

9.0 Seychelles

CC-DARE	Climate Change Adaptation and Development Initiative
COI	Indian Ocean Commission
EC	European Commission
DFID	Department for International Development (United Kingdom)
GDP	Gross Domestic Product
GEF	Global Environment Facility
GOS	Government of Seychelles
FAO	Food and Agriculture Organization
IFAD	International Fund for Agriculture and Development
IFRC	International Federation of Red Cross and Red Crescent Societies
IUCN	International Union for the Conservation of Nature
MPF	Mangroves for the Future
SIDA	Swedish International Development Agency
SNCCC	Seychelles National Climate Change Committee
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
USDS	United States Department of State

Seychelles is an archipelagic country of over 115 islands located off the east coast of continental Africa in the Indian Ocean, northeast of Madagascar, with a total surface area of 455.3 square kilometers (USDS, 2010). A majority of the country's islands are formed from coral, with forty being granitic (SNCCC, 2009). Seychelles is rich in biodiversity and 45 per cent of the country's land area is protected—one of the largest protected areas in the world in relation to surface area (GOS, 2000). Most of its islands are surrounded by fragile coastal ecosystems.

More than 90 per cent of its population of around 84,600 people and nearly all of its economic activities are concentrated in the narrow coastal zone of Mahe island (SNCCC, 2009). Seychelles has the second highest Gross Domestic Product (GDP) per capita in Africa, and its

Human Development Index is ranked the highest on the continent (SNCCC, 2009). The country's adult population has attained a 92 per cent literacy rate, with school aged children reaching 98 per cent (SNCCC, 2009; USDS, 2010).

While primarily an agrarian country at the time of its independence in 1976, the economy of the Seychelles is now dependent on tourism; the services sector (transport, communications, commerce and tourism) has contributed close to 70 per cent of GDP. In recent years this dependence has made the country susceptible to external shocks (USDS, 2010). Fisheries are the country's second largest economic sector (SNCCC, 2009). The country's domestic food production averages 60 per cent of local consumption, with 40 per cent imported (GOS, 2000). The country further relies on imported petroleum products to meet its energy needs, with fuel imports costing the equivalent of 22 per cent of GDP in 2005 (SNCCC, 2009).

A. Adaptation Needs and Priorities

The mean average temperature of the archipelago is 26.9°C with a humidity of 80 per cent (GOS, 2000). Although precipitation levels vary across the country's islands, most experience a dry season from May to October, (GOS, 2000). Recent accounts indicate that the country's climate may have begun to change over the past few decades. The country warmed by 0.25°C between 1972 and 1997, and its annual rains increased between 1972 and 2006 (SNCCC, 2009). From 2002 to 2006, there are five cases in which sea levels exceeded the average by 10 centimeters—an increase that caused significant damage to infrastructure when accompanied by storm events (SNCCC, 2009).

As a small island nation with highly populated low-lying coastal areas, Seychelles is particularly vulnerable to the impacts of climate change (SNCCC, 2009). Climate projections to date have focused on the island of Mahe, where the majority of the country's population is based. While recent assessments make use of both global and regional circulation models in anticipating the effects of climate change, the Seychelles' recent National Climate Change Strategy notes uncertainty associated with current climate scenarios given the country's very small geographic size (SNCCC, 2009). Projections reveal uncertainty around the magnitude of future changes in precipitation on the island, with model results ranging from -8.6 per cent to +9.3 per cent by 2050 (SNCCC, 2009). It is generally anticipated that the dry season will be drier while the rainy season will be wetter under future climate conditions.

Annual sea level rise is anticipated to be within the range of 0.4 to 0.6 meters during the 2070 to 2100 period, a change that would not allow Seychelles' coral reefs to fully recover; it is anticipated that the health of the country's coral reefs will decline over the next 40 years (SNCCC, 2009). Given Seychelles' economic dependence on tourism, any future climatic changes that impact the country's biodiversity, coastline, coral reefs, fisheries and other tourist attractions may significantly impact its development. A 2007 study of six major tourism



sites in Seychelles found that the country's tourism sector is "extremely vulnerable" to external economic and environmental disasters, but that an aggressive approach to conservation may help to mitigate some of these impacts (Payet, 2007).

