



Overseas Countries and Territories: Environmental Profiles

FINAL REPORT

PART 2 – DETAILED REPORT

SECTION A – CARIBBEAN REGION

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ABBREVIATIONS AND ACRONYMS

ACAP	Agreement on the Conservation of Albatrosses and Petrels
ACOR	Association Française pour les Récifs Coralliens
ACP	Africa Caribbean and the Pacific
ACS	Association of Caribbean States
AEPS	Arctic Environmental Protection Strategy
AFD	French Development Agency
AMAP	Arctic Monitoring and Assessment Programme
AMOC	Atlantic Meridional Overturning Circulation
AOSIS	Alliance of Small Island States
APEC	Asia–Pacific Economic Cooperation
BAS	British Antarctic Survey
BEST	EU Voluntary Scheme for Biodiversity and Ecosystem Services in Territories of European Overseas
BRGM	Bureau de Recherches Géologiques et Minières
CAFF	Conservation of Arctic Flora and Fauna
CANARI	Caribbean Natural Resources Institute
CARICOM	Caribbean Community
CARIFORUM	Caribbean Forum
CBD	Convention on Biological Diversity
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CCAS	Convention on Conservation of Antarctic Seals
CCC	Cod and Climate Change Programme
CCCCC	Caribbean Community Climate Change Centre
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency
CDS	Catch Documentation Scheme
CEHI	Caribbean Environmental Health Institute
CIDA	Canadian International Development Agency
CITES	Convention on International Trade in Endangered Species
CMS	Bonn Convention on Migratory Species
CNRS	Centre National pour la Recherche Scientifique
COLTO	Coalition of Legal Toothfish Operators
COMESA	Common market for Eastern and Southern Africa
CoP	Conference of the Parties
CPA	Country Poverty Assessment
CPACC	Caribbean Planning for Adaptation to Climate Change
CR	Critically endangered (IUCN classification)
CRAMRA	Convention on the Regulation of Antarctic Mineral Resource Activities
CRISP	Coral Reefs in the South Pacific
CROP	Council of Regional Organizations of the Pacific
CSD	Commission on Sustainable Development
CSME	Caribbean Single Market and Economy
Darwin Plus	Fuses OTEP and Darwin (OCT component) in what concerns competitive funding to deliver long-term strategic outcomes for the natural environment in the UK's Overseas Territories
DCNA	Dutch Caribbean Nature Alliance
DEFRA	Department for Environment, Food and Rural Affairs of UK government
DFID	DEPARTMENT FOR INTERNATIONAL DEVELOPMENT of UK government
DK	Denmark

DPSIR	Driver, Pressure, State, Impact and Responses
ECCB	Eastern Caribbean Central Bank
EDF	European Development Fund
EE	Energy efficiency
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EN	Endangered (IUCN classification)
ENSO	El Niño Southern Oscillation
EPA	Economic Partnership Agreement
EPD	Environment, planning and development
EPPR	Emergency Prevention, Preparedness and Response
EU	European Union
FAO	Food and Agriculture Organisation
FCO	Foreign & Commonwealth Office UK Government
FEA	Fonds pour l'Environnement et l'Agriculture
FR	France
GCRMN	Global Coral Reef Monitoring Network
GDP	Gross Domestic Product
GEF	Global Environment Facility
GGF	Good Governance Fund
GHG	Greenhouse Gas
GIWA	Global International Water Assessment
GLIPSA	Global Islands Partnership
HMS	His Majesty's Ship
I&M	Dutch Ministry of Infrastructure and Environment
IAATO	International Association of Antarctica Tour Operators
IAC	Inter-American Convention for the Protection and Conservation of Sea Turtles
IBA	Important Bird Area
IBRD	International Bank for Reconstruction and Development
ICCAT	International Commission for the conservation of tuna-like fish in the Atlantic
ICES	International Council for the Exploration of the Sea
ICES-CCC	ICES Cod and Climate Change Programme
ICRI	International Coral Reef Initiative
IDB	Inter-American Development Bank
IFRECOR	Initiative Française pour les Récifs Coralliens
IIED	International Institute for Environment and Development (UK)
IMF	International Monetary Fund
INTEGRE	Initiative des Territoires du Pacifique pour la gestion régionale de l'environnement
IOC	Indian Ocean Commission
IPCC	International Panel on Climate Change
IRD	Institut de Recherche pour le Développement (FR)
IUCN	International Union for Conservation of Nature
IUU	Illegal unregulated and unreported fishing
JCNB	Joint Commission on Narwhal and Beluga
JNCC	Joint Nature Conservation Committee UK Government
LPO	Ligue pour la Protection des Oiseaux
LSB	Landbased Sources of Marine Pollution (protocol of the Cartagena Convention)
MAB	Man and Biosphere (Reserve)
MACC	Mainstreaming Adaptation to Climate Change
MDGs	Millennium Development Goals
MEA	Multilateral Environmental Agreement
MoU	Memorandum of Understanding

MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSP	Marine Spatial Planning
n.a.	not available
NAFO	North Atlantic Fisheries Organisation
NAMMCO	North Atlantic Marine Mammal Commission
NBSAP	National Biodiversity Strategy and Action Plan
NEMS	National Environmental Management Strategy
NGO	Non-governmental organization
NL	Netherlands
NNR	National Nature Reserve
NT	National Trust
NZ	New Zealand
OAD	Overseas Association Decision
OAU	Organisation of African Unity
OCTA	Overseas Countries and Territories Association
OCTs	Overseas Countries and Territories
OECD	Organisation for Economic Co-operation and Development
OECS	Organisation of Eastern Caribbean States
OT	Overseas Territories (commonly used in texts from the UK)
OTCF	UK Overseas Territories Conservation Forum
OTEP	Overseas Territories Environment Programme (replaced by Darwin Plus)
PAME	Protection of the Arctic Marine Environment
PCCFAF	Pacific Climate Change Finance Assessment Framework
PECCO	Pacific Environment and Climate Change Outlook
PEP	Poverty and Environment Partnership
PGA	Plan Général d'Aménagement
PGEM	Plan de Gestion de l'Espace Maritime
PID	Pacific Islands Development Programme
PILN	Pacific Invasives Learning Network
PIP	Pacific Invasives Partnership
PNG	Papua New Guinea
POP	Persistent Organic Pollutant
PPCR	Pilot Program for Climate Resilience
PROE	Programme régional océanien de l'environnement
PWSD	Public Works and Services Department
RE	Renewable Energy
RFMO	Regional Fisheries Management Organisation
RIP	Regional Indicative Programme
RSP	Regional Seas Programme or Regional Strategy Paper
RSPB	Royal Society for the Protection of Birds
SADC	Southern Africa Development Community
SAERI	South Atlantic Environmental Research Institute
SAWG	South Atlantic Working Group (of the UK OTCF)
SCOR	Scientific Committee on Oceanic Research
SCP	Strategic Country Programme
SD	Sustainable Development
SDP	Sustainable Development Plan
SEA	Strategic Environmental Assessment
SEAFO	South-East Atlantic Fisheries Organisation
SIDS	Small Island Developing States
SIDSnet	Small Island Developing States Information Network
SME	Small and Medium Enterprises

SOPAC	South Pacific Applied Geoscience Commission
SORP	Southern Ocean Research Partnership
SPA	Specially Protected Area
SPAW	Protocol concerning Specially Protected Areas and Wildlife
SPC	Secretariat of Pacific Community
SPD	Single Programming Document
SPREP	South Pacific Regional Environment Programme
SPT	South Pacific Tourism Organisation
STZC	Sustainable Tourism Zone of the Caribbean
TAC	Total Allowable Catch
TAO	Territorial Authorising Officers
TEP	Tonne Equivalent Pétrole (TEP Vertes is a climate change mitigation programme in the Pacific)
UK	United Kingdom
UKAHT	United Kingdom Antarctic Heritage Trust
UKOTA	Association of OCT linked to the UK
UKOTCF	United Kingdom Overseas Territories Conservation Forum
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Social and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
VMS	Vessel Monitoring System
VROM	Netherlands environment ministry
VU	Vulnerable (IUCN classification)
WH	World Heritage
WIDECAST	Wider Caribbean Sea Turtle Conservation Network
WRI	World Resources Institute
WTO	World Trade Organisation
WWTP	Wastewater Treatment Plant

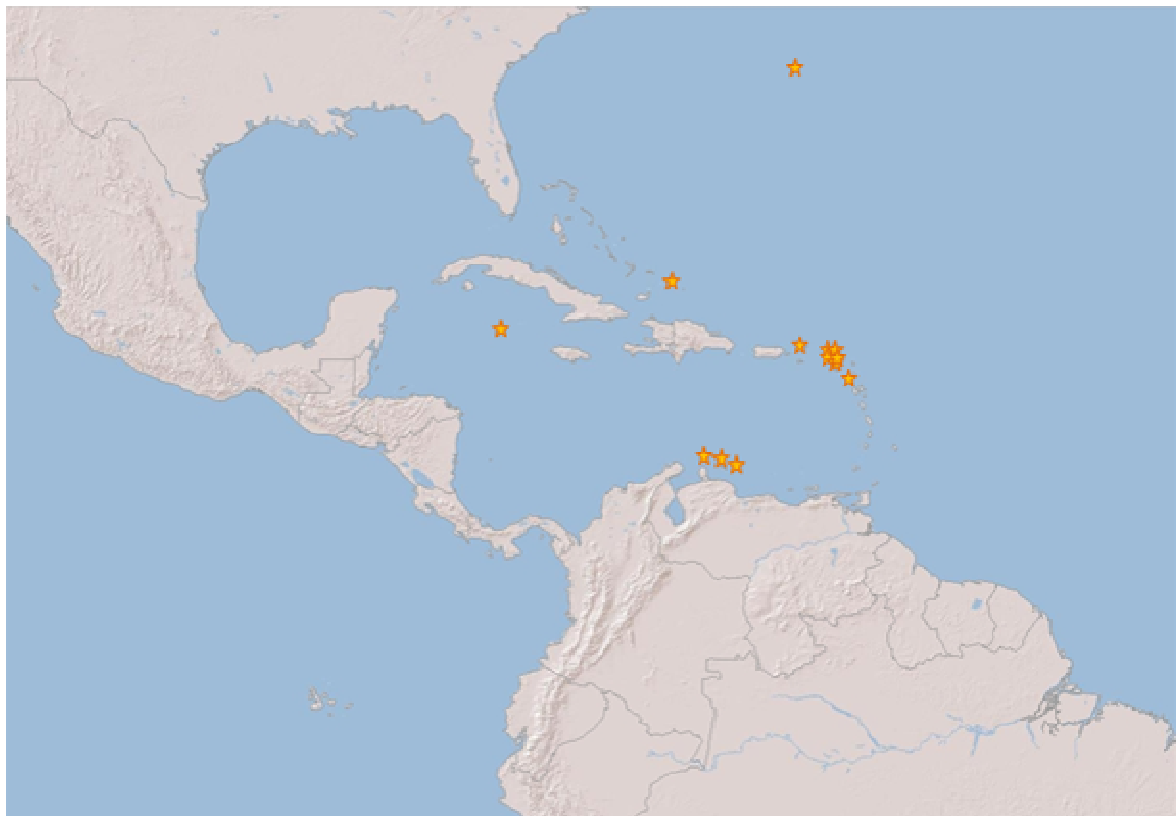
AI	Ascension Island
ANG	Anguilla
ARU	Aruba
BAT	British Antarctic Territory
BIOT	British Indian Ocean Territory
BLM	Saint Barthelemy
BM	Bermuda
BON	Bonaire
BVI	British Virgin Islands
CAY	Cayman Island
CUW	Curaçao
FLK	Falkland Islands
FP	French Polynesia
GL	Greenland
MSR	Montserrat
NC	New Caledonia
PIT	Pitcairn
SAB	Saba
SGSSI	South Georgia and South Sandwich islands
SH	Saint Helena
SHATdC	St Helena, Ascension and Tristan da Cunha
SPM	St Pierre and Miquelon
StEus	Sint Eustatius
SXM	Sint Maarten
TAAF	French Southern and Antarctic Territories
TCI	Turks and Caicos islands
TdC	Tristan da Cunha
W&F	Wallis and Futuna

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REGIONAL ENVIRONMENTAL PROFILE

CARIBBEAN REGION



1 INTRODUCTION

This volume is part of a 6-volume report made at the request of the European Commission. It presents environmental profiles for the twelve overseas countries and territories (OCTs) in the Caribbean region. There are companion volumes for the OCTs in the Pacific, North Atlantic, South Atlantic and Indian Ocean regions. The purpose of the environmental profiles is to feed discussions on the environment and possible consequences environmental trends may have on OCTs socio-economic development, and more specifically, to assist the EU in programming its EDF assistance to the OCTs.

