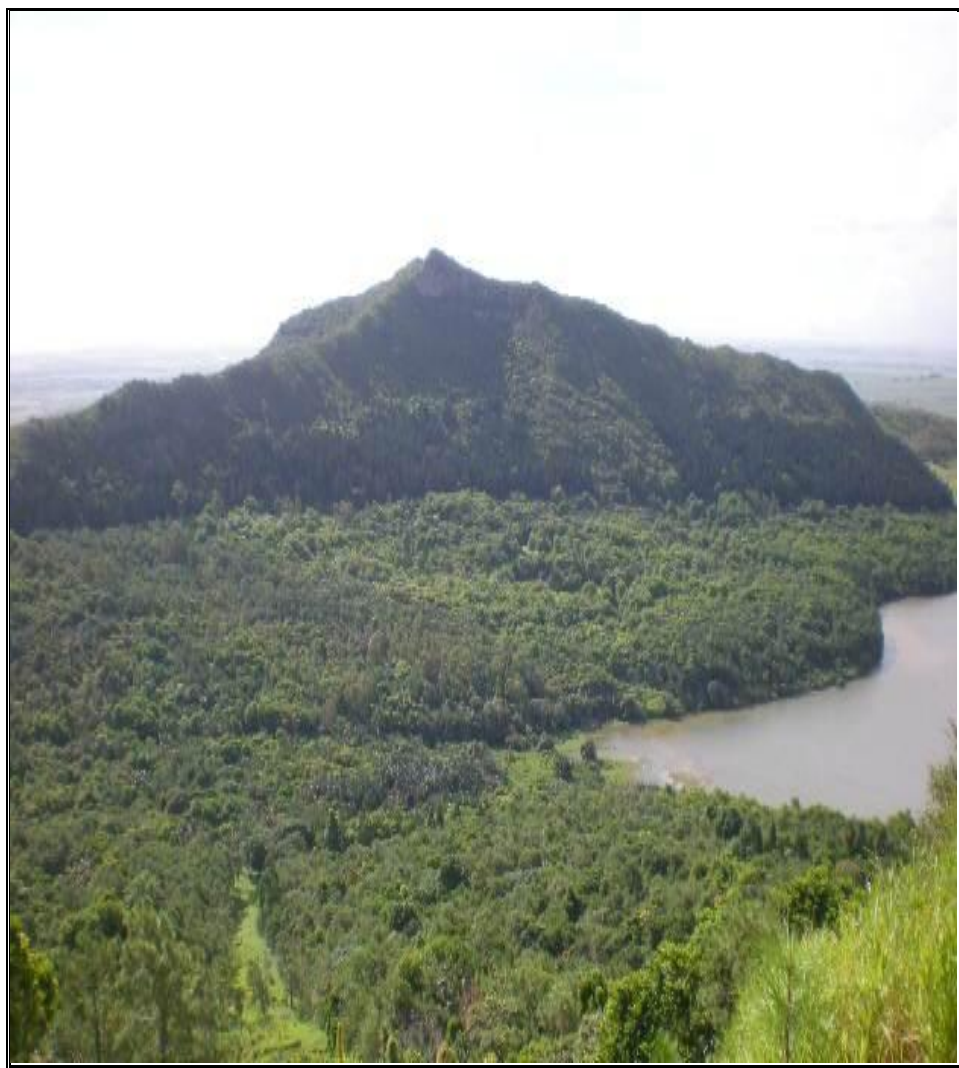


2013

FORESTRY SERVICE

user1



[CLIMATE CHANGE & FORESTRY]
COUNTRY REPORT FOR MAURITIUS

CONTENTS

I.	Introduction	3
II.	National Priority Actions for addressing climate change in Forestry	4-7
III.	Key gaps, constraints and challenges in addressing climate change	7-8
IV.	Assistance required for climate change actions	8
V.	Recent climate change activities and projects related to forests	8-9
VI.	Funding opportunities	9
VII.	Recommendations and conclusions	9-10
	References	11

I. INTRODUCTION

Mauritius is classified as a Small Island Developing State (SIDS) with the characteristics of remote location, large population size (around 625 inhabitants per km²), limited land mass, limited natural resources and a high ratio of coastline to land area, susceptible to natural disasters and vulnerable to global developments. The total surface area of the republic of Mauritius is 2,040 km².

