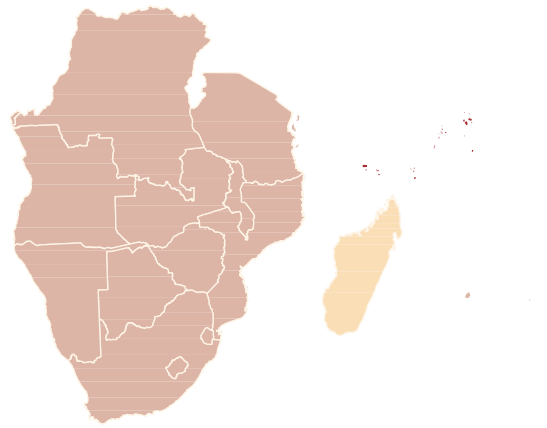


Vicki King & Bryony Walmsley



Seychelles

Contents

National vision

Biophysical profile

Socio-economic profile

Legal profile

Institutional profile

EIA practice

Key successes and challenges

Conclusion

Appendix 1: Case studies

Banyan Tree Beach Resort

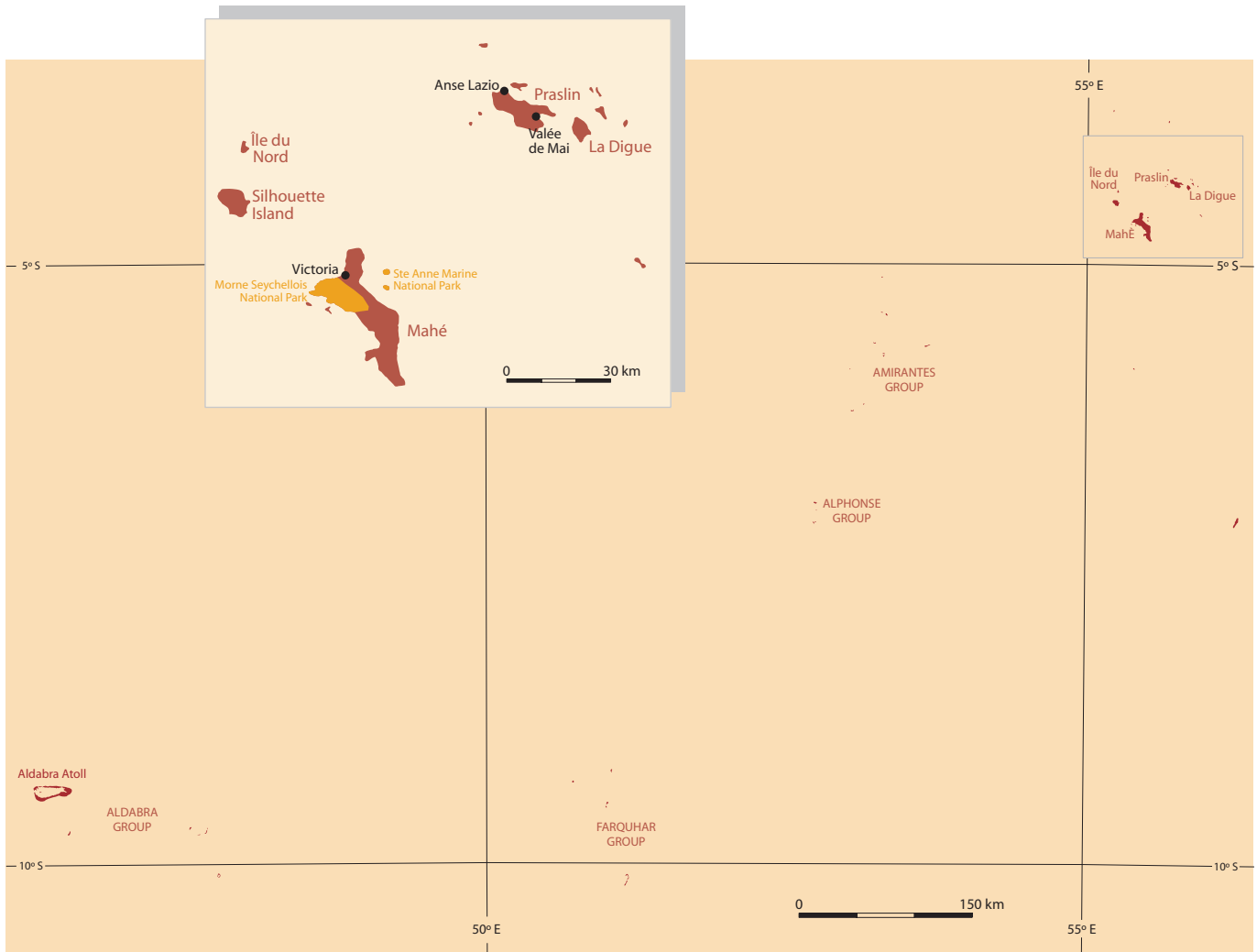
St Anne Resort Development

Appendix 2: Useful contacts

References and other key publications

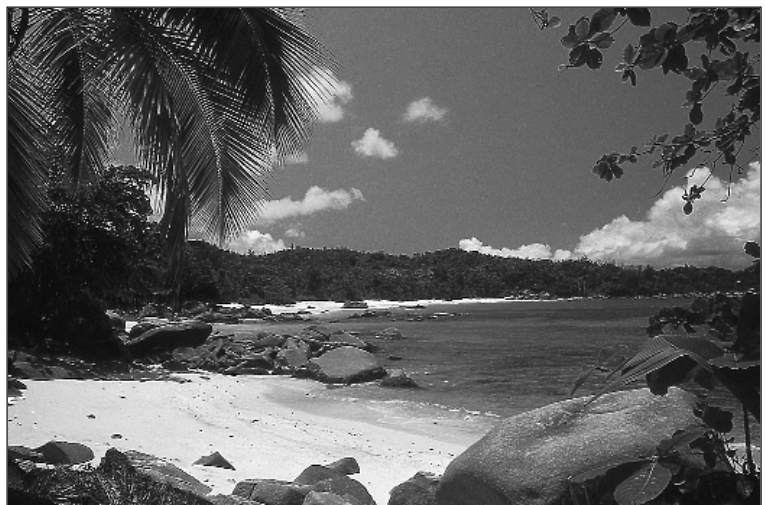
Acknowledgements

COUNTRY REPORTS



WSP Walmsley

Strict conservation measures have saved the giant tortoise from extinction.



P Wagner (Photo Access)

'Seychelles – as pure as it gets'

National vision

The value and uniqueness of the ecology of the Seychelles archipelago has long been recognised both locally and globally. Almost 50% of the land surface of the Seychelles is designated as national park, reserve or protected area under national legislation. In addition, two areas – the Aldabra Atoll and the Vallée de Mai on Praslin – are World Heritage Sites, protected by international law.

In July 1997, the environment of the Seychelles was afforded a higher status locally when the Ministry of Environment was separated from the Ministry of Environment and Transport. This reflected the Government's recognition of the importance of the environment to the health of the Seychelles economy. Vice-President James Michel, who simultaneously serves as the first Minister of Environment, stated that –

[W]hen visitors come here they spend money. And tourism, a pillar of our economy, thrives on the beauty of our environment. We want to ensure that this pillar of our economy remains. In a way our environment is our bread and butter.

(Seychelles Unlimited, December 1997)

The Seychelles Tourism Marketing Authority slogan to differentiate the Seychelles from all the other sun, sand and sea destinations is 'Seychelles – as pure as it gets'.

The key documents guiding sustainable development in the Seychelles are the Government's environmental management plans for the Seychelles (EMPS) for 1990–2000 and 2000–2010 (GRS 1990a, GRS 2000b). The President supported the EMPS initiatives, which served to propel the progress of the 1990 National Development Plan in the direction of sustainable development for the country. The 1990–2000 EMPS was also approved internationally, but has since been criticised for a lack of input from stakeholders during its formulation, and for its inflexibility with regard to incorporating new programmes. Nonetheless, about 90% of the projects discussed in the 1990–2000 EMPS have been implemented.

The 2000–2010 EMPS (GRS 2000b), on the other hand, was prepared with significant stakeholder involvement and presents a far more flexible approach to environmental management. In the introduction to the latter EMPS, Vice-President Michel, as Minister of Environment, stated the following:

Capacity-building will be one of the most important challenges for this new EMPS, as the importance of planning and environmental responsibility continue to permeate throughout all levels of society. Being a small island developing state, severe constraints work against us. Our challenge has always been to achieve much with little because we believe in improving the prosperity of our people and the quality of our environment.

Additionally, there is increasing pressure for economic development and international environmental issues. We will continue to integrate economic development and environmental protection as guided by Agenda 21.

Biophysical profile

The Republic of Seychelles comprises 115 islands: 41 islands and islets constituting pre-Cambrian rock, and 74 coral islands. The total land area is 455 km², with the islands distributed over the exclusive economic zone of 1,374,000 km². Mahé, the main island, is 148 km², rising to a maximum height of 914 m at Morne Seychellois.

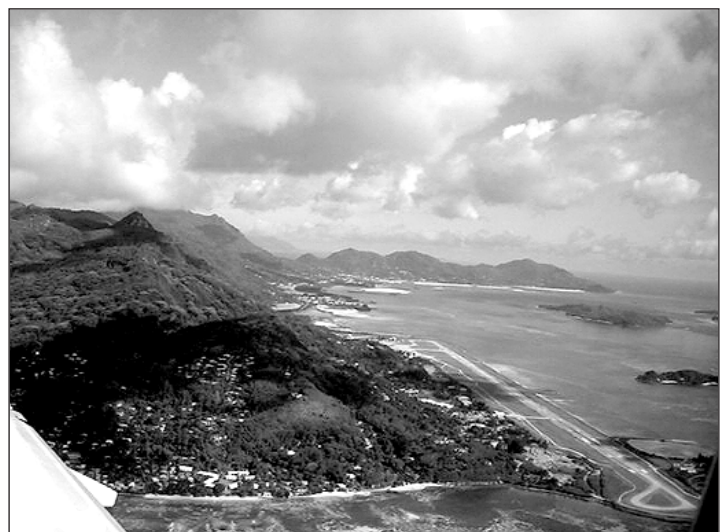
The islands rise from the Seychelles Bank, a shoal area covering approximately 31,000 km², with water depths of up to 60 m. The Seychelles Bank forms the north-western portion of a curved offshore feature that includes the Mascarene Plateau, Saya de Malha, the Nazareth Bank, and the islands of Mauritius and Réunion.

The islands of Mahé, Praslin and La Digue are composed of pre-Cambrian granite between 700–750 million years old. These three islands are considered to be the main islands of the Seychelles – they are the most densely populated and economically active – and, unless otherwise specified, most of the information provided in this chapter refers to them. Silhouette Island and the Ile du Nord are composed of syenite, diorite and microgranite, whilst the Amirantes Group to the west comprises low coralline islands that rise 2–3 m above sea level. The five westernmost islands of the Aldabra Group are composed of limestone reefs up to 8 m high.

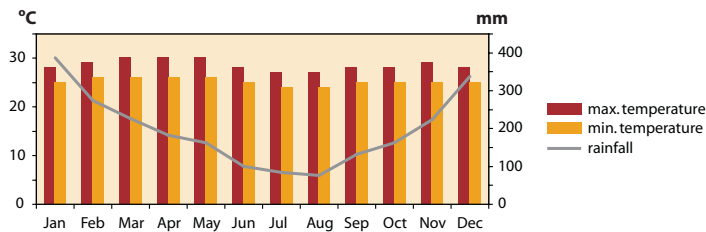
Mahé has the highest relief of the three main islands, which are typically rugged and hilly. It has a coastal strip rising fairly sharply from the coast to heights of up to 300 m in the south, reaching 914 m in the northern portion of the island. Praslin and La Digue have less severe relief, reaching heights of just over 300 m.

Climate

Temperature and humidity remain generally high throughout the year, with a mean temperature of 27 °C and humidity of



Because of its steep topography, Seychelles is in short supply of land suitable for large infrastructure. Here, land was reclaimed to accommodate the airport.

Figure 1: Average temperatures and rainfall at Victoria

Source: Washington Post (2002).

80%. There is very little seasonal variation in climate, although between June and October, south-east trade winds result in cooler, drier conditions.

November to April is the cyclone season for the south-west Indian Ocean, and although the Seychelles is not in the direct track of tropical cyclones, cyclonic activity can result in gale force winds, flash floods and severe thunderstorm activity.

During the summer, the wind is predominantly north-westerly, bringing warm weather with a high moisture content.