This volume comprises an overall profile in which the territories are treated in the context of the Caribbean region as a whole (chapter 1), followed by the environmental profiles for the individual territories (Annexes A to L). The regional findings are brought together and consolidated in Part 1 - Main Report.

2 DESCRIPTION OF THE REGION

We here regard the Caribbean region as loosely comprising the archipelago of islands which bound or lie within the Caribbean Sea together with the islands immediately to the North of the archipelago, but not the littoral states of Central and South America.

Until recently the Dutch Caribbean OCTs were Aruba and the Netherlands Antilles. On 10 October 2010, two of the former territories of the Dutch Antilles became independent countries in the Kingdom of the Netherlands (Curaçao and Sint Maarten), and the other three territories (Bonaire, Saba and Sint Eustatius) became 'special' municipalities of the Netherlands¹.

The Caribbean region includes:

- five British territories (Anguilla, Montserrat, British Virgin Islands, Cayman Islands and the Turks and Caicos Islands);
- three countries are part of the Kingdom of the Netherlands (Aruba, Curaçao and Sint Maarten) and three territories (Bonaire, Saba and Sint Eustatius) are 'special' municipalities of the Netherlands;
- one French territory (Saint-Barthelemy) since 1 January 2012.

Apart from the OCTs, the Caribbean region comprises:

- 16 independent nations: Cuba, Haiti, the Dominican Republic, Jamaica, Barbados, the Bahamas, Belize, Trinidad and Tobago, Dominica, Guyana, Grenada, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Suriname and Antigua and Barbuda, and
- a number of other territories and possessions: the French 'Outermost Regions'² Martinique, Guiana, Guadeloupe, and Saint Martin. Puerto Rico and the US Virgin Islands are part of the US commonwealth.

In their geology and biology the Caribbean OCTs have many common features. The Caribbean Sea region is active tectonically and seismically. The Soufrière volcano on Montserrat has been active since 1995 and has caused deaths, extensive damage and social and economic disruption, with the migration of 2/3 of the population and a temporary collapse of the economy. Hurricanes are a risk for all the 12 OCTs. Even Aruba, although outside the hurricane belt, was affected by three in recent years: Lenny (1999), Ivan (2004) and Felix (2007). Hurricanes are expected to become more intense in future as a result of climate change. The Caribbean OCTs are all fringed by mangroves, sea grass and coral reefs. These last three

1 More precisely they have become a "Openbaar Lichaam" or 'Public Entity' and these 3 are usually referred to as Caribbean Netherlands. So the Kingdom now has 4 countries: Aruba, Curaçao, Sint Maarten and the Netherlands.

2 In French 'Départements' with St-Martin a 'commune' of Guadeloupe.

habitat types form an interrelated ecosystem which is important to the economic³ and physical well-being of the islands. Both coral and mangrove provide well-documented protection against rough waves and storm surges during hurricanes and tropical storms. Sea grass provides a very important settlement and sedimentation function for the particulate matter which runs off or is discharged from land, thereby protecting the coral reefs which are intolerant of and smothered by turbidity, but coral reefs also protect sea grass beds against storm damage.

An important distinguishing factor between islands is the extent to which they are low-lying. This fact is important because it causes vulnerability of the islands to natural hazards such as hurricanes which can produce a storm surge of several metres, tsunamis, as well as to longer term climate change induced sea level rise. Most of the Caribbean OCTs are generally low-lying, i.e. either all low or mostly low, the exception being Montserrat, the British Virgin Islands⁴, Saba and Curaçao as they are volcanic islands with rough topography.

Key facts and statistics

TABLE: Key facts and statistics for OCTs in Caribbean. Region						
OCT	Land area (km²)	EEZ (km²)	Population	inhab/km²	GDP/cap (€)	Illiteracy rate
Anguilla	100	92,178	15,754	158	16,345	5%
BVI	153	80117	28,280	185	21,273	2%
Cayman	262	119,137	55,036	210	38,609	0.3%
Montserrat	102 (44 habitable)	7,582	4,959	113	9,271	4%
Turks and Caicos	500	154,068	31458	63	16,335	2%
St-Barthelemy	25	4,000	9,171	367	29,000	5 ⁵ %
Aruba	180	2,200	109,153	606	17,842	3%
Curaçao	443	68,783	150,563	340	24,500	n.a.
Sint Maarten	34	12,860	39,000	1147	15,259	4%
Bonaire	294	3,198	18,250	62	13,808	n.a.
Saba	13	8,033	1,990	153	n.a.	4%
St Eustatius	21	1,107	3,900	186	n.a.	n.a.

The population of the islands ranges from 2,000 (Saba) to 150,000 (Curaçao), with population densities ranging from about 60 in Bonaire and Turks and Caicos to 1,147 in Sint Maarten; Aruba also has high population density. The population on the Dutch territories (332,000) account for 71% of the population of the 12 territories, and in general population density is higher. Many of the territories are experiencing net inward migration. As the Dutch Antilles was dissolved, the inhabitants of the 3 special municipalities now have the same rights as Dutch citizens. Population on the three islands has increased slightly between 2010 and 2012.⁶

There is a wide variation in mean incomes between the islands. In some of the OCTs income is distributed unevenly across the society and their GDP levels mask the development challenges faced by the territory.

There has been a shift in the economies of most Caribbean economies from agriculture and fishing to tourism, and the OCTs have participated in this trend. The majority of the islands import most of the food.

³ Coral reefs are a major attraction and boost for the tourist industry.

⁴ Island of Anegada is the exception in BVI, being a very low-lying atoll.

⁵ <https://www.ethnologue.com/country/BL>

⁶ <http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=80539ned&D1=0-1,9-10&D2=a&D3=a&HDR=T&STB=G1,G2&CHARTTYPE=1&VW=T>

The ratings⁷ of countries most dependent on tourism show British Virgin Islands, Aruba and Turks and Caicos, Cayman Islands and Anguilla occupying the first positions.

Economy					
OCT	Finance	Fisheries	Tourism	Hydrocarbon /Mineral	Other
Anguilla	●	○*	●		
BVI	●	○	● ⁸		
Cayman	●	○ tourists and anglers	●		
Montserrat		○ tourists and anglers	○		External Aid (UK)
Turks and Caicos	○	○*	●		Government suspended from 2009 to 2012
St-Barthelemy			●		Construction
Aruba	○	○ tourists and anglers	●	Refinery closed down	Marine transhipment
Curaçao	●		●	● Oil refinery	
Sint Maarten			●	● Oil terminal	
Bonaire	○	○ tourists and anglers	●	● Oil storage facility	Salt
Saba			●	Drilling for oil in experimental phase	Saba Univ School of Medecine
St Eustatius			●	● Oil terminal	
○ Unimportant ○ Artisanal / incidental / mainly for tourists ● Moderate activity ● Important ● Major activity * Important for own consumption					

Offshore finance is the first or second main activity on some territories, particularly Anguilla, BVI, Cayman, and Curaçao. There is an oil refinery on Curaçao and oil terminals on 3 other Dutch OCTs. Aruba is considering reconversion/ renovation of the refinery that closed down. Oil prospecting in the Saba Bank will probably not continue now that the Bank is a marine reserve, protected under Dutch environmental laws. These oil-related activities constitute the only heavy industry found on the OCTs in the region, posing pressures on the environment: accidents have occurred and cases registered of pollution of air and water.

Fisheries are important in all the islands, as a source of food, as a direct economic product and/or as an attraction to dive tourists and anglers. Most of the fishing takes place on the shallow shelves around the islands.

⁷ For example: <http://www.wttc.org/research/economic-data-search-tool/> and <http://www.rediff.com/business/slide-show/slide-show-1-25-most-tourism-dependent-countries-in-the-world/20120625.htm#11>

⁸ Rated as the most tourism dependent country in the world, <http://listdose.com/top-10-countries-that-are-dependent-on-tourism/> and Travel & Tourism Economic Impact 2014, British Virgin Islands, World Travel and Tourism Council, http://www.wttc.org/site_media/uploads/downloads/british_virgin_islands2014.pdf

Besides spectacular landscape of coral reefs, sea grass and mangroves, the isolation conferred by the insularity of the territories promotes endemism⁹. The following are some statistics on endemism on the Caribbean OCTs. There are no endemic freshwater fish on these territories, and the only endemic mammals are bats.

Endemism and other wildlife values in Caribbean region						
OCT	Endemism					Other notable aspects of wildlife (threatened species, etc.)
	Birds	Reptiles, amphib.	Insects	Plants	Fresh-water fish	
Anguilla		2	> 40			Anguilla's salt ponds are a habitat for many birds, including the endangered roseate terns, least terns and red-billed tropic birds. Endangered turtles.
BVI		8		>40 (endemic to Puerto Rican bank)		In 2012 a total of 48 threatened species had been identified. Home to the critically endangered Anegada rock iguana.
Cayman	16	18 30 land snails	>40	28	2(+ 1 marine)	Home to the rare blue iguanas and critically endangered ghost orchids
Montserrat	1	2 (4 sub-species)	>120	3		795 known native plants 78 of which are restricted range. 10 species of bat to include 1 endemic sub species and two species only found on 2 islands. The Montserrat oriole is critically endangered.
Turks and Caicos		≥3 lizards 2 snakes	≥ 3 butterfly.	≥ 8		Other endemic: at least 4 cave dwelling arthropods Two threatened species of wetland bird are found on the islands.
St Barthelemy	1 endemic bat	1				Among the 348 inventoried plants, 13 are endemic for the Lesser Antilles.
Aruba	1 owl 1 bat 1 parakeet	1 rattle snake, 1 snake, 2 lizard			1	The rattlesnake is threatened with extinction, as are a number of tree species. Four endangered sea turtle species breed on Aruban beaches. Different endangered and internationally protected bird species visit Aruba frequently.
Curaçao						68 coral species = more than 70% of all Caribbean species.
Sint Maarten						3 IUCN Red List Species, 10 CITES Appendix I species and 89 Appendix II species.
Bonaire		Lizard (7 species, 2 endemic)	> 200 endemic sp. and ssp. of beetle			6 IUCN Red list species, 11 CITES Appendix I species and 94 Appendix II species.
Saba		1 lizard (<i>Anolis sabanus</i>)				
St Eustatius		1 endemic ground lizard	The rare Caribbean native iguanas can be seen	1 (Statia Morning Glory)		3 species of endangered turtles (leatherback, green, and hawksbill) nest on Zeelandia Beach, the main nesting beach for them in the Caribbean Netherlands.

⁹ Endemism refers to the phenomenon that a species occurs in only one country (or island or group of islands). The species is then said to be endemic to that country. Endemism confers a special responsibility on the country or territory concerned since it is the sole steward of the fortunes of that species

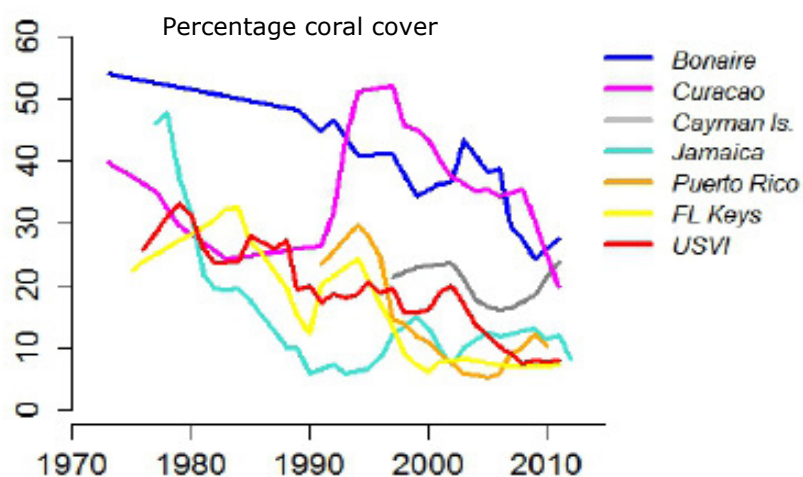
The table below provides the relative importance of the different habitats in the Caribbean OCTs.

