations. Some of these strategies, then suggested, and to test its possible application include:

- ✓ Grazing systems alternative
- ✓ Changes in stocking rates,
- ✓ Changes in the timing of the grazing period,
- ✓ Changes in the genotype of cattle and
- ✓ Other alternative strategies dependent on the country.

Other adaptation programs underway include the joint UN (UNJP) on environmental improvement and adaptation to climate change, involving six agencies United Nations (FAO, UNDP, UN-Habitat, UNEP, UNIDO, WFP) and six institutions government (Ministry of Agriculture, Ministry for Coordination of Environmental, National Institute of Disaster Management, National Institute of Meteorology, Government of Gaza Province and the Government of the District of Chicualacuala).

The program's specific objectives are:

- 1) Integrating environment and climate change in the government's plans and policies at national, provincial and district levels.
- 2) Increase the capacity of rural communities to cope with changes climate.

With regard to livestock, the livestock program UNJP formed prosecutors and provided basic equipment, drugs and veterinary drugs to reduce morbidity and mortality of cattle is the main wealth of the district. The program advises breeders to use in a rotational grazing to prevent overgrazing located and to reduce the prevalence of tick-borne diseases, which are an important cause of morbidity and mortality of livestock in the district.

However, the developers continue with their traditional continuous grazing. The main reason for this lack of adherence to advice is that most of the land available for grazing cattle do not have water to drink. Therefore, the livestock is kept nearby residential areas where they can share a little water in the human population.

Promising adaptation measures to reduce the effect of changes and climate variability in pastures and livestock are already being implemented in the country.

However, all actions listed above should be expanded to all areas semiarid where livestock production is a major economic activity because its current coverage is very limited. Additionally, it is suggested that the following actions be carried out:

- Open water sources in pasture areas, because the lack of water is what causes potential grazing areas that are not used. This is an activity priority to areas of the country where livestock production is an activity economic importance for the population.
- Identify centers of livestock development, such as areas where livestock have comparative advantage in agriculture and should be given priority investment in livestock

production, including animal husbandry promotion, veterinary assistance and implementing measures to adapt to climate change.

- Implement measures for the conservation and restoration of vegetation cover rangelands that have been degraded by overgrazing or other causes
- Promote the production of pastures where water is available for irrigation
- Promote the creation of breeders' associations and support them in infrastructure such as fences / pens and water sources so that the creators can change the continuous grazing system for rotational.
- Fund research into the impacts of climate change on grassland and livestock
- Raising awareness to decision makers on the impact of climate change on animal production and on adaptation measures and mitigation

III. Key gaps, constraints and challenges in addressing climate change

- About 80% of active population of Mozambique lives in rural area and practices Shifting cultivation which depends on rainfall that forecasts indicate a reduction due to climatic changes.
- The weak capacity of management of shared river basins
- The low literacy rates
- The weak implementation of existing policies

IV. Assistance required for climate change actions

The required assistances needed for climate change action is manly capacity building, technology transfer and funds to implement the following activities:

Forestry area

- Sensitization programs against wildfires
- Realization of forest inventories at the district level
- Training the operators on the sustainable practices of exploitation
- Empowerment of communities in sustainable management of resources
- Improve the forest and wildlife surveillance capacity

Rangeland management

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V. Recent climate change activities and projects related to forests and rangelands

Several actions that contribute to climate change adaptation are ongoing into several national institutions, in the context of the implementation of plans, programs and strategies. In the adaptation actions, we highlight the followings:

Forestry area

- Presidential directive: one leader one forest, one student one plant
- Elaborated and in implementation the national strategy of reforestation
- Under the REDD + Mozambique is developing a national strategy
- In the country, 10 companies operating in the area of reforestation distributed by Provinces Niassa, Zambezia, Nampula and Manica. These companies have an area of 534.000 ha.
- There are 13 companies claiming interest in reforestation area in Mozambique totalizing an area of 1.047.000 ha. The requested areas include the provinces of Cabo Delgado, Zambezia, Manica, Sofala, Nampula, Maputo and Gaza
- From 2005 to 2010 have been reforested 46.278 ha in the provinces of Sofala, Manica, Zambezia;
- Improving the national capacity on MRV for REDD+
- In preparation the National Strategy of Biomass Utilization

Rangeland management

- Training of technicians in different options to minimize the effects of drought on livestock productivity, including the distribution of seeds and seedlings *Leucaena leucocephala*, use of nutritional blocks, hay production and silage, this training was done by the Department of Animal Production National Directorate of Veterinary Services.
- Research to identify alternative sources of supply for livestock during the dry season, including research on crop production forage forms of forage conservation through silage and hay, and use of nutritional blocks. Research activities are led by Department of Animal Sciences IIAM through Zonal Centers.

- Veterinary assistance to farmers.
- Water collection and storage of various purposes including livestock abeberramento.
- This activity is sponsored by INGC.
- Promotion cattle breeds using robust and adapted to local conditions.
- Sensitization of communities on best management practices for pastures, including the prevention of wildfires

VI. Funding opportunities

Indicate bi-lateral and/or multi-lateral partnerships that your country is or has engaged in related to forests, rangelands and climate change

- The investment volume of private sector for reforestation programs
- Japan International Cooperation Agency (JICA)
- United Nations Joint Program (UNJP- FAO, PNUD, UN-Habitat, PNUMA, UNIDO, PMA)
- Forest Carbon Partnership Facility (FCPF)
- Norwegian Government
- Belgium Government
- And Others

VII. Recommendations and conclusions

In Mozambique, REDD+ will be our major contribution to global mitigation and adaptation action. The challenge is to have the necessary capacity to address deforestation, which their drivers are complex. Therefore the required assistances needed for climate change action is manly capacity building, technology transfer and funds to address the drivers of deforestation.