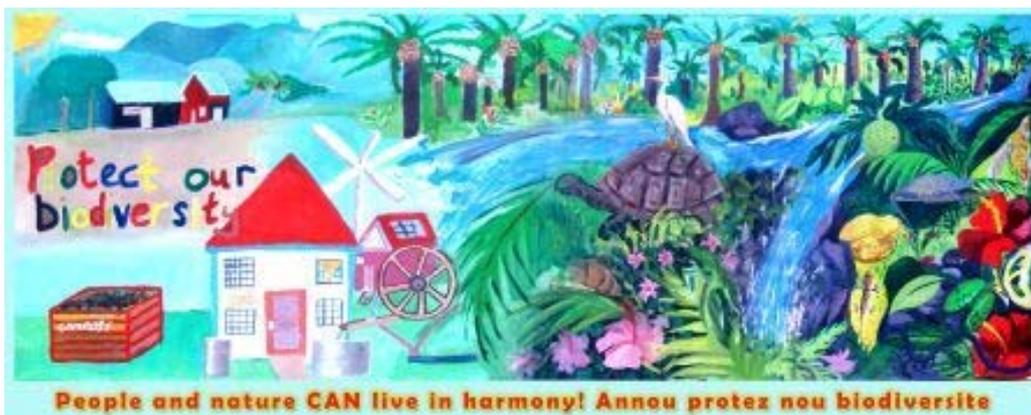


# National Assessment Report Republic of Seychelles (2004-2009)

5-Year Review of Progress Made in Addressing Vulnerabilities of SIDS through  
Implementation of the Mauritius Strategy for Further Implementation (MSI)  
of the Barbados Programme of Action (BPOA)



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February, 2010

**Republic of Seychelles**  
**National Assessment Report - Mauritius Strategy for Implementation +5**

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## EXECUTIVE SUMMARY

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Development in the small island state of Seychelles is guided by a vision informed by the ideals of economic growth, social justice and equality and environmental conservation: the pillars of sustainable development. Compared to many other small island states, Seychelles has achieved much in terms of the environment and social welfare. However, due to a combination of internal economic imbalances and vulnerability to changes in the global economic situation Seychelles has become one of the most indebted small countries in the world.

In attempt to rectify economic imbalances, and safeguard social and environmental gains, the country has over the last five years embarked on an ambitious economic reform programme. In 2008, the International Monetary Fund was invited to help guide and assist with this reform programme, and by all accounts the reforms appear to be on track.

Seychelles socio-economic situation has changed somewhat since the BPOA +10 report, partly as a result of this economic reform program. The cost of living has increased while salary increases trail behind. Issues such as energy security, climate change and food security now feature high on the public agenda. New challenges have arisen, such as piracy in the Western Indian Ocean, and an increase in hard drug use and trafficking. Other issues remain an ongoing challenge for Seychelles, such as the shortage of skilled human resources, conflicts over land use in coastal zones, and effectiveness of the EIA system guiding new developments in the country.

Despite these economic, social and environmental challenges facing Seychelles, many achievements have been made under the diverse sectors of the Barbados Programme of Action over the last five years. The contributions of NGOs and civil society to these achievements is significant; the last five years have seen an increase in the number of environmental and social groups working in collaboration with government, civil society, the private sector and parastatals to promote the ideals of environmental, social and economic sustainability.

Some of the highlights of the past five years achievements include:

- A National Strategy for Climate Change was produced in 2009, based on some of the recommendations of Seychelles Second National Communication to the UNFCCC. Many stakeholders from government, parastatal, NGO, the private sector and civil society are collaborating to step up Seychelles' mitigation and adaptation efforts as well as public awareness of this significant challenge to livelihoods and the economy.
- Establishment of a Department of Risk and Disaster Management under the office of the Vice President, to coordinate efforts to improve Seychelles' preparedness and response procedures.
- A shift towards more sustainable waste management with improved waste recycling options initiated by government and civil society
- Sustained and improved participation in local and international research and monitoring programs for biodiversity and coastal and marine resources
- Reorganisation of the parastatal organisation managing energy and water in Seychelles, with plans for more sustainable and integrated options for water management and energy production.
- Tourism sustained through the local and global economic crises due to improved collaboration and management by the private sector and government.
- Improved telecommunications services.

- Sustained environmental education and awareness programs through schools and the media, with collaboration between government, NGO, parastatal and civil society partners.
- About 20 million USD in funding secured from UNDP/GEF and other granting agencies to support environmental projects by government and NGOs.
- The launching of the University of Seychelles in 2010 should help to ease some of the human resource constraints in providing more opportunities for in-country further education and reducing brain drain.

However, despite these achievements, Seychelles remains constrained by a number of challenges recurrent in most if not all sectors including:

- Shortage of skilled human resources in fields related to environmental management as a result of the small size of the population and (until recently) limited opportunities for further studies.
- Funding constraints for implementation of technological measures to reduce greenhouse gas emissions and adapt to the impacts of climate change, as well as to monitor changes in environment and biodiversity.
- Funding constraints for capital expenditures such as upgrading, construction and maintenance of sewage treatment plants, waste management facilities, electrical grid, upgrading of internet, etc.
- Funding constraints for social and environmental programs that fall outside of the parameters of environmental projects, and a lack of infrastructure and equipment for proper management of marine and coastal resources.
- NGOs and other civil society organizations require more support for capacity building to more effectively contribute as partners in sustainable development as government downsizing continues.
- The need for better integration of sustainable development concerns into all sectoral development plans, providing a balance between environmental, social and economic considerations. There is a particular need for an improvement in the tourism sector as well as land use planning.
- International and regional collaboration in combating international waters issues such as piracy and IUU fishing
- Better strategic planning for environmental education and awareness and improved integration with the EMPS and other sectoral plans for sustainable development.

Of all these concerns, perhaps the greatest threat shared by Seychelles with all other small island states today is climate change. Seychelles' government has played an active role in recent international climate change talks to bring the concerns of SIDS to the attention of the international community. Continued collaboration between SIDS will be essential to influencing the outcome of the next international climate change agreement.

# 1 - INTRODUCTION

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In 1994, most small island states joined together in Barbados to see how the Rio Convention on Sustainable Development could be adapted to the particular contexts and vulnerabilities of small islands. The result of these deliberations was the Barbados Programme of Action for Sustainable Development in Small Island States (1994).

In 2004, ten years later, participants in the BPOA submitted progress reports and met again in Mauritius in 2005 to assess progress made towards the implementation of the programme. At this time, participating countries drafted the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (MSI). A delegation from Seychelles, headed by President James Alix Michel, participated in this conference as well as a number of side events.

During the five years since Mauritius, all participating countries were expected to do their utmost to try and implement the Mauritius Strategy, and to continue to incorporate principles of sustainable development into all aspects of their national development plans.

In 2010, SIDS will meet again to assess their progress in implementing the MSI over the past five years. Each country has been requested to submit a National Assessment Report summarizing their achievements, challenges, experiences with monitoring, lessons learned and emerging issues. This document is Seychelles' MSI +5 National Assessment Report and provides an overview of the degree to which we have been able to address the ten thematic areas of the BPOA, as updated in the Mauritius Strategy. This report builds on and updates (but does not duplicate) information contained within Seychelles BPOA +10 report (2004), both in the sectoral reviews and in the description of the Seychelles context. It also draws on information provided in other national reports on the status of sustainable development in Seychelles, particularly from the recently conducted review of the Environment Management Plan for Seychelles (2000-2010).

For more information about activities prior to 2004 or more details about Seychelles' social, cultural and ecological context, readers are encouraged to refer to Seychelles BPOA +10 report, available at [http://www.env.gov.sc/Seychelles\\_BPOA\\_National\\_Report.pdf](http://www.env.gov.sc/Seychelles_BPOA_National_Report.pdf).

## 2 – SEYCHELLES: SOCIO-ECONOMIC CONTEXT

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Since Seychelles BPOA+10 report was submitted in 2004, one of the most significant changes to the socio-economic context has been the implementation of Seychelles Macro-Economic Reform Programme, which was first initiated by the Government of Seychelles in 2003 but stepped up in 2007 to address built-up arrears to bilateral creditors, the exhaustion of official reserves, foreign exchange shortages and extensive foreign exchange restrictions that constrained economic activity (EC, 2009). By 2008 the global energy, food and economic crises exacerbated domestic economic problems and the Government of Seychelles was obliged to seek assistance and support from the International Monetary Fund.

This section will include an overview of this economic reform programme as well as other key challenges to the local socio-economic situation over the last five years.

### 2.1 GENERAL CHARACTERISTICS OF SEYCHELLES

Seychelles is a small island developing state located in the Indian Ocean just below the equator, some 1600km from the east coast of Africa. The Seychelles consists of 155 islands, 42 granitic and the remainder coralline (Agricole, 2009). Most of the population of 85,000 live on the granitic islands of Mahé, Praslin and La Digue, along the narrow strip of coastal land. The total land mass

of the islands stands at only 455km<sup>2</sup>, but the Exclusive Economic Zone (EEZ) covers just under 1.4 million km<sup>2</sup> (Agricole, 2009)

Seychelles is one of the smallest and most indebted countries in the developing world, with a total public debt stock to GDP ratio of around 140% in 2008 (World Bank, 2009). The size of the economic is small, only US\$920 million GDP in 2008 and mostly service-based, with tourism, transportation and fisheries being the largest contributors to GDP. Seychelles suffers from a high level of dependence on imports as well as a constant risk of overexploitation of its few natural resources. The islands have a limited range of natural resources, limited flat coastal land. The small land area and mountainous topography of the populated granitic islands do not easily lend themselves to large-scale industries and agriculture.

Seychelles' development is constrained by its great distance from other economic centres, its dependence on two volatile industries (tourism and fisheries), its limited human resources, and now its vulnerability to the impacts of global climate change (Agricole, 2009, World Bank, 2009). Seychelles is already beginning to feel the effects of climate change on its economy, its weather patterns and its ecological systems (Agricole, 2009; NCCC, 2009)

Despite all of these constraints, Seychelles has long been considered one of the countries with the highest human development index ratings in the African region, and since the 1990s has compared favourably with many other small island states in terms of education, health, literacy and environmental conservation. The environment continues to be high on the country's political agenda, and since 1990 Seychelles has had a national sustainable development plan (the Environmental Management Plan for Seychelles – EMPS). About 47% of the land mass is designated as national parks and protected areas (Agricole, 2009), and the relatively well-preserved condition of the environment in Seychelles is what primarily attracts tourists to the islands. Government, NGOs and the private sector are all involved to varying degrees in advancing environmental conservation and management. However, sectoral fragmentation poses a real challenge for an integrated, holistic and truly participatory approach to sustainable development in Seychelles (Jean-Louis et al., 2009).

