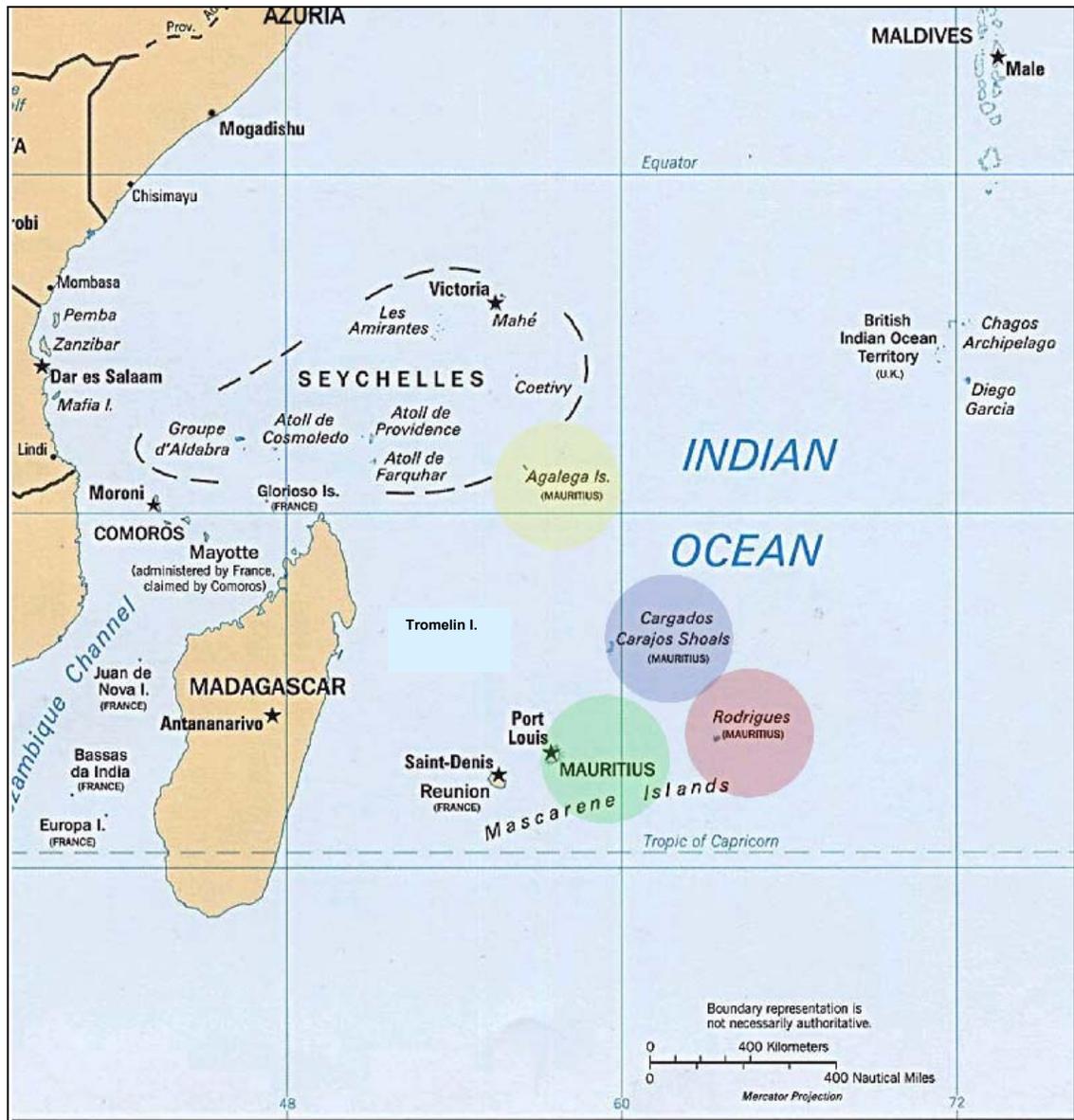


Chapter 1. Introduction to the Republic of Mauritius

1.1 Introduction

The Republic of Mauritius is located in the Indian Ocean 800 km southeast of Madagascar. It consists of two main islands, Mauritius (1865 km²) and Rodrigues (109 km²) and two groups of outer islands, namely the St Brandon Archipelago (3 km²) and Agalega (c21 km²) (Figure 1.1). The total land area of the Republic of Mauritius is 2,040 km² with an Exclusive Economic Zone (EEZ) extending over more than 2 million square kilometres.

