

## Chapter 4

### Mauritius: A Case Study

#### Geographical Profile

The island of Mauritius, which together with Reunion and Rodrigues form the Mascarene group, is situated in the South Indian Ocean between latitude 19°51' and 20°51' South and longitude 57°48' East. It is about 2,000 km from the African main land and 880 km from the east coast of Madagascar. Its area is 1865 square km and its breadth from east to west is 35 miles.

Ironically the strategic position of Mauritius in the Indian ocean, hence the motto 'Stella Clavisque Maris Indici,' the star and key of the Indian Ocean. The island country has favoured its occupation, exploitation and development by visitors and colonizers to the detriment of its rich biogentic diversity.

The whole area of Mauritius is embraced by the present flora is under 85 sq. miles. The northern quarter of the island, the tract between Port Louis, Pamp lemousses and Flacq, is a low plain covered with sugar plantation. "The centre consists of a cultivated plateau, while rises up to a height of about 1500 feet above sea-level. The great mass of rock is entirely volcanic, but no active volcano has been known within the memory of man. Raised beds of coral, clay, and gravel are found scattered through the island at various elevations, showing that, although many craters remain in a almost complete condition, there has been great general elevation since the main volcanic mass was laid down. On the outside of the central plateau, within a short distance of the sea, rise the three principal mountain-ranges which the island contains. The south western range is the most considerable of the three."<sup>1</sup> The warmest and wettest season

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(1) N.R. Bronard, "Damage by Tropical Cyclones to Forest Plantation with Particular Reference to Mauritius", Port Lais, Mauritius; Government Printer, 1967 p. 21.

of the year is from November to April, the times of the north west monsoon, the comparatively cool and dry season being from May to October, when the wind blows from the south-east. The rain is very irregular from year to year and very different in quantity in different parts of the island.

Unfortunately, so far as botany is concerned, the value of land of Mauritius for sugar cultivation has been so great that the forests, in 1598, covered it to the water's edge, have been by degrees cut down till now they are almost entirely destroyed. The cultivation of sugar was introduced in 1740, and in ten years we are told it had almost entirely supplanted the useful vegetable products previously grown, which were cloves, indigo, cotton & coffee. Van Warwick's report (1601) on the resources of the island states: "the island is uninhabited and very mountainous. The soil is 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 were mostly black ebony. There were also a large number of palms."<sup>2</sup> This report resulted in the exploitation of the island's resources by the Dutch East India Company. The exploitation process was later accelerated markedly during the French and British administration for agriculture and also for infrastructure like roads and settlements. The cleared forest areas have been planted with sugar cane, tea, eucalyptus and pine. In 1970 half of the endemic sideroxylon scrub in Plaine Champagene was cleared for forestry plantation by the Development Works Corporation and financed by the World Bank. This has resulted in the drastic decline in the population of endemic birds like Echo Parakeets, Mauritian Foddy and Olive White-eye which were using the scrub as foraging ground.

Now days the indigenous forests are restricted to the south west escarpment which is the most inaccessible or least economically exploitable part of the island. "These indigenous forests remnants which represent less than one per cent (1%) of

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(2) Van Warwick, "The Resources of the Island states", Port Luise, 1601, p. 18.

the pristine native vegetation are under heavy pressure of the proliferous, introduced exotics like privet, the vigorous scrambling bramble and Chinese guava introduced by the French. The south west area of the island is rated, in terms of priorities for conservation action, by the International council for Bird Preservation (ICBP) as first among the 75 forests of major importance for threatened birds in the African regions. It is indeed the home of all the remaining threatened birds of Mauritius."<sup>3</sup>

In the following lines we will discuss the types of endemic as well as introduced flora and fauna.

### **Flora of Mauritius**

"Mauritius has over 900 species of plants out of which 300 species are endemic to the island, which means that they are found nowhere else in the world. To these should be added about 100 or more that are shared with Reunion and Rodrigues islands. The early history of the native forest of Mauritius has been extensively reviewed by several writers (Vaughan and Wienhe, 1937; Brouard, 1960; Procter and Salm, 1974; De Rahm, 1987). A high proportion of the endemic species are considered as endangered. Many are known from single or a handful of individuals. The reason for their being endangered is that introduced exotic plants are overwhelming them in their natural habitat and many are damaged by exotic animals, preventing their regeneration."<sup>4</sup>

Today there is only 2000 hectare (Black River Gorge area) of land covered by endemic evergreen tropical primeval forests. The major endemic plants are, i.e.,

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(3) J.G. Baker, "*Flora of Mauritius and the Seychelles: A Description of the Flowering Plants and Ferns of those Islands*", 1877, Reeve & Company, p. 38.