## **2.2 KEY SOCIO-ECONOMIC CHALLENGES IN SEYCHELLES**

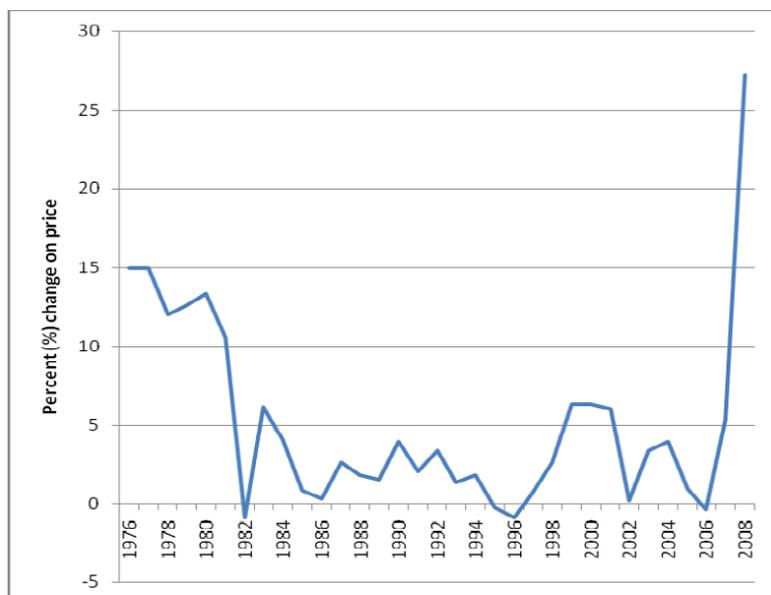
### **Seychelles' Macro-Economic Reform Programme**

Since the last report in 2004, Seychelles economic situation has undergone significant changes. Around mid-decade the Seychelles Government began to introduce the first stages of a national macro-economic reform program. But economic imbalances persisted and by 2008 the country's external debt was around USD 800 (Agricole, 2009) and the domestic debt around USD 500 million. In mid-2008, the global oil and food price spikes pushed Seychelles over the financial brink on which it had teetered for many years, due to unsustainable macroeconomic policies (EC, 2009). Due to Seychelles' inability to repay loans due to structural problems, and the global food and oil crises of 2008, Seychelles was obliged to turn to the IMF for assistance in restructuring the economy. According to the Central Bank of Seychelles Annual Report for 2008, the reform program included the following elements:

1. the liberalisation of the foreign exchange market so as to achieve full rupee convertibility, involving removal of all exchange restrictions and floatation of the rupee;
2. a reform of the monetary policy framework to create a more market oriented financial system whilst preserving financial stability;
3. a significant and sustained tightening of fiscal policy supported by a reduction in public employment and the replacement of indirect subsidies by a targeted social safety net (a tool to maintain social stability);
4. a reduction of the role of the state in the economy so as to boost private sector development through further privatisation, enhanced fiscal governance, and a review of the tax regime.

- a comprehensive debt restructuring strategy aimed at restoring public debt sustainability consistent with the government's ability to pay

The implementation of the IMF reform programme began on November 1<sup>st</sup>, 2008 with the



Sources: Central Bank of Seychelles, *Annual Report* and *Quarterly Report* (various years)

Table 1: Average rate of inflation, 1975-2008 (From Campling et al., 2009)

place structural reforms to remove barriers to growth and improving the efficiency and performance of the public sector. The IMF is also working with Seychelles to address the issue of external debt which continues to remain unsustainable.

Overall it appears that Seychelles economy is responding positively to the reforms (CBS, 2009; EC, 2009; IMF, 2009, 2010). Now the biggest threat would seem to be dynamics in the world economy which could severely impact the tourism industry in particular (Campling et al., 2009).

### Global Crises: Economic, Food and Energy Crises

The initiation of the Seychelles economic reform measures unfortunately coincided with the global economic crisis as well as the energy and food crises of 2008, exacerbating the local economic situation (EC, 2009). Fuel prices were prohibitive, affecting the costs of local goods, transportation and the cost of imports. The cost of many basic imported food items such as milk, rice and wheat products more than doubled. The prices of fuel, foods and many other imported goods had come down significantly by the end of 2009, mainly due to the stabilization of the rupee, but still remain much higher than pre-crisis prices.

The global economic crisis had a severe effect on tourism earnings in the first quarter of 2009, but by the end of 2009, the tourism industry reported a complete recovery with the number of arrivals comparable to 2008. Some attribute this success to the fact that in March 2009, as part of the economic reform programme, the government handed control of the tourism sector over to the private industry professionals (Ste Ange, 2009).

These global crises have served as a reminder to Seychelles of our extreme vulnerability to global economic trends, and for the need to plan for diversification and greater self-sufficiency. In response to these challenges Seychelles initiated the development of a new Energy Policy (underway) which will address issues of alternative energy sources to reduce Seychelles' absolute dependence on imported fuel.

## Food Security

Although Seychelles is capable of producing a large amount of food for its local population if not the tourism population, the country is highly dependent on food imports, mostly because of consumer preference for imported staple foods such as rice, rather than staples that are available locally. It is not actual lack of food availability but rather a lack of recognition of the richness of locally available resources that creates a situation whereby a high proportion of the local population are at risk of food security (Hendriks and Maleebo, 2009). However, the global food crisis and of 2008 brought to the fore Seychelles' vulnerability vis a vis the world food economy and the country's reliance on imported staple foods.

In 1978 10,500 ha of land were allocated for agriculture, but this is much lower now due to agricultural lands being converted to housing or tourism developments. Current estimates are that 6,000ha of land could potentially be still used for agriculture but only 600ha are actually being used (Agricole, 2009).

In response to the food crisis, Seychelles introduced a new Food Security Strategy in 2008 to find ways of becoming more self-sufficient in basic foods which can be produced in Seychelles such as fish, poultry, pork, fruits and vegetables (Agricole, 2009). Part of this plan also involved ensuring that farmers were actually using land allocated to them for cultivation - if not, the land would be taken back from them.

Local food production is extremely vulnerable to climatic conditions such as drought, heavy rains, and flooding, all of which are expected to increase with climate change. The GOS together with several NGOs have promoted several climate change adaptation measures to the local farming population including low-volume irrigation and a revised insurance scheme.

The MENRT launched a successful campaign to promote home gardening to enable people to grow some of their own fruits and vegetables and this has been moderately successful though it is widely felt that most households do not take advantage of the rich and abundant diversity of local fruits available (Hendriks & Maleebo, 2009).

## Human Resources

Approximately 50% of Seychelles population is of working age and employed (NSB, 2008). The unemployment rate for 2007 was recorded as 1%, although individuals registered on unemployment reduction schemes are not included, thus the figure should be slightly higher (Campling et al., 2009). Unemployment is expected to have risen with the downsizing of the public sector, although many vacancies are still available in the private sector. Much of the unemployment can be attributed to lack of interest among the local population or mismatched skills. Many vacancies are in the hotel, restaurant and construction industries; at the end of 2008 the number of vacancies stood at 7,108 outweighing the number of jobseekers by 93% (CBS, 2009). Labour productivity of the local population is generally considered to be low because of poor attitudes and poor work ethic (UN, 2009).

To make up for labour shortages, Seychelles relies heavily on expatriates for education and health services, as well as in the parastatal and private sectors. Foreign workers in the tuna processing, construction and five star hotel industries, accounted for approximately 11% of the total workforce in 2007 (Campling et al. 2009).

Local limitations for postsecondary training and higher education remain a challenge. The establishment of the University of Seychelles in 2009 is hoped to redress some of the problems although the number of candidates and courses that will be offered are limited. Up until 2009 there was no university locally and rising costs of overseas higher education limited the number of government scholarships to only about 100 per year. A further 20 graduates per year pursued further education through other funding sources (Campling et al., 2009). No data is available but it

is estimated that a significant number of graduates default on their bonds and do not return to Seychelles, contributing to the problem of brain drain and exacerbating the problem of a lack of human resources for sustainable development planning and implementation.

One of the major challenges currently being faced by the public sector is that many professionals are leaving and seeking better paid jobs in the private sector (CBS, 2009) or even overseas in response to the increased cost of living. The public sector salary structure for professionals has been revised but is unable to compete (Rosalie, E., pers.comm, January 2010). Thus, trained professionals in fields such as marine biology, environmental management, agriculture, ecological research, education, health, water management, energy policy etc. are no longer working in their fields but in banking, off-shore industries, private businesses etc. This has serious implications for sustainable development planning and policies as without the appropriate trained, experienced professional staff, the government will be unable to improve on the EMPS and implement a coherent, integrated and well coordinated sustainable development program. The National Human Resources Development Council, established in 2006 by an act of Government, is charged with the responsibility of promoting human resource development in Seychelles, but further work is needed to ensure that the NHRDC is fully responsive to the needs of each sector and adaptive to the changing economic environment.

One way of responding to this labour crisis within government is to involve the private sector and NGOs more in sustainable development planning and implementation. This is already happening to some extent in biodiversity conservation and research where NGOs and island hotels are involved, but needs to be further supported in areas such as energy, water and waste management, construction and development, tourism, etc. and needs to pay particular attention to private sector involvement.

## **Health and Social Welfare**

Since the 1980s, Seychelles has had an extensive and universal social welfare system to ensure an adequate standard of living for its population. Seychelles MDG status report released in 2004 concluded that Seychelles had met most of the 8 Millennium Development Goals (GOS, 2004). The major challenge at that time was the need for capacity building, recognizing that human resource shortages could undermine gains in health and social welfare. Emerging challenges identified at the time of the MDG report: pockets of poverty, particularly among women, increasing trends in teenage pregnancy and households headed by single women, infectious and communicable diseases such as HIV/AIDS and leptospirosis, and lifestyle related diseases (GOS, 200b) - all continue to be a concern today. One of the challenges mentioned in was the lack of an official and accepted "poverty line", which is still in development today.

In 2006 20.4% of public expenditure went to health (4.6% of the GDP) and this has remained relatively constant. The macroeconomic situation has been putting the health and social welfare system under pressure over the last half of the decade, and social service delivery has been negatively affected (UN, 2009). Despite these constraints, general health care indicators such as low infant mortality, long life expectancy remain quite impressive although emerging threats include the macroeconomic instability, the ageing population, increases in unhealthy lifestyles, substance abuse, crime and violence and the increase in sexually transmitted infections (UN, 2009). The number of AIDS cases has tripled in the last 20 years, but it is believed that as many as half of the actual cases go unreported (Campling et al., 2009; UN, 2009). The increase in AIDS is attributed family instability, early sexual activity, unprotected sex and increased substance abuse (UN, 2009).

There is evidence to suggest that drug related problems are on the rise in Seychelles. The numbers of hard drug related offences are on the rise, and substance abusers are increasingly younger (Campling et al., 2009, UN, 2009). The past five years have seen a notable shift from smoking of cannabis and hashish to intravenous heroin use and addictions. Current policies and laws do not seem to be effective, and authorities lack capacity and resources to deal with the problems. (UN, 2009). While some measures to control illegal drugs coming in by air have been

implemented, the illegal drug trade by sea remains extremely difficult because of the size of Seychelles EEZ and limited resources of the coast guard. More effort is needed to ensure that all stakeholders participate in a well coordinated and planned campaign against drugs and substance abuse.

Public expenditure on education has remained at about 4% of the GDP over the last decade (Campling et al., 2009) and Seychelles enjoys a high literacy rate and school attendance, although underperformance of boys and limited interest in pursuing post-secondary studies are a concern (Campling et al., 2009). Public schooling is free but private education is also available. Generally, the quality of public education is considered to be in need of improvement (Campling et al. 2009; UN, 2009). The Ministry of Education has responded by instituting several reforms to be implemented in 2010.

## **Cost of Living**

While the macro-economic reform is expected to improve Seychelles' economic situation over the long term, in the short term it has meant real challenges for local industries, small businesses and the local population as they adjust to the high cost of living, the removal of certain subsidies and incentives for fishermen and farmers, and loss of jobs in the public sector. The cost of living remains high and salaries in the private and public sectors have not substantially increased; the increase in average earnings has trailed the underlying annual average inflation rate by a substantial 27% (CBS, 2009).

Figures are not available to show how the reforms have influenced the level of poverty in Seychelles but a household budget survey conducted in 2006/7 just prior to the major economic reforms indicated that 30% of households at that time were below the Basic Needs Poverty Line BPNL (at SR1529 per person per month) (NSB, 2009). It can be expected that more families are living below the poverty line now than there were at the time of the previous BPOA national assessment in 2003. The Social Welfare system is currently being reviewed by the UNDP and it includes the development of a system for measuring and monitoring poverty levels.