The length of the dry season varies significantly from island to island, meaning they have highly variable rainfall. Mahé, for example, has an annual average rainfall of 3,237 mm, whilst the northern atolls receive 1,700–2,000 mm and the southern islands 850–990 mm. There is also extremely high inter-annual variability in rainfall in the Seychelles, and this has a significant effect on socio-economic activities there.

Vegetation

The flora of the Seychelles is highly altitude-dependent. Prior to disturbance by humankind, the island shores were fringed with coconut palms and other plants whose seeds were carried in by the sea. The only endemic species thought to occur along the coast was *Pandanus balfourii* (Vakwa Bord-d-mer). Subsequent anthropogenic activities such as sand mining and construction have resulted in the destruction of most of the original coastal vegetation.

The Coastal Plains used to be dominated by lowland and coastal forests (200–300 m above mean sea level), which typically comprised tall (20–25 m) tree species. Indigenous vegetation is no longer common in these areas because it has been significantly altered by agricultural and development activities.

Intermediate Forest occurs between 200–500 m in altitude. Formerly rich in endemic species, much of it has now been felled. Remaining areas have been invaded by exotic species or have been planted with exotics.

The relatively high-altitude Mountain Mist Forests originally covered most of the land above 400–500 m. These areas are typified by rainfall of over 3,000 mm per annum. The transition between the Intermediate Forest and Mountain Mist Forests has been obscured by the dominance of exotic vegetation, which is threatening the sustainability of these high-

altitude forests. The Mountain Mist Forests are typified by mosses, lichens, ferns and epiphytic orchids. Tree ferns and creepers are common, and tall trees are still found in undisturbed sites at higher altitudes. The number of endemic species is lower at this altitude than in the Intermediate Forest.

Mangroves were common along the coastline of the granitic islands, but many have been destroyed by development activities. Mangroves are re-establishing in the lagoon areas created by coastal land reclamation. The Mangroves are important bird habitats.

There are approximately 69 km of rocky shores on Mahé, 22 km on Praslin and 7 km on La Digue. Plants associated with these environments include the coconut (*Cocos* spp.), *Casuarina equisetifolia*, the *Hibiscus tiliaceus*, some scramblers and grasses, Mauritius hemp (*Furcraea gigantea*) and the endemic Vakwa Bord-d-Mer.

Wildlife

There is a total of about 65 km of sandy shoreline on the three islands, and although the vegetation has been severely modified, the shores still provide an important habitat, particularly for seabirds and marine turtles (for nesting). Most notably, the hawksbill and green turtles are dependent upon the sandy shores for breeding.

There are three species of snake on the Seychelles – two of which are endemic; 25 species of lizard; and three species of terrapin (the terrapins are endangered due to habitat loss). Four species of turtle occur, all of which are endangered because of human activities. Giant tortoise (*Dipsochelys* spp.) were the dominant terrestrial herbivore throughout the Seychelles prior to the introduction of domestic animals. Conservation efforts have resulted in an increase in the tortoise population from 1,000 in the 1890s to more than 150,000 today (the majority of these inhabit Aldabra).

Thirty endemic taxa of birds occur on the Seychelles, including eight globally threatened species. At least three species of birds have become extinct as a result of human activities, and several others are currently under threat on the islands – including the Seychelles magpie robin (*Copsychus sechellarum*), the Seychelles white eye (*Zosterops modesta*), the Seychelles black paradise flycatcher (*Tersiphone corvine*) and the Seychelles scops owl (*Otus insularis*). The Seychelles also hosts some of the most globally important seabird colonies.

The only indigenous land mammals on the Seychelles are bats, although various other mammals have been introduced. There are five species of bats on the islands, two of which are endemic. The Seychelles sheath-tailed bat (*Coleura seychellensis*) is highly endangered.

Marine life

The marine environment is an extremely important part of both the Seychelles ecology and its economy. For example, the two species of nesting turtles, ten species of breeding seabirds and 900 species of marine fish are all significant natural capital of the Seychelles. At least 70 of the fish species are important to the country's fishing industry.

Marine mammals are strictly protected in the waters around the Seychelles. Some 21 species of marine mammals have been positively identified there, including the dense-beaked whale (*Mesoplodon densirostris*), the fin whale (*Balaenoptera physalus*), the killer whale (*Orcinus orca*), the melon-headed whale (*Peponocephala electra*), the right whale (*Eubalaena glacialis*), the Sei whale (*Balaenoptera borealis*), Risso's dolphin (*Grampus griseus*), the rough-toothed dolphin (*Steno bredanensis*), and the spotted dolphin (*Stenella attenuata*).

Three main types of reef occur, namely fringing reefs, platform reefs and atolls. All are sensitive to disturbance and many are being damaged by dropping anchors and by other human activities.

Seagrass and algae are abundant and diverse, and the *Sargassum* beds are some of the largest in the world. The beach environment is rich in molluscs, crabs, rockhoppers, small limpets, barnacles and nerites.

Water resources

There are difficulties associated with the provision of an adequate and reliable supply of fresh water on the main islands. Demands are relatively high (five-star hotel accommodation uses a particularly high quantity) and space for storage is limited due to the topography.

Rainfall is abundant, but up to 98% of rainfall is lost through run-off and evaporation, while only 2% infiltrates the ground. The principal source of potable water, therefore, is groundwater. The majority of the population is connected to the main water supply (on Mahé), but during dry periods, the water supply is unable to meet demand and water rationing is common. Table 1 illustrates the current and predicted deficits in water supply on Mahé.

Several industries and all the new large hotels are installing desalination plants to ensure a reliable supply of water, partly because the Public Utilities Corporation (PUC) is currently unable to guarantee an uninterrupted supply.

The PUC, too, is currently constructing a large desalination plant on reclaimed land adjacent to the new sewage works. This development aims to increase the water supply capacity, as there is no space on the islands to build additional storage.

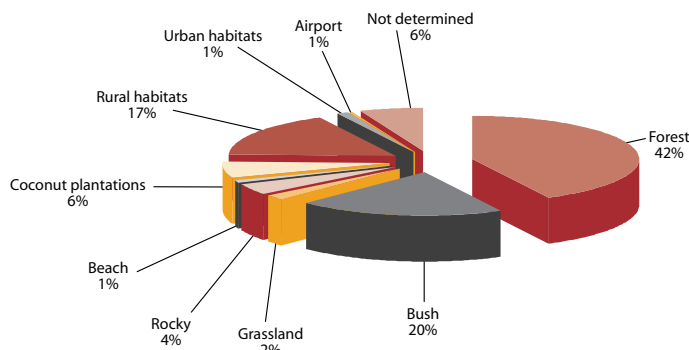
Ecological sensitivity

On many of the islands biodiversity is under great pressure and threat, partly because of the problems associated with the lack of land, and partly because endemic species are particularly vulnerable to disturbance and to being out-competed by alien invasive species. Climate change and the associated potential rise in sea level also represents a threat to island ecology.

Current and projected land use

Some 47% of the land surface area of the Seychelles is protected under various conservation designations. The total land surface area suitable for farming is approximately 10,000 ha, of which about 6,000 ha are coconut and other tree-crop plantations. A considerable proportion of the agricultural land has been lost to other land uses, particularly housing.

Figure 2: Land use on Mahé



Source: Payet (1998).

On the main granitic islands, the predominant land use (42%) is forest. Forest cover comprises unprotected natural forest (41%), those in national parks (48%) and plantations (11%). These areas are not suitable for other use due to the nature of the topography, although, as land becomes increasingly scarce, housing developments are encroaching into the higher forested areas at a relatively high rate.

The need for industrial land is growing as well, due to an economic desire to add value to local products. This has resulted in the development of coconut oil and soap manufacturing factories, a tuna-canning operation and various related operations. There is also a mounting need for land to be appropriated to public utilities such as sewage works and desalination operations. The airport, the Victoria Sewage Works and the desalination plant on Mahé are all located on reclaimed land, along with other industry and some housing.

Key environmental limitations

The most significant environmental limitations in the Seychelles relate to the lack of flat land for development, as this leads to pressure on the ecologically sensitive, steeper slopes and problems with water supply and sewage disposal. Only a small portion of the land surface of the three main islands has slopes of less than 10% (gentle): the remainder of the land comprises heavily vegetated steep slopes.

The unreliable supply of fresh water is another significant issue on the islands, particularly in view of the high demand from upmarket tourist establishments.

Wastewater disposal is becoming an increasing problem on the islands. Larger hotels have their own treatment plants, but since many of these do not operate in compliance with the

Table 1: Comparison between water supply and demand (kl per day)

	1996	2000	2005	2010
Projected gross demand	19,150	27,350	27,390	27,450
Safe yield (1996)	13,500	13,500	13,500	13,500
Deficit	5,650	13,850	13,890	13,950

required standards, they impact on the water quality at their discharge points. Smaller hotels and most houses have septic tank and soak-pit systems. These, too, have significant impacts on inland water quality and hygiene, as access to these tanks for maintenance and repair is often extremely difficult due to the topography and density of habitation. In order to cope with the problem more effectively, a new sewage works has been constructed at Victoria and a second works is under construction at Beau Vallon. A feasibility study has also been completed for the construction of two government sewage works on Praslin.

Key environmental impacts caused by development

Direct impacts associated with development on the islands include –

- soil erosion on steep slopes
- biodiversity loss (endemic species, forests, mangroves, wetlands)
- increasing alien plant invasion
- water pollution associated with sewage disposal
- the visual impact of developments, and
- disturbance of animals such as turtles during nesting activities.

Indirectly, development results in impacts associated with increased power and fresh-water consumption, as well as increased waste production (air pollution, lack of available land, etc.).

Importance of natural capital to socio-economic development

The dynamic but diminutive economy has been supported by tourism and fisheries, which are the major foreign exchange earners in the economy. The sustainability of these two sectors is clearly essential to the economy and the survival of the Seychelles. As their sustainability depends on the maintained integrity of the terrestrial and marine environments, the country needs

to be especially careful to avoid the consequences of biodiversity loss and degradation.
(GRS 1997)

It is estimated that agriculture, fishing and forestry contributed US\$15 million to the gross domestic product (GDP) in 2000, whilst tourism generated US\$144 million – the highest single contribution. Together, therefore, these sectors generated 27% of GDP in 2000. However, the sectors concerned are totally reliant upon the preservation of the Seychelles’ natural resources. In 1992, for example, the St Anne Marine Park received more than 27,000 visitors, who spent an estimated US\$2 million there. The preservation of natural resources offer other, less tangible benefits – for example, the physical protection provided to the city of Victoria by the reefs from wave action and current.

The Seychelles marketing drive (‘as pure as it gets’), which uses the relatively undisturbed nature of the environment on the islands to differentiate itself from other similar destinations, relies totally upon the conservation of natural capital. Plans for expanding tourism on the islands involve creating an ecotourism market, which will also be based on a well-preserved environment.

Figure 3 shows the economic value placed on biodiversity in the Government’s Seychelles Biodiversity Strategy and Action Plan (GRS 1997).

Transboundary environmental impacts

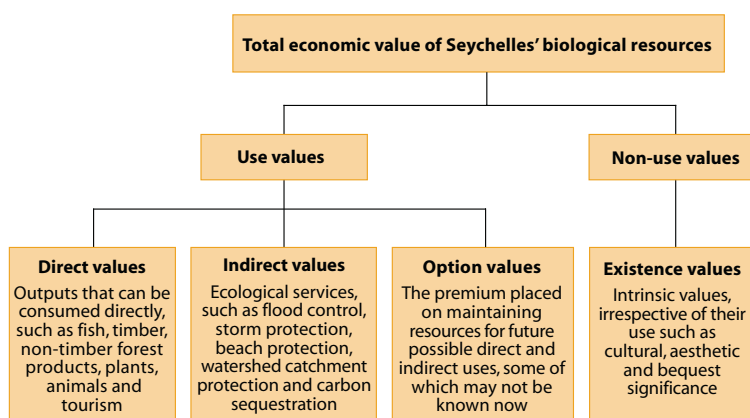
There are very few transboundary risks in the Seychelles due to the islands’ relative isolation. However, the islands lie on a major international oil transportation route and, therefore, are at risk from a major oil spill. The last incident occurred in 1972, when a Royal Navy vessel ran aground near Aldabra, discharging 40,000 t of oil.

Other risks include –

- the importation of alien vegetation (the cinnamon plant, *Taraserianthes salcataria*, and *Albizia* are currently out-competing local species)
- the introduction of foreign plant pests and diseases such as the fungus attacking the indigenous takamaka tree (*Calophyllum inophyllum*)
- the introduction of alien animals (rats are causing significant problems on many of the islands), and
- the illegal export of plant and animal products (e.g. turtle shells).

The conservation of migratory seabirds in the Seychelles is dependent on the preservation of their habitats along their migration routes.