Extent of habitats in the Caribbean region					
OCT	Man-groves	Sea-grass	Wet-lands	Dry shrub/forest	Remarks
Anguilla	●	●	●	○	Anguilla's salt ponds are of great importance. These wetlands are a habitat for various bird species. Woodland is sparse and degraded.
BVI	●	●	●	●	Steep-sided rugged topography (except Anegada). Rain forests on the upper slopes of Tortola and Virgin Gorda. Anegada's salt ponds are of great importance. These wetlands are a habitat for various species; the Western Salt Ponds are a declared Ramsar site.
Cayman	●	●	●	●	Unique geomorphology with a large central swamp. Significant loss of forest as a result of development and hurricanes.
Montserrat	●	●	●	●	45% of the forest was destroyed by Volcano, as well as coral. Mangroves have also been severely depleted due to anthropogenic activities.
Turks and Caicos	●	●	●	●	Extensive but degraded forest.
St Barthelemy	●	●	●	●	3 IBAS on satellite islands. 50 ha lagoons Mangroves have been destroyed for coastal development.
Aruba	●	●	●	●	Arid terrain, shallow coastal lagoons, Bubali pond and Spanish lake have mangroves, some of the reef islands on the south side of the island are arid and some are populated by mangroves, 4 IBAs.
Curaçao	●	●	●	●	Salinas, some wetlands and mangroves.
Sint Maarten	●	●	●		Large salt pond and fresh water lakes. Mangroves and sea grass beds rapidly disappearing due to development.
Bonaire	●	●	●	●	5 Ramsar sites, 6 IBAs, hyper saline lakes. Loss of forests.
Saba	○	●	○		Moist forest, 1 IBA.
St Eustatius		●	○	●	Moist forest, 2 IBAs.
● Extensive ● Some ○ None IBA- Important Bird Area					

The table below shows how widespread coral reefs occur on the territory and an indication of their state.

Coral reefs		
OCT	Occurrence	Remarks
Anguilla	●	Dubbed as the least damaged in the Eastern Caribbean ¹⁰
BVI	●	Anegada Horseshoe Reef is the third largest barrier reef in the world
Cayman	●	Serious damage after 2005 bleaching episode.
Montserrat	●	Small patch and fringe coral reefs scattered around the island
Turks and Caicos	●	Dubbed as the least damaged in the Caribbean
St-Barthelemy	●	Poorly developed fringing reefs, degraded by terrestrial runoff, high mortality after bleaching in 2005, infections later
Aruba	●	Coral reefs are found all around the island. Coral reef at north coast still healthy.
Curaçao	●	Reefs suffered but are recovering. Nutrients pollution in places.
Sint Maarten	●	Threatened. A mixture of artificial reefs made by wrecks, old coral reefs, and encrusted rocks
Bonaire	●	Best preserved in region. Coral reefs around uninhabited Klein Bonaire are particularly well preserved. Nutrients pollution in places.
Saba	●	Saba Bank: new corals are growing
St Eustatius	●	Suffered bleaching and smothering
● Extensive ● Some ○ None		

10 https://www.iucn.org/about/union/secretariat/offices/europe/activities/overseas/overseas_list/overseas_anguilla.cfm



A 2012 Global Coral Reef Monitoring network workshop report depicts the evolution of the coral reefs in some OCTs and countries.¹¹ It is clearly seen that coral reefs are improving in Cayman after a decay in the mid of last decade, while in Bonaire and Curaçao there has been great degradation in recent years. In Bonaire the trend seems to start to revert.

All the islands are subject to the Ramsar Convention, and all contain at least one designated Ramsar site of international importance (sites on Anguilla and Montserrat not yet confirmed).

Protected Areas					
	Marine	Terrestrial	UNESCO WH	Ramsar	Remarks
Anguilla	6	1	2	0	Terrestrial PA owned by National Trust. Terrestrial protected areas are a particular difficulty because of the land ownership issue. No Ramsar site yet.
BVI	1	19			Protected Areas System Plan (2007-2017) ¹² managed by various governmental organisations. Areas extend throughout the 60 islands and cays. Total land area 153.67 km ² and total marine area 82,759 km ² .
Cayman	10,255 ha of which 3,816 ha are no-take zones.	1,941 ha (7.35%) are protected			Marine parks well protected. National Conservation Law, 2013 was approved enabling establishment of protected areas. Up to now land protected areas were animal sanctuaries and land of the National Trust.
Montserrat		3 (30% of volcano safe zone)			No marine protected areas. Terrestrial protected areas: 2 forests, and 1 bird sanctuary which has been decimated by volcanic activity
Turks and Caicos	8 Marine + 4 Land and Sea	12		1	11 national parks, 11 nature reserves. Well established protected areas network
St-Barthelemy	1 (1,200 ha)	ZNIEFF (37 ha) and 42 ha of vegetation at Pointe à Toiny			ZNIEFF ¹³ located around island's 5 ponds. Uninhabited islets identified as Littoral Conservation Areas. Biotope Protection Orders in some areas (21 ha)
Aruba		1		1	National Park Arikok (est. 2000) with 3,400 ha covers 18 % of the country, 1 Ramsar site but not legally protected
Curaçao	(600 ha)	2	1	4	The Curaçao underwater Park (est. 1983) has no legal protection. Shete Boka: 470 ha of coastline plus Terrestrial Christoffel park (est. 1978) 2,300 ha and Shete Boka Park (est. 1974)

¹¹ http://gcrmn.org/wp-content/uploads/2012/11/Tropical_Americas_Coral_Reef_Resilience_Final_Workshop_ReportC.pdf page 10

¹² <http://ess-caribbean.com/wp-content/uploads/2011/08/British-Virgin-Islands-Protected-Areas-System-Plan-2007-2017.pdf>

¹³ Zone naturelle d'intérêt écologique, faunistique et floristique, a French system, with concrete criteria.

Sint Maarten	3,100 ha	None			Man of War Shoal Marine Park (est. 2010) is a home or migratory stopover for whales, dolphins, numerous species of shark, sea turtles and hundreds of fish species
Bonaire	1 (2,700 ha)	2		5 in marine park, 2 Terrestrial	Bonaire marine park (est. 1979) covers 100% of the waters surrounding Bonaire and Klein. Includes 2 no take areas. Terrestrial Washington Slagbaai National Park (1969) covers 19% of land area and Klein Bonaire island (est. 2000) 600 ha
Saba	2 (2,200 km ²) and 800 ha)	1			Saba Bank National Park (est. 2010) is the third largest of its kind in the region and received Particularly Sensitive Sea Area status in 2012. Saba National Marine Park (est. 1987) has 800 ha. Terrestrial: Saba National Park and Trails (est. 1999) 41 ha
St Eustatius	1 (2,750 ha)	1			St. Eustatius National Marine Park (est. 1996) protects an area from the high-water mark to a 30-metre depth contour around the island. Humpback whales regularly pass through on their migration route. Terrestrial : Quill / Boven National Park (est. 1997) 540 ha

4 ISSUES AND THREATS

Many of the islands suffer similar problems. As stated above most of these territories are low lying and exposed to cyclones, hurricanes, and earthquakes, and two to volcanoes. The territories that due to topography are less exposed to sea level rise and beach erosion, are exposed to heavy rains, floods and landslides. Besides, as seen above the OCTs rely on tourism and tourists are very sensitive to the beauty of the landscape, and the existence of corals and beaches. The cost of inaction in the Caribbean has been estimated to be high.¹⁴ Therefore climate change adaptation and Natural Disasters preparedness are a constant concern (and are not mentioned in the table below). One of the most developed regional initiatives in the region, which also include OCTs is indeed climate change and disaster risk management (see section 5). These initiatives should be continued and strengthened.

Main environmental challenges and problems in OCTs in Caribbean region				
OCT	Challenge / problem	Severity	Short description	Status 2007*
Common to all	Climate Change	Severe	Most of Caribbean OCTs are low lying and exposed to cyclones, hurricanes. The territories less exposed to sea level rise and beach erosion, are exposed to heavy rains, floods and landslides. There are on-going regional initiatives on climate change and disaster risk management that should be continued and strengthened.	
Anguilla	Coastal zone protection	Severe	Sedimentation runoff into coastal wetlands and coastal environment as a consequence of inadequate coastal development, in-filled ponds and unpaved roads. Beach erosion. Lack and/or exemption of ICZM ¹⁵ plans in the legislation related to coastal development	Severe
	Water supply and sanitation	Severe	Shortage of water resources. Lack of National groundwater/water management plan. Very limited sewage system. Contamination of groundwater and seawater.	Attention required
	Solid waste	Severe	Very weak management of domestic waste and hazardous waste (particularly electronic waste and bio-waste)	Attention required

¹⁴ 5% of GDP for the whole Caribbean, in 2025. "The Caribbean and Climate change, the cost of inaction", 2008.

<http://ase.tufts.edu/gdae/pubs/rp/caribbean-full-eng.pdf>

¹⁵ Intergrated Coastal Zone Management

Main environmental challenges and problems in OCTs in Caribbean region				
OCT	Challenge / problem	Severity	Short description	Status 2007*
BVI	Coastal zone protection	Severe	Tourist infrastructure development causes degradation of the forest ecosystem (water shed protection) which is contributing to beach erosion, greater flood events and increased sedimentation, degradation of the coral reefs and diminished water quality. The socio-economic implications include loss of property, heavier concentration of settlements, and decrease in fish stocks and decline in recreational marine activities.	Severe
	Energy climate change	Severe	Particularly: low-lying territory, vulnerable to beach erosion and to sea level rise, vulnerable to more intense hurricanes. For mitigation establish the best mix of renewable energies and update legislation	Severe
	Oil spills	Attention reqd.	Marine traffic, especially oil tankers and large cruise liners and cargo vessels in transit through coastal waters, present the risk of major oil pollution from collision, fire and explosion and from grounding. Lesser, but nevertheless serious, pollution is caused by vessels pumping out their bilges or otherwise illegally discharging oil.	Attention required
Cayman	Invasive species	Severe	Domestic and feral animals continue roaming and wild fed on protected species Rapid lionfish spread in the marine environment. Inadequate biosecurity protocols continue allowing import of invasive species.	Severe
	Waste and wastewater	Severe	The process on solid waste reform initiated in 2007 has been halted and the situation has continued to worsen. Landfill is over full and there is no recycling. Treated sewage injected into the groundwater and septic tank system are affecting corals due to nutrient arriving to the coast.	Moderate
	Coastal zone protection	Severe	Decreased water quality and increased turbidity due to upland and shoreline construction and modification, offshore dredging, clearance of fringing coastal mangroves and wetlands, sand removal from beaches. Increased fishing pressure removes important trophic groups, particularly herbivorous fish that have significant impacts to reef health and coral resilience.	Severe
Montserrat	Biodiversity	Severe	Key challenges facing biodiversity are climate change, habitat loss/fragmentation due to the expansion of agricultural practices and the built environment, invasive alien species and water harvesting.	Severe
	Invasive Alien Species	Moderate	Ungulates (pigs, goats, sheep, cattle) destroying habitat for the Montserrat Oriole. <i>Batrachochytrium dendrobatidis</i> (chytrid) impacting the mountain chicken. There are several invasive plants (<i>Cryptostegia grandiflora</i> , <i>Casuarina equisetifolia</i> , <i>Syzygium cumini</i> , <i>Mimosa sp.</i>). Invasive lionfish impacts native fish species	n.a.
	Coastal zone protection	Severe	Lack of an integrated coastal zone management plan to include an inventory and mapping of the coastal and marine assets and to undertake monitoring of the coastal and marine environment. Impacts of Climate Change on the coastal and marine zone via sea level rise, warmer and more acidic waters, increased frequency and intensity of tropical storms. Erosion of the coastline, loss of aesthetics and destruction of coral reefs and sea grass beds.	Moderate
	Solid and Liquid waste	Moderate	There are no recycling programs. There is a need for environmental education and awareness. The disposal of hazardous waste streams such as industrial waste, oils and abandoned cars is problematic. Need for a comprehensive strategy to address increased sewage load in the North Montserrat.	Moderate
	Capacity (human and financial)	Moderate	Insufficient human and financial resources to adequately staff, fund and equip environmental management agencies	n.a.