Figure 1.1: Map of the Western Indian Ocean Islands



Mauritius and Rodrigues form part of the Mascarene Archipelago, along with Réunion Island (France). All three are of volcanic origin and share many similarities in terms of their biodiversity. Mauritius was formed c8 million years ago and is encircled by fringing coral reefs that enclose coastal lagoons of varying widths. It has no proper continental shelf with seabed dropping off to a depth of 3000 meters within a few kilometres of the shore. Rodrigues is thought to be the oldest of the 3 islands at 8-10 million years (Giorgi & Borchiellini 1998) and is encircled by a large fringing reef.

1.2 Socio-economic background to Mauritius

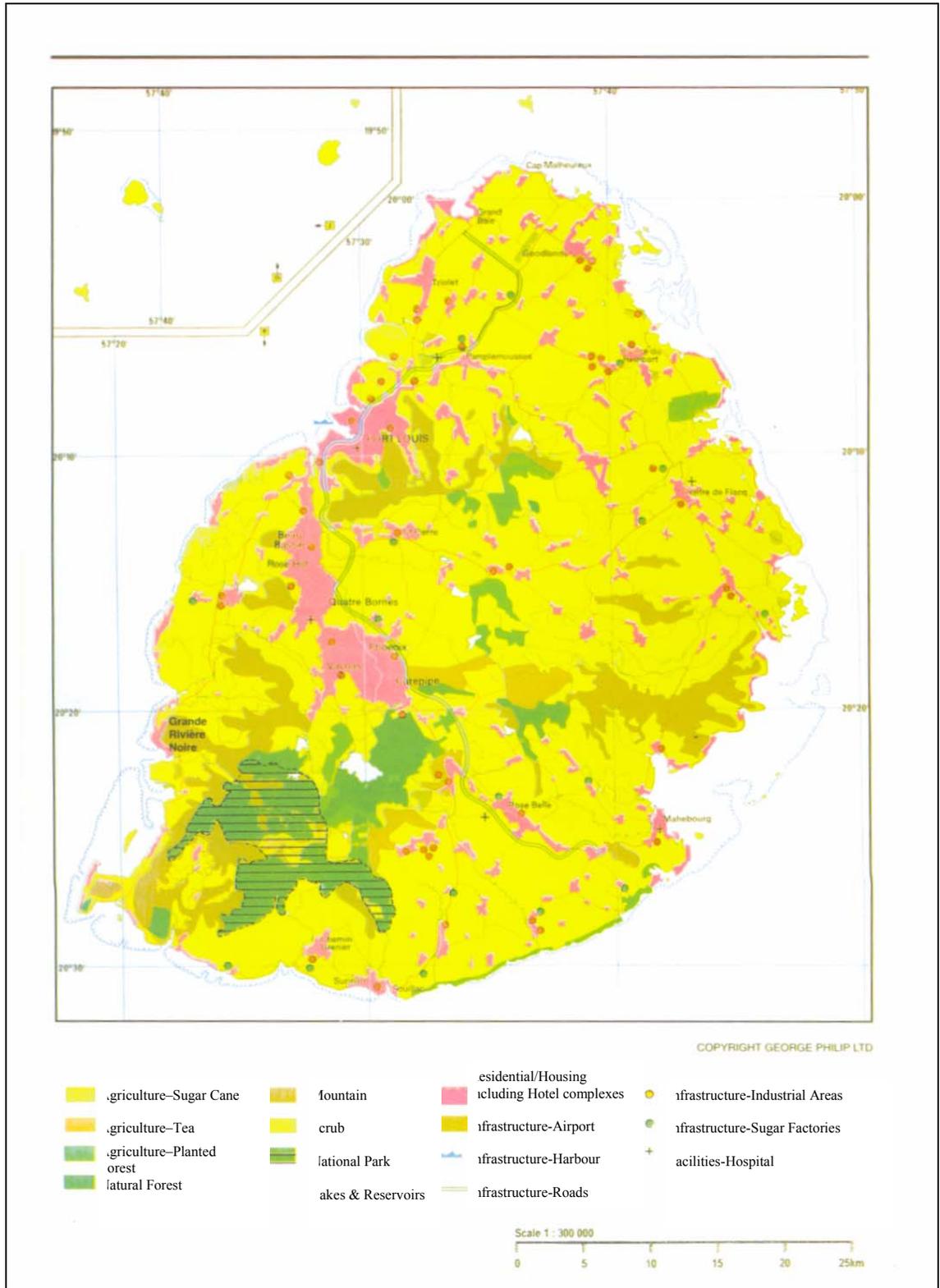
Mauritius gained its independence on the 12th March of 1968 and became a Republic in March 1992. It has a multi-cultural society, made up of descendants of immigrants from Africa, Asia and Europe. All the major religions are practiced. In 2004 the total population was 1.2 million with a growth rate of about 1.1% per year. Over the next twenty years population growth is expected to stabilise at replacement levels or less, but as population density in Mauritius is already high at 600 people per km², the predicted modest population growth (of 250,000 by 2010) will increase pressures on land use. Government policy is thus actively seeking to generate employment in rural areas.