The Seychelles' Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) outlines many of the Seychelles' key vulnerabilities to climate change, including impacts on natural habitats and biodiversity, coastal zones, agriculture, freshwater resources and fisheries (GOS, 2000). Priority adaptation needs identified in the National Communication include the following (GOS, 2000):

- Monitor, survey and collect data on climate change and potential sea level rise;
- Formulate comprehensive integrated coastal zone management strategies to address potential sea level;
- Improve public awareness and political understanding around the effects of climate change;
- Increase participation in bilateral, regional and global research and assessments that are monitoring and mapping climate impacts;
- Develop information systems on construction technologies and land-use planning tools; and
- Introduce coastal adaptation technologies and conduct regular assessments on these technologies.

The National Communication also mentions some of the barriers to adaptation in Seychelles, including the country's dependence on a narrow range of resources, dependence on international trade, high coastal population density, overuse of resources, and limited institutional capacities (GOS, 2000).

The country's recent National Climate Change Strategy identifies the Seychelles' main needs in order to implement adaptation as being: (1) development of capacity at the tertiary level, especially in the mainstreaming of climate change, research and monitoring, and capacity building; (2) the development of a policy framework to enable stakeholders to tackle climate change issues; and (3) develop capacity within the government to manage the change through appropriate institutional channels (SNCCC, 2009). The Strategy also outlines a number of strategic objectives and planned adaptation activities, as outlined in Table 3.

In addition, based on the findings of a recently completed adaptation project, the Red Cross Climate Centre has identified the following needs to move adaptation along within the country: address risk reduction and improve surveillance of climate impacts; build capacity; establish community pilot projects to address the impacts of coastal erosion and flooding; and develop innovative financing mechanisms to enable community participation in risk reduction efforts (IFRC, 2010).

B. National Level Policies and Strategic Documents

Seychelles has produced a number of policies and reports that address adaptation needs, priorities and planned actions. The country prepared an Initial National Communication under the UNFCCC that was released in 2000, and is in the process of developing its second National Communication (SNCCC, 2009). In addition, the Seychelles has in place a ten-year Environmental Management Plan (2000-2010) that addresses how the country’s environment will be managed across thirteen thematic areas; climate change is integrated into the plan as a cross-cutting theme. Finally, the government has recently released a National Climate Change Strategy which lays out the policy actions that the government could carry out to address climate change—in relation to both mitigation and adaptation.

In addition to the policies discussed above, the government has organizational frameworks in place to coordinate climate change internally. In 1992 the government established the Seychelles National Climate Change Committee to provide broader coordination of the development and implementation of national climate policies (SNCCC, 2009). As well, the Seychelles Meteorological Services established a climate center in 1998, which has contributed to a number of studies and understanding of historical meteorological data (SNCCC, 2009).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Seychelles Initial National Communication to the UNFCCC ²¹⁷	Ministry of Environment and Transport	Submitted in 2000	Multi-sectoral	This document provides a review of the country’s national circumstances, identifies greenhouse gas sources and sinks, discusses the technologies and measures for greenhouse gas mitigation, presents vulnerability and adaptation options, and discusses the country’s capacity building needs and priorities.
2.	Seychelles National Climate Change Strategy	The Seychelles National Climate Change Committee	Released 2009	Multi-sectoral	This document provides a broad overview of the adaptation challenge in Seychelles, including a review of the country’s current climate and the anticipated effects of climate change by sector. It then discusses the measures that will allow Seychelles to adapt to climate change through a consideration of five overarching objectives.
3.	Second Environmental Management Plan of the Seychelles (2000 – 2010)	Government of the Seychelles		Multi-sectoral	The Environment Management Plan is a 10 year strategic document that outlines the country’s environmental objectives across 13 thematic areas. The vision is for the Management Plan to “serve as a flexible yet robust vehicle for continued improvement of proactive environmental management excellence.” In the document, climate change is viewed as a cross-cutting theme that must be integrated across all program areas.

²¹⁷ UNFCCC, http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=2737#beg

C. Current Adaptation Action

Less than 10 discrete adaptation projects have been identified as being underway in Seychelles, which is a low number compared to other country in the region, but high relative to the size of its population. These initiatives include one nationally focused project, “Ecosystem-based Adaptation to Climate Change in Seychelles,” that was recently approved by the Adaptation Fund and will be implemented by the United Nations Development Programme (UNDP). Outside of this project, Seychelles participates in several joint projects involving countries from Africa, Asia and Latin America. This includes participation in the Danish-funded program “Climate Change Adaptation and Development Initiative;” the “ACCLIMATE” project being implemented by the Indian Ocean Commission (COI) that facilitates regional cooperation amongst COI countries; and the “Mangroves for the Future” program promoting investment in coastal ecosystem conservation.