(4) *Ibid*, p. 53.

Ebony (Black, Red, Yellow), Palm of west coast, now very few in Round island. It is extinct by burning of its habitat.

### **Rarest Native Plants**

The following top 20 priority list has been compiled on terms of rarity and also feasibility. Feasibility refers to whether it is feasible to propagate the plant by cutting and/ or seeds.

- i) *Dombeya Mauritiana* - Only one plant known from Magenta.
- ii) *Olax psittacorum* - Only one plant known from lowland native forest.
- iii) *Albizzia Vaughanii* - Only one plant known from Tamarin.
- iv) *Badula Reticulata* - known from one locality.
- v) *Tamborissa tetragona*- known from one locality.
- vi) *Claoxylon linostacys* - Known from two individual.
- vii) *Chionanthus boutonii* - known from two individuals at perrier.
- viii) *Hibiscus fragilis* - Wild at corps de Gardes
- ix) *Tambourissia cocottansis* - At monte cocotte.
- x) *Cylindrocline commersonii* - Small localized population pause summit.
- xi) *Eleocarpus bojeri* - Small population known from Grand Bassin.
- xii) *Croton vaughanii* - Small population known from Perrier.
- xiii) *Embellia micrantha* - Very rare in Mauritius.

Introduced animals, also contribute significantly to the degradation process. the herbivorous mammals such as deer and hare cause the most obvious damage by browsing through young plants and tender shoots. "Monkeys damage both fauna and flora. They selectively pull out inflorescence flowers and fruits as well as foliage. Monkeys damage fauna by devouring both the eggs and young of birds which breed in the forests. The wild pigs also cause extensive damage by eating roots of plants and distributing the soil. Other animals such as the black rat, snails and exotic birds constitute a real threat to the native plants either by physically damaging the plants or helping in the dispersion of the exotic plants. Snails damage young plants, but Tenrac or madagascar hedge hog feed on snail. Wherever the Tenrac hunted for it's flash by the African creoles, there snails do incalculable damage. In crown land Tenrac is protected animals. The wood eating insects also play a pig role in damaging the standing plants. Other cause of floral destruction's are white ants, microfungoidal diseases, Creepers and Epiptytes and winds etc."<sup>6</sup>

Moreover the major cause behind depletion of endemic plants in Mauritius is introduced plants. Which compete with native plants, especially if means of seed dispersal are also introduced. These invasive plants need dispersal agents and reduced competition by selective browsing to help them spread. In turn it seems likely that the extraordinarily high fruit production of the straw berry guava has helped sustain high population of pigs and monkeys, forcing them to continue damaging the native flora outside the guava fruiting season.

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(6) R.A. Howard, *"Flora of the Mauritius, Endemics Counted by Huger Synge"*, 1991, 6 Vol., p. 43

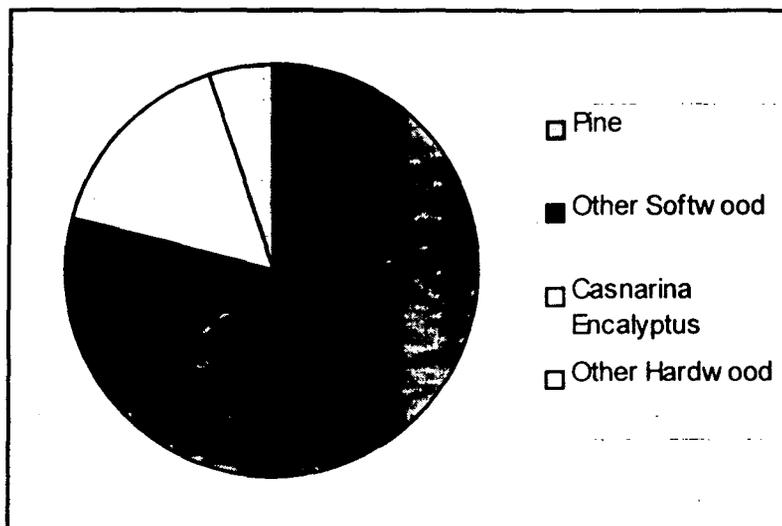
Area under 'Primeval' forests was as below:

	Year	Area
(i)	1835	2/3
(ii)	1872	70,000 acres
(iii)	1880	35,000 acres
(iv)	1995	1 % of the total area of Mauritius