Figure 3: Economic value of Seychelles’ biodiversity



Socio-economic profile

Population

The population of the Seychelles reached approximately 81,000 in 2002, with an almost equal ratio of men to women.

Population growth has been constant at around 1% for several years. At least 90% of the population of the three main islands live on Mahé, whilst 8% are resident on Praslin and 2% on La Digue.

Health facilities on the main islands are adequate and there is a notable lack of many serious diseases, such as malaria, on the islands. In addition, HIV/AIDS¹ rates are fairly low (GRS 2001) and life expectancy high (77 years for women, 67 years for men).

The education system in the Seychelles is good, with an average pupil-to-teacher ratio of 14.5:1. There are 26 primary schools and 14 secondary schools in the Seychelles, but no universities. There are, however, eight colleges for 'post secondary' education, namely the Polytechnic, the Industrial Training Centre, the Maritime Training Centre, the Farmers' Training Centre, the National College of the Arts, the Seychelles Hospitality and Tourism Training Centre, the Centre for Health Studies, and the National Institute of Education.

The Gini Co-efficient of equality for the Seychelles during the period 1990–1998 was 0.47 (on a scale of 0–1, where 1 is total inequality). This indicates the Seychelles has less disparity between the rich and poor than the majority of African countries, which tend to have co-efficients of around 0.5. The Seychellois people do not consider that there are any 'disadvantaged communities' in the country, and gender issues do not arise. The Seychelles has one of the world's highest percentages of women in Parliament. There are also initiatives to empower children, and ensure they have appropriate legal rights and representation (Nirmal Shah², pers. comm. 2002).

The Seychelles workforce comprises only 30,000 people and unemployment rates are low at about 10%. There is a shortage of labour at most levels, and, due to the paucity of tertiary education on the islands, many people leave the islands to further their education and do not return. There are, therefore, insufficient Seychellois graduates to undertake technical positions within the economy.

Figure 5 illustrates that approximately one-third of the economically active population is employed directly in the primary production and tourism sectors, with a further 38% employed in service industries.

While some 5,000 people – about 22% of the labour force – are currently employed directly in the tourism sector, an additional 5,000 are estimated to be required within the next ten years as a result of existing facilities being upgraded and additional resorts being developed (GRS 2000c). This will result in tourism becoming the single largest employment sector in the country.

Table 2: Health statistics, 1997–2000

Life expectancy (years),	Males:	67
	Females:	77
Number of deaths (total)		393
People: doctor ratio		873
HIV rates (%)		0.1
Infant mortality (% of live births)		9.2

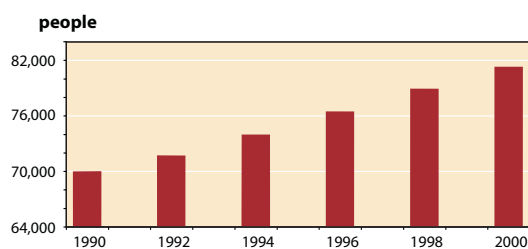
Source: MISD (2001).

Table 3: Education statistics, 1998–2001

Children at primary school (%)	56
Children at secondary school (%)	44
Children:teacher ratio	14.5
Males:females at school (%)	50.5:49.5

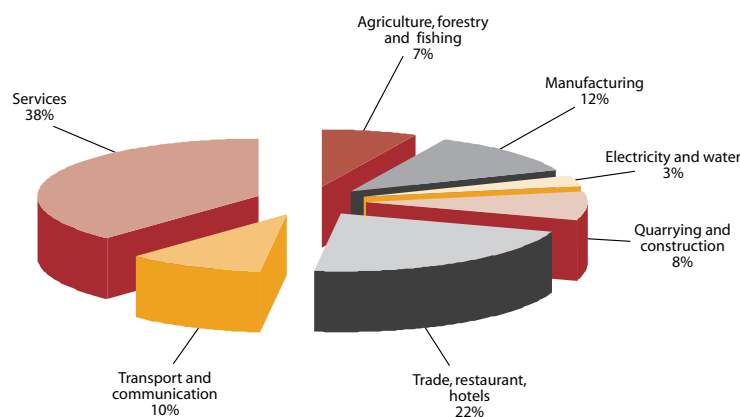
Source: MISD (2001).

Figure 4: Population, 1990–2000



Source: World Bank Group (2002).

Figure 5: Employment by sector, 2000

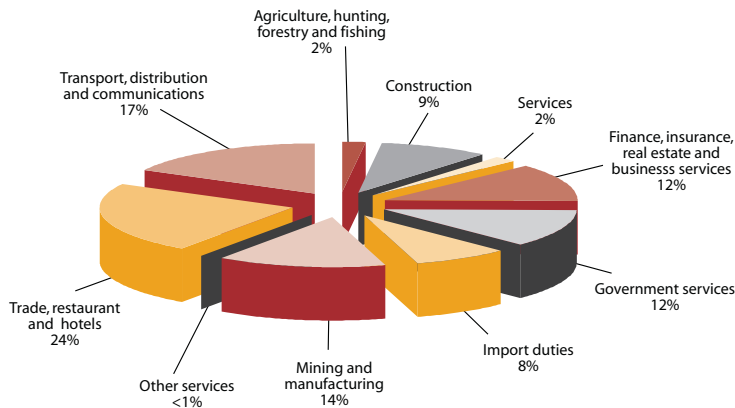


Source: MISD (2001).

¹ Human immunodeficiency virus / acquired immune deficiency syndrome.

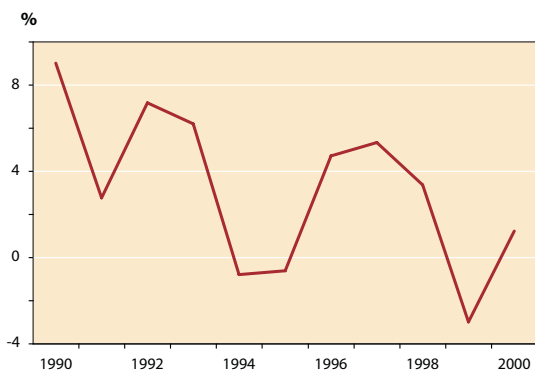
² Nirmal Shah, Birdlife, Seychelles.

Figure 6: Economic activities, 2000



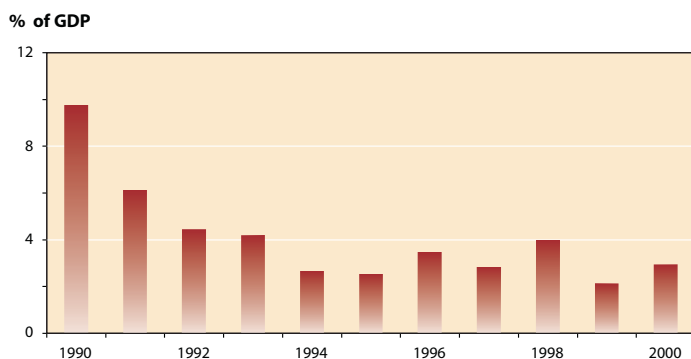
Source: MISD (2001).

Figure 7: Economic growth rate, 1990–2000



Source: World Bank Group (2002).

Figure 8: Development aid, 1990–2000



Source: World Bank Group (2002).

The development – and retention – of people in the Seychelles is imperative to the continued success of the tourism industry in particular. There is currently only one hotel school, although another is being developed. The image of the Seychelles as a five-star destination is partly reliant upon the presence of enough well-trained staff. However, appropriately trained people are in short supply in most areas, with many people performing several different tasks at once.

Main economic activities

Since Independence in 1976, per-capita output in the Seychelles has expanded to approximately seven times the original subsistence level. This growth has been led by the tourism sector, which provides more than 70% of hard currency earnings and is the single largest contributor to GDP, contributing 23% in 2000. The fishing industry is also an extremely important part of the economy, with the opening of the tuna-canning factory in 1990 adding further value to the product. Canned tuna generated US\$108 million in trade exports in 2000, i.e. over half of the total export trade.

Whilst the Government has recently encouraged foreign investment for upgrading hotels and other tourist facilities, it is also promoting the growth of the farming, fishing and small-scale manufacturing sectors in an attempt to reduce the dependence of the economy on tourism. This is because the tourist industry is unpredictable, and because the market is facing strong competition from other destinations that are perceived to be better value for money (Mauritius, the Comores, the Maldives and Madagascar).

Economic growth in the Seychelles is highly variable, being dependent mainly upon the tourist and fishing industries: these industries are influenced by global economies and events as well as local factors such as climate and marine productivity.

Tight controls on exchange rates and the scarcity of foreign exchange have hindered short-term economic prospects, and further by the low black market value of the Seychelles Rupee (US\$1 = 5.62 Seychelles Rupees), which is half of the official exchange rate.

Key capital development projects envisaged for the next ten years include the development of ecotourism facilities, the continuation of land reclamation projects, the provision of housing, the establishment of sewage works on Praslin and industrial development. Developing integrated waste-management systems for the main islands and upgrading sewage disposal systems are listed as potential projects in the 2000–2010 EMP (GRS 2000b).

Development aid has reduced significantly over the last ten years in the Seychelles, as GDP has increased. Much of the work carried out under the 1990–2000 EMPs (GRS 1990a) was funded by donor agencies.

The World Bank and the Commonwealth are reviewing the current system of using GDP alone to assess the amount of aid to be provided, in recognition of the fact that the vulnerability of the economies of small island states should also be considered.

Projected growth areas for the future

It is likely that the tourism industry will be the focus of economic growth over the next ten years. Vision 21 (GRS 2000c) states that the development of niche markets such as ecotourism is necessary to reflect changing market trends and address the issue of increased competition from other destinations. The current perception of poor value for money and service will be improved on, and recognition will be given to the need to develop the tourist industry on a sustainable basis to 'conserve the natural environment of the Seychelles and the cultural heritage of the Seychellois people' (GRS 2000c). It is also acknowledged that local communities need to participate in and benefit more directly from tourism.

The incorporation of environmental considerations into all new development projects is promoted by the Government, and hotels will be encouraged to promote the Seychelles natural environment. Environmental codes of conduct will be distributed to hotel guests.

The Government also hopes to attract foreign investment by developing a free processing zone for the transshipment, redistribution, assembly and processing of products for export.

Socio-economic limitations

Public demand for goods and services has increased along with development. Expectations relating to quality of life and standards of living have also increased amongst the population in recent years. This has resulted in additional stresses on the environment (waste disposal, power and water supply, etc.), which are likely to increase further in the future.

The population's reliance on the island's limited natural resources in terms of water supply, suitable waste-disposal sites and the ongoing pursuit of economic progress will continue to hamper sustainable development. The Government should actively strengthen the move towards rationalising water supply and waste disposal, and should educate the population accordingly.

Legal profile

Environmental rights are clearly entrenched in the Seychelles Charter of Fundamental Human Rights and Freedoms (GRS 1993). Article 38 states that –

The State recognises the right of every person to live in and enjoy a clean, healthy and ecologically balanced environment and with a view to ensuring the effective realisation of this right the State undertakes:

- i. To take measures to promote the protection, preservation and improvement of the environment.*
- ii. To ensure sustainable socio-economic development of the Seychelles by judicious use and management of the resources of the Seychelles.*
- iii. To promote public awareness of the need to protect, preserve and improve the environment.*

In addition, Article 40(e) of the Constitution places a duty on every citizen of the Seychelles to protect, preserve and improve the environment.

Since the Constitution is the supreme law of the islands, such stringent protection of the environment at constitutional level should facilitate environmental management in the Seychelles.

Current and emerging policies and laws pertaining to the environment

Although conservation was initiated as an institutional activity in the 1960s, very little exists by way of established policy to guide its incorporation into government activities. Thus, policies, plans and programmes need to be developed to guide sustainable resource management in the long term.

In general, legislation relating to environmental management is dated and fragmented. Since the adoption of the Constitution in 1993, only the Environment Protection Act (EPA; No. 9 of 1994), the Environment Trust Fund Order (SI No. 39 of 1994), the Maritime Zones Act (No. 2 of 1999), the Plant Protection Act (No. 10 of 1996), and the Pesticides Control Act (No. 4 of 1996) have been promulgated. The remaining 23 Acts that relate to environmental management were promulgated prior to the formalisation of the constitutional environmental rights (1993). Certain Acts, such as the Breadfruit and Other Trees [Protection] Act (of 1917), are extremely outdated – it makes provision for the protection of species that have since been declared alien invasives. Furthermore, these Acts are administered by more than eight different government or parastatal agencies, resulting in inevitable coordination problems.