A number of the current projects underway in Seychelles have a focus on disaster risk management, followed by improving governance capacity, coastal zone management, freshwater resources, agriculture and strengthening climate information services. The activities being implemented within these projects generally include research, capacity building, knowledge communication and supporting policy development and integration. Fewer projects include community based adaptation and field implementation components.

Table 2: Current Adaptation Projects and Programs active in Seychelles

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action							
1. Ecosystem-based Adaptation to Climate Change in Seychelles ²¹⁸	This projects looks at water scarcity and coastal flooding. The project will concentrate on the coastal zones and hinterlands the main granitic islands. The main objective of the project is to include ecosystem-based adaptation into the country’s risk management system in water supplies. This will include the introduction of technology for ecosystem restoration and strengthen ecosystems to climate change resilience.	Adaptation Fund Budget: US\$6,455,750	UNDP	Capacity building; Field implementation	2011 – 2018	Freshwater supply; Coastal zone management; Ecosystem restoration	Mahé, Praslin, La Digue and Silhouette

²¹⁸ Adaptation Fund, http://adaptation-fund.org/sites/default/files/AFB.PPRC_.5.13%20Proposal%20for%20Seychelles_1.pdf

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
Participation in Regional and Global Projects								
2.	“ACCLIMATE” (adaptation au changement climatique) ²¹⁹	This project aims to promote regional cooperation between the Indian Ocean Commission (IOC) countries on climate change adaptation. This objective consists of reinforcing the IOC’s capacities in the area of climate change adaptation in the short and long term through the development of projects and policies. Several activities are implemented, including: capacity building for climate change observation and for regional vulnerability analyses; the identification of priority axes for regional alert systems and risks prevention plans; demonstrative actions; elaboration of a regional adaptation action plan and policy; and improving the conditions for national and regional knowledge sharing.	European Union, Fonds Français pour l’Environnement Mondial, French Ministry of Foreign and European Affairs Budget: € 3.645 million	Indian Ocean Commission	Capacity building: Policy formulation and integration	2008 – 2011	Climate information services; Government; Disaster risk management	<i>Regional:</i> Comoros, Madagascar, Mauritius, Réunion (France), Seychelles
<i>In Seychelles:</i> Further information required.								
3.	Enhancing the Disaster Risk Reduction Capacity in Agriculture and Rural Development ²²⁰	Preparation of 10 capacity building modules on pre- and post-disaster risk management and mainstreaming of disaster risk reduction in agriculture and rural development, with a focus on climate change adaptation.	Global Facility for Disaster Reduction and Recovery Budget: US\$50,000	Agriculture and Rural Development & Sustainable Agriculture Systems, Knowledge and Information	Capacity building	2008 – 2010 (closed)	Agriculture; Disaster risk management	<i>African:</i> Burkina Faso, Comoros, DRC, Eritrea, Ethiopia, Kenya, Madagascar, Niger, Rwanda, Senegal, Seychelles
<i>In Seychelles:</i> Further information required.								

²¹⁹ IOC, <http://www.ioi-ioc.org/index.php?id=158> and ACCLIMATE, <http://www.acclimate-oi.net/en>

²²⁰ GFDRR, http://gfdrr.org/gfdrr/ca_projects/detail/1228

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
4. Climate Change Adaptation and Development Initiative (CC-DARE) ²²¹	The joint UNEP–UNDP program provides demand-driven, flexible and rapid financial and technical support to 15 sub-Saharan countries. The emphasis of CC-DARE support is on short-term (3–6 months) initiatives that contribute to addressing key gaps for national climate change adaptation. The support is made available to improve the ability of sub-Saharan African countries to remove barriers and create opportunities for integrating climate change adaptation into national development planning and decision-making frameworks. The three main types of activities undertaken through the program are country-level activities, regional training courses, and national and regional workshops to communicate project results and share experiences and lessons learned.	Danish Ministry of Foreign Affairs	UNEP and UNDP	Capacity building; Knowledge communication; Field implementation	2008 – 2011	Multi-sectoral	African: Benin, Ghana, Ethiopia, Malawi, Mozambique, Rwanda, Senegal, Seychelles, Tanzania, Togo, Uganda
							<i>In the Seychelles:</i> Consultative meetings were held in the Seychelles in May 2009 to scope out project options. One activity included a school rainwater harvesting project, whereby water tanks were installed in schools to harvest rainwater from school roofs for domestic uses (other than drinking). This project also incorporated an educational angle. ²²²
5. Global Climate Change Alliance ²²³	The Global Climate Change Alliance seeks to deepen the policy dialogue between the European Union and developing countries on climate change; and to increase support to target countries to implement priority adaptation and mitigation measures, and integration climate change into their development strategies. The program's five priority areas for funding are: improving the knowledge base of developing countries to	European Commission, Czech Republic, Sweden, 10th European Development Fund <i>Budget:</i>	National Governments	Policy formation and implementation; Knowledge communication	2008 – ongoing	Disaster risk management; Government	17 developing countries and the Pacific Region, ²²⁴ including: Mauritius, Mozambique and Seychelles