**Present forest cover of different trees**

(i)	Pine	64%
(ii)	Other Softwood	15%
(iii)	Casuarina Encalyptus	16%
(iv)	Other Hardwood	5%
	Total	100%

**Present Forest Cover of Different Trees in Mauritius**



**MAP -1**

**DECLINE IN AREA UNDER NATIVE VEGETATION 1773-1935 IN MAURITIUS**



1773



1835



1872



1935

**Source: Resources of Mauritius, Ministry of Environment,  
Government of Mauritius, 1997**

In spite of the depletion and clearing of native forests, and competition with the fast growing introduced exotic, a good representation of endemic plant species is still thriving (see table-1). But many of these endemic species cannot survive long without proper conservation measures. The Govt. of Mauritius, aware of the rich biogenetic diversity of their natural resources still remaining, have taken several measures to protect and prevent our natural heritage from disappearing.

The cultivation of sugarcane in Mauritius has also increased the depletion of native flora. There are 17 sugar factories, they collectively produce 98,7000 tones of sugar. Now the area under sugarcane cultivation receding and it has been replacing by other crops, i.e., tea, coffee, peddy, etc.

The following table indicates the real situation of sugar cane cultivation and the area under it in five zones of Mauritius.

**Table-1**

**Sugarcane Cultivation and the Area Under it in Five Zones of Mauritius**

Year	Total area under sugarcane cultivation in Mauritius	Percentage to Total Area				
		West	North	East	South	Central
1992	82.12%	6.11	18.36	18.93	24.10	8.47
1992	82.96%	5.97	17.73	18.91	24.15	8.32
1993	79.45%	5.94	17.58	18.59	24.15	7.77
1994	77.47%	5.78	17.36	18.39	23.82	7.76
1995	76.84%	5.49	17.30	18.21	23.62	7.36

Source: Resources of Mauritius, Ministry of Environment, Government of Mauritius, 1997

The above table and following graph shows that nowhere the area under sugarcane cultivation is increasing. In every zone it is declining.

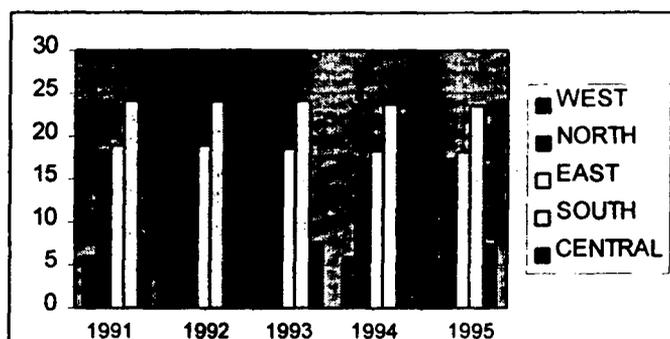


Table- 2

**Status of Plants of Mauritius and Rodrigues**

Status of Plants	Endemic		Non-endemic		Total	
	M	R	M	R	M	R
Extinct	12	8	1	-	13	8
Extinct/ endangered	6	3	-	-	6	3
Endangered	78	21	12	7	90	28
Vulnerable	42	7	16	5	58	12
Rare	52	10	10	2	62	12
Indeterminate	4	-	6	-	10	-
Insufficiently	-	-	1	2	1	2
Status Unassigned	18	-	36	17	54	17
Not threatened	31	3	54	17	85	20
threatened	194	49	45	14	239	63
Grand Total	234	52	136	50	370	102

M= Mauritius

R= Rodrigues

Source: Part – 1, Resources of Mauritius, Ministry of Environment, Govt. of Mauritius, 1997.

## **Flora Conservation**

One of the first steps taken towards the preservation of the natural vegetation was to declare these areas as 'Nature Reserves'. The basic philosophy of declaring Nature Reserves as we know them today has been to safeguard as far as possible representative samples of the original plant formation. The first systematic ecological studies made in Mauritius are those of Dr. Vaughan and P.O. Wiche in the 1930's. Their work have been the reference for the delimitation of the various Nature Reserves. The first Nature reserves was declared in 1951 and by 1974 there were a total of 20 Nature Reserves. In 1980, 6 of these were made into one large Nature Reserve block and this was called the Macchabee / Bel ombre Nature Reserve. This now constitute the largest Nature reserve on the island. It has also been proclaimed as a Biosphere Reserve under the Man and Biosphere Programme of UNESCO. Perrier Nature Reserve is the smallest, but it is the best preserved forest ecosystem. The map given below shows the distribution of all the Nature Reserves of the Island. On the mainland, with the exception of Le Ponce and corps De Garde, all are located in the South Western part of the island. this region is dissected into gorges, valleys and mountain ranges and is not easily accessible. The Black River Natural Park is also situated in this region too. Moreover the Maurition Govt. has set up many Botanical gardens in different parts of the country. Recently, under the leadership of Wayne Page and Gabriel D. Argent of the Mauritius Wild Life Foundation (established in 1996) conducted a nationwide survey to enquir the real situation of forests in Mauritius. This project was financed by Union International of Conservation of Nature. They also determined the facts that the forest cover in Mauritius is only 1 per cent of the total land area.