Main environmental challenges and problems in OCTs in Caribbean region				
OCT	Challenge / problem	Severity	Short description	Status 2007*
TCI	Coastal zone protection	Severe	Lack of a Physical Development Plan led to unplanned and haphazard development and progressive degradation in the environment There is no legal protection for threatened reptiles except within protected areas where all species are protected. Lack of enforcement is a major problem for species protection and conservation.	Severe
	Fisheries	Severe	Poor fishing practices and hurricane events of 2008 have resulted in 50% declines in stocks for conch and lobster. Declines are also noted in reef fish stocks and some fin fish populations. DEMA lacks enforcement capacity to be able to adequately patrol and enforce coastal areas and regulate fisheries	n.a
	Forest	Severe	Deforestation due to illegal charcoal manufacturing of undocumented persons. DEMA and other enforcement agencies lack capacity to enforce. This problem has increased exponentially due to inadequate border control.	n.a
	Water	Moderate	Need of funding and technical assistance to implement appropriate watershed management plans	n.a
	Waste	Moderate	Although the landfills on Providenciales and Grand Turk have been upgraded and improved the facilities are not lined and pose threats of toxic contamination to ground and coastal waters.	Attention required
St Barthelemy	Loss of biodiversity	Severe	Soil erosion due to rains, smothering and death of coral reefs due to run off and pollution. Less insects (and pollination) due to use of pesticides against mosquitoes. Vegetation eroded by overgrazing. Sea birds population declined because of rodents.	n.a.
	Fisheries	Severe	Fishing has increased on the continental shelf, from fishermen from other Caribbean islands incl. from Guadeloupe and Martinique. Urgent need for regionally agreed rules for sustainable use of marine resources.	n.a.
Aruba	Coastal zone protection	Moderate/severe at places	Coral communities threatened by intensified touristic and economic activities, diseases, invasive species, and polluted rainwater runoff (from construction, land clearances, polluted soils and economic and household waste). Cactus shrub vegetation disappearing and less turtles.	Attention reqd.
	Invasive species	Severe	Loss of local fauna and flora, marine and terrestrial. Unbalanced ecology. Loss of fisheries yield.	n.a.
	Degradation of natural habitats	Moderate	Cactus shrub vegetation disappearing. Natural/green areas outside the national park are decreasing due to economic development.	n.a.
	Freshwater	Severe	Dryness. Not enough freshwater, no/limited rain last years.	n.a.
	Waste	Severe	Landfills are overloaded	n.a.
Curaçao	Coastal zone protection	Severe	Decrease in the abundance of corals in the last 25 years due to non-treated waste water and pollution by industrial activities by Isla oil refinery and Aqualectra. Also effect on mangroves and sea grass beds.	n.a.
	Invasive species	Severe	A real problem but no policies yet: lionfish, agave, neem trees, and free roaming goats.	n.a.
	Water and air pollution	Severe	Causing health complaints around Schottegat bay (and refinery): high emissions of sulphur dioxide and particulates, and a 'tar lake'.	n.a.
Sint Maarten	Coastal zone protection	Severe	Due to ongoing development: building activity, habitat destruction, increased population density in low-income areas, mass tourism. Some appropriate national (Dutch) and island environmental regulations exist, but enforcement is limited by institutional capacity.	n.a.
	Waste	Severe	Lack of sewage and waste water treatment in many areas is polluting the groundwater and the sea. Poor waste management: landfills are reaching maximum capacity, increasing risks of groundwater contamination.	n.a.

Main environmental challenges and problems in OCTs in Caribbean region				
OCT	Challenge / problem	Severity	Short description	Status 2007*
	Energy dependency	Severe	Fully dependant on petroleum products. Power station uses heavy fuel oil. Plan for a new power plant using waste is ongoing.	n.a.
Bonaire	Coastal zone protection	Severe	Reefs are at the thresholds of polluted values at 10 sites due to wastewater pollution: nutrients, bacteria and organic matter. Also due to tourism, runoff and warm water episodes. Vegetation at risk due to overgrazing.	n.a.
	Waste	Severe	Landfills are full. Separate collection has started, new waste plan adopted but Bonaire is too small to process this waste on its own.	n.a.
Saba	Climate change	Moderate	More frequent and intense storms are a threat as the island is already frequently affected by hurricanes. Hurricane Hugo severely damaged the elfin forest and caused landslides. Hurricane/ tropical storm Earl 2010.	n.a.
	Coastal zone protection	Severe	Contaminated storm water by household pollution in ravines and debris from stone crusher runs into the sea at places, killing and smothering reefs. Animals endangered by hunting, free roaming animals detrimental for vegetation and rodents for birds (eggs).	n.a.
	Fresh water	Severe	Not enough water (there are two desalinisation plants).	n.a.
	Waste	Severe	The lack of proper waste disposal causes pollution of soil, the coast and the sea, also from accidents at the oil terminal. Waste dumped in sea at places.	n.a.
St Eustatius	Coastal Zone protection	Severe	Erosion and disturbance by increasing coastal development and inefficient waste removal systems. Debris, sand, cement, stones and other runoff of coastal development, land clearing techniques, and erosion are washed into the sea, causing serious damage or mortality to corals. Anchoring of vessels in the Marine Park damages coral reefs. Pollution from ships including ballast waters. An expansion of the terminal to another location was not allowed recently.	n.a.
	Invasive Species	Severe	The Mexican creeper (<i>Antigonon leptopus</i>) has invaded large areas of nature, suffocating all other vegetation. ¹⁶ The lionfish arrived in 2011 and is now established, though still in relatively low numbers. The African giant snail and a new invasive species of sea grass (<i>Halophila stipulacea</i>) arrived in 2013.	n.a.
	Erosion	Moderate	Particularly goats, sheep, cattle, pigs and chickens cause a lot of degradation of the vegetation, which causes erosion. The latter is a serious problem because the soil of the Kultuurvlakte is extremely prone to erosion. Donkeys are now fenced in.	n.a.

All the Caribbean OCTs are currently subject to rapid development, and in particular a fast growing tourist industry which forms the backbone of their economy. In the case of Montserrat, although access is still not as it used to be before the volcanic activity, port and airport access infrastructure and housing stock has increased significantly in the past 5 years (reconstruction and relocation of population). And to varying degrees they are all facing the dilemma of reconciling this rapid development with preserving the pristine beauty, natural resources and wildlife both terrestrial and marine, which are so important in attracting the tourists in the first place.

As can be seen in the table above, development and tourism place multiple stresses on the fragile ecosystems found on these islands:

- More buildings often in valuable nature areas or involving damage to ecosystems,
- Increased sewage load, much of which is pumped either untreated or partially treated into the sea, leading to algae formation, de-oxygenation of the seawater and distress and destruction of coral reefs;

16 <http://www.statiapark.org/downloads/downloads/Corallita%20pilot%20project-results%20recommendations-jan07.pdf>

- Increasing solid waste loads, requiring new waste treatment facilities and probably, increased discharge of contaminated leachates into the sea.

All small island states face special problems in relation to waste management: 1- lack of the critical size for modern facilities for safe processing solid waste (including hazardous) in sanitary landfills and incinerators; 2- lack of public awareness about waste, need for prevention and reduction; 3- making recycling and composting feasible.; 4- hurricanes can generate large volumes of waste and debris, which may be toxic, e.g. timber treated with preservatives. Several Caribbean OCTs are finding solutions and enacting policies. However, there is scope for a regional action and synergies between the OCTs, allowing for some scale and to value waste.

Well-functioning sewers for wastewater collection to be treated in water treatment plants are expensive infrastructures and not everywhere available to households and hotels in the Caribbean. Septic tanks and Packaged Sewerage Treatment Plants often service residential developments, hotels and industrial estates, but the systems are often poorly maintained and deliver raw sewage into ground and surface water. Hotels discharge untreated sewage into inshore waters throughout the region (often from inoperative treatment plants), affecting coastal wetlands, coral reefs and seagrass beds.

5 REVIEW OF ENVIRONMENTAL GOVERNANCE

5.1 ENVIRONMENTAL MANAGEMENT ADMINISTRATION

Environmental management administration in OCTs in Caribbean region		
OCT	Summary of government administrative capacity	NGOs, etc.
Anguilla	Department of environment with 6 technical staff Environmental Health Department deals with solid waste Water Authority water supply. There is a Department of Disaster Management. Anguilla Renewable Energy Office established in 2008.	Anguilla National Trust is a statutory body with a conservation mission. Although non-governmental it receive some government funding and works closely with government. Schools active in awareness-raising.
BVI	Conservation and Fisheries Department overall responsibility for environmental protection, nature conservation and fisheries. National Parks Trust designates protected areas. Solid Waste Department falls under the Ministry of Health and Social Development. Water and Sewerage Department under the Ministry of Communication and Works. <i>Planning Authority</i> grants permission for all developments and is responsible for economic and social planning. <i>Department of Disaster Management</i> the Deputy Governor's Office	National Parks Trust is a statutory body with a conservation mission. Although non-governmental it receives some government funding and works closely with government and runs national parks. One other US-based NGO active in BVI.
Cayman	Department of Environment (environment and fisheries), Department of Environmental Health (waste), Water Authority, the Central Planning Authority responsible for Development control. Ministry of Home and Community Affairs deals with Hazards management	National Trust is a statutory body which acquires land for conservation. Also has environmental education and awareness-building activity.
Mont-serrat	Ministry of Agriculture, Lands, Housing and Environment (MALHE) is the lead ministry for policy on environment and natural resources management. It has 6 major sections including – Administration, Environmental Management, Agriculture and Fisheries, Lands and Survey, Physical Planning and Housing. It has 87 staff and yearly budget of about, € 1.88 million one third of which is for the environment. Department of Environmental Health, within the Ministry of Education, Health and Community Services, is responsible for management of solid and liquid waste and promotes coastal water quality standards. There is Disaster Management Coordinating Agency that reports to the Governor's office and has responsibility for oil spill management	National Trust is the main conservation NGO, with a mandate to manage and preserve natural resources. It is also involved in education and awareness campaigns and trail development.

Environmental management administration in OCTs in Caribbean region		
OCT	Summary of government administrative capacity	NGOs, etc.
TCI	Ministry of Environment and Home Affairs comprises <i>inter alia</i> the Planning Department, the Department of Agriculture and the Department of Environment and Maritime Affairs. DEMA counts with 25 staff and an annual budget of \$1,213,055. Planning Department counts with 14 staff and an annual budget of \$ 599,215. Department of Disaster Management and Emergencies (DDME) was established in 2001, as a department of the Chief Secretary's Office	National Trust is a statutory body with a conservation mission. Receives no budgetary funding from government. Manages some protected areas, does education and public awareness
St Barthelemy	A Territorial Agency for the Environment was created in May 2013, with an Administrative Council (12 members), a Scientific Council (3) and an office (3).	Two NGOs have a seat in the Admin. Council.
Aruba	A Directorate of Nature and Environment (DNE) created in 2012 and since January 2014 it resorts under the Ministry of Economic affairs, Communication, Energy and Environment. Also: statistical office, meteorological service and city inspectors.	The National Integrated Strategic Plan (NISP) of 2010 involves civil society. There are NGOs which do awareness-raising, litter clearance, etc. National Park Arikok foundation manages the national Park.
Curaçao	Inside the Ministry of Public Health, Environment and Nature there is an Environment and Nature Department with 7 policy staff members and 22 inspectors and 8 monitors of air and water quality.	Many NGOs, including CARMABI Foundation that manages nine protected areas and organizes activities and projects in these parks. The NGO SMOC has launched many legal appeals against the oil refinery.
Sint Maarten	Ministry of Public Housing, Spatial Planning, Environment and Infrastructures with policy advisors, incl. for nature and environment.	Many NGOs, incl. The Nature Foundation Sint Maarten that manages the Marine Park.
Bonaire, Saba, Sint Eustatius	Bonaire has a Directorate Space and Development. Saba has a planning bureau and a public works department. St Eustatius has a Directorate Economy and Infrastructure and one for Inspection and Control. These 3 special municipalities of the Netherlands receive expert support from the Dutch Ministry of Economic Affairs (incl. nature) and Infrastructure (incl. environment).	Stinapa (a foundation) manages the Marine Park on Bonaire. Saba Conservation Foundation manages the Saba Bank Mari Park. STENAPA (St Eustatius National Park Foundation) manages the Marine and Terrestrial parks (and has a staff of 8). Local NGOs and WWF, Birdlife and DCNA (Dutch Caribbean Nature Alliance) which works for all 6 Dutch OCTs.