## **Development**

Since the BPOA +10 report in 2004, hotels and private housing developments in Seychelles have increased significantly. Many of these developments are taking place in the coastal zone on popular beaches and reclaimed land, while others are on private or government islands. Many of the new developments are five-star hotels, or free-hold luxury condominium, villas and chalets outside the budget of the local population. Others are cultural or natural heritage sites which have been handed over to local and/or foreign investors for tourism development. There has been some public resistance to several of these projects on the grounds that they may limit public access to beaches or other cultural sites, islands and other areas and that foreign investment in luxury developments have few benefits for the local community and economy.

Environmental Impact Assessments (EIA's) are conducted for all developments, but often after the initial approval for the project has already been granted by GOS. The procedure for public response to these EIAs impractical (requiring individuals to read a very long technical document) and thus ultimately public say is very limited. However, more recently, public meetings have been held for several recent development proposals and these have been very well attended. The EIA procedures are currently being revised to ensure that the Department of Environment has input at the beginning of the planning application process, not the end. There is no separate procedure in place to assess the social, health or cultural impacts of developments, but the EIA procedure does make provision for assessing of how they will impact the local community and how the developer might contribute more directly toward the local economy and community improvement. This is currently being addressed in a social impact assessment procedure being developed by a separate government department but might better be integrated into the existing EIA process. One

weakness of the system, likely due to human resource shortages and conflicting priorities between different government departments, is monitoring developments to ensure that EIA recommendations are implemented.

The overall issue of land use planning is one that remains a challenge in Seychelles, particularly in coastal areas where there are at times conflicting demands for land from different sectors such as housing, agriculture, infrastructure and roads, waste management, recreation, tourism, schools and industries. Seychelles has recently received funding under the Mainstreaming Biodiversity project funded by UNDP/GEF to finally undertake a revision of the Town and Country Planning Act and current planning practices. It will also entail the creation of a new land use plan based on the principles of integrated coastal zone management (ICZM) and sustainable land management (SLM).

## **Piracy**

Somali piracy in the Indian Ocean has developed into a major security concern for Seychelles and the region, as well as a severe challenge for the tourism and fisheries sectors, mainstays of the Seychelles economy. Imports of goods and fuel by ship are also at risk. Fishing activities alone are reported to have declined 54% from January to August 2009 due to the risk of piracy (SFA, 2009). Some tourism activities such as boat charters to outlying islands have been severely affected, but no information is yet available regarding the effects of piracy on tourism in general. By July 2009, increased military presence closer to the Horn of Africa resulted in the pirates shifting closer to the Seychelles and using more sophisticated weaponry (Africa Research Bulletin, 2009; Ploch, 2009).

In the last half of 2009, Seychelles responded to this crisis by becoming a hub for anti-piracy action in the region. Seychelles' internal capacity to deal with piracy is extremely limited due to insufficient vessels and human resources, and the vast area of the EEZ requiring patrolling. The government signed agreements with the EU and the USA in 2009 allowing the deployment of anti-piracy troops and equipment on the islands. The US military is now operating P-3 Orion aircraft and unmanned aerial vehicles from Seychelles in an effort to improve maritime surveillance in regional waters. It remains to be seen whether these activities will in fact resolve the piracy problem.

## **Climate Change**

Like other small island states, Seychelles is extremely vulnerable to the impacts of climate change. Most of Seychelles infrastructure and developments are located along coastal areas and reclaimed coastal land due to the steep topography inland. Data collected by the National Meteorological Services is already indicating changes to local rainfall patterns affecting both agriculture and general availability of water for the local population at certain times of the year. Data is also suggesting that the cyclone belt may be shifting northwards to eventually encompass Seychelles, resulting in possible damage to coastal infrastructure which has not been constructed to cyclone-proof standards. In 2009 at the COP15 meeting in Copenhagen, Seychelles officially launched its Climate Change Strategy which address mitigation and adaptation measures to be implemented over the next 5 years. More detail on how Seychelles is responding to the climate change is provided in the sectoral review.

### **3 – SEYCHELLES STRATEGY FOR SUSTAINABLE DEVELOPMENT**

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As outlined in Seychelles' BPOA+10 report, sustainable development in Seychelles is guided by the Environmental Management Plan for Seychelles. The mission of this plan is to promote, coordinate, and integrate sustainable development programmes that cut across all sectors of society in Seychelles. The implementation of the plan is guided by a Steering Committee which includes as members representatives of all key stakeholder groups. The Committee meets monthly but attendance of all members is irregular (Jean-Louis et al., 2009).

The EMPS is guided by the principles of sustainable development as outlined in Agenda 21, as well as the principles of the BPOA though not explicitly. The first EMPS covered the period from 1990 to 2000, and it was considered 90% successfully implemented. We are currently coming to the end of the period covered by its successor the EMPS 2000-2010. This plan was organized under ten themes, which cover most of the thematic areas of Agenda 21 and the BPOA:

1. Society, Population and Health (including Gender)
2. Land Use, Coastal Zones and Urbanisation
3. Biodiversity, Forestry and Agriculture
4. Energy and Transport
5. Fisheries and Marine Resources/Processes
6. Water, Sanitation and Waste
7. Tourism and Aesthetics
8. Environmental Economics and Mainstreaming, and Sustainable Financing
9. Regulatory, Policy and Institutional Mechanisms
10. Commerce, Industry and Production

Each thematic area includes a series of goals, objectives, and activities with a time-frame. Cross-cutting themes which were to be integrated throughout included education, awareness and advocacy, climate change, civil society participation, science and research monitoring etc. but the document did not specify any measurable objectives or activities for these.

It should be noted that many of the sectors included in the EMPS document actually also have their own sectoral plans which were devised with wide input from stakeholders. These sectoral plans all address sustainable development to varying degrees but many do not cross-reference the EMPS at all making the whole process of sustainable development rather fragmented. It has been noted that many high level policy makers and professionals outside of the MENRT and the EMPS steering committee are completely unaware of its existence, although they are aware of Seychelles' political commitment to the ideals of sustainable development and environmental conservation. The EMPS and the entire process of implementation have been critiqued for not being holistic and integrated enough to adequately encompass all of the dimensions of sustainable development and adequately engage the commitment of all stakeholders and high-level policy makers (Jean-Louis et al., 2009).

In 2009, an extensive review of the EMPS 2000-2010 was conducted by a group of consultants with input from with a wide range of stakeholders. This EMPS review document has been used extensively for the purpose of compiling this report. The EMPS review is currently focused on studying options for re-organising the structure and implementation process of the next generation EMPS and its role in helping Seychelles achieve sustainable development.

## 4 - SECTORAL REVIEWS

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### 4.1 CLIMATE CHANGE AND SEA-LEVEL RISE

#### Seychelles' Second National Communication

The Second National Communication (SNC) to the United Nations Framework Convention for Climate Change (UNFCCC) was launched in 2006, due to be completed in 2010 (Jean-Louis et al., 2009). This facilitated the revamping of the National Climate Change Committee, which had been more or less inactive since the submission of the Initial National Communication (INC) in 2000. There have been various important sector reports that have been completed under the SNC so far, such as the Education and Awareness Strategy, highlighting the importance of increasing the awareness of the population on how to mitigate and adapt to the changing climate; the greenhouse gas (GHG) inventory, completed in 2008 which revealed that the Seychelles contribution to climate change had gone up marginally.

A report on mitigation and adaptation options reported that xxx had been achieved (or not) and recommended that Seychelles prioritize its mitigation and that adaptation efforts should focus on technology transfer. Though Seychelles GHG emission for 2005 was capacity as a sink till exceeds GHG emissions, by the year 2025 the country will produce more than it absorbs (Cooposamy et al, 2008). This highlights the fact that there needs to be measures in place that will allow GHGs to be mitigated.

Other important components of the SNC include the reports on the fisheries, agriculture, coastal, health and water sectors (Agricole, 2009).

The final step will be to produce the SNC and submit this to the UNFCCC. This would mark the end of this activity.

#### Climate Change Strategy

Recommendations from the SNC have been incorporated into Seychelles new Climate Change Strategy was launched at conference of parties (COP15) in Copenhagen, Denmark in December 2009. This strategy, funded by UNDP, highlights the significant impacts of climate change on the country and presents options to mitigate and adapt to climate change. The president himself highlighted the importance of the implications of the effects of climate change, including sea level rise, drought and would have on the country, with a significant portion of the country being low level islands. Accelerated coastal erosion has also had an impact on the country. The document will focus on these 3 key issues highlighting the importance on increasing awareness;

1. What are the characteristics of the key risks and opportunities of climate change?
2. What is required to build a resilient approach to mitigate and adapt to climate change impact and consequences?
3. How can key climate change issues be integrated or mainstreamed into key national policy areas and other stakeholder areas?

#### Institutional Arrangements

The Department of Environment (DoE) has been restructured to have a division (and Section), the Climate and Environment Services Division (CESD), which will oversee the implementation of the Climate Change Strategy. There are also other non-governmental organizations, namely Sustainability for Seychelles (S4S) and the Sea Level Rise Foundation (SLRF). S4S has a specific objective to work in partnership with other (state and non-state) actors to achieve national environmental (including climate change) policies and strategies. SLRF is an organisation set up by the President of Seychelles by an act of law; its aim is to provide a mechanism for leveraging global attention on the impacts of sea level rise on small island states and other low-lying area ([www.sealevel-rise.org](http://www.sealevel-rise.org))

## **Government actions**

The main vehicle for government action in the area of climate change has been the EMPS. Although in the current EMPS 2000 – 2010, climate change has been treated as a cross cutting theme, the review of the EMPS has come up with a proposal to specifically address climate change through a specific action plan. This means that climate change will now be a thematic area under the proposed 'EMPS 2011-2020'.

## **Constraints and Challenges**

Some of the major constraints that the Seychelles faces are the fact that it is harder to access international funds because of its status as a middle income country. With the recent release of the Climate Strategy, the European Union has agreed to release EUR2m for adaption project. But this is not enough to fund the activities as listed in the strategy. There are also major constraints in mitigating and adapting to climate change:

### **Mitigation**

Almost 98% of GHG emission is as a result of burning of fossil fuel (Coopoosamy et al., 2008), mainly to produce electricity and for transportation purposes. If current emission trends continue, Seychelles emissions will surpass the absorption capacity by the year 2025. To ensure that this scenario is not achieved, significant changes will have to happen, including fundamental behavioural changes in how energy is consumed. New technologies for producing electricity and means of transportation will have to be introduced. New capacities will be needed to address the introduction of new technologies. PUC is currently undertaking feasibility studies to investigate the potential for wind, biomass, micro-hydro, solar and other renewable energy sources for Seychelles.

### **Adaptation**

Almost all the adaption to climate change will have to deal with the issues of sea-level rise. As a significant portion of the land lies only a few feet above the sea, any increases in the level of the sea will have serious future implications. On the main island islands of Mahé, Praslin and La Digue, most of the infrastructural development, such as the power station, lies on the coastal plateau. The threat of sea level rise is significant and considerable investment will be need for adaptation. Another major area for action involves adaptation to water shortages which are expected to increase. Agricultural production will need serious attention as most of the farming occurs on the plateaus of the 3 main islands.

There are also other challenges listed below;

- Shortage of human resources for climate monitoring, reporting, planning for mitigation and adaptation, advising
- Technical capacity in adapting to climate change

## **4.1 NATURAL AND ENVIRONMENTAL DISASTERS**

Being non-volcanic and outside of the cyclone belt, Seychelles has historically been safe from many natural disasters. However, those that occur are generally weather related such as storms, high winds, droughts, landslides, etc. Climate change is expected to increase Seychelles vulnerability to such disasters. Seychelles was affected by the Tsunami of 2004 but suffered far less infrastructure damage and loss of human life than other Indian Ocean Countries.