We suggests that the ideal solution to the problems of conservation of the endemic forest ecosystem would be to completely eradicate all the pests from the forest. This is an impossible task and will never be realised. Unfortunately there is no place in the island forests where exotic species have not reached. This shows the

**Endemic Elements** are peculiar to the island and do not occur anywhere else in the world. They are believed to be derived from indigenous ancestors which having found access to the island a considerable time ago have developed special characteristics through isolation. The only mammals indigenous to Mauritius are bats: two species of large frugivorous flying foxes which are apparently confined to Mauritius and Reunion and three or four insectivorous species also found in other parts of the Malagassic region.

**Indigenous Elements** occur naturally in the island having found access to it by their means or by natural ones, i.e., transported across the ocean on drift wood or by the wind.

**Introduced Element** imported willfully or accidentally by man. There are almost a dozen introduced mammals now found in the wild. The Portuguese, the first settlers in Mauritius, introduced Monkey, wild pig and Indian Goat. Their successor, the Dutch, introduced deer and wild Rabbit. To the French, the Mauritius owe the Hare, the Musk Rat, the Madagascar Hedgehog (Tenrac); to the Britishers, the Mongoose.

The Monkeys (Malaya) introduced in 1528, the Indian Goat about 1550, the wild pig about 1530. These all introduced mammals were and still are serious menace to the surviving flora and fauna. The Deer belongs to Java. With regard to Aquatic Mammals, Sperm Whales, Sei Whales, Pilot Whales, Dolphins and others are occasionally stranded on the reefs of the island or captured near it.

There are 103 species of birds listed from Mauritius, figure which includes the extinct ones as well as those which no longer occur in the island. After deducting these we are left with 76 species out of which 42 are residents.

There are about six hundred (600) species of **fishes** occur in the Mauritius seas. But practically all of them belong to the Indo-pacific marine fauna and very few are peculiar to the island. The fresh water fish fauna is comparatively very poor. Among these fresh water fishes 14 (Eels, Perchs & Mulletts) are indigenous species. Other belongs to imported fish species are six only.

### **Extinct Birds**

The following bird species have extinct from Mauritius long ago.

The Mascarene Parrot

The Bourbon Crested

Dodo (1680)

Solitaire of Rodrigues

The Dutch Pigeon

The Red Rail

The Broad-billed Mauritian Parrot

Aepyornis Maximus

### **Marine Fauna and Flora**

The important marine fauna's found in seas around Maurities island are: Game fish, rays, eels, shells, nudibrands, whale, shark, bottom fish, dolphins, wide variety of shark.

**Mangroves** are holophytic flowering plants in intertidal areas of shores and estuaries. Mangroves play a important role in coastal ecosystem.

**Corals** are available in enough brilliant forms and colours. The major forms of Corals are Stagehorn coral and elkhorn coral.

of pigs and mongoose. The latter were introduced in the early 1900 to control the rats in the sugarcane fields."<sup>11</sup>

"The Indian Mynah introduced by the French in early 1780's for biological control of an insect pest, the grass hopper. It has been a success as far as the control of the pest was concerned, but mynah are now abundant and have become themselves a serious pest to both exotic and native fruits and birds. They are very aggressive and they steal eggs or newly hatched birds from nest. They also compete with the endangered endemic Echo Parakeet for nesting sites in tree cavities in native forests."<sup>12</sup>

Other introduced fauna's are, i.e., Indian Ring-necked, deer, hare, etc., have also damaged the endemic fauna to a great extent. Another factor which constitutes a constant threat to the dwindling population of endemic species is the cyclone. It is true that Mauritius being in the Cyclonic belt. "Cyclones have played an important part in the evolution of the Mauritius flora and fauna. The root system, buttresses and thick leaves of the endemic plants are cyclone adapted. The cyclone of 1892 caused the extinction of the introduced Gray-headed love bird and the gray headed canary. The native fauna survives the actual cyclones much better than the introduced birds, but some species may die of starvation as a result of scarcity of food and fruits after the cyclone. Though cyclones do not seem to affect healthy endemic populations considerably in the case of the dwindling Echo parakeet population."<sup>13</sup>

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(11) A. W. Owadally and Butzler, *"The Deer in Mauritius"*, Alpha Printing, Mauritius, 1973, pp. 13-14.