5.2 POLICIES, STRATEGIES, PLANS, AWARENESS AND MONITORING

OCT	Sustainable Developmt	Environmt	Biodiversity	Climate Change	Spatial planning	Marine/ Fisheries	Disaster Risk Reduction	Other	Remarks
Anguilla		✓	✓	+/-			✓	✓	Has NBSAP and Invasive species action plan. Lion fish response plan; National energy policy 2009; draft Climate Change policy. Social, Economic and Environmental Considerations into National Development Policies, Plans and Programmes is lacking.
BVI			(withi n Prote cted Areas)	✓	+/-	✓	✓		All of the following plans have been approved by Government: - VI Comprehensive Disaster Management Strategy and Implementation Plan and the VICDM Policy; - Protected Areas System Plan 2007 – 2017 addresses marine and fisheries areas for management; - Climate Change Policy 2012 under the Ministry of Natural Resources and Labour addresses CC adaptation and mitigation

									measures for the Territory. EIA under the Physical Planning Act can be requested and it is mandatory based on the type of development project undertaken. Road Town Physical Development Plan 2005-2020. National Oil Spill Contingency Plan (2006)
Cayman		✓	✓	✓	+/-		✓	✓	No NBSAP but yes Protected Areas action Plan. Road Town Physical Development Plan 2005-2020. National Oil Spill Contingency Plan (2006). CI climate change policy (2011).
Montserrat	✓	+/-		+/-	+/-			+/-	Sustainable Development Plan 2008-2020; National Environmental Management Strategy. Public Participation Policy. Physical Development Plan (PDP) for North Montserrat 2012-2022. Climate Change Adaptation Policy (2011). Species plans for 6 species
Turks and Caicos	✓	✓	+/-	✓	+/-		✓	✓	10-Year National Socio-economic Development Strategy - NSDS (2008-2017). Plan for Biodiversity Management and Sustainable Development around the Turks and Caicos Ramsar Site. National Climate Change Adaptation Strategy and Action Plan in preparation.
St Barthelemy		✓	✓		+/-	✓	+/-		New waste water treatment plant in 2012. Subsidies for solar boilers and panels. Spatial planning for part of the coast.
Aruba	✓	New draft	New draft				+/-		National Action Plan 2010-2013 (NISP) has been adopted in 2010 and includes sustainable development. Commitments for reducing use of fossil fuels. Directorate DNE is drafting a Nature and Environment Policy plan with 16 themes, which will be publicly discussed in June 2014. The Arikok National Park provides for 18% of the island's area to be reserved for nature conservation, but it is not known whether, for example, there is a management plan for the Park.
Curaçao							+/-		'Old' policies from before 10-10-10 are still in force. Govt' programme for 2013-2016 deals among others with a healthy living environment. Vision 2025 deals mostly with higher standards of living and education.
Sint Maarten		New draft	New draft		✓		+/-		New Nature Policy Plan and new Environmental Policy Plans drafted. EIA included. An adopted 'Structure Vision' includes zoning and measures to protect nature and environment. A Waste to power plant is being planned.
Bonaire, Saba, St Eustatius									Collectively the three islands are known as the Caribbean Netherlands and are the focus of a Nature Policy Plan 2013-2017. ¹⁷ The plan was made in close consultation with them.

Definitions:

- Sustainable development – if environment is included in the overall territory development plan or strategy;
- Environment – water and sanitation and waste plans as well;
- Biodiversity – protected areas, species, strategy on invasive, etc.;
- Climate change – policy, strategy, or adaptation/mitigation programmes;
- Spatial planning – considering as well coastal zone management;

¹⁷ Nature Policy Plan- Caribbean Netherlands 2013-2017: http://www.dcnanature.org/wp-content/uploads/2013/10/EZ_BO_NaturePolicyPlan%20Car.NL_ENG_2.pdf

- Marine / Fisheries – strategy/plan on marine issues (blue growth) and/or fisheries master plans or management programmes;
- Other – if at least one of the following: forest, renewable energy and/or energy efficiency;
- Remarks - plans on specific environmental components (protected areas, waste...).

5.3 LEGAL FRAMEWORK

The OCTs cannot sign MEAs in their own right. But OCTs can take on the responsibilities of an MEA if the associated sovereign state (in this case the United Kingdom, France or the Netherlands) has signed the MEA and asks, at the request of the OCT, that the MEA is extended to the territory of the OCT. If this happens, and if the OCT complies with the obligations of the treaties concerned and implements them fully, it can be an effective way of protecting its natural capital.

The situation with regard to some of the most relevant MEAs is as follows:

OCT	MEAs Party	Remarks
Anguilla	World Heritage Convention, Ramsar Convention, International Convention on the Regulation of Whaling	Aruba is considering the ask for the extension of 10 MEAs
British Virgin islands	CBD, CITES, Ramsar, CMS, London Convention (Dumping at Sea), UNCLOS, Straddling Fish Stocks and Highly Migratory Fish Stocks, World Heritage Convention	The Caribbean Action Plan in World Heritage (2004-2014) was signed by BVI
Cayman Islands	CBD, Ramsar, CITES, Migratory Species, Climate Change, London (Marine Pollution)	The National Conservation Law has been enacted enabling implementation of CBD. The territory asked for UNFCCC/KYOTO to be extended to it in September 2005.
Montserrat	World Heritage, Ramsar, CITES, CMS, Vienna Convention (Ozone Layer, and Montreal Protocol, London Convention (also ratification of amendments and protocol), Marine pollution conventions and protocols oil and non-oil, UNCCD, Regulation of Whaling	Two Ramsar sites proposed
Turks and Caicos	World Heritage, Ramsar, CITES, CMS, Nagoya Protocol, London Convention, MARPOL	Considering extending CBD
Saint-Barthelemy		
Aruba	CITES	Aruba plans to have Cartagena Protocol and is also considering the Climate Change Convention and Kyoto Protocol
Curaçao	CBD, CMS, CITES, Ramsar, Basel, MARPOL, ICCAT Convention	
Sint Maarten	Basel, CMS, CITES, Ramsar, Rotterdam	
Bonaire	CBD, CMS, CITES, Ramsar	Many of these MEAs are not yet fully implemented.
Saba	CMS, CITES	
St Eustatius	CITES	

*Including Oil Spills Protocol

Although the OCTs are all participating in some MEAs, these are not always fully implemented. For example only two of the Caribbean OCTs (BVI and Cayman) have signed the CBD, and neither of these has yet implemented it fully.

Several regional conventions have been developed by UNEP and SPREP that are relevant to coral reef conservation. All countries have ratified the following conventions:

Name of convention or agreement	Main goal	Parties
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)	To provide the legal framework for cooperative regional and national actions in the Caribbean. The Convention is supplemented by the Oil Spills Protocol, the SPAW Protocol and the LBS Protocol	Curaçao, Sint Maarten, Bonaire, Saba, St Eustatius, BVI, Cayman Is, Turks and Caicos Is
Specially Protected Areas and Wildlife (SPAW Protocol)	To assist with regional implementation of the broader and more demanding global Convention on Biological Diversity (CBD).	Aruba, Sint Maarten, Bonaire, Saba and St Eustatius, BVI
Oil Spill Protocol	To ensure means of responding to oil spill including relevant legislation, contingency plans, capability to respond to an oil spill incident and the designation of a national authority in the countries and territories of the Wider Caribbean Region.	Sint Maarten, Saba, BVI
Pollution from Land-Based sources LBS Protocol	To implement article 7 of the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region concerning pollution from land-based sources and activities.	Bonaire implemented but not yet ratified, BVI
Inter-American Convention (IAC) for the Protection and Conservation of Sea Turtles	Promotes the protection, conservation and recovery of the populations of sea turtles and those habitats on which they depend.	Sint Maarten, Bonaire, Saba

The following table provides a notion of the environmental components covered by local legislation in each OCT.

Theme	ANG	BVI	CAY	MON	TCI	ARU	CUW	SXM	B O N	S A B	St Eus	BLM
Nature protection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conservation of species	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sites and habitats						2 parks	2 terrestr. parks	1 marine park	2 parks	1 marine park	3 parks	
Terrestrial & Marine development control	✓	+/- not complete regime		✓	✓	+/- moratorium on building hotels	?	✓	Obligation to make own spatial / physical plan			No spatial plan
Coastal /Beach Protection	✓	✓		✓	✓							
Strategic Environmental assessment and EIA			+/- with National Conservation Legislation	✓ (protocol for monitoring and enforcement needed)	✓	✓	✓	✓	✓			✓
Integrated Pollution Prevention and Control					✓	Limited to nuisance	New being drafted	?	Obligation to make spatial / physical plans			?
Air							? yes for measuring					Measurement
Water and	✓	✓ oil	✓	✓	✓ +	+/-	?					✓

Theme	ANG	BVI	CAY	MON	TCI	ARU	CUW	SXM	B O N	SA B	St Eus	BLM
wastewater		pollution by shipping			Marine pollution							
Waste (oils, clinical, construction and demolition) Landfills		+/- Derelict vehicles only	+/- Draft version only			For pollution yes, but not for waste as such	yes but not actively implemented	✓				✓
Noise		✓	+/- outdated			✓						
Hazardous Substances (chemicals)			✓	✓ pesticides		✓	yes but not actively implemented	✓				?
Remediation				+/- Wrecks and ships		no		?				?
IUU fisheries	✓	✓		✓	✓	✓	✓	✓				
Other relevant sectorial legislation with environment related requirements				Disaster preparedness	Limited application of EIA							

6 COOPERATION

6.1 RELEVANT REGIONAL ORGANISATIONS AND PROGRAMMES

There are a number of regional organisations important in a technical or financial sense for the purpose of these environmental profiles. These include:

Name	OCT members	Other members	Remarks
Association of Caribbean States (ACS)	Associated members : Aruba, Curaçao, Sint Maarten NL on behalf of Bonaire, Saba, St Eustatius, FR on behalf of St-Barthelemy	25 other countries including Latin American countries Associated: France on behalf of French Guiana, St Martin, Guadeloupe, Martinique	Created: 1994. Goal: strengthening regional co-operation and integration, creating an enhanced economic space, preserving the environmental integrity of the Caribbean, promoting the sustainable development of the Greater Caribbean. Activities: 1- prevention and mitigation of natural risks: incorporating knowledge on prevention in education and planning, also on effects of disasters. 2- Sustainable tourism: achieve the establishment of the Sustainable Tourism Zone of the Caribbean (STZC) involving the certification of countries adopting sustainable tourism. Also work on indicators for sustainable tourism.