Following a large storm which hit the island of Praslin in 2002, and the recommendations of UNEP Seychelles established a National Risk and Disaster Management Secretariat (NRDMS) in October 2004, and this was upgraded to a department in 2006, Department of Risk and Disaster Management (DRDM), now under the President's Office. DRDM is responsible for identifying the risks facing the populace, setting up disaster response systems, and helping individuals and society learn how to avoid unnecessary risk, and what to do in the event that a disaster (small or large, natural or anthropogenic) does occur.

### **Disaster Preparedness**

- DRDM delivered a number of workshops over the past four years to help communities identify risks and develop an emergency evacuation plan.
- Every district has an evacuation plan, and a volunteer emergency brigade whose members are to provide assistance in the case of small emergencies or disaster. However, the districts need more training for the emergency brigade members, more logistical support, and more equipment to respond to disasters and emergencies.
- Several disaster response simulation exercises were successfully carried out by the DRDM in 2009
- A very small number of local companies, schools and other organisations have disaster response plans.
- The DRDM has done some good groundwork to promote disaster preparedness over the last five years but has suffered from funding constraints. A grant received recently from the Global Facility for Disaster Reduction and Recovery will facilitate the "mainstreaming of disaster risk reduction in development"
- DRDM is working now to mainstream its objectives into other national plans including the EMPS

### **Public Awareness**

- A public awareness study completed in 2009 revealed that the public are generally not aware of procedures to be followed in the event of a natural disaster.
- DRDM produces a newsletter which is widely circulated to all partners and stakeholders
- DRDM has recently launched a blog highlighting their activities (<http://drdm-drdm.blogspot.com/>)
- DRDM developed a public awareness strategy in 2009 through participatory consultation with stakeholders, but this has not yet been funded or implemented. Some of the activities included community based workshops, door to door visits by Emergency Brigade volunteers to help residents identify risks, and the production of media programs.

### **Regional Networking**

- Seychelles continues to network with regional disaster management initiatives.

### **Constraints and Challenges**

- Disaster and risk reduction management in Seychelles needs to be better harmonized with the organizations and programmes coordinating climate change adaptation measures.
- More resources and training need to be provided to communities and organizations to help them develop disaster reduction and response plans.
- Further funding needs to be allocated for the public awareness strategy. This can be harmonized with Seychelles strategy for climate change public awareness.

## 4.3 MANAGEMENT OF WASTES

Waste management in Seychelles is overseen by the Landscape and Waste Management Authority, under the Ministry of Environment, Natural Resources and Transport. This waste management body has undergone several institutional changes over the last ten years but is generally responsible for overseeing activities such as road and beach cleaning, waste collection and disposal, and cleaning of drains. Actual collection and disposal is undertaken by private contractors on Mahé, Praslin and La Digue. In general, the management of solid and hazardous wastes is constrained by a lack of suitable land for landfill sites, diseconomies of scale for the implementation of recycling programmes, and a lack of qualified local professionals to lead the field. Solid waste and sanitation projects are extremely costly relative to the small population size and difficult to finance sustainably. Nonetheless, Seychelles has made some measurable progress since 2004 towards more sustainable management of solid and liquid wastes with the involvement of government, parastatals, the private sector and NGO sectors.

### Solid Waste Collection and Disposal

The amount of solid waste produced per capita in Seychelles (625kg per year, Croguennec, 2009, pers. comm.) is comparable with many industrialized countries. This may be partly attributed to the high dependence on packaged imported goods and increasing consumerism. Over 60% of the waste is biodegradable, but mixed with most other forms of waste. Waste is collected in 240L bins in public bin sites, provided by the contractor. Many such sites are short of bins as they need to be replaced on a frequent basis. More bins are expected in early 2010.

Solid waste collection and disposal is undertaken by private companies under contract with the GOS, and supervised by the Landscape and Waste Management Agency (LWMA). On Mahé and La Digue, the contractor is STAR Seychelles, on Praslin, the Praslin Development Fund.

Solid waste on the island of Mahé is disposed of at a sanitary landfill site at Providence which is situated on reclaimed coral fill land. This landfill is almost full and an alternative location, also on reclaimed land is being prepared in 2010 with funding from GOS and the EU under the 9<sup>th</sup> EDF. A new lined landfill was built at Anse Royale in 2000 but this project has now been abandoned and is only being used for a small amount of inert waste such as glass. The other populated islands of Praslin and La Digue also have designated sanitary landfill sites. However, illegal dumping and littering in forests, roadsides and wetlands continues to be a problem on all three islands though may have reduced somewhat since 2004.

Waste collection and disposal on Mahé is contracted to STAR Seychelles, a private company under contract with the LWMA. Waste from residences is collected from public bins along the main roadsides, while hotels and other industries have contracts with the LWMA for commercial waste collection. Since 2004, new bin sites have been installed. A consignment of new bins to expand public bin sites and replace broken equipment is expected in early 2010. New machinery such as waste compactor trucks have improved the efficiency of the collection system, but problems still remain with availability of bin sites and collection schedules.

An existing fine for littering under the Environmental Protection Act was increased in 2007 and a new green police force was created under the DOE to enforce it and other environmental laws. Littering does still occur, but is cleared up regularly by road cleaners and beach cleaners contracted by LWMA, who also clear out roadside drains of litter, leaves and other waste. A new Environmental Engineering section under the DOE was created to help deal with issues of drainage.

The capital of Victoria is cleaned daily with waste collection from public bins occurring twice daily. The greatest challenges are establishing and maintaining an efficient residential waste collection and disposal system.

## **Hazardous Waste**

In accordance with international standards and practices, a management system was implemented in 2005 whereby producers and disposers of hazardous waste comply with a requirement for them to declare their wastes and hazards to the Department of Environment. Collection, treatment and disposal is to be done by the waste contractor, however the fee charged for these services on Mahé is a deterrent. Critically, the waste contractors also do not have the capacity to safely collect, store and dispose of hazardous wastes despite provisions of their contract, therefore the system (other than notification) is generally not fully functioning on any of the islands.

Larger lead acid batteries such as car batteries are being collected by some companies and exported, while smaller batteries are mixed with the waste stream.

A waste oil collection system was initiated but is no longer functioning partially again due to the prohibitive fee charged by the contractor. Waste oil was being collected by the contractor on Mahé for export but is now being incinerated at PUC power station. Smaller point sources of waste oil from mechanic shops etc. are either stored on site or being dumped in the environment since no formal collection or disposal system is functioning.

Hospital waste from Mahé is incinerated, but the incinerator is not in good working order.

## **Waste Recycling and Reuse**

Systems for collecting and reusing glass bottles for drinks and ketchup continue to be sustained.

Several recycling projects have been initiated since 2004 but not all have been sustained. The government initiated a PET bottle deposit and collection system in 2008; the bottles are shredded and exported for recycling. The collection system is hampered somewhat by the small number of collection points for redemption of empty bottles, making it impractical for many people. However some individuals make a living by collecting PET bottles out of public bins and off the streets, contributing to the success of this initiative whereby very few of these bottles still make their way into the environment or even the landfill. Some 20 million bottles are collected and exported each year.

In 2008, the DOE introduced a ban on thin plastic bags which cannot be easily re-used. Many merchants now charge a fee for plastic bags and re-usable bags are becoming more popular.

A paper recycling company, Navin, was initiated in 2006 but by the end of 2007 had been abandoned. They collected cardboard and other paper waste from local businesses and offices to make egg trays and a few other products, but were unable to compete with cheaper imported egg trays being used by local egg producers. Navin is now exporting some waste paper for recycling.

STAR shreds garden waste brought in from hotels and gardens to make compost, which is then sold back to hotels and the public for landscaping. STAR also has a Materials Recycling Facility to remove metals, plastics and other from household waste and make compost from the remaining organic materials, but this is not in operation. Very limited composting is done at household level; most garden waste is burned in open pits. The DOE produced a small composting guide in 2008 but distribution has been limited.

Several private companies collect and compact scrap metal at the landfill on Mahé and export it for recycling in India and Mauritius. There is no system in place for ongoing sorting and collection of household metal, although once per year during the Clean up the World Campaign one of the private companies does a collection of scrap metal at the public bin sites. This company, SAMLO also offers a service to pick up scrap metal on site if accessible but with very poor response.

NGOs are becoming more actively involved in waste management. Members of several NGOs and community groups organise clean ups. Sustainability for Seychelles, received a grant from

ReCoMaP in 2009 to initiate a glass waste collection system primarily with hotels and other industries on Mahé. The glass will be crushed and used as construction fill. Another NGO, APANA, received funds from the same source to recycle glass for artisanal purposes.

Generally the situation regarding waste management and recycling has improved over the last five years, largely due to ongoing public awareness and education programs by the media in collaboration with GOS, as well to the increase in actual recycling programs for residents and local companies.

### **Sanitation (Sewage)**

There has been little change in the sanitation situation since the last report in 2004. Seychelles strategy in the EMPS was to have the parastatal company, Public Utilities Corporation (PUC) provide central sewage treatment in highly populated areas and individual treatment systems in areas of lower density. In 2009, the management of PUC was contracted to Coffely, a subsidiary company of SUEZ, and the new management is committed to improving the sanitation in Seychelles. The Planning Authority ensures that all developments outside the sewerage networks have their own systems but it is estimated that only about 60% of these work effectively (Gonzalves & Mussard, 2009), likely largely due to the rocky terrain which is unsuitable for soak-away pits. Only about 18% of potential connections on Mahé are online, primarily because most residents already have their own individual system and do not want to incur the sanitation fee. There is no incentive or legislation by GOS to ensure that residents within clearly designated areas that can connect to central sewage treatment actually do connect to the system.

Wastewater from ships is collected from ships by PUC and other local companies who have recently entered the market.

Mahé has two central sewage treatment plants, one at Providence and one at Beau Vallon. Plans to build new plants on Praslin and at Anse Royale Mahé have not yet been implemented due to lack of funds, although PUC currently has plans to expand its' central sewerage network and facilities (Gonzalves & Mussard, 2009).

The plant at Providence collects sewage from Victoria and surrounding areas that are online, which represents mostly businesses. Most residents have their own system. The major hotels in Beau Vallon are now connected to the sewage treatment plant at Beau Vallon which has improved water quality in the sea nearby. The treatment plants were functional but very inefficient until the end of 2009 when the new PUC management implemented a recovery plan of both plants, which are now functioning at 75% efficiency. PUC plans to continue maintaining and improving the plants. However, it is critical that more residents be encouraged or forced to connect to both plants in order to ensure that they run at maximum capacity and efficiency.

Water tests in some areas reveal that there is faecal contamination in several rivers and coastal areas, most likely the result of ineffective sewage treatment at household level.

### **Overall constraints and challenges**

- Lack of sustainable financing for waste and sanitation projects
- Limited number of trained Seychellois professionals and technicians in waste management
- Institutional changes, and ineffective coordination between all parties involved in waste management (government, waste agency, STAR, NGOs and private sector)
- More involvement of private sector needed to help initiate and maintain progressive and creative systems for reducing, re-using and recycling waste in Seychelles' specific context.
- Facilities and equipment for all forms of waste management require upgrading and maintenance
- Public awareness programs must be further developed to foster a culture of the 3 Rs in society in general.

## 4.4 COASTAL AND MARINE RESOURCES

Sustainable development in small island states depends largely on coastal and marine resources. During the period 2004-2009, Seychelles has developed and managed a number of national, regional and international programmes for the sustainable use of coastal and marine resources.