(12) *Ibid.*

(13) N.R. Bronard, *"Damage by Tropical Cyclones to Forest Plantation with Particular Reference to Mauritius"*, Port Lajos, Mauritius; Government Printer, 1967 pp. 21

As a result of habitat destruction and alteration and being preyed upon by man and his introduced, alien species, the fauna have been impoverished considerably. All the tortoises, and large defenseless lizards have become extinct on the mainland. Out of the 30 or more endemic species of birds that were initially found in Mauritius, only 11 species are left. Rodrigues has a similar history of extinction.

The following table shows the list of native birds of Mauritius & Rodrigues.

**Table-3**

**The Native Land Birds of Mauritius and Rodrigues**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Country</b>	<b>Status</b>
Kestral	Falco Punctatus	Mauritius	Endangered
Pink Pigeon	Neseona Mayeri	Mauritius	Do
Echo Parakeet	Prittacula Echo	Mauritius	Critically Endangered
Cuckoo Shrike	Ceracina Typica	Mauritius	Rare
Merle	Hypsipetes Olivacea	Mauritius	Uncommon
Paradise Fly Catcher	Terpsiphona Bourbonnesis	Mauritius	Do
Olive White-Eye	Zosteoops Choloronothos	Mauritius	Very Rare
Gray While Eye	Borbonica	Mauritius	Common
Mauritius Fody	Fodia Rubra	Mauritius	Very Rare
Cave Swiflet	Collocacia Francica	Mauritius	Common
Mascarene Martin	Phedina Borbonica	Mauritius	Do
Rodrigues Fody	Foudia Flavicans	Mauritius	Very Rare
Warbler	Brebormis Rodricamus	Mauritius	Do

Source: Part-1 Resources of Mauritius, Ministry of Environment, Govt. of Mauritius, 1997.

"The Rodrigues Fruit Bats were brought into captivity in 1977-1978 when there was an estimated population of 75 to 80 individuals left in the wild. Thus there are over 90 bats today. Besides the Jersey Wild Life Preservation Trust there are many institutions in Europe and America which are breeding them in captivity."<sup>15</sup>

Similarly, the productivity of the wild population of the Mauritius kestrel has been enhanced by double clutching and sometimes triple clutching of wild pairs. In the case of the Echo Parakeet the activities of the birds are being observed in the wild and nesting birds located. To reduce the competition for nest sites with other exotic birds like Indian Ring-necked Parakeet or Indian Mynah and also to provide an alternative for nesting, dozen nest boxes have been fixed on very high trees in the Echo-Parakeet habitat. Unfortunately, so far, none of these boxes have been used by Echo Parakeets while the other exotic birds and honey bees have elected the boxes as their nest or hive. Echo Parakeets have proved to be very difficult both to bring into captivity and to manage in the wild because they tend to be very specialised in their feeding and nesting habits. The only food item, offered, sampled by the Echo Parakeet has been the chilli.

In this way, therefore, 11 species of native land birds have so far escaped from extinction in Mauritius. Extensive conservation work is being carried out both in captivity and management in the wild on 3 of the 11 species, Mauritius Kestrel, Pink Pigeon, and Echo Parakeet. Of the remaining 8 species only the Mauritius Grey white eye is common and all the others are threatened.