Name	OCT members	Other members	Remarks
Forum of the Caribbean ACP States (CARIFORUM)	OCTs are observers	Fifteen independent countries in the Caribbean region	Created in 1992 Goal: bringing together CARICOM members and ACP countries in the region with a view to better coordination of EU support and improved regional integration and cooperation. In 2011, the Caribbean Community Council of Ministers decided that the new CARIFORUM structure should include both the Economic Partnership Agreement (EPA) Implementation Unit and the traditional programming and development co-operation function, with its own dedicated staff.
Caribbean Community (CARICOM)	Montserrat Associated: ANG, BVI, CAY, TCI	Most former British colonies in Caribbean plus, recently, Suriname and Haiti	Created in 1973 as a free trade area (incl. Montserrat). Other British OCTs became associated members between 1991 and 2002. Goal of CARICOM Task Force on Climate Change and Development: facilitate and coordinate technical work, advise on policy directions, support CARICOM Member States in their preparations for key regional, hemispheric and other global forums and in their negotiations with international development partners.
Organisation of Eastern Caribbean States (OECS).	Member : Montserrat Associated members : Anguilla, BVI	Antigua and Barbuda, Dominica, Grenada, St Kitts and Nevis, St Lucia, St Vincent and Grenadines	Created in 1981, revised treaty signed in 2010. The Treaty establishes the OECS economic union, making possible the creation of a single financial and economic space. Goal: economic harmonisation and integration, protection of human and legal rights, and the encouragement of good governance. Activities: there is an Environment and Sustainable Development Unit (OECS-ESDU) and an RRHCC (Reduce risks to human and natural assets from climate change) project. As part of this project, the EU is financing a 2014 'Global Climate Change Alliance Project on Climate Change Adaptation and Sustainable Land Management in the Eastern Caribbean' for € 10 million for Implementation of specific physical adaptation measures, including soil and land stabilisation, river and sea defence, forest and ecosystem restoration.
Caribbean Community Climate Change Centre (CCCCC)	As above		Created in 2005. Goal: coordinate the region's response to climate change, working on effective solutions and projects to combat the environmental impacts of climate change and global warming. Activities: climate change-related policy advice and guidelines to the Caribbean Community (CARICOM) Member States through the CARICOM Secretariat and to the UK Caribbean OCTs. Clearing House for regional climate change data and documentation.
CDEMA (Caribbean Disaster Emergency Management Agency)	ANG, BVI, MSR, TCI	11 other CARICOM members	Created in 2009, an agency of CARICOM. Goal: CDM (Comprehensive Disaster Management) and reducing risk and losses which come with disasters, such as natural and technical hazards and risks and losses associated with climate change. Activities: mobilising and coordinating disaster relief; providing immediate and coordinated response by means of emergency disaster relief to any affected States
Caribbean Environmental Health Institute (CEHI)	ANG, BVI, MSR, TCI	12 other CARICOM members	Created in 1979 as a technical institute of CARICOM. Goal: Focus on the impacts of human activity on the environment and consequent effects on human health (and socio-economic development) Activities: providing technical and advisory services to its 16 Member States.
Pan American Health Organisation (PAHO)	All OCTs in region	FR, UK and NL are 'participating states'	Created in 1902. International public health agency for the Americas, regional office of WHO. Supports country efforts in the development of affordable and sustainable water and sanitation services and solid waste disposal.
Caribbean Tourism Organisation	CAY Montserrat		Created in 1989. Goal: develop sustainable tourism for the economic and social benefit of Caribbean people. It is made up of government and private sector reps involved with tourism across the Caribbean. CTO collects and disseminates research and data on the development of the regional industry, gives scholarships and organises a yearly conference on sustainable tourism.
Caribbean Natural Resources Institute (CANARI)		Non-profit organisation	Created in 1989. Goal: independent research to analyse and promote the participatory management of natural resources in the islands of the Caribbean. Activities: stimulate the participation of stakeholders in ecosystem management and develop appropriate responses to climate change, through participatory action research and application and dissemination of lessons learned. CANARI is the Regional Implementation Team (RIT) for the Critical Ecosystem Partnership Fund (CEPF) ¹⁸ .

¹⁸ The Critical Ecosystem Partnership Fund unites seven global leaders who are committed to enabling nongovernmental and private sector

Name	OCT members	Other members	Remarks
Wider Carib. Sea Turtle Cons. Network (WIDECAST)	All OCTs in the region		International scientific network comprised of volunteer country coordinators (sea turtle experts and community-based conservationists), an international Board of Scientific Advisors, and partner organizations in more than 40 Caribbean States and territories. Annual meetings.
Dutch Caribbean Nature Alliance (DCNA)		Coalition of Environmental organizations from all Dutch OCTs	Created in 2005, non-profit organisation. Goal: protect the natural environment and to promote sustainable management of natural resources on the six Dutch Caribbean islands, that contain the richest biodiversity in the Kingdom of the Netherlands. Activities: assists the 6 organisations that have been mandated to manage the protected areas within the Dutch Caribbean: research, database, meetings, training, work plans
E. Caribbean Central Bank (ECCB)	ANG, MSR	6 other E. Caribbean states	Created in 1983 as the Central bank of the OECS countries which all share a common currency, the Eastern Caribbean dollar. Goal: To maintain the stability of the Eastern Caribbean dollar and the integrity of the banking system in order to facilitate the balanced growth and development of Member States.
Caribbean Development Bank (CDB)	ANG, BVI, CAY, MSR, TCI	13 other former British colonies + Suriname, UK, Italy, Germany	Created in 1970. Development Bank for the Caribbean. Makes loans for development purposes to its members
World Bank	None	12 Caribbean countries	The Caribbean Regional Pilot Program for Climate Resilience (PPCR); is geared toward vulnerable countries and small island developing states. The PPCR was set up in 2008 as a collaborative effort among five multilateral development banks to help bridge the gap in financing and learning for climate change action. Example of project: the Regional Disaster Vulnerability Reduction Project protecting Grenada/ Saint Vincent and the Grenadines from the effects of natural disasters with 'Climate-Safe Infrastructure', a 5 years project, costing US\$ 50 million, benefitting more than 200,000 people).

It should be noted that organisations tend to be rather segregated along linguistic/historical/cultural lines.

6.2 RELEVANT REGIONAL INITIATIVES AND PROJECTS

As seen in the previous section (relevant regional organisations and programmes), the countries and territories organised themselves in several institutions, some which (e.g. CARICOM) have established operational bodies for direct action. The international community, donors, development banks, NGOs, foundations, etc., often work with these organizations or their operational bodies on a regional level. It should be highlighted that while the CARICOM and the sub-regional Organization of East Caribbean States are integration organisations bound by treaties, CARIFORUM and ACS are modes of regional cooperation.

The setting is quite complex and a recent paper¹⁹ highlights that “The policies and activities of the European Union (EU) in the Caribbean are a complex mix of overlapping but distinct programmes implemented through an ‘alphabet soup’ of regional organizations which themselves have overlapping responsibilities and areas of competence.”

The EU itself relates to the Caribbean OCTs through different delegations, the *Delegation of the European Union to Jamaica, Belize, The Bahamas, Turks and Caicos Islands and Cayman Islands* deals with the two referred OCTs, the *Delegation to Barbados and the Eastern Caribbean* deals with Anguilla, Montserrat and the British Virgin Islands, and the *Delegation to Guyana, Suriname, Trinidad and Tobago and for the*

organizations to help protect vital ecosystems. The participants of the fund are the Global Environmental Facility (GEF), the European Union, the World Bank, the French Cooperation Agency, the Japan Government, Conservation International (NGO) and the The John D. and Catherine T. MacArthur Foundation. Grant recipients range from small farming cooperatives and community associations to private sector partners and international organizations in developing and transitional countries engaged on conserving their environment and influencing decisions that affect lives, working in network, promoting synergies and eliminating duplications. (<http://www.cepf.net/>)

¹⁹ Sutton, Paul, The European Union and the Caribbean Region: Situating the Caribbean Overseas Countries and Territories. European Review of Latin American and Caribbean Studies 93, October 2012 | 79-94

Dutch Overseas Countries and Territories deals with Aruba, Curaçao, Sint Maarten, Bonaire, Saba and St Eustatius. Saint-Barthelemy has just joined the ODA.

The EU institutions (Commission plus EU Member States) have been the largest donor to the Caribbean region since 1975. Focus has been on implementation of Cotonou Agreement, namely Caribbean achievement of the Millennium Development Goals (Article 1); integrating ACP countries into the world economy by promoting economic cooperation, the free movement of persons, goods and capital, the diversification of economies, and trade expansion (Article 28); and co-operation on regional economic integration (Articles 29, 30 and 35). The Cotonou Agreement is implemented through the EDF, which is funded by EU Member States outside the EU budget process. Development co-operation under the EDF has been guided since 1994 through the CARIFORUM.

In addition to the Cotonou Agreement, the relationship is complemented²⁰ by the EU-CARIFORUM Economic Partnership Agreement for trade, and the Joint Caribbean EU Partnership Strategy. This latter identifies five key areas for EU-CARIFORUM and intra-CARIFORUM regional cooperation, including Regional Integration, Climate Change and Natural Disasters, Joint Action in Multilateral Fora, as well as Crime and Security and Haiti's Reconstruction. Agreements and fora that help the EU and the Caribbean countries to work towards common goals include: Joint Caribbean-EU Partnership Strategy (2012); EU-CARIFORUM Economic and Partnership Agreement (signed in 2008). Specialized meetings on drugs and migration; and EU-RIO Group - Caribbean countries are either full members or represented.

For the period 2008-2013, the European Development Fund (EDF) made provided approximately € 938 million available for the implementation of the National and the Caribbean regional indicative programmes. Of that amount, about € 72.09 million was allocated to specific Caribbean OCTs and 15M€ for a regional project (see below). For specific OCTs, the 10th EDF the indicative allocation was as follows: Aruba (€ 8.88 million), former Netherlands Antilles (€24 million), Anguilla (€ 11.7 million), Montserrat (€ 15.66 million) and Turks and Caicos (€11.85 million). The amounts for the 11th EDF are already decided, and the eligible OCTs are currently preparing the single programming documents for the new programming period. Due to their high GDP per capita²¹, some OCTs are not eligible for territorial allocations under the European Development Fund (EDF). However, they are eligible for non-programmable aid. For instance, Cayman Islands received from the 9th EDF about € 7 M in aid for the reconstruction and rehabilitation of houses that were destroyed by Hurricane Ivan, and € 4.5 million for a Digital Early Warning System which will fill in a gap in the Regional radar system.

Regardless of their GDP, the OCTs can access funding or technical assistance under 'horizontal'²² European programmes (e.g. research, education and training, innovation and competitiveness, and culture and media among others). For instance under the Technical Cooperation Facility, the OCTA is being supported for 3 years, and several regional (and global) training, studies and seminars are being held. Topics include waste management, biodiversity and conservation, environmental impact assessment aquaculture, renewable energies. However, many OCTs do not take advantage of the horizontal funding due to different reasons – often evoking time consuming procedures and their shortage of human resources.

All the Caribbean OCTs are also eligible for the wider Caribbean Regional Indicative programme (CRIP) and others mentioned above channelled through the CARIFORUM. Humanitarian and Emergency funding is also available and an indicative allocation with the European Investment Bank. Therefore it is hard to account for all the funding received by the OCTs. Anyway, some actions at regional level include:

- EU contribution to the Caribbean catastrophe risk insurance facility;
- The Regional Risk Reduction Initiative (2009-2011) involving the British and Dutch Caribbean OCTs implemented by UNDP under a contribution agreement with the EU23;

²⁰ nao.dm/index.php/projects

²¹ The EU average GDP per capita in 2012 was €25500.

²² EDF10 – Single Programming Document – Regional Cooperation Strategies for Overseas Countries and Territories

²³ This project provided a network of regional infrastructure, programmes, policies and protocols OCTs to strengthen their capacity to predict and prepare for natural hazards, thus improving resilience and reduce risk and subsequent loss.

- Management of protected areas for environmental purposes in the Cayman islands, BVI and Turks and Caicos Islands (€2.475 million);
- Strengthening of medical laboratory services in the Caribbean OCTs (€1.138 million);
- Automated system for customs data in Anguilla, Montserrat and the Turks and Caicos Islands (€1.38 million);
- The Caribbean 10th EDF 15M€ regional programme on Strengthening the Development of Small and Medium Enterprises (SMEs) of the OCTs in the Caribbean Region implemented from the British Virgin Islands.
- Turks and Caicos Islands have received € 4.3 million (B-envelope) following hurricane Ike.
- Started January 2014 Global Climate Change Alliance Project on Climate Change Adaptation and Sustainable Land Management in the Eastern Caribbean²⁴ in OECS Member States (including Anguilla, British Virgin Islands, Montserrat) for € 10 million.