### NATIONAL ACTION, POLICIES AND MEASURES

#### National Fisheries Policy

In 2005, a revised fisheries Policy was prepared by the Fisheries policy unit with the following goals: Sustainable exploitation of marine resources; Maximum amount of employment and welfare in the sector and its related activities; Maximum value –added from fisheries and other related activities; Enhanced food supply and food security from the fisheries sector; an integrated economy. In 2006, a Fisheries Development Committee composed of all major stakeholders in the fishery sector was created to implement the policy.

#### UNDP-GEF Mainstream Biodiversity Management into Production Sector activities

The project started in 2008 for a period of 6 years, with the aim of integrating biodiversity conservation into key production sectors of the economy for a total budget funded by GEF of 3.6 Million USD. The project has recruited an artisanal Fisheries Co management Advisor who will develop pilot co-management systems for artisanal fisheries for the hand line and trap fishery.

#### Spawning Aggregation research and management programme

The programme funded by the Western Indian Ocean Science Association was completed in 2006. The project designed a management framework for grouper spawning aggregation which includes regulation to protect key areas and species. A new project has been designed on spawning aggregation for critical habitats in marine protect Areas and will be implemented between 2009-2010.

#### Large Pelagic Fisheries Research Project (2000-on going)

The project, funded by the French Government, aims of improving the economic viability of the semi industrial longline fishery. It will acquire more scientific and biological data on the tuna and swordfish stock to locate fishing grounds and determine techniques to reduce the predation rate for the longline fishery from false killer whales.

#### Sea cucumber Fishery

As part of an FAO project, a management plan for the fishery was produced in 2007. Only 25 licenses per year are now granted to fishermen with a closed season from 1<sup>st</sup> June to 31<sup>st</sup> October.

**Wetland Management** comprises a national management programme for the wetlands of the Seychelles, under the umbrella of RAMSAR Convention and the financial support of Mangrove for the Future.

#### Mangroves for the Future (2008-on going)

Mangroves for the Future supports initiative in coastal ecosystem conservation for sustainable development by providing financial support , generating knowledge, empowering institutions and individuals to promote good governance in coastal ecosystem management.

### REGIONAL ACTION

#### Coral bleaching on reef fishes and fisheries

Several regional organisation are involved in funding research to monitor the effects of coral bleaching such as

- UNESCO IOC development of hydrodynamic modelling activities in mapping reef fish connectivity
- Fisheries Research funded by SWIOP(2008-2012)

- Recomap project to support the development of improved fisheries monitoring at SFA (2009-2010)
- WIOMSA/MASMA project on regional effect of coral bleaching on reefs species (2008-2009)

### **ASCLME (Agulha Somali Current Large Marine Ecosystem Project (2008-2013))**

This regional project funded by UNDP and the World Bank will survey the Mascarene large marine ecosystem to:

- Collect information about the complex ocean currents and how they interact with and influence the climate, biodiversity and economies of the Western Indian Ocean Region.
- Document the environmental threats-such as marine pollution and declining fisheries-that are faced by the countries of the region
- Develop strategic programme of action to deal with environmental threats
- Introduce an ecosystem approach to manage the living marine resources of the Western Indian ocean region

### **Tuna Tagging project (2005-2010)**

The project funded by the European Union study the tuna stock structure and its distribution in the Western Indian Ocean. This project will contribute to improve scientific and practical knowledge of the tuna and small pelagic stock in the region.

### **RECOMAP(2006-2011)**

This a regional project programme for the sustainable use of the coastal zones of the countries in the Indian Ocean funded by the European Union. Activities include integrated coastal zone management courses, call for proposals, education and awareness programme, support to management committees etc..

### **WIOLab**

The project entitled: "Addressing land based activities in the Western Indian Ocean" addresses environmental problems and issues related to the degradation of the marine and coastal environment resulting from land-based activities in the region.

## **INTERNATIONAL ACTION**

### **Promoting safe mineral exploration in Seychelles waters**

Agreements for prospection/exploration of mineral resources have been signed during the past 6 years taken full consideration of possible environmental impacts

In 2006, Petroquest, an oil prospecting company did a 2 dimensional seismic survey. During the period 2007-2010 East African Exploration is interpreting the seismic data and findings will be presented in 2009.

### **Overall Constraints and Challenges**

Coastal and marine resources are very important to the sustainable development of Seychelles. It is a priority to have well defined policy guidelines with clear strategy to ensure appropriate and effective management of these resources. The main constraints for the development and the implementation of management of programme of these resources are:

- The lack of financial resources. Local funding is reduced due to the difficult economic situation prevailing in Seychelles since 2008.
- The lack of capacity in terms of infrastructure and human resources. Seychelles is lacking qualified scientific in the field of marine science, oceanography ,coastal management and appropriate equipment to ensure proper management of marine and coastal resources
- Further Pressure on the demersal resources around the coastal areas of the granitic islands of Seychelles will need to be carefully monitored to ensure sustainable use of marine resources. Appropriate Management measures of marine resources will need to be carefully put in place. Marine protected Area should be clearly defined and be representative of marine ecosystem in Seychelles

## 4.5 FRESHWATER RESOURCES

The Seychelles, just like many other small island states, faces major freshwater (and potable) water issues. Although there is sufficient rainfall of the order of 2369 mm (mean annual) per year (Agricole, 2009), there is significant run off to the ocean and not enough capture and storage, currently there are only 4 capture sites and 1 storage site on Mahé storage capacity of 250,000 cubic metres (Chan-Seng, 2009).

On the demand side, the main challenge that the country faces is the steady growth in population and continually increasing tourism arrivals, and ultimately this increases the pressure on an already limited resource.

PUC (Water Division) has the mandate to collect, store and distribute safe water in the country. 95% of homes are connected to the PUC treated water supply, the remainder use river and/or rain water. Now falling under the GDF Suez contract, the PUC (Water Division) is also undergoing re-organisation to streamline its operation, upgrade its resources and improve its efficiency.

In 2005, PUC commissioned a series of 4 reverse osmosis desalination plants on the main granitic islands (2 on Mahé, 1 on Praslin and 1 on La Digue), that will provide sufficient water in the system to cater for the drier periods from June to September.

### Water Master Plan

The African development Bank (AfDB) announced in 2007 its support to the Seychelles to draw up its master plan. (<http://seychelles-offshore-companies.offshore-journals.com>). The bank is providing almost USD1million from the African Water Facility, to design this master plan. A consultant has already been selected to draft up the plan. This will lay forward the infrastructural developments plan in the water sector for the future.

### Integrated Water Resource Management (IWRM) project

There is project document being developed by a consultant to be submitted to the GEF for funding. This will be a medium size project looking at freshwater resources on the island of La Digue, the 3<sup>rd</sup> most populated island. Around 50% of fresh water on La Digue comes from bore holes on the plateau (comments made by PUC at the IWRM stakeholders workshop). There is increasing pressure on the resource, from pollution. This project will aim to come up with a more sustainable solution for the provision of freshwater on La Digue.

There have several small scale pilot projects to promote rain-water harvesting at schools, and an increasing number of residences are practicing rain water harvesting for garden and general usage. However this is still very limited, and remains to be further developed as a means of reducing demand for treated water.

### Constraints and Challenges

The country faces multiple challenges with managing freshwater resources listed below;

- Very steep terrain that accelerates the run off.
- Limited availability of land that makes it difficult to have large scale storage facilities
- Small population and remoteness of the country, both of which contributes to lower economies of scale, higher capital and investment costs and difficulty in achieving supply efficiency.
- Lack of technical expertise to deal with the increasing network and maintenance issues.

## 4.6 LAND RESOURCES

The small size of most of Small Island Developing States limits the area available for urban settlement, agriculture, tourism and other infrastructure and creates intense competition between land use options. During the period 2004-2009, Seychelles has implemented the following activities to better manage its land resources:

### Policy and Planning

The Town and Country Planning Act (1972) which provides the basis for land use planning is currently under review. The Plan D'aménagement du Territoire which lays the ground rules for land use planning, based on sustainable development and coastal zone management for the main three granitic islands is currently under review.

In 2006, Seychelles adopted a National Wetland Conservation and Management Policy in its attempt to address and reverse the degradation of wetlands.

The National Policy on Disaster Management (2006) aims at addressing the increasing incidences and emergence of disasters. The National Disaster Secretariat is carrying out a country wide risk and vulnerability assessment, and will produce a land movements risk map for every district. The Secretariat is also working in partnership with the Ministry of Education to help create awareness and preparedness on natural disasters in schools, of which landslides features as one of the five natural disasters most likely to occur.

A committee was set up in 2004, to guide the necessary actions to implement the United Nations Convention on Combating Desertification (UNCCD) in Seychelles. Seychelles completed its 1<sup>st</sup> National report for the UNCCD in 2004, but has not yet started developing its National Action Plan (NAP) nor has an Investment Plan been prepared, to help implementing the NAP and other Sustainable Land Management actions.

The National Strategy for Plant Conservation (2005) was recently completed by an NGO in collaboration with the MENRT. This Strategy addresses the conservation and sustainable use of plants, especially the indigenous plants, containing 5 objectives and 14 targets.

### Research

The Drainage Task Force has completed flood risk studies of some areas, looking at the contributing factors to flooding, using GIS. The Environment Engineering Section of MENRT ensures that development proposals cater for adequate and effective drainage systems, and monitors ongoing developments with regards to drainage.

### Projects

Recomap (2006-2011) is a regional project for the sustainable management of coastal zones of the countries of the Indian Ocean. Recomap is providing some funding for the development of the next generation EMPS in order to support an ICZM approach to environmental management planning.

Mangroves for the Future (2009-ongoing) is an initiative to promote investment in coastal zone ecosystem conservation for sustainable development.

WIOLAB The project "Addressing land based activities in the Western Indian Ocean" addresses some of the major environmental problems and issues related to the degradation of the marine and coastal environment resulting from land based activities in the region.

UNDP-GEF Sustainable land use Management (2007-2011). Land degradation has mainly occurred because of forest fires, clearing of forest for development purposes (agriculture, including

plantations; housing; infrastructure), effects of invasive alien species, unsustainable agriculture and construction practices, and landslides or rock falls. The project aims to increase capacity in prevention and control of forest fires, rehabilitation of degraded areas, control of IAS creepers, development of forest management plans, soil conservation in agriculture, and minimizing risks of land movements. It also aims to mainstream Sustainable Land Management in relevant policy and regulatory frameworks, and it will assist in developing a National Action Plan and Medium Term Investment Plan.

The FAO Project on “Land Information Management” (2006) was implemented and introduced a Geographic Information System in the Department of Natural Resources, to capture, provide data and analyze the national agricultural land resources for better management.

### **Constraints and Challenges**

- The major long term land management issue in Seychelles like any other small island States is the degradation of the limited land area.
- There is a need to have a proper legal framework to address coastal zone management as a whole and an appropriate action plan.
- The lack of human resources capacity has been identified as a barrier to the development of an effective land use planning and management.
- Recent tourism development along the coast has put pressure on land resources in Seychelles.

## **4.7 ENERGY RESOURCES**

The Seychelles commissioned a new energy policy in 2009 and UNDP is supporting a team of experts, including a renewable energy specialist, to develop a 2<sup>nd</sup> National Energy Policy during the period 2009-2010. The new energy policy is supposed to improve on the previous energy policy of 1999, especially a more in-depth analysis of the energy potential of the country. So far a first draft has been produced.