Over the last three decades the Mauritian economy has been regarded as a success story, with annual growth rates of over 5 % and a per capita income of US\$ 5,000 in 2004. Mauritius is amongst the top group of upper middle-income countries and was listed fourth in the African Competitiveness Report of 2004. The country was ranked 65th on the Human Development Index in 2003, with life expectancy at birth of 72.2 years and an adult literacy rate of 84.3%. Mauritius has realised a fair degree of diversification in its economy with agriculture, manufacturing, tourism and financial services emerging as the main pillars. Mauritius has embarked on an ambitious strategy to find new drivers for economic growth. The Government is putting a lot emphasis on the development of the ICT sector and the promotion of Mauritius as a seafood hub in the region.

Gross tourism receipts grew from Rs 7.5 billion in 1995 to Rs 23.4 billion in 2004. The tourism industry has been one of the most dynamic sectors of the Mauritian economy, with its contribution to GDP increasing from 3.8 % in 1995 to 7.5 % in 2004. Expanded tourism has led to the rapid construction of hotels and other facilities along the shoreline, providing considerable direct and indirect employment, but also increasing stress on the environment. Many other sectors of the economy are benefiting from the success of tourism, including agriculture, fisheries, transport, and handicrafts.

Figure 1.2 shows the land use pattern in Mauritius. The tropical climate, topography and over a million of years of isolation have resulted in the evolution of a diverse biota with a high degree of endemism. However human settlement and interference has caused extensive habitat loss, degradation and high rates of species extinction.

Figure 1.2: Land use in Mauritius (Source: NEAP 1999)



Land in Mauritius is largely privately owned. State land is distributed throughout the island and the Pas Géométrique, a narrow belt of land (250 French feet) around the coast is Government-owned. Vacant land for development is limited since most of the useable land has already been put to productive use. As shown in Table 1, of a total land area of 186,500 ha, 45% is devoted to agriculture, 31% to forests or natural green areas and the remaining 24% is either built upon or unusable. In contrast, 90 % of the land in Rodrigues is state-owned.

Table 1: Land Use in Mauritius (1986 - 1996)

Land Use	1986 ²		1996 ¹		Change
	Area (ha)	%	Area	%	
<i>Agriculture</i>	91,574	49.1	84,424	45.3	-7,150
Sugar cane	83,289		76,814		-6,475
Tea	3,776		1,109		-2,667
Tobacco	600		611		11
Food crops	1,791		1,333		-458
Fresh vegetables	2,118		4,557		2,439
<i>Forestry</i>	65,400	35.6	56,639	30.4	-8,761
Planted forests ³	12,307		13,089		782
Natural forests ³	8,485		8,325		-160
Savannah, scrub, grazing and other forest lands	44,608		35,225		-9,383
<i>Community</i> ⁴	29,526	15.8	45,437	24.4	15,911
Reservoirs	1,180 ⁶		1,165 ⁵		
Swamps and rocks	1,430 ⁶				
Roads (including agricultural roads)	3,465 ⁶				
Built up areas	23,451 ⁷				
<i>TOTAL</i>	186,500	100	186,500	100	

Source: ¹ 1996 State of Agriculture (Mauritius).