The two key Acts in terms of planning for sustainable development are the EPA, administered by the Ministry of Environment (MOE), and the Town and Country Planning Act (of 1972), administered by the Ministry of Land Use and Habitat. Unfortunately, the Town and Country Planning Act was written 22 years before the EPA, and the provisions are not readily compatible. A new Planning Bill was apparently drafted some time ago, but its progress in the system is unclear. The aim of this Bill is, *inter alia*, to incorporate the provisions of the EPA so that coordination between the two can be facilitated. It should be noted that, in terms of Section 10 of the Town and Country Planning Act, the Minister may exempt any development project application from having to obtain environmental authorisation.

The Government has a policy for the development of five-star resorts. This hotel-related policy conflicts with the principles of sustainable development, as it makes provision for large amounts of land usage, high levels of water and power consumption, etc.

The origin of the pre-Independence legislation in the Seychelles is unknown, but significant reference has been made to foreign legislation (Australia, the United States of America) in the development of the more recent Acts such as the EPA.

A comprehensive new law entitled the Biodiversity and Conservation Areas Bill was drafted in 1993, but has not yet

COUNTRY REPORTS

Table 4: Key policies and laws relating to environmental management

Act or policy	Key elements and regulations	Implementing authority
Breadfruit and Other Trees [Protection] Act of 1917 (recently amended; Chapter 18)	Protection of certain tree species	Division of Environment, Ministry of Environment
Dumping at Sea Act of 1974 (Overseas Territories) Order of 1975 (Chapter 67)	Control of waste disposal from ships	Port and Marine Services, Ministry of Environment
Environment Protection Act, No. 9 of 1994 (Chapter 71)	<ul style="list-style-type: none"> Environment Protection (Designation of Solid Waste Agency) Regulations, SI No. 48 of 1995 Environment Protection (Standards) Regulations, SI No. 83 of 1995 Environment Protection (Miscellaneous) Regulations, SI No. 84 of 1995 Environment Protection (Impact Assessment) Regulations, SI No. 39 of 1996 Environment Protection (Marine Parks Authority) Order, SI No. 54 of 1996 Environment Protection (Noise Emission Standards) Regulations, SI No. 49 of 1999 Environment Protection (Fixed Penalty) Order, SI No. 51 of 1999 Environment Protection (Ozone) Regulations, SI No. 24 of 2000 Environment Protection (Containers) Regulations, SI No. 14 of 2001 	Division of Environment, Ministry of Environment
Fisheries Act of 1987 (Chapter 82) Fisheries (Amendment) Act, No. 3 of 1997 Fisheries (Amendment) Act, No. 2 of 2001	<ul style="list-style-type: none"> Fisheries Regulations, SI No. 35 of 1987 	Ministry of Agriculture and Marine Resources
Forest Reserves Act of 1955 (Chapter 84)		Division of Environment, Ministry of Environment
Land Reclamation Act of 1967 (Chapter 106)		
Maritime Zones Act, No. 2 of 1999		Port and Marine Services Ministry of Environment
Merchant Shipping (Oil Pollution) (Seychelles) Order of 1975 (Chapter 128)	<ul style="list-style-type: none"> The Oil Pollution (Compulsory Insurance) Regulations, SI No. 8 of 1976 	Port and Marine Services, Ministry of Environment
National Monuments Act of 1980 (Chapter 140)	<ul style="list-style-type: none"> Declaration of Monuments, SI No. 96 of 1984 	
National Parks and Nature Conservancy Act of 1969 (Chapter 141)	<ul style="list-style-type: none"> Management of protected areas 	Division of Environment, Ministry of Environment
Pesticides Control Act, No. 4 of 1996		Ministry of Agriculture and Marine Resources
Plant Protection Act, No. 10 of 1996	<ul style="list-style-type: none"> Plant Protection (<i>Verticillium calophylli</i>) Regulations, SI No. 76 of 1997 Plant Protection (Quarantine Pest and Infected Area) Regulations, SI No. 14 of 2000 	Division of Environment, Ministry of Environment
Protected Areas Act of 1967 (Chapter 185)		Division of Environment, Ministry of Environment
Public Health Act of 1960 (Chapter 189)		Environmental Health Division, Ministry of Health
Public Utilities Corporation Act of 1986 (Chapter 196)		Public Utilities Corporation
Removal of Sand and Gravel Act of 1982 (Chapter 203)	<ul style="list-style-type: none"> Removal of Sand and Gravel (Fees) Regulations, SI No. 40 of 1982 	
Seychelles Island Foundation Decree of 1979 (Chapter 217)		Seychelles Island Foundation
State Land and River Reserves Act of 1903 (Chapter 228)		
Town and Country Planning Act of 1972 (Chapter 237)	<ul style="list-style-type: none"> Planning authorisation Land use management 	Ministry of Land Use and Habitat
Wild Animals and Birds Protection Act of 1961 (Chapter 247)		Division of Environment, Ministry of Environment

been enacted. The draft legislation was developed in response to the Seychelles' ratification of the Convention on Biological Diversity. In fact, very little national enabling legislation exists with respect to international conventions that the Seychelles has ratified.

The Environment Protection Act

The aim of the EPA is stated as being –

... to provide for the protection, improvement and preservation of the environment and for the prevention, control and abatement of environmental pollution.

The Act provides for the establishment of the National Environmental Advisory Committee. This body will comprise representation from government departments, non-governmental organisations (NGOs) and associations with environment-related functions. The Committee has been formed, but has only met once – in early 1996. This Committee would be useful for facilitating communication between the Government and NGOs on environmental matters – an area in which there is currently inadequate interaction.

The Minister of Environment has promulgated regulations in terms of the EPA relating to, *inter alia*, noise emissions, ozone, container storage, the establishment of the Marine Parks Authority, the designation of a Solid Waste Agency and environmental impact assessment (EIA).

Although there is no specific water- or air-related legislation, it is addressed, albeit not in great detail, in the EPA. Fines for offences in terms of the legislation are small (maximum US\$3,500 in the EPA) and prosecution is very rare. Nevertheless, there is a focus on enforcement in the Act, presumably reflecting the influence of the USA's EPA in its development.

The EIA process

Part IV of the EPA deals exclusively with EIA, setting the necessary parameters for the promulgation of regulations. However, in terms of Section 15(11), the Minister of Environment is entitled to exclude a prescribed project from the EIA process.

The Environmental Protection (Impact Assessment) Regulations were published in the *Government Gazette* (GRS 1996a), and were promulgated in terms of Sections 15 and 40 of the EPA. In terms of these Regulations, the following projects or activities are subject to EIA:

- An activity listed in Schedule 1 to the Regulations
- A project in a protected area or ecologically sensitive area listed in Schedule 2 to the Regulations, or
- Any other project or activity likely to have a significant impact on the environment.

The Schedules are extremely comprehensive in their listings of activities as well as sensitive areas. It is unclear in some of the listings whether the EIA Regulations apply only to the listed sites, or to all industrial risk areas although only specific sites are listed. Where a proposed project does not fall into any of the

categories, the MoE is empowered to insist that it comply with the EIA Regulations as it may have a potentially significant impact upon the environment. Major aid agencies usually require stringent EIAs to be undertaken for projects they fund. The activities listed in Schedule 1 are given in Box 1 (page 184), while Schedule 2 protected and ecologically sensitive areas are given in Box 2 (page 184).

Where a planning application is made in terms of the Town and Country Planning Act, applications for environmental authorisation need to be submitted to the Minister of Land Use and Habitat, who then forwards the application to the Minister of Environment. In this situation, the Minister of Land Use and Habitat does not have to accept the recommendations of the Minister of Environment; the Act merely states that they (the Ministry of Land Use and Habitat) will 'have regard to a grant or refusal of an environmental authorisation'.

Where a project does not fall under the Town and Country Planning Act, the environmental application is made directly to the Minister of Environment. On receipt of the application, the relevant authority – in this case the Environmental Assessment and Pollution Control (EAPC) Department of the MoE – decides whether the project or activity requires a Class 1 or Class 2 EIA. Where a project is deemed to have a potentially significant impact on the environment, a Class 1 EIA will be



Adil Bradlow (PictureNet Africa)

Women work on a line at the Indian Ocean Tuna plant. The fishing industry is one of the most significant components of the economy.

Box 1: Projects or activities requiring environmental authorisation**Mining**

- Quarries and deposit sites
- Stone crushing
- Commercial production of aggregates and other materials

Agricultural production

- Commercial rearing of livestock, including pigs, cattle and poultry
- Drainage or irrigation for commercial purposes

Forestry

- Logging operations
- Construction or improvement of forest tracks or trails
- Construction of sawmills

Farming of fish and associated products

- Fish farming works and extensions
- Aquaculture
- Fish processing plants and equipment

Chemical industries

- Manufacture, handling, storage and transportation of hazardous chemicals or substances

Industry

- Construction of industrial buildings
- Installation of industrial equipment
- Transportation equipment of industrial products classified as dangerous in terms of United Nations Environment Programme specifications

Food and agricultural industries**Energy production and distribution**

- Power plants
- Power lines
- Gas storage
- Pipelines
- Bottling plants

Water

- Dams and reservoirs
- Water treatment plants

- Public water supply networks
- Desalination plants

Sewage and waste water

- Sewage treatment plants
- Sewage networks and outfall

Solid waste

- Dumping sites
- Treatment plants
- Waste-collecting equipment

Hotels, restaurants and tourism

- New hotels or the extension of existing hotels
- Facilities such as golf courses and swimming pools
- Restaurants

Fishing vessels and fleet construction**New industrial vessels****Transport, and harbour and marine**

- Harbour construction and development
- Construction of airfields, aviation strips and landing sites
- Harbour dredging operations
- Equipment and installation
- Construction of sea defences and sea walls
- Construction and maintenance of dry docks

Land reclamation**Habitat**

- Housing developments and/or land subdivisions that would give rise to the creation of large housing estates
- Housing developments and/or land subdivisions that would result in increased pressure on existing infrastructure and/or the environment

Road network

- Constructing new roads
- Extending out from existing bank
- Surfacing of earth tracks or roads
- Constructing water drainage networks

Box 2: Schedule 2 areas, in which any proposed project will require an EIA**Protected areas**

- National parks, special nature and wildlife reserves, and certain specified areas
- Historical sites and areas surrounding national monuments (all those protected by legislation are listed: there are 55 in total at present)
- Certain remarkable natural landscapes (43 areas are specifically listed)
- Viewpoints (only the six listed)
- Inter-urban buffer zones (defined on the land-use plan, June 1992)
- Water catchment areas (all areas upstream of water supply dams, together with four listed sites)
- Industrial risk areas (areas with a high risk potential in case of an accident: 15 sites are listed)
- Natural risk areas (eight areas are listed and reference made to the corresponding map)
- Steep slopes (gradients of more than 1:2)
- Earth erosion areas (where the vegetation covers less than 50% of the ground)
- High elevations (above 200 m, or 300 m in listed areas)
- Skyline

Ecologically sensitive areas

- Natural habitats for rare, protected or endemic species of flora and fauna (38 listed sites)
- Marshes and wetland habitats (areas with wetland vegetation – including mangroves)
- Streams and their surrounds (areas categorised in the State Land and River Reserves Act of 1903 (Chapter 228))
- The coastal strip (100 m landward of the high water mark, with the exception of several cases)
- Beaches and intertidal zones (all areas between the lowest low tide and 20 m landward of the dune crest)
- the seabed, and
- the small and outlying islands (i.e. all except Mahé, Praslin and La Digue)

required and the MoE will provide the terms of reference for the EIA. If a Class 2 EIA is deemed adequate, the MoE may undertake the study themselves, or request that the proponent does so. The Class 2 study involves completing a checklist of potential issues, which is passed to the Senior Project Officer of the EAPC Department for approval.

Once a Class 1 EIA has been completed, it needs to be submitted to the MoE for approval. The EIA will be reviewed, whereupon further information may be requested from the proponent. The MoE may also request that the EIA be reviewed by any person, organisation or agency in the public or private sector. Furthermore, the EIA is obliged to be open to public inspection prior to MoE approval. People may submit comments, but no provision exists for such comments to be included in the final EIA report. Nonetheless, the Environmental Appraisal Committee – comprising at least five technical experts in the relevant development sector and representatives of the ministries or departments concerned – are obliged to consider any such comments in their decision-making process. The MoE will approve the EIA, usually with conditions, or refuse environmental authorisation. The proponent is entitled to appeal against such decision.

The Environmental Protection (Impact Assessment) Regulations are currently being enforced, in spite of capacity issues within the regulatory authority (the MoE).

To date, the legal system has not been used to defend environmental principles relating to EIA in the Seychelles, although prosecutions have been instituted for poaching, effluent discharge, littering, etc.

Emission standards

Emission standards have been published under the EPA for noise (Environment Protection [Noise Emission Standards]

Regulations, SI 49 of 1999), and effluent quality (Environment Protection [Miscellaneous] Regulations, SI 84 of 1995). No other emissions are monitored or regulated.