Due to its geographically isolated position in the Western Indian Ocean, evolution has resulted in a diversity of flora and fauna, many of them unique in the world. However, anthropogenic activities has resulted in the decimation or extinction of a large number of floral and faunal species, the most famous of them being the Dodo bird – cited as being the very symbol of extinction. On the other hand, there are some good, success stories of rehabilitation of habitats and species.

The forests of Mauritius are relatively small in area but perform vital functions, the most important of them being soil and water conservation. The environmental functions of forests far outweigh their economic functions. The roles of forests in reducing soil erosion, carbon sequestration, conservation of biodiversity and genetic resources, recreation and ecotourism are recognized and valued.

It is noteworthy that forests in Mauritius are no exception to the vulnerabilities to the impact of natural disasters and climate change. *Projections of future changes in climate include increasing temperatures, severe droughts, rising sea levels, possible decreasing rainfalls, flash floods and reduced water availability.*

Some of the observed impacts of climate change are:

- Average temperature rose by 0.74°C – 1.1°C when compared to the 1961-90 mean;
- Decreasing trend in annual rainfall of around 8% over Mauritius since the 1950's;
- Sea level has been rising by around 3.8 mm/yr at Port Louis over last 5 years (compared to 2.1 mm/yr in late 90's and early 2000 ; 1.2 mm/yr in the 70's- 80's);
- Flash floods;
- Infrastructure damages in the coastal roads in Mauritius and Rodrigues

Projected Impacts

- Increase in average temp by 1-2 °C, higher precipitation in May- Oct period;

- Reduction in sugar yield is expected to range from 47% to 65% with an increase in temperature of 2°C;
- The amount of utilisable water likely to decrease by **13%** by 2050;
- Serious risks due to Flash Floods, Landslides, Inundations, Surges and Sea-Level Rise;
- **5-70 km²** of built up areas, **19- 30 km²** of agricultural land, **2.4-3 km** of motorway, **18-29 km** of main roads and **68-109 km** of secondary roads are exposed to flood hazard;
- The estimated costs of damage **from flooding** in the next 50 years is estimated at Rs **101 billion** while the cost of protection measures amounts to Rs 61 billion.

As a result of climate change, current threats to our forests include habitat loss, intensification of weeds, pests and forest fires. There is also ample evidence of climate change and their complexities on Mauritius as SIDS. While decrease of forest land has been governed by pressure on demands for agricultural and residential purposes, change in rainfall patterns are affecting some species of forest trees. Thus the decrease in rainfall amount is leading to a shrinking in the habitat of endemic species. Forests in Mauritius also face the major problem of the spreading of invasive alien species and moreover climate shifts may lead to new opportunities for invasive species.

II. NATIONAL PRIORITY ACTIONS FOR ADDRESSING CLIMATE CHANGE IN FORESTRY

Government of Mauritius is fully conscious that the long-term socio-economic success of the country is not possible without environmental sustainability and has put environmental concerns high on the agenda. A number of measures of forest and conservation of biodiversity are listed, amongst others, namely:-

- A National Biodiversity Strategy and Action Plan (2006-2015) are being implemented;
- The National Invasive Alien Species Strategy and Action Plan have been finalised which represent a first step towards a comprehensive and coordinated approach to the management of invasive alien species (IAS) threat in the country. It is to be noted that IAS is the major threat to the protection of our native forests;

- The National Forest Policy, 2006 spells out key activities to counter the major cause of climate change. The strategy includes measures to enhance sink capacity through better management of existing forests.
- 50% of the state forest plantation areas have been set aside for protection of ecosystem services and about 31% of the total forest area has been proclaimed as protected areas;
- Restoration of degraded forests and rehabilitation of native forests to increase native tree cover has been implemented;
- Management Plans for Islets have been developed to address the management and conservation of our offshore islets.
- Study and demarcation of Environmentally Sensitive areas has already been completed to protect the Environmentally Sensitive Areas including our forests, wetlands, rivers, coastal areas, and will be implemented with action plan;
- National Tree Planting Campaign

Forest mitigation strategies should on the one hand minimize GHG emission and on the other increase carbon stocks. The options available to reduce emission by source and to increase removal by sink in the forest sector are:-

1. Maintaining or increasing the forest area through reduction of deforestation and degradation and through afforestation/reforestation.