Since the oil price hike of July 2008, the government has begun to seriously address the issue of alternative energy technology as part of the national plan. In his State of the Nation address in February 2008, President James Michel stated: “The issue of energy is one that is critical for us, and for our future. The amount of petroleum products our country is consuming now is not sustainable in the long term. Government is presently drafting an energy policy that will look at radical solutions that we will have to adopt. Government will remove all taxes, including GST [Goods and Services Tax], on certain solar energy products.”

### **Energy Security Steering Committee**

The Ministry of National Development (which had the jurisdiction on energy policy) established an Energy Security Steering Committee in 2008, with the aim of studying how the country can move away from its dependence on imported oil to satisfy its energy needs. A report from this committee, with a list of policy recommendations ranging from short- to long-term, identifying the need to promote other viable technologies, including energy efficiency, energy awareness and grid-connected PV to name a few, as part of the national energy mix. Recommendations for the medium-term measures were aimed at changing the energy mix to make it more sustainable and reduce the country’s vulnerability to oil price fluctuation on the world market. A final report was produced in December 2008, updated in early 2009, and submitted to the Cabinet of Ministers, where it now awaits final approval. The MND is also negotiating with the Agence Reunionnaise pour L’Energie Renouvelable (ARER) to conduct an assessment to determine to what degree renewable energy can contribute to the energy production mix of the country, in support of the Government’s commitment to increase energy security. In addition, the recently established Seychelles Energy Commission also strongly supports the idea of implementing more renewable energy systems in the Seychelles.

## **Seychelles Energy Commission**

The Seychelles Energy Commission (SEC) was established in July 2009 as part of MENRT; part of its role will be to promote the use of more sustainable and viable alternative technologies, especially RETs. The Commission now takes the lead role in policy/legal issues related to renewable energy and PV systems in particular.

### **Private Sector Involvement**

MASDAR, a Dubai-based company promoting carbon neutral initiatives, is active in renewable energy development in the Seychelles. Currently it is focused on wind power development. In-depth studies on the potential of wind will begin in 2010 and various test sites

### **Constraints and Challenges**

- There are major constraints that the country faces, especially if it is to attain energy independence and move away from fossil fuel.
- As is the case with most small island developing states, Seychelles faces a serious shortage of trained personnel in the energy field, ranging from policy experts to education and awareness specialists.
- There have been serious gaps in energy planning, energy forecasting and the development of an energy master plan.

### **Lessons learned**

There is a fundamental flaw in being dependent on mainly one source of fuel to supply the final energy needs of any country, especially a small island state lying in the middle of the ocean, out of the reach of main interconnect grid systems. However it is hard to come up with a sustainable energy solution. The benefits of diversifying the energy sources are, however, far reaching.

## **4.8 TOURISM RESOURCES**

The Barbados Programme of Action+10 Review highlighted five specific challenges facing the tourism industry at that time: (a) compete more effectively with other destinations by providing more “value for money” and enhanced quality levels; (b) improve air access and airport infrastructure; (c) diversify attractions and activities; (d) address shortages of trained and qualified personnel; and (e) protect the environment. Since the inception of the BPOA+10, some work has been done in Seychelles to address to the afore-mentioned issues and challenges in the tourism industry.

### **Value for Money**

- The Tourism Incentives Act (TIA) came into force in 2004 in order to provide incentives and concessions to investors in all tourism sectors. Since the enactment of the act, more Seychellois have entered the sector, benefiting directly from tourism. All tour operators, tourist guides, travel agents and car hires are entirely owned and operated by Seychellois citizens.
- The Tourism Board Act was changed in 2009 to privatize the Seychelles Tourism Board and make it more responsive to the industry. Now the majority of board members are from the local tourism and hospitality industry rather than government.
- Several large hotels have undergone major refurbishment and renovation works, upgrading their standard and facilities and attracting a higher clientele.
- The Tourism Strategy 2017 was also launched as part of the National Strategy 2017 with the aim of doubling GDP in ten years. The 2017 strategy aims – “To attain self-sustaining economic growth by securing targeted increases in the number of visitor arrivals and the

amount spent by each tourist” by increasing Seychellois “stake-holding” at all levels of the industry

### **Improve Air Access and Airport Infrastructure**

- Two new air-carriers – Emirates Airlines and Qatar Airways – have commenced operations to Seychelles since the BPOA +10 report. The country now is served by a number of international airlines: Emirates Airlines, Qatar Airways, Condor, Kenya Airways and Air Austral; and Air Seychelles.
- The Seychelles Tourism Board (STB) is intensifying efforts to access other markets in Eastern Europe, the Far East, and regionally in Reunion and Kenya to reduce Seychelles’ dependence on the European market, which currently accounts for approximately 80% of tourist arrivals coming to Seychelles.
- Since 2006, work has been ongoing to renovate and expand Seychelles’ airport – this is nearing completion. The airport is now managed by the Seychelles Civil Aviation Authority as an autonomous body (it was previously managed by the Ministry of Tourism and Transport)
- The progress made includes an increase in operators, improvement of service offered by the airport, an upgrade of infrastructure and more competent and qualified personnel to manage the aviation operations of the Seychelles.

### **Diversify attractions and activities**

- The STB has added several activities on to the Seychelles calendar of events in the past few years, in collaboration with other stakeholders, i.e., the Eco-Healing Seychelles Marathon, SUBIOS Underwater Festival, and evening open air markets at several locations.
- the designation of Ile Moyenne National Park in 2009 has added a new ecotourism attraction for tourists
- Seychelles Heritage Foundation is working on increasing the list of national heritage sites to promote cultural sustainability. Some old historical traditional buildings and sites are being restored.
- STB is undertaking an inventory/situation analysis of all ecotourism sites, products and activities in the country to help the tourism industry engage in more effective planning and management of ecotourism attractions and activities

### **Address shortages of trained and qualified personnel**

- In 2007 the Seychelles Tourism Academy (STA), the only provider of Certificate, Diploma and Advanced Diploma Level training in hotel and tourism studies in Seychelles, was transferred from the Ministry of Education to the newly-created Seychelles Tourism Board. STA provides students the opportunity to partake in internship programmes whereby they can gain state of the art experience in the hotel establishments.
- STA has established an exchange programme for students in collaboration with Lycee Hotelier La Renaissance-La Reunion, and CENTHOR-Mauritius, an exchange student programme focused on tourism management. STA is in joint negotiations with ITM- Austria, Shannon College- Ireland, and SHATEC-Singapore, to enable students to enrol for advanced degrees in Tourism and Hospitality. Plans for renovation and expansion of the school had been finalised and construction was expected to commence in 2008. BADEA was to finance the project estimated at SR 66 million, however, due to the economic reform programme, this project has been postponed.
- Since 2008, STA and STB have been retraining individuals from the public service Voluntary Departure Scheme who were qualified to join the tourism industry.

### **Protect the environment**

Seychelles is beginning to undertake several initiatives to shift towards more sustainable tourism, ecotourism and nature-based tourism, although this sector requires urgent development

- The criteria for a sustainability label has been developed and tested for the accommodation sector, implementation is now being initiated under the UNDP-GEF Mainstreaming Biodiversity project. The sustainability label criteria include environmental, social and economic aspects. The label is not yet in force.

- Some island resorts have their own conservation plans and staff, i.e. Denis Island, Bird Island and North Island.
- Ozone Depleting Substances (ODS) have been phased out in tourism establishments
- Climate change workshops for the tourism industry have been initiated by the NGO Sustainability for Seychelles
- Seychelles Eco-Tourism Strategy for the 21<sup>st</sup> Century (SETS 21) was launched in 2003 and serves as a basis for reviewing and developing ecotourism products and to create awareness about ecotourism significance for Seychelles.
- Seychelles Hospitality and Tourism Association has a working group on environment

### **Constraints and Challenges**

- There is a shortage of human resources at all levels of the tourism industry. While the Seychelles Tourism Academy is trying to address this, plans to renovate the school have been postponed due to the economic reform programme.
- Limited industry understanding of ecotourism beyond nature tourism (i.e. integrating the social, environmental and economic aspects of tourism).
- Many tourism establishments have high ecological footprints regarding energy, water use, waste production and reliance on imports.
- More education is needed to help tourists and the tourism industry understand the need for sustainable ecotourism in Seychelles.
- No mechanism in place to ensure that benefits from high end tourism (particularly on islands) trickles down the community (i.e. a percentage of profits donated to community)
- Few local organisations have tried or marketed programs for tourists to offset the carbon generated through their holiday
- It remains to be seen whether the privatization of the STB will lead to greater commitment to sustainable ecotourism in Seychelles.

## **4.9 BIODIVERSITY RESOURCES**

Small island States have fragile island ecosystem with high level of diversity and endemism. Seychelles is well known worldwide for its unique and rich biological diversity. It is considered by IUCN as a biological hotspot. However, due to its small size and isolation the different ecosystems of Seychelles are among the most threatened in the world.

As a small island state, the economy of Seychelles is highly dependent of its biodiversity resources: the main economic sectors are tourism and fisheries. Seychelles has a long history of conservation and environment protection activities, and in trying to ensure environmental sustainability. Satisfactory results have been achieved in the assessment and taxonomic survey of key species, and some measures have been implemented to control invasive species. Public information and education on biodiversity issues have been effective. Seychelles is currently in the process of designing its third Environment Management Plan (2010-2020) which will most certainly include plans for the continued sustainable management of biodiversity resources.

Seychelles is now completing the implementation of its second Environment Management Plan (EMPS 2000-2010) which had the overall goal to promote, coordinate and integrate sustainable programme in all sectors including biodiversity. For the period 2004-2009, the main objectives and achievements for biodiversity were:

### **Increase In-situ Conservation**

- Successful projects of rehabilitation of Island ecosystems including eradication of Alien invasive Species and reintroduction of endemic species were implemented by NGOs on several islands funded by private sector and FFEM(2004-2009)

- 2 on-going UNDP-GEF projects (2008-2012): Sustainable Land management and Bio security are now looking at reviewing legislation for Bio security and develop protocol for the management of different Alien Invasive Species.

### **Strengthening Identification and Monitoring of Biodiversity**

- An assessment of terrestrial and freshwater biodiversity was completed in 2005 by an NGO funded by individual donors.
- A threat assessment of very rare plant taxa of the Seychelles is ongoing since 2004.
- Monitoring and tagging of whale shark project (2000-2009)
- Action of Plan for species conservation were developed and implemented for Sharks, Terrapins, Seychelles white eye, Seychelles Scops Owl, Coco de Mer, Seychelles Black Parrot, Seychelles Magpie Robin, Seychelles Fody, Seychelles Black Paradise Flycatcher, Sheath tail bat, Sea Turtles.

### **Conserving Biological Diversity of Inland Water Ecosystems**

- Assessments of river biodiversity and wetlands for terrapins were undertaken (2005)

### **Strengthening ex -situ Biodiversity Conservation**

- A Biodiversity Centre Project is being implemented including digital library ,education awareness program, propagation of endemic plants

### **Strengthen Biodiversity Capacity –Building Community Partnership and Networking**

- Training to identify marine invasive species on coral reefs(2005)
- Establish University of Seychelles on going
- Establishment of poaching control network(2005)
- Develop educational activity books for children about Aldabra (2009)

### **Development of National Biodiversity Policy**

- A biodiversity policy is currently being developed (2010-2011)
- The Seychelles National Parks Authority(SNPA) was constituted as a body corporate in 2009.It replaces the Marine Park Authority and is now responsible for the protection and management of National Parks both marine and terrestrial, as well as the forestry division. SNPA is now autonomous and expected to be financially self-sufficient as the marine parks generate income from ticket sales and mooring.