Institutional profile

There are several agencies involved in the administration of environmental management in the Seychelles, as listed in Table 5 (page 186–187).

The MoE is responsible for administering the EPA through a number of departments, sections and units (see Figure 9). The MoE, comprises the following:

- Administration Department
- Botanical Gardens Department
- Conservation Department
- EAPC Department, and
- Forestry Department.

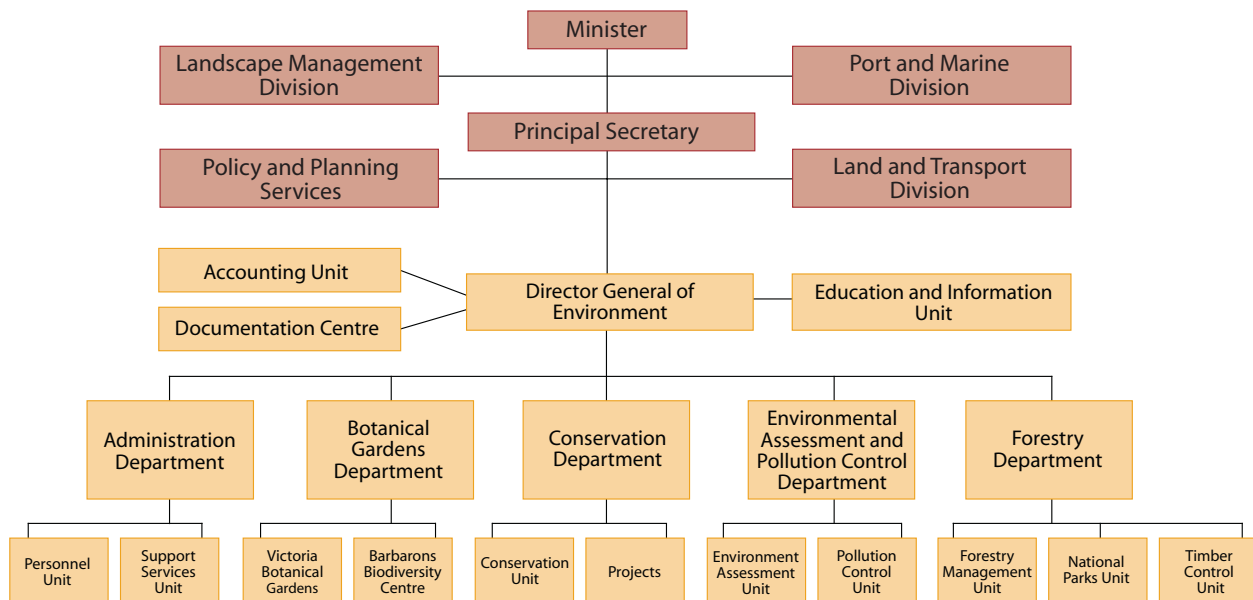
The departmental heads meet several times a week to discuss ministerial matters.

Capacity is lacking in the ministries related to the assessment and implementation of EIA and nature conservation, namely the Ministry of Land Use and Habitat, and the MoE.

Staffing and training

There are nine people in the EAPC Department: one Senior Project Officer, one Senior Inspector, five Inspectors, one Environmental Officer and one Technical Officer. The only member of the team with a qualification in EIA (a Master's Degree) is the Senior Project Officer.

Figure 9: Organisational structure of the Ministry of Environment



The EAPC Department carries out all tasks associated with the administration of the EIA Regulations (GRS 1996a). The Department is also responsible for pollution control, the control of environmental malpractice, coastal erosion monitoring, and public education with regard to environmental management issues.

Middle management within each MoE department is responsible for undertaking weekly training for the junior staff. Staff attend donor-aid-funded seminars and workshops when they are available, but there is no formal training or skills development programme for EAPC Department personnel. Generally speaking, the staffing situation is relatively stable, but when people leave a department, it is usually because of better prospects of promotion and higher remuneration.

With respect to funding, the MoE's annual budget amounts to approximately US\$5 million per annum. The funds are mainly from government sources, with some donor financing. Together, the Government and the private sector have recently

established an Environmental Trust Fund, and the money is available to any potential developer for environmental projects. However, the EAPC Department lacks funds for additional manpower and vehicles. Consequently, it suffers constraints such as insufficient time and resources to carry out its responsibilities effectively.

Monitoring

Monitoring the implementation of the recommendations in EIAs is relatively new in the Seychelles. It is, therefore, still fraught with difficulties relating to manpower and resources. Nonetheless, the entire EIA process appears to have positively affected the behaviour of developers, who now see it as more than simply a paper exercise.

One member of the EAPC Department is solely responsible for the monitoring of EIA implementation. This official visits each construction site every one or two weeks, depending on

Table 5: Principal institutions involved in environmental management

Institution	Type	Activities and responsibilities
Agriculture Division, Ministry of Agriculture and Marine Resources	Government	<ul style="list-style-type: none"> • Agricultural planning • Establishment of drainage systems
Beautification Division, Ministry of Local Government	Government	<ul style="list-style-type: none"> • Town and country beautification • Cleaning and landscaping
Cabinet, Council of Ministers	Government	<ul style="list-style-type: none"> • Executive decisions
Environment Division, Ministry of Environment	Government	<ul style="list-style-type: none"> • Environmental authorisations (right to veto development) • Pollution control • Conservation • Forestry • Parks and gardens • Information • Sensitisation • EIA focal point
Environmental Health Division, Ministry of Health	Government	<ul style="list-style-type: none"> • Public health • Provision of sanitation • Control and monitoring of ambient water
Housing Division, Ministry of Land Use and Habitat	Government	<ul style="list-style-type: none"> • Provision of low-cost housing • Establishment of drainage systems
International Relations and Economic Planning Division, Ministry of Foreign Affairs	Government	<ul style="list-style-type: none"> • Maintenance of international relations • Macroeconomic planning
Island Development Company	Parastatal	<ul style="list-style-type: none"> • Management of the outer islands
Land Transport Division, Ministry of Environment	Government	<ul style="list-style-type: none"> • Provision of roads and infrastructure • Establishment of drainage systems
Landscaping Division, Ministry of Environment	Government	<ul style="list-style-type: none"> • Town landscaping • Beautification
Marine Parks Authority	Parastatal	<ul style="list-style-type: none"> • Management of marine national parks
Meteorological Services Division and Policy Planning and Services Division, Ministry of Environment	Government	<ul style="list-style-type: none"> • Policy planning and services • Climate change • Meteorology

the sensitivity of the site. Personnel from the EAPC Department also undertake formal monitoring of development activities on Mahé on both Saturday and Sunday mornings. According to a predetermined staff roster, two officials from the EAPC Department, together with a representative from the Forestry Department, drive around either northern or southern Mahé. This official measure was undertaken because the majority of transgressions occurred over weekends.

Monitoring EIA implementation would be more effective if the quality of the construction management plans in EIA documents was improved. The plans produced generally do not contain the detail needed for developing an audit checklist, against which performance can be judged. Current monitoring is, therefore, very generic.

Recently, the MoE has focused on monitoring activities

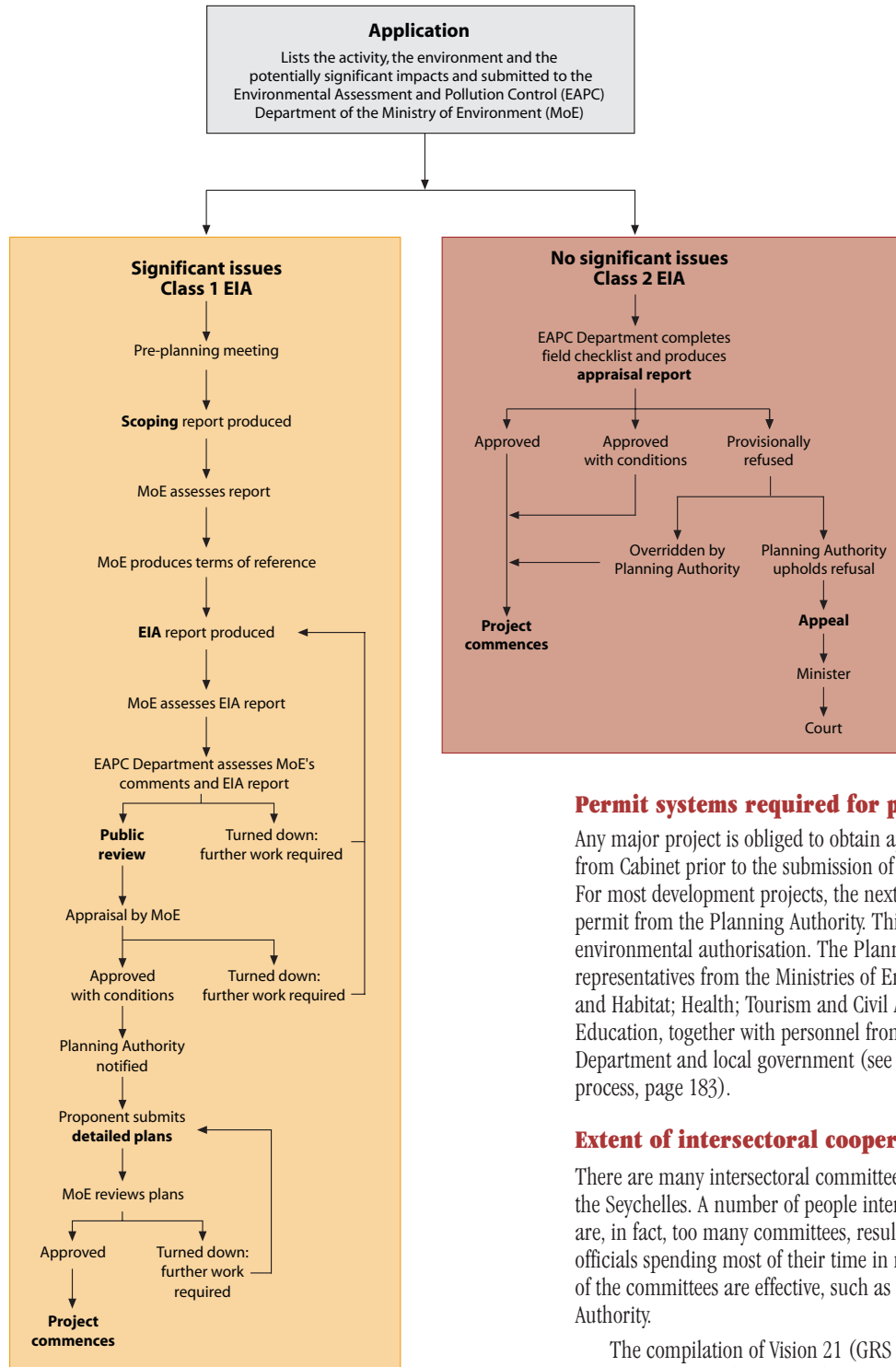
relating to environmental management. This is commendable because this is often where government departments fail to place enough emphasis. However, vehicles and petrol are extremely expensive in the Seychelles, and environmental officers do not generally have their own transport. In addition, the MoE does not have enough vehicles. Consequently, the logistics of monitoring become prohibitive – particularly on the outlying islands.

The MoE is currently discussing the possibility of devolving more responsibility to the developer, for example, placing EIA advertisements in the newspapers, monitoring effluent discharges and beach erosion, and employing a consultant to monitor the implementation of environmental management plans. EIA administration would not be outsourced, however; the Government will retain full control of this function.

Table 5: Principal institutions involved in environmental management (continued)

Institution	Type	Activities and responsibilities
National Interministerial Committee	High-level government interministerial body	Policy, and socio-economic and macroeconomic decisions
Physical Planning Division and Geographical Information Systems (GIS) Division, Ministry of Land Use and Habitat	Government	<ul style="list-style-type: none"> • Land and infrastructure • GIS • Building control • Drainage
Port and Marine Services Division, Ministry of Environment	Government	<ul style="list-style-type: none"> • Control of ship-borne waste pollution • Control of oil spills • Control of marine pollution
Public Utilities Corporation	Parastatal	<ul style="list-style-type: none"> • Water supply • Sewage treatment • Power supply
Seychelles Bureau of Standards	Parastatal	<ul style="list-style-type: none"> • Laboratory analysis • Information provision • Standards development and implementation
Seychelles Coast Guard Division, Ministry of Defence	Government	<ul style="list-style-type: none"> • Patrolling of territorial waters • Control of maritime pollution
Seychelles Fishing Authority	Parastatal	<ul style="list-style-type: none"> • Management of fisheries and aquaculture
Seychelles Island Foundation	Internationally sponsored quasi-non-governmental organisation	<ul style="list-style-type: none"> • Management of World Heritage Sites: Aldabra, Val Mer National Park
Solid Waste and Cleaning Agency	Parastatal	<ul style="list-style-type: none"> • Solid waste management • Littering abatement • Cleaning
Tourism Division, Ministry of Tourism and Civil Aviation	Government	<ul style="list-style-type: none"> • Tourism planning
Tourism Projects Appraisal Committee	Interministerial committee	<ul style="list-style-type: none"> • Tourism projects • Reports to the National Interministerial Committee
Town and Country Planning Authority	Interministerial and private-sector multi-disciplinary authority	<ul style="list-style-type: none"> • Physical planning permissions

Figure 10: The EIA process



Permit systems required for projects

Any major project is obliged to obtain approval in principle from Cabinet prior to the submission of a planning application. For most development projects, the next step is to obtain a permit from the Planning Authority. This permit includes an environmental authorisation. The Planning Authority comprises representatives from the Ministries of Environment; Land Use and Habitat; Health; Tourism and Civil Aviation; and Youth and Education, together with personnel from the PUC, the Fire Department and local government (see the section on the EIA process, page 183).