Afforestation and reforestation offer the best option to effectively mitigate climate change in the medium and long term. The only hope to increase forest cover in Mauritius is through the conversion of some 5,000 ha of abandoned sugarcane (classified as difficult and environmentally sensitive) to forest. Besides, it is one of the ten priority issues of the National Forest Policy 2006. This is a daunting challenge and the major constraint is the high initial investment coupled with several decades delay until revenue is generated.

The Forestry Service has an annual reforestation programme of about 80 ha, which mostly consists of replanting clearfelled state forest lands. Owing to very limited land area, there is hardly any scope to have additional land for tree planting. However, linear forestry offers good scope to increase tree cover on the island. Linear forestry means the planting of trees along highways, roads, tracts, etc. The Forestry Service is already implementing this type of activity.

2. Maintaining or increasing the stand level carbon density (tonnes of carbon per ha) through planting, tree improvement or other appropriate silvicultural techniques

Forest Management activities to enhance stand-level forest carbon stocks include harvest system that maintain partial forest cover, filling of gaps, reducing soil-erosion (soil carbon), and by avoiding burning slash after clearing land for planting.

Timber exploitation has been gradually reduced over the years and only some 10,000 m³ of timber, poles and firewood are now exploited annually. In the future timber production will be limited only to salvaging operations after natural calamities (cyclones, pests, diseases) in line with the National Forest Policy. Consequently carbon emission from exploitation will be considerably reduced. Mauritius, being a small island with limited land area, is and will always be a net importer of timber.

3. Forest protection against fires, diseases, cyclones, etc

Fires, cyclones, disease, etc can have devastating effect on forests and considerably reduce the living biomass, thus lowering forest carbon stocks. In Mauritius, firebreaks are opened and maintained in fire-prone forest areas like Port Louis Hills. The grass is regularly kept in check through cutting and spraying of herbicides in order to reduce burning materials. Fire-resistant tree species are selected to reforest these affected areas.

4. National Tree Planting Campaign

The National Tree Planting Campaign was initially launched in 1985 with a view to increase tree cover and embellishes the environment. Plants are issued free of charge to government institutions, para-statal bodies, socio-cultural organizations, youth clubs and NGOs as well as owners of mountain and river reserves. To date more than 750,000 plants have already been issued under this scheme.

One of the objectives of the National Forest Policy is to increase tree cover to enhance the environment and the carbon sink capacity. The CO₂ sequestration role of trees could add more impetus to the National Tree Planting Campaign. Raising awareness on the importance to plant trees to mitigate climate change needs to be strengthened with a view to enlist the support and participation of all stakeholders, which will contribute in the establishment of trees in backyards, roadsides and other available blank areas.

Mitigation Scenarios

Some 7,000 hectares of abandoned marginal sugarcane lands would be available for forestry and other related activities in the wake of the 36 % reduction in the price of sugarcane under the sugar protocol (National Forest Policy, 2006). This area will include about 5,000 hectares of land, mostly mountain slopes and degraded lands, classified as difficult and sensitive and will be maintained for environmental purposes. The conversion of these areas to forest is one of the ten priority issues of the National Forest Policy.

The following two mitigation scenarios have been identified:

1. Afforestation of 5000 ha of abandoned sugarcane lands (Increasing removals).
2. Combating deforestation and land degradation (Reducing emissions) coupled with increasing carbon stocks on forest lands.