The three frameworks through which the EU engage with the Caribbean and directly or indirectly address the concerns of the Caribbean OCT have not yet focused on promoting coordination and synergies between the Caribbean countries and territories. The 2013 Overseas Association Decision, however, does promote a stronger regional dimension to OCT-EU relations and major studies on EU-OCT relations endorse it as a practical way forward²⁴. The experience of the last decades indicates that in order for this process to progress, efforts are also required coming from the Caribbean OCTs themselves, to take the initiative in their own interest. In November 1993 Chief Minister Lavity Stoutt of the BVI organized the first meeting of the Caribbean OCTs associated with the EU in Tortola, to explore closer cooperation.

At the 7th OCT-EU Forum held in the Cayman Islands in November 2008 the CARICOM/CARIFORUM and the French Outermost Regions in the Caribbean, as well as the relevant Member States and the Commission agreed on the intention to create a regional OCTs, ACPs and Outermost Regions cooperation platform in the Caribbean, and decided on a pilot-project on civil protection to create synergies through increased cooperation²⁵. Despite regional work on disaster risk reduction, the envisaged platform was not established. Besides, the Joint Caribbean-EU Partnership Strategy (JCEUS) has been progressing slowly among the independent states and the Caribbean OCTs, due to their constitutional status. They cannot participate at such a high level and have been participating only collectively through the OCTA. The establishment of a dedicated mechanism to facilitate dialogue among all the Caribbean OCTs and a specific EU-Caribbean OCT regional arrangement can be envisaged under the new ODA, and can be expected to have a real impact.

There is also bilateral cooperation between the UK, the Netherlands, and France and the Countries and Territories linked to them. However, this cooperation tends restricted to some group of OCTs linked with the respective MS. Some UK initiatives include the JNCC initiatives such as Environmental Economics with the UK Overseas Territories in the by the EEWOC Caribbean developed and provided tools, training and technical support. This allows Caribbean Overseas Territories to use environmental valuation to inform and improve decision-making. The 2011 Biodiversity Snapshot (for the whole UK OCTs) is another example. To provide a central access 'place' where as many links as possible to other sources of biodiversity information about the OTs and CDs can be found.

Other major donors in the region include UNDP, United Nations Population Fund (UNFPA), UNAIDS, World Bank, International Bank for Reconstruction and Development (IBRD), InterAmerican Development Bank (IDB), Caribbean Development Bank, UK-DFID, USAID, CIDA, the Dominican Republic, Italy, Spain and Japan.

²⁴ E2011 Regional Level Evaluation of the Commission of the European Union's co-operation with the Caribbean Region

²⁵ European Union Delegation of Barbados and the Eastern Caribbean (2009) Press Release: European Commission discuss a platform for regional co-operation in the field of disaster management and civil protection Bridgetown, 22 May.

7 RECOMMENDATIONS FOR COOPERATION IN THE ENVIRONMENT BETWEEN THE EUROPEAN UNION AND CARIBBEAN OCTs

This section considers recommendations at the level of the Caribbean region. Recommendations with regard to individual OCTs are made at the end of the individual OCT environmental profiles. Part 1 of this report contains recommendations at the overall and interregional levels.

The OCTs identified the following issues:

Issues	Severity
Coastal zone issues causing loss of biodiversity and other hazards	10 OCTs state this is the number one priority. Problems are related to lack of appropriate physical development plans and regulations. Also diffuse and point source land based pollution.
Waste	9 OCTs mention lack of adequate waste management as one of their top priorities. Problems are linked to lack of infrastructure, lack of management processes, and lack of governance instruments.
Water and wastewater	5 OCTs refer water shortages and lack of adequate management as severe problems. Wastewater problems include groundwater contamination, coastal waters contamination and impact on corals.
Invasive Species	4 OCTs place the issue of invasive species as a top priority. In other OCTs the problem also exists, namely the lionfish in the marine environment, or destruction of birds and endemic lizards or plants
Energy dependency	2 OCTs refer the dependency on fossil fuels and the need for renewable energy and energy efficiency as top priority
Oil spills	2 OCTs refer this problem, particularly in the cases where there is heavy traffic or where there are large oil related infrastructures.
Fisheries	2 OCTs refer overfishing as a problem
Forest	1 OCT suffers heavy pressures on its forest
Climate change and disaster risk management	All OCTs are concerned with climate change, and all are integrated in regional initiatives

It is possible to identify best practices that can be expanded or replicated in other OCTs in the region:

Actions	Comment
Increase protected areas (terrestrial and marine)	British Virgin Islands and Turks and Caicos have well established protected areas networks. The OCTs linked to the Netherlands all have protected areas/ parks and the foundation DCNA coordinate and supports them all.
Wastewater	Turks and Caicos has established and maintains eco-marinas designed to protect the water resources and the coral living waters – this programme makes local communities and tourism operators work together and build mutual trust.
Solid waste collection and (re)use	Sint Maarten is building a waste to energy power plant, it would seem possible that all nearby OCTs and ACPs would be able to ship their waste to this facility. In some of the islands the Hotel Operator Associations have a role on waste management, namely on its recycling and elimination without hazards
Reduce energy dependency	Anguilla and Aruba are making efforts on promoting renewable energy as well as green growth.
Natural catastrophes and climate change	The whole Caribbean region is mobilized for this subject and receiving support. More coordination could be useful.

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Integrated Coastal zone Management	Develop and implement coastal zone management plans and harmonize legislation	There are pressures on coastal zones in all OCTs. Corals and mangroves are being destroyed due to several pressures. Income generating activities in the coastal area including in the sea are to not being fully explored.	5 years	OCT governments			Member States, EU
	Activities Involve and coordinate the various actors (environment, land, fishing, police, defence, ports, tourism, rural development, local authorities) Develop a study on the potential economic and environmental risks in coastal areas including climate change and the legal framework in the different OCTs. Develop studies on income generating activities in the coastal areas, with a view also to support activities at sea. Conduct workshops to discuss options both at national and regional level. Develop a regional strategy for the elaboration of each territories integrated coastal zone management plans integrating the several uses and the needs for protection, and take into account prospective scenarios and climate change. Drafting legislation necessary to implement the plan – having a perspective of harmonization of legislation. Promote co-management, eco-tourism, renewable energies, wherever possible.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Improve waste management	Develop waste management systems within each territory and in the region	Solid waste management is problematic in many of the OCTs. Some OCTs are making efforts to improve waste management. Sint Maarten is building a waste-to-energy plant requiring volume of waste.	5 years	OCT governments, Caribbean countries governments, private sector			Member States, EU, banks
	Activities Assess the waste streams and the installed infrastructure and process to detect the comparative advantages of the different OCTs in managing waste streams. Assess the capacities of neighbouring ACP countries and OR to deal with different waste streams with a view to establish cooperation, where adequate. Study the several options and strategies for waste valorisation through recycling and waste to energy methods – including cost-efficiency analysis, assessment of human resource capacity, strategic environmental assessment, etc. Promote regional agreements (OCTs, ACP, ORs) on different waste streams in order to achieve valorisation of waste, and to manage more efficiently some sorts of hazardous waste. Develop a regional strategy involving as well the neighbouring Caribbean states, including investments on infrastructure on a regional perspective, and on vessel(s) for inter-islands transport of waste. Organise a structured business dialog with the stakeholders and decision makers of each OCT in order to fix realistic plans (ready to be implemented) on different waste streams in order to achieve valorisation of waste, and to manage more efficiently some sorts of hazardous waste. Update standards and regulations for waste management. Establish agreement with other country outside of the Caribbean to receive sorts of waste that cannot be adequately managed in the region.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Reduce dependency on fossil fuels and GHG emissions	Establish conditions for the penetration of renewable energies and promotion of energy efficiency	OCTs are extremely vulnerable to increased oil prices and there is uncertainty of delivery in isolated places. Due to the cost of production and transport, electricity tariffs can be high which poses access problems to less well-off population. Each OCT has established its own targets, as there is no legal obligation to adhere to EU goals for sustainable development, and in general this means increase energy efficiency, and renewable energy use. These initiatives can also be seen as climate change mitigation measures.	5 years	OCTs governments Regional Organisations			Member States, EU WB and Regional Development Banks Private sector
	Activities Organise networking between the different regional (OCTs, ACP, ORs) public and private stakeholders dealing with energy issues. Study the possibilities of interisland transport of electricity through submarine cables. There are some studies undertaken by the US National Renewable Energy Laboratory. Promote sharing of experiences, and knowhow and agree on possibilities – regional interconnection, smaller sub regional interconnections. Assess the renewable energy resource of the different islands and establish energy mix and forecast scenarios. Devise what can be done regionally (specialised technical teams, production of equipment, training teams) and support its development. Review the institutional framework so that energy can be dealt in its integrity – electricity, fuels, etc. and linked with environment and climate change – this at both territorial and regional level. Study the most appropriate renewable energies (RE) solutions, and the most appropriate energy efficiency (EE) solutions, taking into account the initial cost and the cost of operation, the feasibility of local maintenance and repair – engage private sector and increase local expertise on RE and EE solutions. Establish appropriate regulatory framework, enabling involvement of private sector, incentives towards the shift to renewable energies and increase of energy efficiency, and establishing the adequate safeguards for energy safety and security. Develop capacity building in project finance, including strengthening fund raising expertise and requiring regular “Donor” coordination meetings.						

Caribbean region

Archer, A. (1988). Report on Sewage Disposal Problems in the Eastern Caribbean. Regional Sewage Disposal Coastal Conservation Studies. Prepared for the United Nations Economic Commission for Latin American and the Caribbean, Port of Spain.

Bouchon, C., Miller, A., Bouchon-Navarro, Y., Portillo, P. and Louis, M., 2004: Status of Coral Reefs in the French Caribbean Islands and other Islands of the Eastern Antilles. In: C.R. Wilkinson (ed.), Status of Coral Reefs of the World: 2004. Chapter 19.

Bueno, Ramon, C. Herzfeld, E. Stanton, F. Ackerman: "The Caribbean and climate change- The costs of inaction", Tufts University and Stockholm Environment Centre. May 2008. <http://ase.tufts.edu/qdae/pubs/rp/caribbean-full-eng.pdf>

Burke, L. and J. Maidens and contributing authors: M. Spalding, Ph. Kramer, E. Green, S. Greenhalgh, H. Nobles, J. Kool, 2004: Reefs at Risk in the Caribbean. World Resources Institute research report. http://marine.wri.org/pubs_description.cfm?PubID=3944

Caribbean Development Bank (CDB), 2006: Annual Economic Review 2005 (Country profiles for all the territories).

"Caribbean faces threat of biggest tsunami ever recorded", Caribbean 360, February 12, 2014. <http://www.caribbean360.com/index.php/news/1106618.html#ixzz2y0r7UPyT>

CCCCC- Caribbean Community Climate Change Centre: "Climate Change and the Caribbean: A Regional Framework for Achieving Development Resilient to Climate Change (2009-2015)", 2009. http://www.widecast.org/Resources/Docs/CCCCC_2009_Climate_Change_and_the_Caribbean_2009-2015.pdf

DCNA (Dutch Caribbean Nature Alliance): Dutch Caribbean Islands: Management Success Report 2012- <http://www.dcnanature.org/resources/protected-area-management/>

DCNA (Dutch Caribbean Nature Alliance): Fundraising Strategy building fundraising capacity amongst conservation organizations 2013 – 2017. <http://www.dcnanature.org/wp-content/uploads/2013/12/Fundraising-Strategy-2013-2017.pdf>

DCNA: Methods for funding for Nature Conservation: <http://www.dcnanature.org/wp-content/uploads/2013/04/2013-12-fundraising-brief.pdf>

DCNA: Multiyear nature management plan, 2014: <http://www.dcnanature.org/wp-content/uploads/2014/01/Multi-Year-Plan-compact.pdf>

Debrot, A.O., R. H. Witte, M. Scheidat: "The marine mammals of the Dutch Caribbean: a comparison between EEZ sectors, contrasts and concerns", IMARES, Wageningen University Research Center, Den Helder, The Netherlands. 2011. <http://edepot.wur.nl/189433>

Duncombe, M., E. Roussel, « Les mangroves de l'outre-mer français- Écosystèmes associés aux récifs coralliens La pointe Allègre, Guadeloupe. Conservatoire du littoral et Coordination : Marc Duncombe, Catherine Gabrié, IFRECOR. <http://www.icriforum.org/sites/default/files/Mangroves-OM-francais.pdf>

ECLAC- Economic Commission of Latin America and the Caribbean: Comprehensive review of the implementation of the Programme of Action for the sustainable development of Small Island developing States (SIDS POA).