#### **Measures taken to protect the Marine Resources and Environment**

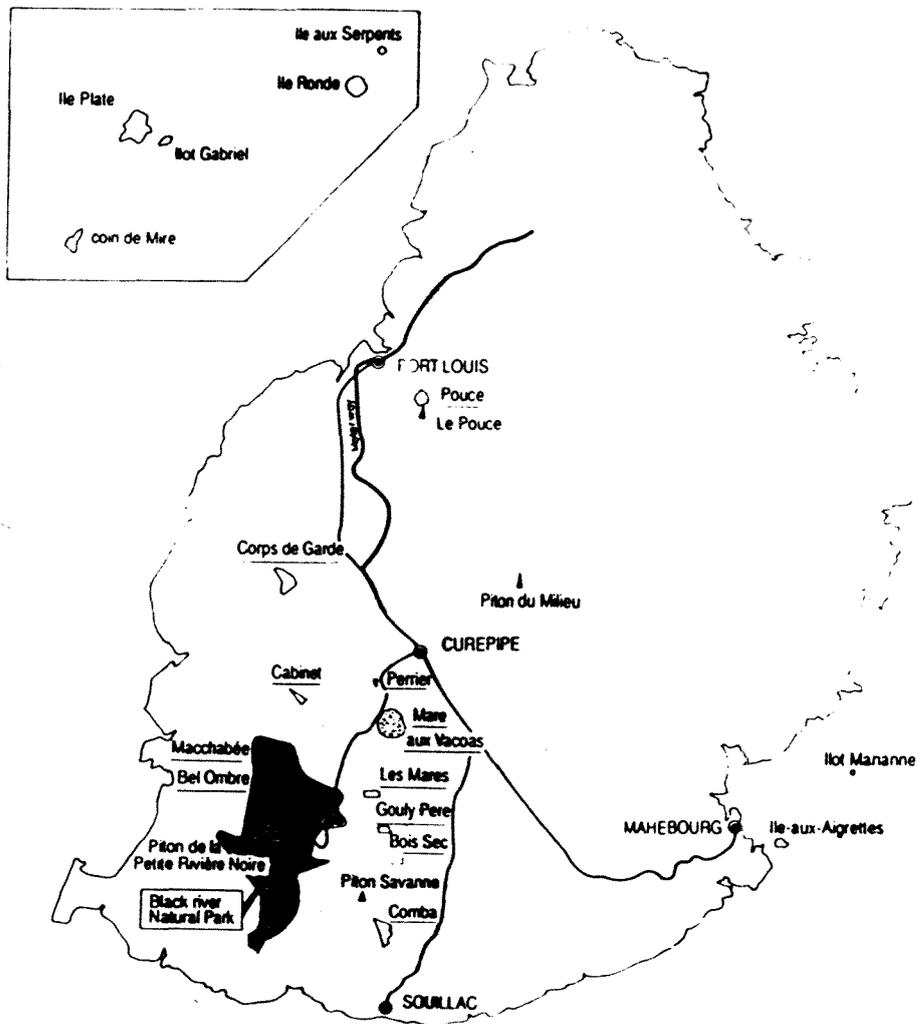
- (a) The removal of sale of corals and shells has been banned;
- (b) a closed season for net fishing has been reintroduced;

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(15) *Ibid.*

MAP -2

**MAURITIUS**  
NATURAL RESERVES



Source: Resources of Mauritius, Ministry of Environment,  
Government of Mauritius, 1997

Three zone types have thus been identified in this national park:

(a) Reserved zone (b) Nature zone; and (c) Recreation zone.

### **International Cooperation**

Mauritius has a long tradition of commitment and cooperation with international organizations in the field of conservation. The Jersey Wildlife Preservation Trust (JWPT), U.K., has been active in Mauritius since 1976 and together with other organizations, including the Bird Centre of Birds of Pray, Boise, USA, the World Wide Fund for Nature (WWF) and Mauritius Wildlife Appeal Fund (MWAFF), has been working in close collaboration with the Ministry of Agriculture, Fisheries and Natural Resources. Moreover, Many institution specialised in the breeding of endangered species of animals are helping the Government in preserving the genetic diversity of these species. The Jersey Wildlife Preservation Trust and the Peregrine Fund have been breeding Pink Pigeons and Kestrels respectively in captivity an sending them back to Mauritius to be released in their native homeland. Similarly, the Royal Botanical Garden at Kew has been helping with the propagation of difficult plant materials. For example, Kew has been successful in propagating the rare endangered "Cafe Marron" of Rodrigues from cuttings.

Besides establishing solid working links with other agencies like the international Trade on Endangered Species of Flora and Fauna (C.I.T.E.S.) and is a member of the International Union of the Conservation of Nature and Natural Resources (IUCN).

The role of NGOs will compaign for common initiatives commensurate with international demands relevant to biodiversity. Since local cooperation is essential for long term success of conservation efforts, a socio-economic survey of the communities affected by development projects that involves controlling the use of biological resources

can be undertaken by these organisation. They can perform the role of trainer and motivator. They can involve the community in post literacy programmes to elevate the community's status in understanding their rights and responsibilities in uplifting their community in conjunction with sustainable development within their island ecosystem. Unfortunately the role of NGOs in Mauritius is not so significant, especially in the conservation of biodiversity and its sustainable use, as it is in India.