Extent of intersectoral cooperation

There are many intersectoral committees in the Government of the Seychelles. A number of people interviewed stated that there are, in fact, too many committees, resulting in government officials spending most of their time in meetings. However, some of the committees are effective, such as those of the Planning Authority.

The compilation of Vision 21 (GRS 2000c) and the 2000–2010 EMPS (GRS 2000b) involved an extensive process of consultation with different government ministries and agencies.

It is recognised that, in order that these two initiatives are successfully implemented, the various government agencies need to continue their coordination. The success of these two initiatives also requires cooperation between the public and private sectors as well as among private sector agencies, besides needing the support and involvement of civil society.

EIA practice

The legally defined EIA process has already been described above (pages 183–185). However, in reality, the process is more complex. The flow diagram (Figure 10) illustrates the path followed for Class 1 and Class 2 EIAs, from application to the granting or refusal of authorisation.

Class 2 EIAs are extremely brief and are not necessarily undertaken by personnel with specialist knowledge on the ecology of an area; however, they are a useful initial check on the sensitivity of a potential site. Class 1 EIAs are generally very comprehensive and are reviewed by several institutional bodies.

No formal records exist with regards to the number and types of EIAs that have been submitted to the EAPC Department for approval over the past ten years. It is nonetheless well known that the majority have been tourist developments.

EIAs submitted since the promulgation of the EIA Regulations

The quality of EIAs submitted to the MoE is highly variable, and there appears to be no trend to an improvement in quality over time. The MoE produces detailed terms of reference for each project, and requires that a scoping assessment is undertaken first. The MoE also specifies the potentially affected parties to be contacted. However, these terms of reference appear to be ignored in many of the EIAs, and are even dismissed in some reports as being ‘too detailed’ for the project concerned.

A senior government official had undertaken several of the reports examined for this study. These reports illustrated an understanding of the issues involved, and seemed to present a fair assessment of the situation. Some of the other locally produced reports lacked any understanding of either the purpose of EIA or the required process. Moreover, of the several reports produced by international consultants, these usually reflected issues prominent in their country of origin.

Alternatives with respect to locations and alternative technologies for proposals are, in general, not adequately assessed in the EIAs, in spite of the terms of reference including a requirement for alternatives to be assessed.

Baseline data

The level of baseline data collected for EIAs was extremely variable, with some studies making comments such as ‘Forestry Services will undertake a detailed vegetation survey prior to commencement of construction’ (Ove Arup 2000). For example, certain studies focus on offshore conditions (bathymetry) whilst

ignoring vegetation almost completely – even if it could potentially be an environmental issue.

It would appear that very little biophysical data is readily available in report form in the Seychelles. For this reason, consultants are obliged to collect all the data for the purposes of an EIA study, which is possibly prohibitive in terms of costs for some proponents. In other cases, the evident lack of understanding of the issues concerned means the important parameters cannot be defined.

Hydrology, flood lines and – particularly – storm-water control are rarely dealt with in detail in the EIA reports, but evidence around the islands would suggest that these issues should be considered due to the nature of the rainfall (constituting heavy falls of short duration) and the topography of the area.

Soil erosion, exacerbated by the extremely steep terrain of many development areas, is a significant problem in the Seychelles. Nonetheless, soil types, soil productivity and soil erodibility factors are rarely considered in EIA reports. Moreover, specific methodologies to manage erosion problems do not seem to have been given enough consideration for specific projects.

Socio-economic, historical and cultural data are generally scant in the reports, and very little attention is given to potential impacts in these fields.

Public participation

The MoE defines the scoping process necessary for each EIA. Although government departments are generally extensively scoped, the involvement of civil society is rarely a requirement, except when the EIA is presented for public comment. Furthermore, there is no call for educating the public within an EIA project to enable them to contribute meaningfully to the project.

Impact assessment

Very few of the reports reviewed described a process by means of which potential environmental impacts were assessed. No mention is made of the extent, duration, severity, or receptor sensitivity for particular impacts. As a result, the quantification of significance of the impacts is rarely undertaken.

Most of the reports did not contain a summary table of impacts or receptors, and they did not consider the different phases of development (planning, construction, operation and closure).

Environmental management plans

Most of the reports reviewed provided for the mitigation of identified impacts. However, very few provided a detailed description of proposed project activities, their potential impact, and specific avoidance or management of impacts. Moreover, environmental management plans tend to be generic at best. This complicates the design of a monitoring plan because there is no basis upon which to audit a site. In fact, monitoring plans, programmes and checklists were found in very few of the documents reviewed.

Extent of public participation

The only mention of public involvement in the EIA Regulations is the two-week public review period for the final EIA report (Class 1 EIAs only). There is no mention of public participation in the EIA guideline documents prepared by the MoE, but the standard terms of reference prepared by the EAPC Department states the following:

In preparing the EIA, the applicant/consultant should consult affected and interest groups. The EIA should detail any public comment sought from and any consultation conducted with any affected groups (e.g. community, environmental, industry) in developing the proposal and preparing the EIA. Early consultation is beneficial in helping to ensure that a development will cause a minimum of undesirable effects and in reducing delays in the latter stages of planning and design. In relation to this EIA, the following referral agencies should be contacted during the preparation of the EIA: ...

Listings provided in the majority of EIA terms of reference comprise government agencies and parastatals such as the PUC. In fact, reference to civil society and NGOs was found in only one terms of reference document. Consequently, the majority of EIAs do not contain any true public participation.

With regard to public review of the final EIA report, the following deficiencies have been identified:

- The two-week period is too short.
- People do not understand the process and, therefore, are not motivated to become involved.
- People often do not notice the advertisements in the newspapers notifying them of the final EIA report's availability.
- The final EIA report is only available at the Botanical Gardens in Victoria between 08:00 and 15:00, Monday to Friday, although if the project concerned is on another island, it will be available there as well.
- The EIA final report is finalised prior to any public involvement.



Steep slopes and high rainfall contribute to soil erosion.

WSP Mainstay

- There is no feedback to the public on the impact of their comments. They assume, therefore, that no cognisance was taken of their concerns.
- Because people are not empowered to comment on technical reports, they feel intimidated to do so.
- People are afraid to speak out against Government, whom they consider as the ultimate authority (the projects are perceived to be a government *fait accompli*).
- NGOs lack capacity to become involved. NGO effectiveness is further reduced by the *locus standi* provisions in the EPA, which are weak.
- There also appears to be no feedback to the agencies consulted. They are not asked to comment on the draft document and, therefore, are unable to judge whether their concerns have been incorporated into project planning.

Media coverage of environmental issues

There are four main newspapers in the Seychelles. Two of these are government-controlled (*The Nation* and *Seychelles People*), while two are produced by the opposition party (*Regar* and *Vision*).

There is significant environmental coverage in all the papers, with *The Nation* providing a large environmental section every Monday. However, although the reporting in *The Nation* is relatively objective, it is highly unlikely that they would publish anything contentious: the focus is on good news. The opposition papers are often critical of the Government's activities with regard to environmental management, which perhaps also does not present a balanced view of the issues.

The Seychelles has one TV station, which, together with the two radio stations, is government-owned. These media provide extensive environmental coverage. For example, 'Planet Seychelles', an environmental programme, has a weekly TV slot.

Although the amount of coverage the media grants to environmental issues in general is more than adequate, perhaps the nature of the exposure should change. For example, there needs to be more discussion of environmental issues, and the media could be instrumental in encouraging this.

Quality assurance process

The MoE prepares the terms of reference for EIA reports. Therefore, it has a benchmark against which to judge the reports when they are submitted. The MoE's four technical departments review the reports, while other government agencies or private bodies can be called in for additional evaluation if necessary. Finally, the Planning Authority, with whom the ultimate decision rests, comprises technical experts from several different government agencies, providing further expertise to the process of EIA review.

Unfortunately, as stated previously, the public review process is not well supported. For example, there is no follow-up with the agencies consulted with regard to whether they accept the EIA. Also, the EAPC Department has a lack of resources, which may result in insufficient time to study a report in detail.

Accrediting of EIA practitioners

The Seychelles has no system of practitioner accreditation. Although the MoE recognises the need for such a system, there are concerns about the logistics of the process.

At present, the MoE possesses a list of consultants who have previously undertaken work in the country, although there is no system of approving or recommending particular practitioners. Judging from the variation in the quality of EIA reports available for the Seychelles, there are both qualified and experienced practitioners, as well as people who have no technical expertise or experience undertaking EIAs.

Training courses

There are no formal environmental training courses available in the Seychelles. Nonetheless, there is a strong focus on environmental education, with schools and the hotel and maritime colleges incorporating environmental issues into their curricula. Both the MoE and the Ministry of Education produce a great deal of environmental education material.

Local vs. expatriate consultants

The majority of larger EIAs appear to have been undertaken by foreign consultants. This is often due to the fact that outside developers will employ consultants that their companies usually use. Of the EIAs reviewed, 40% were undertaken by foreign consultants (British, French and South African), local consultants undertook 40%, and 20% were undertaken by a local senior government official.

EIA funding

In the case of Class 1 EIAs (significant issues and/or impacts), the proponent is responsible for the costs of compiling the EIA. The MoE executes Class 2 EIAs (less significant issues and/or impacts) on the proponent's behalf, reviews the EIA, and carries out environmental monitoring at the Government's expense.

EIA review

There is no defined process for EIA review other than the standard practices adopted by the EAPC Department. In the process of EIA review, the technical personnel of the Botanical Gardens, Conservation, Forestry and EAPC Departments also consider the following aspects, amongst others:

- Has prominence been given to relevant issues?
- Does the information identify and address the main concerns of the interested parties?
- Is the information factually correct?
- Are the assessment methodologies consistent with internationally accepted methods?
- Is the identification and description of impacts complete?
- Have alternatives been adequately considered?
- Has the EIA addressed the need for monitoring and auditing?
- Does the EIA include environmental requirements and mitigation measures that the applicant is prepared to implement?

The reviewing officials need to be satisfied that each of the

above questions – as well as others posed – have been addressed. If not, reasons need to be given for not regarding the information given as satisfactory.

EIA reports are not subjected to external review, although the MoE recognises that this may be appropriate in certain instances. The National Environmental Advisory Committee could carry out this role; alternatively, a separate technical review body should be established.

Cost and time of EIAs

Although no time limit is imposed on the completion of an EIA, the MoE often recommends that a full season's data is collected for the study. With regard to costs, expenditure on EIAs ranges from US\$10,000 to approximately US\$70,000 (Nirmal Shah, pers. comm. 2002).

Incorporating EIAs into decision-making

Section 10 of the Town and Country Planning Act, which deals with exemption from EIA compliance, is used less frequently than in the past. However, the Planning Authority may still choose to ignore the recommendations of the MoE and authorise planning to go ahead despite a lack of an environmental authorisation.

There is recognition within the MoE that environmental authorisation is not being sought early enough in the development process. An applicant has often already started clearing the development site before MoE personnel visit it to assess the need for an EIA, significantly reducing the effectiveness of the EIA process.

Larger projects are obliged to obtain permission in principle from Cabinet prior to the relevant planning and environmental applications being submitted. However, certain projects have such strong support at a high political level that an EIA is unlikely to significantly affect the outcome of the application.

Overall, the decision-making process within the MoE is effective, as it involves senior personnel from all the different departments. The principal flaw in the process, however, is that the public and NGOs are unable to truly influence the decision



Alien vegetation poses a threat to indigenous species. This mountain forest clearly shows infestation of *Albizia* in the drainage channels.

made. Because of this lack of involvement on an ongoing basis, by the time the public and NGOs discover the outcome, it is much more difficult for them to influence the decision so they are obliged to submit a formal appeal.