²²¹ CC-DARE, <http://www.ccdare.org/>

²²² CC-DARE, <http://www.ccdare.org/Portals/131/outputs/Seychelles/final%20report%20cc%20dare.pdf>

²²³ GCCA, http://www.gcca.eu/pages/1_2-Home.html

²²⁴ These countries are: Bangladesh, Belize, Cambodia Ethiopia, Gambia, Guyana, Jamaica, Malawi, Maldives, Mali, Mauritius, Mozambique, Nepal, Pacific region, Rwanda, Senegal, Seychelles, Sierra Leone, Solomon Islands, Tanzania and Vanuatu.

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	the effects of climate change; promoting disaster risk reduction; mainstreaming climate change into poverty reduction development strategies; reducing emissions from deforestation and degradation; and enhancing participation in the Clean Development Mechanism.	€ 140 million					
		<p><i>In Seychelles:</i> The program is supporting the development of a National Climate Change Strategy for the country, coordinating with other donors. The project in this country will run from 2010-2013 and focus on sustainable development, energy and the clean development mechanism.²²⁵</p> <ul style="list-style-type: none"> • Budget: Euros 2.0 million • Duration: 2010 – 2013 					
6.	Mangroves for the Future (MFF) ²²⁶	<p>2007 – 2009: Australia, Germany, Norway, Sweden, UNDP, UNEP</p> <p>2010 to now: Norway and Sweden</p>	<p>National governments with CARE International, FAO, IUCN, UNDP, UNEP and Wetlands</p> <p>International with NGOs and CBOs</p>	<p>Research; Knowledge communication; Policy formation and implementation</p>	2006 – present	Coastal zone management	<p>Global; Asia region: India, Indonesia, Maldives, Pakistan, Seychelles, Sri Lanka, Thailand, Viet Nam</p>
		<p><i>In Seychelles:</i> This program supported a number of activities in the Seychelles, including integrated coastal zone management, as well as support for a Seychelles National Strategy and Plan of Action on coastal zone management.</p>					
7.	Preparedness for Climate Change ²²⁷	Red Cross/Red Crescent Climate Centre	National Red Cross/Red Crescent Societies	Capacity building; Policy formation and integration	<p>Phase 1: 2006 – 2009</p> <p>Phase 2: ongoing</p>	Disaster risk management	<p>Global: 39 countries</p> <p>South African participants in</p>

²²⁵ GCCA, http://www.gcca.eu/cgi-bin/datadirs.pl?&lg=2&id_datadir_family=1&extlink=8&sw=detail&id_datadir_sheet=15

²²⁶ MFF, <http://www.mangrovesforthefuture.org/> and <http://www.mangrovesforthefuture.org/Assets/documents/IUCN-MFF-Brochure-Web.pdf>

²²⁷ IFRC, <http://www.climatecentre.org/site/preparedness-for-climate-change-programme>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks through preparation of a background document, capacity building programs, and developing climate change resilient plans.						Phase 1: Madagascar, Malawi, Mauritius, Seychelles, Zimbabwe	
		<i>In Seychelles:</i> The Seychelles Red Crescent Society undertook a number of capacity building activities, including awareness raising, education, communication, and planning activities. ²²⁸						
8.	Southern Africa Regional Climate Change Program ²²⁹	The program aims to synthesize relevant climate change science, develop strategic research and strengthen the science-policy-governance-finance dialogue. The program will aim to build an evidence base for transboundary responses to climate change, strengthen the region's voice in international platforms, and enhance its ability to access necessary finance for climate change adaptation.	DFID, SIDA	OneWorld Sustainable Investments	Policy formation and integration; Research	2009 – 2014	Government; Climate information services	<i>African:</i> Angola, Botswana, DRC, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe
		<i>In Seychelles:</i> Further information required.						
9.	Regional Initiative for Smallholder Agriculture Adaptation to Climate	The objective is to support the adaptation of small-scaled productive systems to climate changes in the islands of the Indian Ocean to	IFAD <i>Budget:</i>	Indian Ocean Commission	Capacity building; Community	2010 – 2013	Agriculture	<i>Regional:</i> Comoros, Madagascar,