² CSO and 1987 Annual Report of the Forestry Service of the Ministry of Agriculture.

Notes: ³ Includes mountain reserves (government and privately owned), excluding river reservoirs.

⁴ Including built-up areas, reservoirs, roads, including swamps. No figure available for 1996.

Figure provided = total land area - agriculture - forestry.

⁵ *Pers comm* CWA, 1998.

⁶ CSO. Breakdown based on aerial photographs taken in 1965.

⁷ CSO breakdown states 25,000ha for built up areas. Figure revised to retain consistency with total for community land.

1.3 Biodiversity in Mauritius

Terrestrial and Forest Biodiversity

Due to its volcanic origin, age, isolation and its unique terrain Mauritius is blessed with a diversity of flora and fauna not usually found in such a small area. Before its discovery by the Portuguese in 1507, there were no terrestrial mammals on the island. This allowed the evolution of a number of flightless birds and large reptile species. The arrival of man saw the introduction of invasive alien species and the rapid destruction of habitat and the loss of much of the endemic flora and fauna.

The Dutch visited the island after the Portuguese, and Van Warwick's report (1601) on the resources of the island stated:

"the island is uninhabited and very mountainous. The soil is extremely rocky but fertile as can be judged from the large number of trees which are so close to each other that one can hardly walk in the forest. The trees are mostly black ebony. There are also a large number of palms, the palms and the palmists are edible."

The Dutch East India Company first began to clear forest to exploit the ebony and palms in the lowlands. The process was accelerated markedly during the later French and the British administrations to make room primarily for agriculture as well as roads and settlements. The cleared forest areas were planted with sugar cane, tea, eucalyptus and pine.

The island, which once supported a rich diversity of wildlife, is now sadly famous as the former home of the flightless Dodo (*Raphus cuculatus*), the very symbol of extinction. Less than 2% of the native forest that once stretched from the mountain tops of the central plateau to the shore now remains, concentrated in the Black River Gorges National Park in the south west, the Bamboo Mountain Range in the south east and the Moka-Port Louis Ranges in the north west. There are also some isolated mountains which are important e.g. Corps de Garde, and Le Morne Brabant, and several offshore islands with remnants of coastal and mainland diversity.

Over 100 species of plants and animals have become extinct and many more are threatened. Conservation activities began some 25 years ago with the implementation of programmes for the reproduction of threatened bird and plant species as well as habitat restoration in the National Parks and Nature Reserves.

Coastal, Marine and Freshwater Biodiversity

The coastline of Mauritius is 322 km long and almost entirely surrounded by a fringing coral reef enclosing a lagoon area totalling 243 km². The reef complex of Rodrigues has an area of 200 km². The coral reef of St Brandon covers an area of 190 km², while Agalega has 100 km². The marine ecosystem is quite vulnerable with threats from both marine and land-based activities. In 1997 the Blue-Bay (353 ha) and Balaclava (485 ha) Marine Parks were proclaimed. Coral bleaching was observed in 1998.

Six Fishing Reserves have been proclaimed under the Fisheries and Marine Resources Act 1998, (Port Louis, Grand Port, Black River, Poudre d'Or, Poste La Fayette and Trou d'eau Douce). The main objective of the Reserves is to protect and conserve habitats that are nursery grounds for juvenile fish.

The freshwater bodies on the mainland of Mauritius comprise approximately 2000 ha of reservoirs, rivers and streams. There are three known endemic freshwater fish and many endemic crustacea. Introductions of exotic fish species including the Tilapia (*Oreochromis* spp.), have invaded almost every fresh water body and have resulted in significant changes in freshwater biodiversity.