The strategies for the conservation of biodiversity and sustainable development must be adopted as follow:

- (i) Fundamental shift in development planning
- (ii) Empower local community to participate in decision's regarding the use of natural resources. This must be based on the twin principles of sustainability an equality
- (iii) Proper forest management on sound environmental principles
- (iv) Environment friendly agricultural strategie
- (v) Strict legal sanctions
- (vi) Creation of awarness among islanders on the hazards of biodiversity loss
- (vii) Human Resource Development
- (vii) Last but not least, control of excessive exploitation of biological resources.

The proper adaptation of above mentioned strategies can not only help in biodiversity conservation but also play a very important role in the development of natural resource on the line of sustainable development.

The conservation work carried out in Mauritius, by Mauritius Government and reputed international agencies, has shown that many or most of the endemic

species can be saved from extinction provided that proper, timely remedial measures are taken. However, there are many constraints which still need to be overcome and this can be done only by further studies and collaboration at both national and international levels.

### **Sustainable Development: Options Available and Prospects**

A population density of 522 per sq. km. or 852 per square mile of arable land, places Mauritius among the most densely populated agricultural islands in the world. It has, at least, the saving grace of having managed to control its population explosion.

The narrow natural resource base of a small island, like Mauritius, imposes severe constraints on sustainable development strategies. In trying to pursue the single-minded objective of ensuring a higher level of material well being for its increasing population, the economic managers of Mauritius island have perforce taken some environmental shortcuts. "When black ebony fetched high prices, the Dutch felled ebony with such ferocity that they denuded Mauritius of this indigenous hardwood. When food resources failed, the loggers assumed their up the dodo. This environmental sin was compounded by later colonisers who transformed this island into plantation economies specialising in an even narrower range of agricultural products. The end result was not environmental catastrophe, but the institutionalisation of economic brinkmanship as a way of life as the islanders battled against natural disasters such as floods, droughts and cyclones, crop disease, falling commodity prices, mounting food and fuel bills and so forth. The diversification of their economic structure is justifiably viewed as a major policy objective in many of the islands."<sup>16</sup>

(16) L. Hurpaul, "Industrial Development and Pollution in Mauritius", in *Institute for Development Studies; Development and Environment in East Africa, Occasional Paper No. 15, Nairobi, 1975, p. 9.*

The damage done to the environment is extensive varied. The island has many endangered and rare species. Mauritius has lost many species of endemic flora and fauna because of excessive exploitation of successive colonial regimes. These colonial powers converted most of the parts of this island into commercial agriculture, i.e., sugar and tea, etc. The pressure to put more and more acreage under sugar led to the impoverishment of the local biodiversity. Mauritius has recently suffered from the conversion of erstwhile forest lands to tea cultivation. Deforestation has assumed alarming proportions in Mauritius.

The process of sugar production generates environmental problems that islanders have come terms with. Fly ash and soot emissions are fairly common in the immediate environment of sugar factories. It has been the traditional practice for these factories to dispose of their waste water and other effluents in the nearest stream; with consequential damage to plant and animal life. More pernicious still is the damage done by over use of fertilizers and improper use of pesticides in the cultivation of both sugar and other agricultural crops. The extent of the damage done to underground aquifers and to plant and aquatic life in the lagoons surrounding the island can only be guessed at.

The increasing pressure that a growing population has exerted on limited food resources has led to an intensification of the fishing efforts in the coastal lagoons, falling fish yields, and the wider utilisation of illegal fishing methods. The fragile coral reefs and some sea-shells varieties are under threat because the growth of tourism which Mauritius government has been encouraging in their attempts to diversify their economic structure. Uncontrolled tourism expansion can bring environmental degradation in its wake. This island is fortunate in the sense that its geographical remoteness protect her from the backpackers at the cheap end of the market, she is forced to go for quality tourism. Even so, the economic benefits flowing from tourism should not divert attention from its environmental costs, not only to the physical

environment but also to the cultural and social environment. Mauritius is a cultural crossroads, where people of diverse origins, languages and religions work and live in peaceful harmony. They can thus adapt themselves to the changing situation. Elsewhere, the fragile social structure can disintegrate in too close contact with outside influences. Environmental degradation will quell the tourism that may have contributed to such degradation in the first place. For those who want to reconcile development and environment, the question that arises is how to maximize the economic benefits of tourism while ensuring that it is environmentally benign.