²²⁸ Further information is available here: http://www.climatecentre.org/downloads/File/programs/FINAL_Seychelles.pdf

²²⁹ Southern Africa Regional Climate Change Program, http://www.rccp.org.za/index.php?option=com_content&view=article&id=68&Itemid=61&lang=en

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Change in the Indian Ocean Islands ²³⁰	improve incomes and living conditions of family scaled farmers. It entails four main components: knowledge sharing, information and awareness, improvement of operational skills and support to small-scale farms.	US\$0.75 million		based adaptation; Knowledge communication			Mauritius, Seychelles, Reunion Island
<i>In Seychelles: Further information required.</i>							

D. Proposed Adaptation Action

Through the Seychelles National Climate Change Strategy, the country has identified a number of key objectives that will help the archipelago adapt to climate change, along with several policy options under each of these objectives. While the Strategy notes that the implementation of these actions will require assistance from international funders, the document provides a good indication of the planned adaptation projects and programs that Seychelles would like to undertake.

In addition, Seychelles is identified as have submitted the project “Adaptation of the Water Sector to Climate Change” to the Special Climate Change Fund for funding in the amount of US\$4.7 million. Co-financing for this project is estimated to be US\$8.0 million (GEF, 2010).

Table 3: Proposed Adaptation Projects and Programs in Seychelles’ National Climate Change Strategy

Objective	Examples of possible adaptation actions	Priority Sector(s)
1. To advance understanding of climate change, its impact, and appropriate responses.	Adaptation options mentioned in the Strategy include research and monitoring; the development of higher resolution models to understand the impacts of climate change on small islands; closing of research gaps in key sectors, including health, coastal areas, agriculture and marine fisheries; establishment of a national research council; and capacity building of existing institutions.	Multi-sectoral
2. To put in place measures to adapt, build resilience, and minimize vulnerability to the impacts of climate change.	Creation of inter-sectoral task force to coordinate effective implementation of actions, and identify key stakeholders and synergies. In addition, the Strategy mentions the following adaptation options: identify priorities for adaptation in critical sectors; assess and improve ongoing management activities and contribution to adaptation; and implementation of adaptation activities including adaptation at the community level, alternative coastal design, nationwide rainwater harvesting, evaluation of new	Multi-sectoral

²³⁰ COI, http://www.coi-ioc.org/fileadmin/multimedia_francais/activites/downloads/R%E9sum%E9%20projet%20Agro%E9cologie%20English%20version.pdf

Objective	Examples of possible adaptation actions	Priority Sector(s)
	plant varieties, etc.	
3. To mainstream climate change considerations into national policies, strategies, and plans.	Activities under this objective would address addressing institutional learning needs, including the identification and review of main institutions involved in responding to climate change and raising awareness of the likely impact of climate change; incorporating climate risk assessment and response into government; and the incorporation of climate risk assessment into the private sector, including the adoption of guidelines and codes.	Government
4. To build capacity and social empowerment at all levels to adequately respond to climate change.	Activities falling under this objective would address the following: developing climate change education and curriculum within the country; implementing climate change awareness at all levels, including within government and the private sector, and integrating climate change into all sectoral policies and strategies, etc.	Civil society

E. Assessment

The Government of Seychelles has made a concerted effort to identify and address the country’s adaptation challenges, and it is evident that there is a considerable level of engagement within the country on this subject area through the Second National Communication process, the National Climate Change Strategy, and the Environment Management Plan. By its own admission, however, there is still room to further mainstream climate change adaptation considerations into key institutional/sectoral goals and to improve inter-ministerial coordination.

As well, the various adaptation projects currently being implemented generally respond to priority adaptation needs as identified by the Government of Seychelles and key stakeholders. These priority adaptation activities include the need to expand climate research and monitoring capacities, improve climate modeling capacity, enhance coastal zone management, build public awareness, further mainstreaming adaptation and strengthen disaster risk management. For example, the “ACCLIMATE” program being implemented by the IOC responds to this priority need by facilitating regional cooperation and knowledge sharing around meteorology and policy formation; coastal zone management is being addressed through the “Mangroves for the Future” project; policy formation and implementation is being advanced through European Commission and Government of Denmark programs; and risk reduction has been addressed through the “Preparedness for Climate Change” project. Expanded activity in these areas may be appropriate in the future, particularly with respect to coastal zone management, as well as greater attention to issues related to marine management, agriculture and freshwater resources.



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