Agrobiodiversity

Crops and livestock were introduced by the early settlers and have through a process of selection developed traits that suit them to their specific environments. There has also been regular introduction of new crop varieties and breeds by research institutions, commercial enterprises and farmers which are now cultivated by the farming community. These plant varieties and breeds also constitute the agricultural biodiversity of Mauritius. Only one native plant species is used nowadays for food, although some species of *Coffea* are found in the wild.

In the last decade Mauritius has been involved in new biotechnologies, and various institutions devoted to agricultural research, as well as human and animal health, are presently involved in biotechnology. Most of the research in biotechnology has been focused on the agricultural sector.

1.4 Rodrigues

Rodrigues is the smallest of the Mascarene Islands with an area of 109 km². Situated 570 km to the northeast of Mauritius, the island is hilly with a central spine culminating in the highest peak, Mont. Limon (393 m). Rodrigues is the only Mascarene Island with extensive limestone deposits and caves. A large fringing reef surrounds the island forming a lagoon within which lie eighteen small islets. Rodrigues is in the cyclone belt and has a warm wet season from November to April and a cool dry season from May to October; despite this some coastal areas are very dry and drought-prone.

The detailed accounts of Leguat from the early 18th century paint an idyllic picture of 'valleys covered with palm-trees, plantains (lataniers) and ebonys', with an important endemic biodiversity. Today, Rodrigues is one of the most degraded tropical islands in the world, and much of the terrestrial biodiversity is extinct, or highly threatened. In contrast, Rodrigues has the most substantial and best-developed reefs in the Mascarenes (Montaggioni and Faure, 1980), and the coral reefs are amongst the most preserved in the Western Indian Ocean.

The economy of Rodrigues is based on agriculture, fishing and tourism and use of native biodiversity for handicrafts is still quite widespread. Land use patterns are shown in Figure 1.3

Rodrigues gained autonomous status in 2001 and is governed by the Rodrigues Regional Assembly. Given its autonomy and specificity, a separate section is devoted to the island (refer to Part II).

1.5 National Conservation Policies and Strategies

The Government of Mauritius initiated conservation actions in the early 1970's, when at the invitation of the Government Sir Peter Scott wrote a report entitled "Conservation in Mauritius". This was the forerunner to IUCN's Conservation in Mauritius (1974) by John Proctor and Rod Salm which took into account the forest policy and the general environment laws that existed at the time, as well as the work in place to protect the terrestrial and marine environments.

The National Conservation Strategy

In 1985 the Government of Mauritius published a White Paper for a "National Conservation Strategy" (NCS), in which it defined the major objectives for the conservation of natural resources based on the same objectives as the World Conservation Strategy, namely,

- (i) to maintain essential ecological processes and life support systems on which human survival depend;
- (ii) to preserve genetic diversity, on which depend the breeding programmes necessary for the protection and improvement of cultivated plants and domesticated animals, as well as for scientific advancement;
- (iii) to ensure the sustainable utilisation of species and ecosystems, for example, fish and other wildlife, forests and grazing lands.

Priorities to attain the above aims and objectives included:-

- (a) Avoiding extinction of endangered and threatened species of flora and fauna by providing sound planning, allocation and management of land and water use, supported by an on-site preservation in protected areas and an off-site protection such as zoos and botanical gardens;
- (b) Preserving as wide a genetic diversity as possible of many varieties of the same plants and animals;
- (c) Preserving as many habitats as possible;
- (e) Expanding large conservation management areas to other key biodiversity hot spots areas, and
- (f) Encouraging the protection of wetlands and river reserves.

National Environmental Action Plan

In the wake of rapid economic growth and the growing concerns about the degradation of the environment, the Mauritian Government and the World Bank organised a technical seminar on the environment in 1988 to discuss the key environmental issues facing the country. The outcome was a comprehensive first National Environmental Action Plan (NEAP 1) supported by the first Environmental Investment Programme (EIP 1) to address key issues. EIP1 consisted of 32 projects covering institutional strengthening, the main economic sectors, land management, solid waste and marine and terrestrial conservation. The outputs included the establishment of the country's first National Park to conserve endangered species, integrated pest management research, management of nature reserves, offshore islets management, the proclamation of two marine parks, and the initiation of long term monitoring and research.