However, since the two scenarios are independent of each other, they could be implemented simultaneously and produce the best effect (ideal scenario).

Combating deforestation and land degradation coupled with increasing carbon stocks on forest lands. This scenario includes measures to prevent emissions caused by deforestation & land degradation, and to increase carbon stocks through rehabilitation of poorly-stocked forest lands and the use of suitable tree species that have greater sequestration potential. The former one is a low-cost option that will contribute to both sustainable forest management and mitigation of climate change, and include, amongst others:

- New or amendment of legislation to provide adequate protection to both state and private forests
- Increase the forest protected area network by declaring all forest lands in environmentally sensitive areas as National Forest according to section 4 of the Forest & Reserves Act of 1983
- Provide incentives to owners of private forests
- Intense awareness-raising through propaganda
- Limiting timber exploitation to salvaging operations in line with the National Forest Policy (reducing emissions).

The ideal scenario would be the simultaneous implementation of scenarios 1 & 2, where emissions are minimized on the one hand and removals increased on the other. It would result in the greatest net removal of CO₂. The estimate increases in net removals are 43.3%, 84.6% and 159.1% in 2020, 2030 and 2040 respectively as compared to business as usual.

Adaptation

In line with the approved National Forest Policy (2006) on adaptation of forestry to climate change includes the improvement of the forestry planning and management system and the efficiency of forestry activities. Ongoing adaptation measures include:

- Ongoing reforestation through the introduction of species that are more adapted to the new climatic conditions and its accompanying effects;
- Maintenance of firebreaks in fire-prone areas
- Cutting down and removal of all trees affected by disease; and

- Keeping in force an ESA Policy for the protection of ecological systems, including forestry and wetlands.

(Second National Communication of the Republic of Mauritius under the UNFCCC – 2010)

(III). KEY GAPS, CONSTRAINTS AND CHALLENGES IN ADDRESSING CLIMATE CHANGE

The problem of security of land tenure must be addressed in order to combat deforestation effectively in Mauritius. Moreover, there is an urgent need to review legislation in order to adequately protect private forest lands where the greatest loss occurs. This will require bold decision and commitment at the highest level.

The major constraints, gaps and national needs for the effective protection and conservation of forestry resources are:

- Inadequate financial and human resources;
- Limited area under protection and inadequate active conservation management of native ecosystems;
- Weak security of land tenure for forest lands;
- Lack of training and limited human capacity at all levels;
- Inadequate protection of forest and biodiversity, especially on private land;
- Incomplete inventory;
- Lack of expertise in specific areas such as Biomass Expansion Factor (BEF) determination, below ground biomass, calculation of carbon stock for certain plants;
- Habitat fragmentation;
- Limited inter-institutional communication and collaboration;
- Limited research or monitoring to support adaptive management;
- Limited awareness of the population at large;
- Research in new cheaper methodologies to control IAS with a view to rehabilitate degraded native forests rich in biodiversity on a large scale;
- Involvement of volunteers in conservation work;
- Providing incentives to private land owners to conserve their forest lands;
- Setting up of a National Spatial Data Infrastructure (NSDI); and
- Intensification of awareness-raising and mass education on the importance of forests and biodiversity.
- Data availability on climate change due to inappropriate technology

- Lack of mechanisms for information sharing and management across sectors; and
- Limited awareness of adaptation among stakeholders and the population

(IV). ASSISTANCE REQUIRED FOR CLIMATE CHANGE

The International Community has a crucial role to play in helping small island developing states to address the problems of climate change. SIDS are the most vulnerable and are often the first to bear the brunt of extreme weather events due to global warming caused by the emissions of greenhouse gases mostly by developed nations.