EIAs evolving into EMPs

The standard terms of reference prepared for EIA consultants usually require the consideration of an environmental management plan (EMP), as well as environmental monitoring and reporting. However, the EIAs reviewed did not contain the necessary detailed EMPs for the construction, operation and closure of projects concerned. Some of the reports recommended that detailed EMPs be prepared, but the recommendation was not implemented.

EPA does not make specific reference to EMPs, but requires that an EIA should include the following:

any actions or measures which may avoid, prevent, change, mitigate or remedy the likely effects of the activity or the project on the environment[,]

(Section 15(3)(e))

and

the actions or measures proposed for compensating physically or financially for any resulting loss or damage to the environment.

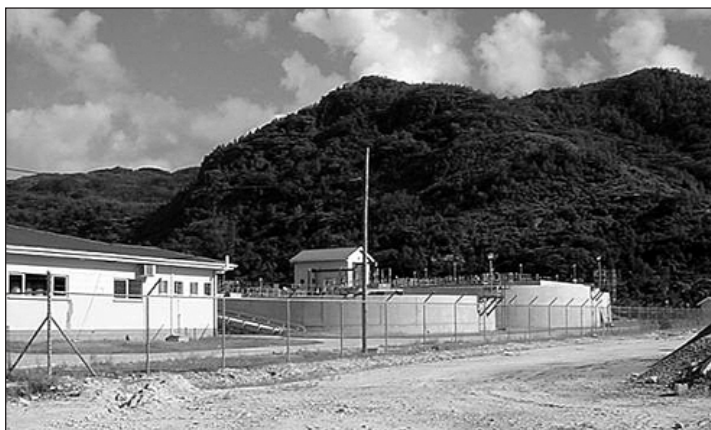
(Section 15(3)(h))

EMPs are required for certain donor-funded projects. The Banyan Tree Resort, for example, had an operational EMP, based on the provisions of ISO³ 14001.

Key successes and challenges

There has been a significant move forward in environmental awareness in the Seychelles, particularly in EIA, in the last decade. The main initiatives taken include –

- the creation of a ministry catering solely for the environment
- the inclusion of strong environmental commitment in the



Limited freshwater resources pose a major challenge in the pursuit of sustainable development.

WSP Wainstay

- Constitution
- the revision of environmental legislation, resulting in –
 - the promulgation of the Environment Protection Act and EIA Regulations
 - the strengthening of legislation surrounding toxic and hazardous substances
 - the promulgation of the Pesticides Control Act
 - the amendment of the Wild Animals (Turtles) Protection Regulations
 - the development of the Plant Protection Act
 - the amendment of the Coco de Mer Management Decree and the Breadfruit and Other Trees (Protection) Act, and
 - the creation of the Marine Parks Authority and the Solid Waste and Cleaning Agency
- the creation of the Liaison Unit of Non-governmental Organisations of Seychelles to coordinate and assist non-governmental organisation (NGO) activity in the Seychelles
- the appointment of a graduate in environmental management to the post of Senior Project Officer for the Environmental Assessment and Pollution Control (EAPC) Department
- reduced political interference in environmental issues as a result of the move to a multi-party democracy
- the development of the various national documents on the environment (e.g. the two EMPs (GRS 1990a and 2000b) and the Seychelles Biodiversity Strategy and Action Plan (GRS 1997))
- the development of EIA guidelines (GRS 1996a) for a range of development sectors, providing useful information for both the private and public sectors
- increased awareness amongst developers and government agencies with regard to EIA
- the involvement of stakeholders in the 2000–2010 EMPs (GRS 2000b) and Vision 21 (GRS 2000c) documents
- the development and successful implementation of the EIA Regulations and some emission standards
- progression within the EAPC Department towards more effective monitoring of developments in spite of limited capacity
- the compilation of the environmental sensitivity atlas (GRS 1996b) for the Seychelles
- the high profile of the environment in the media and schools, and
- the successful completion of the majority of projects in the 1990–2000 EMP (GRS 1990a).

Several areas where opportunities exist to improve the effectiveness of EIA include the following:

General

- Develop a national environmental policy
- Compile a detailed biophysical database for the islands, and produce maps and associated literature
- Finalise the zoning planning exercise commenced by the Town and Country Planning Authority
- Create a precedent of information-sharing within and

³ International Organisation for Standardisation.

- amongst government agencies
- Sensitise developers to the need to undertake studies prior to any on-site activities
- Stress the potential cost-saving aspects of sound environmental management
- Update the Town and Country Planning Act to facilitate coordination with the Environment Protection Act
- Develop more formal environmental training locally for government personnel, private practitioners and the public
- Improve the level of interaction between the Ministry of Environment and other government agencies (e.g. the Chamber of Commerce)
- Rationalise the number of government committees currently active and focus on the most effective
- Introduce some form of accreditation for consultants, particularly with regard to their competence and independence
- Increase the proponent's responsibility in terms of EIA costs, implementation, and monitoring
- Encourage environmental discussions on contentious issues
- Ensure that the National Environmental Advisory Commission becomes more effective
- Develop enabling legislation to honour commitments made with respect to international conventions, and
- Develop more ecotourism resorts in preference to the ecologically expensive five-star beach hotels.

The Government of the Seychelles does not have sufficient funds to undertake the majority of the projects defined in the 2000–2010 EMP (GRS 2000b), and the reduction in donor funding because of increased GDP has resulted in significant economic barriers to sustainable development.

EIA process-specific

- Include scoping into Class 2 EIAs (currently a decision is based on a site visit by personnel who are not always properly qualified to carry out an assessment)
- Define time frames for the compilation of EIAs
- Generate locally-specific terms of reference
- Ensure that alternatives and sustainability are addressed in detail in the EIA reports
- Formalise the external review process
- Build the capacity of NGOs and civil society with regard to the EIA process
- Amend the EIA process to more fully involve civil society and provide feedback to all stakeholders prior to report finalisation
- Impose stricter standards with regard to the quality and detail in environmental management plans, i.e. focus the

- process on information and solutions, not technical data
- Formalise the auditing procedure for each development both during and after construction, e.g. monitoring reports should include a checklist to confirm that requirements from the previous visit have been complied with
- Review the EIA Regulations in respect of time frames provided for eliciting comment by Government, and
- Increase capacity – personnel, training and equipment – within the EAPC Department.

Conclusion

The effective management of the Seychelles environment is imperative to its economic survival. As the population increases in size and society demands a higher standard of living, with a commodity-driven lifestyle, pressure on the environment is increasing.

The Seychelles lacks the land surface area to provide needed infrastructure and services, particularly those associated with five-star hotel accommodation, and this results in pressure on the natural resources of the islands.

The environmental legal system in the Seychelles is fairly well developed, with a strong Constitutional commitment to environmental management. The Environment Protection Act and its various Regulations, including the EIA Regulations, are comprehensive, but there is a lack of capacity to implement the provisions effectively. Nonetheless, implementation of the EIA Regulations is improving, with regular changes being made in the process and activities of the Environmental Assessment and Pollution Control (EAPC) Department to increase efficiency.

The major shortfalls in the current process are the lack of involvement of civil society (for a variety of reasons), variability in the quality of EIA reports, no system of external review, and the inadequacy of the level of information relating to project activities and environmental mitigation in the environmental management plans submitted as part of the EIA process.

There is no doubt that the EAPC Department's activities with regard to EIA are affecting the manner in which development is taking place, and has increased awareness among developers to environmental issues. It is imperative that the EIA process continues to obtain high-level governmental support as well as cooperation from all government agencies if the Seychelles intends to live up to its promotional title – 'as pure as it gets'.

Appendix 1: Case studies

Banyan Tree Beach Resort

The Banyan Tree Beach Resort Project is the first phase of a Development Master Plan submitted to the Seychelles authorities following a Land Transfer Agreement signed in 1997.

The development proposal assessed in the EIA comprises the construction of a five-star hotel complex with –

- 100 guest rooms, distributed in 22 beach villas, 68 hill chalets, and 10 two-bedroom chalets
- a 100-cover restaurant and associated kitchen
- a sewerage collector network and sewage treatment plant
- a spa
- car parking facilities
- a reverse osmosis desalination plant for water supply, and
- a 2-MVA diesel-powered power plant for electricity supply

The proposed development is at Anse Intendance on Mahé. The site comprises 12 ha of wetland, together with relatively undisturbed beach and hillside environments. The Pointe du Reduit, which lies to the north of the site, is classified as a protected area with the status of 'remarkable natural landscape' (GRS 1996b) whilst the Anse Intendance, together with a zone extending 100 m inland from the high water mark, is classified as an ecologically sensitive area. The beach is one of the 34 main reproduction sites in the Seychelles for the marine turtle, with both the hawksbill and green turtles encountered there as well. The local residents also frequent the beach for recreation.

Banyan Tree Hotels and Resorts, an international hotel group, proposed the project with the aim of creating additional five-star accommodation on the Seychelles. The site was chosen by the developer due to its pristine environment suited to the development of an exclusive, high-quality establishment. No alternatives were considered.

Key impacts that were associated with the proposed development included the following:

- Modification of the landscape (cut-and-fill activities)
- Increased potential for erosion, particularly on the steeper slopes
- Modification of the natural drainage pattern of the site
- Loss of vegetation due to clearing activities
- Loss of beach access for local residents
- Impingement on public property; and
- Disturbance of trees planted by the contestants of the 1997/98 Miss World Beauty Pageant and the children of the Seychelles as part of the Coastal Management Programme.

Project planning was undertaken in accordance with a 'least disturbance' philosophy.

The EIA process

- Permission in principle was obtained from Cabinet.
- An environmental application was lodged with the Ministry of Environment (MoE).
- MoE personnel visited the site.
- MoE officials met with the proponent.
- The proponent appointed EIA consultants.
- A pre-scoping meeting was held with MoE personnel, the EIA consultants and the proponent.

- Government departments were consulted as required, and a scoping report was completed and submitted to the MoE.
- The MoE approved the scoping report and prepared terms of reference for the EIA.
- An EIA study was undertaken and submitted to the MoE.
- The EIA was approved for public review.
- The EIA was presented for public comment in the MoE library for two weeks.
- No comments were received.
- The EIA was conditionally approved by the MoE.

Key issues

During the scoping process, several issues emerged as common concerns amongst those consulted (predominantly government officials). The issues raised were as follows:

- Wildlife conservation, particularly with regard to the hawksbill turtle, endemic beetle species in the wetlands and the land tortoise
- The Coastal Reforestation Programme (with particular reference to the Miss World trees)
- Preservation of endemic flora
- Effluent disposal
- Designations in terms of the Seychelles environmental sensitivity atlas (GRS 1996b)
- Sensitivity of the marine environment
- Regional hydrology, and
- Water and power supply.

Civil society participation

There was no public or non-governmental organisation involvement in the project.

The issues raised by government officials with regard to the scoping report were addressed in the EIA report, but the report does not indicate whether this was as a result of the scoping process, or whether the issues had previously been identified by the project team.

Availability and free flow of information

The EIA process was initiated by way of a scoping meeting with personnel from the MoE's Environmental Assessment and Pollution Control (EAPC) Department, who identified the relevant government officials to be contacted in the process. The latter individuals were presented with information on the project, and subsequently had to sign so-called scoping verification forms. These forms serve to verify that the issues presented on the form accurately reflect the assessors' comments. No further liaison appears to have taken place with these individuals.

The EIA report, used by the EAPC Department to assess the proposal, contained detailed information on the project proposal, the biophysical environment and potential impacts. This was lodged for public comment for two weeks in the library at the Botanical Gardens in Victoria.

Proponent response/involvement

The proponent was present at the meetings with the MoE, but does not appear to have been integrally involved in the production of the EIA.

The process of EIA review

The EIA was reviewed by senior personnel from all MoE departments and was deemed acceptable.

The decision-making process

Based on information provided in the EIA, as well as on the comments received from the parties consulted and from the technical personnel within the Ministry, a decision was reached by MoE personnel to the effect that the project was acceptable from an environmental perspective. The decision rested on the fact that every effort would be made to reduce the potentially significant environmental impacts associated with the development. However, a detailed environmental management plan for the site was not produced.

EIA influence in the process

The environmental authorisation that was issued contained certain conditions that the proponent was obliged to meet. These included the following:

- The Department of Forestry was to undertake a survey of the vegetation on site prior to any clearing activities being undertaken.
- The sediment tanks on the beach were to be camouflaged.
- There was to be minimal disturbance on the dunes.
- The beach wells were not to be exposed.
- Effluent quality was to comply with the discharge limits specified.
- The developer was to take action if any adverse impacts occurred on the beach.
- The water balance and water quality in the wetland areas were to be monitored.
- The Miss World trees were not to be disturbed.