Vision 2020

In 1991 the Government published a White Paper for the National Environment Policy providing a commitment to attaining sustainable development. The White Paper placed great emphasis on the duties of the individual in environmental protection and the concomitant right to relevant information, while aiming to safeguard prosperity, health and heritage. The policy was reviewed in *Vision 2020* ("The National Long Term Perspective Study") creating the challenge of establishing a resource management approach that would involve the management of the entire ecosystem. This would be based on the modelling of interactions between the economy and the environment. The *Vision 2020* sets out a scenario for future development based on:

- ▣ gains in agricultural efficiency;
- ▣ high quality, high yield tourism;
- ▣ quality and specialised industrial production, and
- ▣ movement towards financial and value-added services.

National Environmental Strategy

In 1999 to reiterate its commitment to sustainable development the Government of Mauritius commissioned a National Environmental Strategy for the next decade comprising a second 10 year National Environment Action Plan (NEAP2) and its supportive Second Environmental Investment Programme (EIP2). Several stakeholder working groups were established to assist with the formulation and refinement of the strategies identified for the various priority sectors, including terrestrial biodiversity and conservation and integrated coastal zone management.

The goal of the National Environmental Strategy can be summarised as:

'To follow the principles of sustainable development by providing environmental services, encouraging responsible environmental practices and enforcing appropriate environmental standard in order to safeguard the health and welfare, conserve the heritage, and enhance the quality of life of all the people of Mauritius.'

National Development Strategy (2003)

The NDS provides a national-level strategy and policy framework within which a wide range of public and private sector infrastructure and development projects can be efficiently guided, implemented and managed within a sustainable environment. The strategy deals in detail with promoting sustainable development to protect the best quality agricultural land and environmentally sensitive areas.

Non-Sugar Sector Strategic Plan (2003-2007)

This strategy document contains sections on sustainable agriculture, forest and terrestrial biodiversity conservation.

National Biosafety Framework (1999)

A framework has been developed that sets out guidelines for the 'safe development and introduction of Genetically Modified Organisms in Mauritius'. It recommends practises and procedures for the safe use of biotechnology to protect the environment and human and animal health from the potential adverse effects of GMOs.

1.6 International Conventions, Agreements and Co-operation

Mauritius was the first country in the world to ratify the Convention on Biological Diversity in 1992. The Ministry of Environment is the focal point for the Convention and the National Parks & Conservation Service is the National Executing Agency for the preparation of the National Biodiversity Strategy and Action Plan (NBSAP) and the First National Report.

The Government of Mauritius is also signatory to a number of International Conventions relating to Article 1 of the CBD. These include:

- ☐ The International Convention for the Regulation of Whaling, (1946);
- ☐ The African Convention for the Protection of Nature and Natural Resources, (1968);
- ☐ The Convention on Fishing and Conservation of Living Resources of the High Seas, (1958);
- ☐ The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR), (1971);
- ☐ The Convention for the Protection of the World Cultural and Natural Heritage, (1972);
- ☐ The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), (1973);
- ☐ The UN Convention on the Law of the Sea (UNCLOS), (1982);
- ☐ The UN Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (MARPOL), (1989);
- ☐ The UN Framework Convention on Climate Change (UNFCCC) (1992);
- ☐ The Convention to Combat Drought and Desertification in Africa (UNCCD) (1995).
- ☐ The Convention on Migratory Species (1994)
- ☐ The African Eurasian Water Bird Agreement (1999)
- ☐ The Indian Ocean – South-East Asia Marine Turtle MOU (IOSEA) 2003.
- ☐ The Cartagena Protocol on Biosafety to the Convention on Biological Diversity (2000).