Agricultural land is being encroached upon at an alarming pace to provide for infrastructure and residential construction. Some new urban development are veritable concrete jungles and look alien in the tropical environment. The quarrying of coral and coral sand, for lime and building sand, respectively, adds to the environmental stresses on lagoons and beaches. Stone crushing operations to turn the huge basaltic boulders into aggregates for concrete mixes are a rich source of dust pollution. The importation of cement and steel to sustain the concrete bunker mentality that seems to inspire much modern construction in Mauritius. The development of low cost solutions to the housing problem utilising locally available building materials, is a matter of legitimate concern for policymakers. Adequate physical planning of the exiguous land resources of Mauritius to optimise and land utilisation is the need of the hour.

By and large, Mauritius depends on imported fossil fuels for the bulk of its energy requirements. The extension of the national electricity grid to cover all of Mauritius and Reunion has improved the quality of life of their inhabitants. Mauritius has all been hard hit by the rise in oil prices, which, nevertheless, encouraged the search for new sources of energy, in particular renewable energy. The share of GDP spent on energy resources, has actually declined slightly in Mauritius since 1981. Mauritius has also belatedly discovered the tremendous energy potential of the mountains of bagasse which were previously wasted. It is evident that any development strategy that banks

on the availability of cheap fossil fuel imports is doomed from the start and the search for alternative indigenous energy sources, e.g., wind power, solar energy and ocean thermal energy conversion must be pursued with determination. That will release scarce foreign exchange for other uses.

Mauritius is not rich in mineral resources and has been spared such scares as open-cast mining. Which has disfigured the environment of this island. Guano deposits have been exploited in Mauritius, but the mining and quarrying sector has not inflicted any significant environmental damage. This is also true of the industrial development that has taken place here.

There is not much heavy industry in Mauritius. There is, of course, a notable exception, e.g., the fertilizer plant in Mauritius and has some associated environmental hazards. Mauritius is widely seen as success story- an economy that has successful in moving away from mono-crop dependence and diversifying into tourism and export-oriented manufacturing. In 1985, for example, manufacturing overtook the sugar industry in gross foreign exchange earnings for the first time in the islands history. It began to catch up rapidly with the sugar sector in the creation of new employment opportunities with the inception of the Export Processing Zone (EPZ) in 1971. Its relative importance in the islands economic structure has grown immensely and its development has been nothing short of spectacular.

One could conclude from this phenomenal growth that industrial development has been achieved at the expense of the local biodiversity and environment. The development philosophy of the Government rightly emphasised job creation and it proceeded to articulate this philosophy in subsequent development plans. Now emphasis is on productive employment rather than mere employment. The unqualified pursuit of jobs for the increasing numbers of unemployed proved unsustainable and had brought the economy to the verge of collapse.

For a small, remote, and resource poor island faced with a growing unemployment problem, the EPZ route to job creation was literally the answer to a starving man's prayer. It was serendipity in carnate. It solved the problem of market constraints. It harnessed the capital resources salted away in the sugar boom years by sugar interests. Perhaps more important, it capitalised on the skill, resources and entrepreneurial talent that has been patiently built up over the years by the progressive extension of free schooling from primary to secondary and finally to tertiary education. The export oriented strategy was replicable and in, spite of continuing protectionist pressure in target market, it has proved its worth as a sustainable development strategy that has taken over from the sugar sector, the task of gainful employment for the growing population.

"The EPZ route to development squares beautifully with the claims of sound environmental management. This is a very important feature, given the absence of any environmental lobby in the island. The lack of any domestic industrial raw materials, the processing of which might have placed undue demands on the environment, compelled the EPZ to process imported inputs. This is generating value-added in the form of jobs and retained earning locally. The dispersion of industrial activity to areas of population concentration has helped to decongest the peri-urban industrial zone."<sup>17</sup>

For all its geographical isolation. Mauritius is not insulated from environmental problems originating elsewhere. The insular environment is as indivisible as it is elsewhere on spaceship earth and threats to the environment include those that have nothing to do with domestic development strategies. The environmental hazards, e.g., damage of ozone layer will rise sea level and biodiversity loss to a environment polluting stage, are not amenable to domestic policy control with the island and nothing short of wider international understanding and intergovernmental co-operation can protect the islands against such dangers.

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(17) *Ibid.*

Mauritius has little muscle power, economic or political, to flex against those who threatened their economic welfare or their economic environment. Mauritius is at the bottom end of the middle income group of countries. Rapid industrial growth has not turned Mauritius into an affluent society. The human environment in Mauritius island, is relatively pollution free. The human habitat is no immediate danger, but his life style is. Because a agricultural society does not get transformed almost overnight into an industrial one without giving rise to some stresses and strains.