### **Challenges and Constraints**

- In the next ten years, Climate Change will be an important threat to biodiversity resources in Seychelles (habitat destruction, loss of biodiversity, land destruction etc.) which could have a major impact on the economic development of Seychelles.
- Due to the lack of financial resources and capacity in terms of infrastructure and human resources it is unlikely that Seychelles will be able to implement measures to reduce the impact of threats on its biodiversity without international support.
- The recent developments in the tourism sector and the population density will increase pressure on biodiversity resources in Seychelles, which some of them are already in decline. To insure proper management of biodiversity resources, Environmental legislations and policies in Seychelles, which are generally old, will need to be revised to international standards and adequately enforce.

## **4.10 TRANSPORTATION AND COMMUNICATION**

The transport and communication sectors are of vital importance for the country given its geographical characteristics. The Seychelles comprises over 110 islands, spread out over an EEZ of 1.4 million square kilometers. The majority of the population resides on the 3 main islands of

Mahé, Praslin and La Digue and the importance for people, including visitors, to move around and communicate is vital.

Transportation, including land, sea and air, is under the jurisdiction of the MENRT. A new agency, the Land Transport Agency, was set up by law to oversee development of the land transport sector. The Marine Safety Administration and Seychelles Port Authority regulates the domestic sea transport while the Seychelles Civil Aviation Authority oversees the air transport sector.

The national transport sector can be categorized into the following areas;

- Road Transport : For passenger and freight transport;
- Domestic and International Air Transport : For passenger transport using small aircrafts and helicopters and passenger and freight transport using bigger aircrafts;
- Domestic Sea Transport: For passenger and freight using schooners and small landing craft/ cargo boats transport.

There are currently over 525km of roads (primary, secondary, estate and feeder) in the Seychelles (GOS 2009). Although the terrain and topography is quite harsh, the road network is moderately developed with steep and windy road, which limits the speed at which vehicles can travel at and the size of vehicles. This poses a problem for public buses and there has been a number of accidents, some fatal, as a result. This has necessitated a general speed limit of 65 km/hr, with limit of 40 km/hr in the built-up areas and the new roads on the reclaimed land are wider, on level terrain and speed limits of 70 to 80 km/hr are allowed. (Coopoosamy T. et al, 2008)

Public transport is still provided by the Seychelles Public Transport Corporation (SPTC) on Mahé, while this service has been privatised on Praslin. It was recently announced in the local news that there are plans to allow for private operators to provide off peak services.

Passengers travel between the 3 main islands either by high speed catamarans, where new services has brought in competition, small (19 to 30 passengers) turbo prop aircraft or helicopter. With the recent economic crisis and oil price hikes, there has been significant increases in the price of inter-island travel, especially for Seychellois and a notable drop in some services, especially air travel.

The preferred to transport cargo between islands is by sea, even to the furthest islands, like Aldabra, which lies over 1000km from the main islands. Old fashioned schooners are still common on the Mahé-Praslin and Mahé-La Digue routes.

The department of Information Communication Technology (ICT) within the Ministry of National Development (MND) has portfolio responsibility for communication and oversees the regulation of this sector. Seeing the importance of communication in the country, MND established a steering committee to draft a national policy for this sector. The drafting of this policy saw a broad consultative process that included actors outside the committee itself, including the civil societies, in order to gain a more realistic perspective of the needs of the population (GOS, 2007a). The policy sets out that that accessible, affordable, high quality and well-regulated ICT facilities and services, with and within Seychelles is critical to the realization of its vision of 'a modern, ICT enabled and knowledge-based information society,

There are 4 main providers of telephone services with a very well developed land and wireless network and 3 internet service providers ([www.ict.gov.sc](http://www.ict.gov.sc)). The mobile network has proved very valuable to bringing communication to remote locations on the mainland and as well as in between other islands. The government is committed to improving and upgrading communication facilities that exist so as to provide a better service, especially between the different islands. The internet sector is also well developed with the ability to provide broadband service to consumers. There is a plan to further upgrade this service by establishing a link between Seychelles to East Africa via fibre-optic cables to improve the accessibility of the internet. A feasibility study, including the

environmental impact assessment, was officially launched in October 2009 and is expected to be completed in 2010 with concrete recommendations.

There have been various challenges in bringing affordable, reliable and efficient transport and communication at a national level and here are some of the challenges;

- Size of the population and their spread
- Over 100 islands spread across vast distances
- High cost of network and services due to economies of scale
- Rugged and difficult terrain (including very hard granite base)
- Availability and affordability of parts, equipment and other resources to fix, maintain and upgrade the networks.

## **4.11 EDUCATION FOR SUSTAINABLE DEVELOPMENT**

Environmental education for sustainable development in Seychelles has been a priority since the first EMPS in 1990-2000. Although environmental education was not identified as a core thematic area in the current EMPS, it was considered a cross-curricular theme. The Ministry of Education, MENRT, parastatals and NGOs all work closely to promote environmental education through both formal and informal education.

### **Environmental Education in Schools**

Seychelles has 34 primary and secondary schools, as well as a number of post-secondary institutions for further education. Education from ages 5 to 16 is free and compulsory. The Ministry of Education's policy to promote environmental education across the curriculum at all levels has been sustained since the 1990s. The current Education Policy identifies sustainable development as one of the goals of the formal education system (GOS, 2000b). The ministry employs an EE coordinator who works in collaboration with management, schools as well as other government, parastatal and NGO partners. Many EE resources have been produced and distributed to schools, many in-service teacher training workshops have been offered, and teacher training in EE is compulsory at teacher training college, the National Institute of Education (now part of University of Seychelles). Although the Ministry had an Environmental Education Coordinating Committee for many years this committee has lost some momentum since 2007 and is in need of revival. It should be noted however, that informal networking and collaboration is still commonplace.

Work remains to be done to better integrate environmental education into the curricula of different subjects; at present for most subjects other than science, geography and personal/social education, it is left to the discretion of interested teachers take the initiative. Most schools also run environmental clubs during a scheduled extra-curricular time after school and they also do activities on weekends. These include wildlife clubs, citizen clubs, Care clubs, eco-school clubs, and other environmental clubs. The Ministry of Education regularly coordinates competitions on various environmental themes in collaboration with other community partners, i.e. earth day, environment day, world water day, world biodiversity day, world wetlands day, etc. Each year (since 1994) the Ministry of Education coordinates a national eco-school competition to reward primary and secondary schools who have made the greatest effort to integrate environmental education into all aspects of school life.

Generally environmental education has been highly promoted in Seychelles' schools but it has not necessarily not addressed all three dimensions of ESD (social, economic and ecological), focusing mainly on the ecological dimension of sustainability. However this is beginning to change due partly to the Decade for Education for Sustainable Development. Interdisciplinary issues like climate change are beginning to be addressed through theme days and competitions. Issues like gender, human rights, peace, social justice etc. are addressed in formal education but rarely integrated with EE. The national eco-school competition is being revised to incorporate a broader

ESD approach. Some action research is being done by a group of teachers to look at strategies for broadening the reach and approach of EE in schools to include and address all aspects of sustainability.

ESD at the higher education level is less well coordinated, although there is some environmental content in the vocational and A level programs, many of which are influenced or based on international curricula. There is potential for more ESD to be integrated, and for the programs to focus more on the concepts of sustainability and sustainable livelihoods. There is interest among the lecturers, however more support and coordination is needed from the Ministry and other partners such as NGOs and parastatals. One NGO, Sustainability for Seychelles has been doing climate change and sustainability workshops for students at the different vocational schools with funding from LUNGOS and the UNDP/PCU.

The University of Seychelles has just become operational in 2009, and the degree to which they institutionalize the principles of ESD and sustainability in their programs and operations remains to be seen.

## **Public Awareness**

The Public Relations, Communications and Information Management (PRCIM) section in the MENRT leads government programs to promote sustainable development. The section works in close collaboration with the media as well as many NGOs, parastatals and other government departments. Over the last five years, there have been regular weekly or monthly television and radio programs touching on various issues related to sustainability such as climate change, waste management, food security, tourism, biodiversity conservation, cultural traditions, water conservation, etc.

There is a well established network of environmental NGOs all of which contribute to public awareness programmes related to environmental sustainability. NGOs such as Nature Seychelles, Wildlife Clubs of Seychelles, Island Conservation Society, Sustainability for Seychelles, Marine Conservation Society of Seychelles, Plant Conservation Action Group, Nature Protection Trust of Seychelles, Green Island Foundation, as well as public trusts such as the Seychelles Island Foundation and Sea Level Rise foundation, have also been active in promoting sustainability through their own public awareness programs through the media, their websites and blogs. The majority of public awareness campaigns have focused on biodiversity conservation, although sustainable living themes are increasingly being addressed.

Other bodies such as the National Council for Children, the UNDP/PCU, the Ministry of Health, NATCOF, LUNGOS, SeNPA and other NGOs have also undertaken public awareness campaigns focused on different aspects of sustainability such as human rights, gender, health, consumerism, sustainable livelihoods etc. but these have not necessarily been integrated or associated with the ecological dimension of ESD.

## **Constraints and Challenges**

In general Seychelles performance in the area of ESD has been very high, with input and involvement from all sectors of society. However the following require further action:

- Seychelles needs to focus on better integration of all dimensions of SD into Seychelles environmental education programs: environment, society and economy
- More attention needs to be paid to ESD at post-secondary levels to promote sustainable livelihoods
- More specific ESD curriculum modules need to be created for primary and secondary education to ensure thorough coverage
- Better strategic planning and coordination between all stakeholders is needed. The revival of the EE coordinating body would facilitate this although the mandate of the committee could be broadened to encompass public awareness as well as formal education.

- More research is needed to gauge the impacts of environmental education and awareness programmes, and guide strategic planning.

## **5 – CONCLUSIONS AND RECOMMENDATIONS**

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Due to the difficult economic situation prevailing in Seychelles at the present time, it can be expected that the government of Seychelles will be phasing out of financing conservation projects in Seychelles. This is already evident with the creation of autonomous self-sufficient authorities now responsible for managing national parks, gardens, waste, energy, etc.

Seychelles has in recent years been highly successful in securing international grants; a recent UNDP programme evaluation revealed that Seychelles was the highest recipient of GEF funds per capita worldwide. Seychelles main problem is not attracting funding for conservation and sustainable development, but rather in its capacity to absorb funds with the extremely limited human resources available, and deliver on the project outputs in the approved time frame. The establishment of the University of Seychelles in 2009 should help alleviate some of these human resource shortages, but regional and international funding and institutional support is needed to help the University during the first few years.

Conservation programmes in Seychelles are expected to rely more and more on international grants and private funding. NGOs, the private sector and other civil society groups will have to be supported as they begin to play a more active role in Seychelles efforts toward sustainability development. The next generation of Seychelles' EMPS will have to identify new and innovative sustainable financing mechanisms for sustainable development programmes.

One of the greatest cross-cutting threats to sustainable development efforts in Seychelles is that of global climate change. Already some of the impacts have been felt locally, and the two mainstays of Seychelles' economy (tourism and fisheries) are vulnerable to both climate change and global economic changes, putting Seychelles in an extremely precarious situation.

More support is needed from the international community to help Seychelles and other SIDS respond quickly and appropriately to the threat of global climate change. The international community must also accept their responsibility in reducing greenhouse gas emissions. Seychelles produces a minute proportion of the global GHGs but is also preparing to play its part in mitigation.