Implementation of the EIA

Personnel from the EAPC Department have monitored the site on a weekly basis since construction began. In addition, the Forestry Department visited the site during construction to identify sensitive trees, and the resultant development is not visually intrusive from the beach.

However, the EAPC Department has had a little difficulty with the developer's compliance with the conditions of the environmental authorisation. Contraventions have included the following:

- The sewage treatment plant was constructed to only carry out primary treatment, whereas the EIA specifically stated 'tertiary'.
- Rubbish was dumped in the wetlands on an ongoing basis over a period of more than seven months, until the EAPC Department threatened legal action.
- The developer commenced construction of a fence along the beach without authorisation from the MoE.
- Tanks were not camouflaged as required.
- Machinery was used on the sand dunes.
- General housekeeping was poor throughout construction.

The most recent visit to the site, with construction almost complete, indicated that although the beach side of the development was tidy, wells were exposed on the beach and the contractor's area was untidy. There were also several containers in the public car park, reducing the amount of parking available for beachgoers.

Conclusion

Although the compilation and implementation of the EIA reduced the potential environmental impact of the development, there are clearly still factors – usually relating to time and money – that affect developers' or contractors' enthusiasm in complying with stringent environmental controls.

Key lessons learnt

- The public should have been more involved in the EIA process. They could then have acted as environmental watchdogs for the Environmental Assessment and Pollution Control (EAPC) Department during the project's construction phase.
- There was insufficient communication with the developer/contractor with regard to the conditions imposed in the EIA.
- The EAPC Department needs an effective tool to ensure compliance with its conditions.
- A detailed work programme and construction management plan should have been compiled to facilitate the EAPC Department's monitoring.
- Provision should be made for a post-construction audit to ensure, for example, that the contractor's area is adequately rehabilitated and containers are removed.



Banyan Tree Resort

St Anne Resort Development

Indian Ocean Resorts, in association with Beachcomber (Mauritius), presented a Master Plan for the Island of St Anne to the President of the Republic in August 2000. The Master Plan comprised proposals for a marina, a marina village, hillside chalets, a five-star hotel and a golf course. St Anne lies 5.5 km off the eastern coast of Mahé, and forms part of a designated Marine Park (i.e. the St Anne Marine Park (Designation) Order, SI 21 of 1973).

Consultants were commissioned to undertake an EIA for the construction of the hotel, which represents the first phase of the development. The hotel construction will require the removal of certain existing infrastructure on the site, namely diesel storage tanks and associated structures, and the rehabilitation of a disused landfill area, which activities are considered part of the EIA.

Activities undertaken as part of the hotel development (in addition to the abovementioned infrastructure removal and landfill rehabilitation) include –

- scarifying, cleaning and deepening of the reef flat in Anse Mare Jupe, which constitutes deepening the proposed bathing area
- construction of 84 guest rooms, comprising 1 presidential suite, 5 executive bedroom suites, 58 one-bedroom bungalows and 10 two-bedroom bungalows, and
- construction of restaurant facilities, a sewerage collection network and sewage treatment plant, a health club, a reverse osmosis desalination plant, a 1-MVA diesel-powered electricity standby plant, and all associated infrastructure such as staff housing.

The proponent's EIA presented the construction of an incinerator for waste disposal. This idea was rejected by the Environmental Assessment and Pollution Control (EAPC) Department, but later reinstated after the proponent lobbied Government. A scoping study was then undertaken and a Class 1 EIA conducted for the project.

The project site occupies approximately 40 ha of relatively level land on the south-western tip of the island. The island has been significantly altered by past anthropogenic activities such as a diesel tank farm, a whaling station, and cotton cultivation, so very little of the original vegetation remains. Only the employees of the Marine Park and their families currently occupy the island.

The main potential issues associated with the development included –

- activities affecting or controlled within the Marine Park
- the presence of protected Coco de Mer trees and possibly turtle breeding areas
- the proximity of wetlands, which are currently highly degraded
- the scarifying of the seabed, and
- the potential for pollution during the construction and operation of the hotel.

The removal and disposal of the defunct fuel storage tanks on the site required careful planning in order to avoid significant environmental impacts.

The EIA process

- Permission in principle was obtained from Cabinet.
- An environmental application was lodged with the Ministry of Environment (MoE).
- MoE personnel visited the site.
- MoE officials met with the proponent.
- The proponent appointed EIA consultants.
- The EIA study was undertaken and submitted to the MoE.
- The EIA was approved for public review.

- The EIA was presented for public comment in the MoE library for two weeks.
- Objections were received from one member of the public and a senior member of the Marine Parks Authority.
- The MoE conditionally approved the EIA.

It should be noted that the EIA consultants did not comply with the scoping provisions of the EIA Regulations, and used the terms of reference from a previous project. This resulted in the issues relating to the Marine Park not being adequately addressed.

Key issues

The scoping process involved only the MoE, the Ministry of Transport and the Public Utilities Corporation. Key areas of concern raised during this process related mainly to the status of the site as a Marine Park, the supply of water and power to the site, the disposal of wastes (solid and effluent), and the dredging of the seabed. The issue of 'setback' (the distance of structures from the high water mark) was also raised.

The demolition and removal of the fuel storage tanks from the site was a potentially significant issue and was dealt with in detail in the EIA report. The visual impact of the development was also considered, together with noise and light pollution, but they were all deemed to be insignificant, although no sense of what constituted 'significant' was provided in the report. The predicted nitrous oxide emissions from the power plant were found to exceed World Bank standards, and recommendations were made in the report to place bag filters on the stack.

The general effluent emission standards (GRS 1996a) were applied to the design of the sewage treatment works, but no special provision was made for the site's Marine Park status.

Further advice was to be sought with regard to the avoidance of impacts on the turtle population on and around the site prior to the commencement of construction activities.

One of the positive aspects was that the development would create jobs.

Civil society participation

The EIA report was lodged at the Botanical Gardens for two weeks, and comments were received from two people. The issues raised included –

- loss of access to the island for local people for education and recreation
- lack of detail on historical and cultural issues
- the principle of sustainability of five-star hotel developments
- legality of the lease (although the lease was not presented in the EIA report)
- factual inaccuracies in the report
- the impacts on the local population were not considered
- rejection of the scarifying proposal, since it was not permitted in terms of the site's Marine Park status, and
- lack of interaction with the consultant during the scoping process.

The MoE requested additional information on the historical and cultural issues on the island in particular, but the project proposal was not changed to reflect any of these concerns.

Availability and free flow of information

Although the proponent supplied information on the project, it appeared that the EIA was undertaken with insufficient interaction with the

developer, as several of the management provisions proved not to be feasible once construction commenced.

Proponent response/involvement

The proponent was involved in the EIA process, although the MoE's recommendations (e.g. the one concerning the incinerator for waste disposal) were not always accepted.

The process of EIA review

The EIA was reviewed by senior personnel from all MoE departments and was deemed to be lacking in important information. The EIA was approved on condition that the additional information requested by MoE was supplied.

The decision-making process

Based on the information provided in the EIA, the additional information received, comments received from the parties consulted, and comments from the MoE's technical staff, the MoE decided that the project was acceptable from an environmental perspective.

EIA influence in the process

Site occupation by way of some site-clearance activities, the storage of materials, and infrastructure modifications had already taken place prior to the EIA being reviewed or approved. Certain conditions were set for EIA approval, including a request for further information on –

- the historical and cultural status of the island
- options for waste disposal, as opposed to the proposed incinerator
- how the development would be prevented from impacting on the turtles
- the methods and site for off-loading construction materials
- potentially affected vegetation
- the technical aspects of the beach re-profiling exercise, and
- an environmental management plan, with provision for monitoring and auditing of the development.

The requested information was received shortly after the approval was granted. Other conditions of approval included –

- notifying the Environmental Health Section of the Ministry of Health of all herbicides and insecticides used in the rehabilitation of the wetlands
- obtaining the EAPC Department's approval for the location of boreholes and discharge points for desalination plant effluents
- not using beach sand in construction
- employing trained personnel for the operation of the sewage treatment plant, the desalination works, and the power-generation plant, and providing testing facilities on site
- providing a plan for the management of all containers transported to the island, and
- involving MoE officers in all monitoring exercises.

Implementation of the EIA

The MoE sent a letter to the project proponent, highlighting the key aspects of the management recommendations provided in the EIA. The letter recommended a meeting between department employees, the proponent, and the various site managers and supervisors, in order to clarify the issues presented. The requested meeting was held on 23 August 2001, with the proponent, members of the EAPC Department, the project manager and the architect in attendance.

After key management and other issues had been discussed, it was determined that the contractor would be unable to comply with certain provisions in the EIA, e.g. working hours (due to the access difficulties for delivery of materials to the island) and off-site plant maintenance (due to

the location of the site on a small island). It was agreed that the amendment of these requirements was to be motivated to the MoE and authorisation granted for the amendments.

Where compliance with certain provisions was under way, e.g. the requirement for diesel tank sludges to be analysed and dumping sites to be identified, these were reported and MoE approval was granted or applied for where necessary.

The EAPC Department currently monitors the site every week and specific queries are dealt with on an ongoing basis. Problems have arisen in relation to the disturbance of local residents, the lack of ablution facilities for workers, work undertaken in the sea without due authorisation, and beach erosion severely reducing the approved 'setback' distance. In addition, emergency stabilisation has had to be undertaken.

Conclusion

The EIA process was contentious due to the site's location in a proclaimed Marine Park. More cognisance should perhaps have been taken of the comments from the Marine Park Authority (who raised issues relating to local residents and beach erosion and 'setback'). The option of not proceeding with the development was not considered as the project had high-level political support, and certain provisions, which would have reduced the impact of the project significantly, were not given sufficient attention in the decision-making and authorisation process.

Nonetheless, the compilation of the EIA and ongoing monitoring of the site have assisted with sensitising the proponent and contractor to the conservation of the environment.

Key lessons learnt

- The project initiation meeting between the Environmental Assessment and Pollution Control Department, the proponent and the developer was invaluable in terms of raising awareness of environmental requirements and assisting ongoing communication and cooperation.
- A detailed construction management plan – and, preferably, an operational management plan – should have been required as part of the EIA.
- The EIA consultant should have discussed mitigation recommendations with the proponent and contractor prior to finalising the construction management plan.
- The views of interested and affected parties should have been afforded higher status in the decision-making process.
- The Government needs to publicise, possibly in a policy document, its views on incineration as a waste-disposal option.



St Anne Resort – the new buildings and the temporary beach-protection structure

Appendix 2: Useful contacts

Key government officials dealing with EIA

Contact	Ministry	Address	Telephone	Fax	e-mail
J Rath	Ministry of Environment	PO Box 445, Victoria	(+248) 224644	(+248) 224500	eapc@seychelles.net

Key NGOs and community-based organisations (CBOs) dealing with EIA

NGO/CBO	Contact	Telephone
Association of Seychellois Craftsmen	Jenny Ah-kong	(+248) 372029
Association of Small Businesses	Walter Labrosse	(+248) 344517
Birdlife Seychelles	Nirmal Jivan Shah	(+248) 225097
Centre of Rights and Development	Hathew Servina	(+248) 225529
HIV and AIDS Support Organisation	Justin Freminot	(+248) 514997
International Friendship League	Marie-Nella Azenia	(+248) 321333
Liaison Unit of Non-governmental Organisations of Seychelles	N Shah	(+248) 225097
Seychelles Island Foundation	Lindsay Chung-Seng	(+248) 324884
Seychelles Press Association	Linda Rosalie	(+248) 224161
Seychelles Society for the Prevention of Cruelty to Animals	Nancy Plumbley	(+248) 224059
The Nature Protection Trust of Seychelles	Pat Mathiot	(+248) 224161
The Praslin Farmers' Association	Jeannot Patti	(+248) 233840
Val D'endorre Farmers' Association	Juliana Brutus	(+248) 361179
Wildlife Club of Seychelles	Terence Vel	(+248) 225097

Useful websites

ATLAS (Seychelles) Ltd (Internet Service Provider)
Official website of the Republic of Seychelles

<http://www.seychelles.net/>

<http://www.virtualseychelles.sc/>

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Acknowledgements

We would like to thank several people for their assistance during the compilation of this report. They are Mr J Rath (the EAPC Department) for the time he spent patiently answering our endless questions and providing the many documents we requested, Mr N Shah (ENVIRO) for information provided in press reports and during our interview with him as part of the process, Mrs P Baquero (Ministry of Land Use and Habitat) for her insights into the relationships between planning and the environmental processes, as well as Mr P de Commarmond from the EAPC Department, Mr P Louis Marie from the Forestry Department and Mr B Ramshaye (Project Manager for the St Anne's development) for their help. We wish them all every success with the continued care of the Seychelles environment.