Both technical and financial assistance are required to address climate change in forestry. The provision of adequate funding is essential for the implementation of adaptation and mitigation measures in forestry as identified in the Second National Communication to the UNFCCC of Mauritius. Moreover, capacity building is essential and should be ongoing with transfer of knowhow and technology from developed nations to developing ones. Priority activities for assistance are:

- Forest inventory including growing stock and determination of carbon stock in the five carbon pools (Above Ground Biomass, Below Ground Biomass, Dead Wood Biomass, Litter and Soil);
- Use of Remote Sensing and Geographical Information System (GIS) in forest Inventory;
- Propagation of rare endemic species with recalcitrant seeds; and
- Control of invasive alien species.
- Afforestation

(V). RECENT CLIMATE CHANGE ACTIVITIES AND PROJECTS RELATED TO FORESTS

Mauritius has also embarked projects in collaboration with international partners related to environmental sustainability and forest management on the following:-

- i. The “Capacity Building for Sustainable Land Management for the Republic of Mauritius” (SLM) project (2006-2013) supported by UNDP/GEF/FAO is a joint effort with public, private sector groups and civil society, to build capacities for sustainable land management. This project also included the setting up of a Forest Land Information System (FLIS) for better monitoring and management of forestry resources;
- ii. Protected Area Network (PAN) Project (2010-2015) funded by UNDP/GEF is being implemented in collaboration with the private sectors to expand and ensure

- effective management of the protected area network to safeguard threatened biodiversity;
- iii. The National Action Programme (NAP) will be aligned with the 10 year Strategic plan of the UNCCD
 - iv. Regional Capacity Building for Sustainable National Greenhouse Gas Inventory Management Systems in Eastern and Southern Africa Project (2010-2013) by UNFCCC is on-going to undertake GHG Inventory for affected sectors including the forest sector.
 - v. Mauritius is also presently embarking on a low carbon development strategy and is preparing its NAMA (Nationally Appropriate Mitigation Action). This is a means whereby various projects are implemented in view of reducing carbon emissions in developing countries. Consideration is being given to capture the forestry sector in same.

(VI). FUNDING OPPORTUNITIES

The Government of Mauritius is signatory to many International Conventions relating to forestry including UNFCCC, UNCBD, UNCCD, CITES, RAMSAR.

The Government has strong ties with a host of international organizations like the Durrell Wildlife Conservation Trust (UK), Peregrine Fund (USA), World Wide Fund for Nature (WWF), Kew Gardens, Flora and Fauna International and Island Council for Bird Preservation. There is memorandum of understanding with some of these organizations.

Integrated Financial Mechanisms for projects/programmes includes:-

1. Government Budget
2. Donors (FAO, UNDP, GEF, GLOBAL MECHANISM, UNFCCC)
3. Corporate Social Responsibility
4. Green tax

(VII). RECOMMENDATIONS AND CONCLUSIONS

The following recommendations are related to the forest sector:

- Recognize the special needs and requirements of Mauritius as a small island developing state with fragile ecosystems;
- Strategy for accelerating cooperation in mobilisation of funding/financial needs to sustainably manage our forests;

- Cooperation and knowledge sharing including capacity building and best practices for enhanced conservation, protection and sustainable management of forests;
- Research and development in Sustainable Forest Management (SFM), Climate Change mitigation and adaptation through forestry, Payments for Ecosystem Services as well as economic evaluation of biodiversity;
- The problem of Security of Land Tenure should be addressed;
- Updating forestry legislations to address all emerging issues like climate change, biodiversity and ecotourism.

The potential of forests and trees to mitigate climate change through absorption of carbon dioxide is widely recognized. However, the forests of the Republic of Mauritius are fragile and susceptible to damage through deforestation, degradation and climate change. Moreover, being a small island, Mauritius has limited forest area with little scope for expansion. Therefore, the remaining forests of the Republic of Mauritius need to be adequately protected and enhanced through conservation and Sustainable Forest Management for effective mitigation of climate change.

References

National Forest Policy of the Republic of Mauritius (2006)

National Strategic Biodiversity Action Plan (2006-2015)

Second Nation Communication to the UNFCCC-November 2010

(<http://unfccc.int/resource/docs/natc/musnc2.pdf>)

National Greenhouse Gas Inventory Report for the Republic of Mauritius (2000-2006)

(http://unfccc.int/resource/docs/natc/ghg_mauritius.pdf)