## REFERENCES

- Agricole, W. (2009). *National Circumstances: Seychelles' Second National Communication to the UNFCCC*. Government of Seychelles.
- Campling, L., H. Confiance & M-T Purvis. (2009). *Social Policy in the Seychelles (Draft)*. Prepared for the joint Commonwealth Secretariat/UNRISD Project on Social Policies in Small States. Retrieved 10<sup>th</sup> January, 2010 from: [http://www.unrisd.org/80256B3C005BCCF9/%28httpAuxPages%29/8C1D1CB4CBA62E69C12575DF00540D30/\\$file/SeychellesWEB.pdf](http://www.unrisd.org/80256B3C005BCCF9/%28httpAuxPages%29/8C1D1CB4CBA62E69C12575DF00540D30/$file/SeychellesWEB.pdf)
- Central Bank of Seychelles. (2009). *Annual Report for 2008*.
- Central Bank of Seychelles. (2008). *Financial Services Supervision Annual Report 2008*.
- Chinien, S. (2009). *Seychelles Economic Governance Reforms Program Appraisal Report*. African Development Bank.
- Coopoosamy T. , M. Razanajotovo, A. Jean-Louis , D. Laramé & G. Moustache G. (2008) Enabling activities for the preparation of the Seychelles second national communication to the United Nations Framework Convention on Climate Change: national greenhouse gas inventories for the year 2000. August 2008. Seychelles National Climate Change Committee. Reb
- Didon, G. (2009). Society, population, and health (including gender). In Tortell P. & A. Jean-Louis, *Report on the review of the Environment management plan for Seychelles (EMPS) 2000-2010*. pp.22-33.
- European Commission. (2009). *Annexe – Seychelles Economic Reform Programme (SERP)* - CRIS number: 2009/021-770. Retrieved January 22, 2009 from: [http://ec.europa.eu/europeaid/documents/aap/2009/af\\_aap-spe\\_2009\\_syc.pdf](http://ec.europa.eu/europeaid/documents/aap/2009/af_aap-spe_2009_syc.pdf)
- Gonzalves, C. & S. Mussard. (2009). Water, sanitation and waste. In Tortell P. & A. Jean-Louis, *Report on the review of the Environment management plan for Seychelles (EMPS) 2000-2010*. pp.127-169.
- Government of Seychelles (2007a), *National Information Communication Technology Policy*, Republic of Seychelles. Available at [www.ict.gov.sc](http://www.ict.gov.sc) .
- Government of Seychelles / UNDP (2007b). *Capacity Development for Sustainable Land Management in Seychelles: Project Brief*. Republic of Seychelles.
- Government of Seychelles. (2007c). *Seychelles Strategy 2017*.
- Government of Seychelles. (2006). *National Human Resource Development Council Act*. Republic of Seychelles.
- Government of Seychelles (2005a). *National Human Resource Development Council Policy*. Republic of Seychelles. Commonwealth Secretariat. Available at [www.nhrdc.sc](http://www.nhrdc.sc) .
- Government of Seychelles. (2005b). *Seychelles National Capacity Self-Assessment (NCSA): Action Plan for Environmental Capacity Development*. Republic of Seychelles
- Government of Seychelles. (2005c). *Seychelles National Capacity Self-Assessment (NCSA) for Global Environmental Management: Strategic Overview of obligations under the UNFCCC*.
- Government of Seychelles (2004a), *Seychelles - National Assessment of the Barbados Programme of Action+10 Review*. Republic of Seychelles.
- Government of Seychelles (2004b), *Millennium Development Goals Status Report*. Republic of Seychelles.
- Government of Seychelles (2002), *Seychelles National Report to the World Summit on Sustainable Development*. Ministry of Environment, Republic of Seychelles.
- Government of Seychelles.(2000a). *Environment Management Plan of Seychelles (EMPS) 2000-2010*.
- Government of Seychelles.(2000b). *Education for a learning society*. Ministry of Education.
- Hanson, S.J. (2009). Piracy in the greater gulf of Aden: Myths, misconceptions, remedies. *NIBR Report 2009:29*. Norwegian Institute for Urban and Regional Research. Retrieved January 22, 2009 from: <http://en.nibr.no/uploads/publications/26b0226ad4177819779c2805e91c670d.pdf>
- Hendriks, S. and N. Meelobo. (2009). *Workshop report "Seychelles Food Security" – Pillar III under MTRF and UNDP Funding*. Republic of Seychelles.

- International Monetary Fund. (2010). *Seychelles: IMF Country Report No. 10/3*, (January 2010). (Seychelles) Retrieved January 22<sup>nd</sup>, 2010 at: <http://www.imf.org/external/pubs/ft/scr/2010/cr1003.pdf>
- International Monetary Fund. (2009). *IMF Sees Strong Progress in Seychelles Economic Program*. Press Release No. 09/284, August 17, 2009. Retrieved January 22<sup>nd</sup>, 2010 at: <http://www.imf.org/external/np/sec/pr/2009/pr09284.htm>
- Jean-Louis, A., P. Tortell, G. Didon, A. De Commarmond, D. Matatiken, M. Moustache, G. Moustache, P. Andre, J. Nageon, C. Gonzalves, S. Mussard, P. Hollanda, B. Samson, F. Jumaye, G. Cole, W. Agricole & S. Dora. (2009). *Report on the review of the Environment management Plan for Seychelles (EMPS) 2000-2010*.
- Ministry of Tourism and Transport. (2003). *Seychelles Eco-Tourism Strategy for the 21<sup>st</sup> Century SETS-21*. Republic of Seychelles.
- National Statistics Bureau. (2009). *Household Budget Survey 2006/2007*. Republic of Seychelles.
- National Statistics Bureau. (2008). *Seychelles in Figures 2007*. Republic of Seychelles.
- Ploch, L. et al. (2009). Piracy off the horn of Africa. Congressional Research Service (USA). Retrieved January 22, 2009 from: <http://fpc.state.gov/documents/organization/130809.pdf>
- Seychelles National Climate Change Committee. (2009). *Seychelles National Climate Change Strategy*. Republic of Seychelles.
- Staff writer. (2009). PIRACY: Seychelles as Hub. *Africa Research Bulletin: Political, Social and Cultural Series* 46(11).
- St. Ange, A. (2009). Seychelles Tourism ends 2009 on a high note having weathered the economic crisis. *ENT: Global Travel Industry News*. Retrieved January 22<sup>nd</sup>, 2010 at: <http://www.eturbonews.com/13205/seychelles-tourism-ends-2009-high-note-having-weathered-economic>
- United Nations. (2009). *Seychelles Common Country Assessment 2006-2008*. Retrieved January 22, 2010 from: [http://un.intnet.mu/UNDP/downloads/seychelles/Seychelles\\_CCA\\_2006-2008\\_main\\_text.pdf](http://un.intnet.mu/UNDP/downloads/seychelles/Seychelles_CCA_2006-2008_main_text.pdf)
- United Nations, (2005). *Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States*. Retrieved 3<sup>rd</sup> January, 2010 from [http://www.un.int/mauritius/Documents/AOSIS/Prepcom%20Reports/Mauritius\\_Strategy\\_latest\\_version.pdf](http://www.un.int/mauritius/Documents/AOSIS/Prepcom%20Reports/Mauritius_Strategy_latest_version.pdf)
- United Nations. (2005). Report of the the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. Available at: [http://www.sidsnet.org/docshare/other/20050622163242\\_English.pdf](http://www.sidsnet.org/docshare/other/20050622163242_English.pdf)
- United Nations. (2005). Mauritius Declaration. Available at: <http://www.un.org/smallislands2005/pdf/mauritiusdeclaration.pdf>
- United Nations General Assembly. (1994). *Report Of The Global Conference On The Sustainable Development Of Small Island Developing States*. Bridgetown, Barbados, 25 April-6 May 1994.
- United Nations Development Program / Government of Seychelles (UNDP/GOS). (2007). *Capacity development for sustainable land management in Seychelles*. UNDP-GEF Targeted Portfolio Project for SLM in LDC and SIDS.
- Wilson, B. (2009). Effectively controlling a regional threat: Somali piracy. *Conflict trends*, 1, pp. 11-18. Retrieved January 22, 2010 from: <http://www.internal-displacement.org>.
- World Bank. (2009). International Bank for Reconstruction and Development Interim Strategy Note for the Republic of Seychelles. Available at: <http://www-wds.worldbank.org>.
- World Bank. (2008). *Seychelles at a glance*. Retrieved January 14, 2010 from [http://devdata.worldbank.org/AAG/syc\\_aag.pdf](http://devdata.worldbank.org/AAG/syc_aag.pdf)
- World Health Organisation. (2004). *WHO Country Cooperation Strategy*. Republic of Seychelles.

## ABBREVIATIONS

AfDB	African Development Bank
AOSIS	Alliance of Small Island States
ARER	Agence Reunionnaise pour L'Energie Renouvelable
APANA	Asosiasyon Pour Apprann Nouvo Artizana
ASCLME	Agulhas and Somali Current Large Marine Ecosystems <i>Project</i> .
BPOA	Barbados Programme of Action for Sustainable Development in SIDS
BPNL	Basic Poverty Needs Line
CBS	Central Bank of Seychelles
CDM	Clean Development Mechanism
CESD	Climate and Environmental Services Division (of DOE)
COP15	Conference of the Parties (15 <sup>th</sup> meeting)
DOE	Department of Environment
DRDM	Department of Risk and Disaster Management
EC	European Commission
EDF	European Development Fund
EEL	Environmental education
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMPS	Environment Management Plan of Seychelles
ESD	Education for sustainable development
EU	European Union
FAO	Food and Agriculture Organization
FFEM	Fonds Français pour l'Environnement Mondial
GDP	Gross Domestic Product
GDF	Suez Gaz de France Suez
GEF	Global Environment Facility
GIS	Geographic Information System
GOS	Government of Seychelles
GHG	Greenhouse Gases
Ha	Hectare
HDI	Human Development Index
ICT	Information Communication Technology
ICZM	Integrated Coastal Zone Management
IMF	International Monetary Fund
INC	Initial National Communication
IOC	Indian Ocean Commission
LUNGOS	Liaison Unit for NGO's in Seychelles
LWMA	Landscape and Waste Management Agency
MASMA	Marine Science Program for East Africa
MDG	Millennium Development Goal
MENRT	Ministry of Environment and Natural Resource and Transport
MFF	Mangroves for the Future
MND	Ministry of National Development
MSI	Mauritius Strategy for Further Implementation (of the BPOA)
NATCOF	National Consumers Forum
NCCC	National Climate Change Committee
NGO	Non-governmental Organisation
NHRDC	National Human Resources Development Council
NMS	National Meteorological Services
NRDMS	National Risk and Disaster Management Secretariat
NSB	National Statistics Bureau
ODS	Ozone Depleting Substances

PCU	Project coordinating unit (UNDP)
PDF	Praslin Development Fund
PET	Polyethylene terephthalate
PRCIM	Public Relations, Communication and Information Management (Section of MENRT)
PUC	Public Utilities Corporation
PV	Photovoltaic
RETs	Renewable energy technologies
S4S	Sustainability for Seychelles
SEC	Seychelles Energy Commission
SeNpa	Small Enterprise Promotion Agency
SETS21	Seychelles Eco-Tourism Strategy for the 21 <sup>st</sup> Century
SFA	Seychelles Fishing Authority
SHTA	Seychelles Hospitality and Tourism Association
SIDS	Small Island Developing States
SLM	Sustainable Land Management
SLRF	Sea Level Rise Foundation
SNC	Second National Communications
SNPA	Seychelles National Parks Authority
SPTC	Seychelles Public Transport Corporation
SR	Seychelles Rupee
STB	Seychelles Tourism Board
STA	Seychelles Tourism Academy
SUBIOS	Sub-Indian Ocean Seychelles festival
TIA	Tourism Incentives Act
UN	United Nations
UNCCD	United Nations Convention on Combating Desertification
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
WIOMSA	Western Indian Ocean Marine Science Association
WIOLAB	Western Indian Ocean Land

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