1.7 National Legislation for Biodiversity Conservation

A legal framework exists for the protection of key habitats, nature reserves and restoration of some of the unique ecosystems of Mauritius. Some of the most important ones are:

Primary Legislation

- ☐ The Environment Protection Act 1991, 2002;
- ☐ The Fisheries and Marine Resources Act 1998;
- ☐ The Wildlife and National Parks Act 1993,
- ☐ The National Coast Guard Act, 1988
- ☐ The Forests and Reserves Act, 1983 and subsequent amendment of 2003;
- ☐ The Plant Act, 1976;
- ☐ The Pas Geometriques Act, 1895;
- ☐ The Removal of Sand Act, 1975;
- ☐ The Shooting and Fishing Leases Act, 1966;

- ☐ The Town and Country Planning Act, 1954;
- ☐ The Maritime Zones Act, 2005
- ☐ The Continental Shelf Act, 1970
- ☐ The Central Water Authority Act 1981

Secondary Legislation

- ☐ The National Parks and Reserve Regulations of 1996, and the Wildlife Regulations of 1998;
- ☐ The Botanical Gardens (Pamplemousses) Regulations, 1945 and Botanical Gardens Regulations 1922;
- ☐ The Female Sea Turtles (Prohibition of Import) Regulations, 1950;
- ☐ The Plant (Importation and Exportation) Regulations, 1976, and
- ☐ The Plant (Pest and Disease Control) Regulations 1984.
- ☐ The Marine Protected Area Regulations 2001.

1.8 NBSAP Process in Mauritius

Mauritius has prepared its National Biodiversity Strategy & Action Plan (NBSAP) under project GF/1200-96-58, financed by the GEF through UNEP acting as the Implementing Agency. The NBSAP was prepared in order to meet the country's obligations under the Convention on Biological Diversity (article 6a) and provide a strategic approach for biodiversity management in Mauritius for the coming decade (2006–2015). The National Parks and Conservation Service (NPCS) of the Ministry of Agro-Industry and Fisheries implemented the NBSAP process in collaboration with all relevant partners and stakeholders.

The NBSAP process in Mauritius has been lengthy and gone through various stages and reviews. It commenced in 1998 with the recruitment of two national consultants to collate baseline data and information on terrestrial and aquatic biodiversity which resulted in a draft First National Report (FNR). In July 2000 a national consultant was recruited to prepare the NBSAP and finalise the FNR.

The first draft of the NBSAP was structured according to seven thematic areas, devised to reflect the important economic sectors of Mauritius and the institutional responsibilities of the organizations involved in the management of biodiversity resources.

Thematic consultants were recruited to prepare baseline papers on the status of biodiversity. These were presented and discussed during a First National Workshop held in September 2000. Following this national consultation exercise the First National Report was submitted to the Secretariat of the Convention on Biological Diversity in January 2001. Thematic workshops followed in January and February 2001 to identify gaps/pressing issues and proposed strategies/options. A separate process was pursued in Rodrigues, with one coordinator and five thematic consultants recruited from Rodrigues itself to prepare and present baseline papers. The Rodrigues workshop was organised in April 2001.

In February 2002 UNEP recommended to Mauritius that the existing draft be restructured. Agreement was reached with NPCS in 2003 and a contract was signed for a consultant to develop a Country Study report and provide guidance on how the strategy component of the NBSAP might be drafted. The country study was completed in 2003

and is precised in the following pages. The full document can be accessed through the offices of the NPCS.

The strategy document was finalised through a series of local, thematic and national workshops in November 2005. The structure, with separate sections for Mauritius and Rodrigues, was refined to three thematic areas:

- 1) Forest and Terrestrial Biodiversity
- 2) Freshwater, Coastal and Marine Biodiversity
- 3) Agricultural Biodiversity, Biotechnology & Biosafety

with five strategic objectives:

- 1) Establish a Representative and Viable Protected Area Network (PAN)
- 2) Manage Key Components of Biodiversity
- 3) Enable Sustainable Use of Biodiversity
- 4) Maintain Ecosystem Services
- 5) Manage Biotechnology and its Products

set in the context of a Vision, Mission Statement and five working principles.

The process was at all times incorporative and stakeholder driven. The Strategy document lays out an agreed structure and process for the coordination and implementation of the BSAP designed to build and maintain stakeholder participation and implementation. The document is set out in a strategic and modified logical framework and incorporates consideration of ongoing initiatives such as the National Capacity Self-Assessment (NCSA) and Biosafety Framework. Provision is also made for the rapid utilisation of the enabling activities add-on facility and the elaboration of priority projects from the strategic framework to meet the formats and requirements of specific donor agencies.