<http://www.eclac.org/publicaciones/xml/9/13229/lcarg749-03-Chapter01.pdf>

Impact Consultancy Services, 2002: Water and Climate change in the Caribbean, paper prepared in collaboration with the Caribbean Environmental Health Institute (CEHI) and the Organization of American States, Unit for Sustainable Development and Environment, funded by Funding Provided by International Secretariat of the Dialogue on Water and Climate, October 2002.

Island Resources Foundation (IRF), 1996: Tourism and Coastal Resources Degradation in the Wider Caribbean, <http://www.irf.org/irtourdg.html#Characteristics%20of%20States>.

Gibbs, Tony, 2003: Report on the Comparison of Building "Codes" and Practices which are in use in the Caribbean (principally Bahamas, CUBiC, Dominican Republic, French Antilles, OECS) focusing on design and construction of healthcare facilities. Prepared for the Pan American Health Organization under the Disaster Prevention, Mitigation and Preparedness Programme of the European Community Humanitarian Office by CEP International Ltd., May 2003.

GCRMN- Global coral reef monitoring network, Tropical reefs resilience workshop 2012. http://gcrmn.org/wp-content/uploads/2012/11/Tropical_Americas_Coral_Reef_Resilience_Final_Workshop_ReportC.pdf

Lander J.F., L.S. Whiteside, P.A. Lockridge, 2002: A brief history of tsunamis in the Caribbean Sea. International Journal of the Tsunami Society, published by the Tsunami Society, Honolulu, 2002.

Linton, D., R. Smith, P. Alcolado, C. Hanson, P. Edwards, R. Estrada, T. Fisher, R. G. Fernandez, F. Geraldles, C. McCoy, D. Vaughan, V. Voegeli, G. Warner and J. Wiener, 2000: Status of Coral Reefs in the Northern Caribbean and Atlantic Node of the GCRMN. Chapter 15 in: C.R. Wilkinson (ed.) 2000: Status of coral reefs of the world 2000. GCRMN Report, Australian Institute of Marine Science, Townsville. pp 277-302.

Mercedes, S., 2002: Caribbean and Intra-Caribbean Tourism - Current Situation and Perspectives. Presentation at 8th Meeting of the Special Committee on Sustainable Tourism of the Association of Caribbean States, Port of Spain, April 4th, 2002.

Ministry of Economic Affairs (EZ) of the Netherlands: "Nature Policy Plan- The Caribbean Netherlands- 2013-2017", The Hague, April 2013. <http://www.dcnanature.org/nature-policy-plan-for-bonaire-saba-and-st-eustatius/>

Smith, A.H., M. Archibald, T. Bailey, C. Bouchon, A. Braithwaite, R. Comacho, S. George, H. Guiste, M. Hastings, Ph. James, C. Jeffrey-Appleton, K. de Meyer, A. Miller, L. Nurse, C. Petrovic and P. Philip, 2000: Status of Coral Reefs in the Eastern Caribbean. The OECS, Trinidad. Chapter 17 in: C.R. Wilkinson (ed.), Status of Coral Reefs of the World: 2000. GCRMN Report, Australian Institute of Marine Science, Townsville.

Tompkins, E. L., S. A. Nicholson-Cole, L-A. Hurlston, E. Boyd, G. Brooks Hodge, J. Clarke, G. Gray, N. Trotz and L. Varlack, 2005: Surviving Climate Change in Small Islands – a guidebook. United Kingdom.

UK Government, 1999: Partnership for Progress and Prosperity - Britain and the Overseas Territories. White Paper of Secretary of State for Foreign and Commonwealth Affairs. Cmd 4264, March 1999.

UNDP- The Nature Conservancy, "Financial Sustainability of Protected areas in Latin America and the Caribbean", 2010. http://www.undp.org/content/undp/en/home/librarypage/environment-energy/ecosystems_and_biodiversity/financial-sustainability-of-protected-areas-in-latin-america-and-the-caribbean.html

University of the West Indies, Climate Studies Group, Mona Department of Physics, "Observed climate change in the Caribbean: current status and past studies. <http://myspot.mona.uwi.edu/physics/sites/myspot.mona.uwi.edu/physics/files/uploads/Stephenson-%20Observed%20Climate%20Change%20in%20the%20Caribbean.pdf>

Wilkinson, C., Souter, D. (2008). Status of Caribbean coral reefs after bleaching and hurricanes in 2005. Global Coral Reef Monitoring Network and Reef and Rainforest Research Centre. With support from IUCN, GCRMN, ICRI, Reefbase, UNEP. http://www.coris.noaa.gov/activities/caribbean_rpt/SCRBH2005_rpt.pdf

World Bank: Economic valuation of coral reefs Working Group. Chair: Maritta Koch - Weser. Presentation: "Economic Values of Coral Reefs: What Are the Issues?" by John A. Dixon. <http://earthmind.net/marine/docs/world-bank-coral-reefs-valuation.pdf>

World Resources Institute (WRI): "Reefs at Risk Revisited" by Burke L, Reyta K, Spalding M, and Perry A. 2011. <http://www.wri.org/publication/reefs-at-risk-revisited>

Wilkinson, C. (2008): Status of the Coral Reefs of the World 2008". GCRMN, Global coral reef monitoring network. Full report: http://www.reefbase.org/resource_center/publication/main.aspx?refid=27173&referrer=GCRMN

Organisation	Website address	Remarks
CANARI - Caribbean Natural Resources Institute	http://www.canari.org/default.asp	
Caribbean Tourism Organisation	http://www.onecaribbean.org/about-cto/	
Caribbean Development Bank (CDB)	http://www.caribank.org/	
CCCCC	Caribbean Community Climate Change Centre http://caribbeanclimate.bz/	
CARICOM -	Secretariat of the Caribbean Community and Common Market http://www.caricom.org/	
CDEMA -	Caribbean Disaster Emergency Management Agency http://www.cdema.org/	
CEHI -	Caribbean Environmental Health Institute http://www.cehi.org.lc/	
CIMH - The Caribbean Institute of Hydrology and Meteorology		
CYEN- The Caribbean Youth Climate Change Mitigation Project	http://www.cyen.org/climatechange/documents/cc_and_the_caribbean.html	
DCNA- Dutch Caribbean Nature Alliance	http://www.dcnanature.org/marine-mammals-in-the-dutch-caribbean/	On Marine mammals in the Dutch Caribbean
Eastern Caribbean Central Bank (ECCB)	http://www.eccb-centralbank.org/Contact/	
EU- GCCA 2011 project 10 th EDF	Global climate change Alliance - Caribbean component of the Intra-ACP Support Programme to the GCCA: http://archive.gcca.eu/pages/79_2-In-the-Caribbean.html	
Green Antilles	http://www.greenantilles.com/	
IADB - Inter-American Development Bank	http://www.iadb.org/en/about-us/about-the-inter-american-development-bank,5995.html	
Island Resources Foundation	http://www.irf.org/	Foundation is dedicated to solving the environmental problems of development in small tropical islands
NOAA	http://www.ospo.noaa.gov/data/cb/TS_vs/vs_ts_multiyr_CuracaoandAruba.png	With data on evolution temperature water and coral reefs
TNC - The Nature Conservancy	http://www.nature.org/	
Organisation of Eastern Caribbean States (OECS)	http://www.oecs.org	

(OECS-ESDU)	Environment and Sustainable Development Unit of the Organisation of Eastern Caribbean States http://www.oecs.org/our-work/units/environment-sustainable-development	
OECS- RRACC project	Reduce risks to human and natural assets from climate change http://www.oecs.org/our-work/projects/rracc	
OECS- EU project	Global Climate Change Alliance Project on Climate Change Adaptation and Sustainable Land Management in the Eastern Caribbean http://www.oecs.org/rracc-news/816-new-project-activated-to-boost-efforts-to-reduce-the-impact-of-climate-change-in-the-oecs	
Pan-American Health Organization	http://www.paho.org/english/sha/prflcay.htm	Description of solid waste and sanitation
UNECLAC -	United Nations Economic Commission for Latin America and the Caribbean http://www.cepal.org/portofspain/	
UWI - University of the West Indies	http://www.uwichill.edu.bb/	
Wider Carib. Sea Turtle Conservation Network (WIDECAST)	http://www.widecast.org/Who/Contact.html	
World Bank project 2012	Small Caribbean States Work Together against Big Natural Disasters : http://www.worldbank.org/en/news/feature/2012/10/10/Grenada-Saint-Vincent-project-against-natural-disasters	
World Bank project	Regional Disaster Vulnerability Reduction Project, http://www.worldbank.org/projects/P117871/oecs-disaster-vulnerability-reduction-project?lang=en	
World Resources Institute		On refs in the Caribbean

Anguilla

Anguilla Country Poverty Assessment 2007/09. <http://www.caribank.org/uploads/2012/12/Anguilla-CPA-Main-Report-Final-Submitted.pdf>

Assessment of environmental protection frameworks in the UK Overseas Territories, 2013, The Foundation for International Environmental Law and Development and The Royal Society for the Protection of Birds,
http://www.rspb.org.uk/Images/EnvironmentalGovernanceReviewFeb2013_tcm9-342020.pdf

Foreign and Commonwealth Office (FCO): The Overseas Territories: Security, Success and Sustainability, 2012.
<https://www.gov.uk/government/publications/the-overseas-territories-security-success-and-sustainability>

Gumbs, J, 2013, Anguilla National Report, The 11th Meeting of the Caribbean Fisheries Forum March 2013, Greening the Economy' project in the UK Overseas Territory of Anguilla, Caribbean Natural Resources Institute (CANARI) and Joint Nature Conservation Committee Support Co.

Hodge, K.V.D. (2011). Anguilla (pp 6-10) in UK Overseas Territories and Crown Dependencies: 2011 Biodiversity Snapshot, T. Pelembe and G. Cooper (eds). May 2011, UK Joint Nature conservation Committee

Simpson, M. C., *et al.* (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) - Anguilla. DFID, AusAID and the CARIBSAVE Partnership, Barbados, West Indies

Single Programme Document of Anguilla – European Union 10^o EDF (March, 2012)

Sustainable Tourism Master Plan (2010-2020), October 2011

The US Captive, 2012, Newton Media Limited

Wege, D. C. and Anadon-Irizarry, V. (2008) Important Bird Areas in the Caribbean: Key Sites for Conservation. BirdLife International

Websites

Anguilla Coastal Resources Assessment Monitoring and Management Project (ACRAMAM), <http://www.thenrgroup.net/theme/ACRAMAM.htm>

Anguilla Financial Services Commission, <http://www.fsc.org.ai/>

Anguilla Invasive Species Project, <http://jncc.defra.gov.uk/pdf/Anquilla%20lionfish%20project%20report%20form%202a.pdf>

Anguilla Statistics Department http://www.gov.ai/statistics/NA_Publi_11.htm

Caribbean Regional Fisheries Mechanism, <http://www.caricom-fisheries.com/Members/MemberStates/Anguilla/tabid/65/Default.aspx>

Central Intelligence Agency, World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/geos/av.html>

Environmental Vulnerability Index Country Profiles, http://www.vulnerabilityindex.net/EVI_Country_Profiles.html
FOR- Anguilla project

EU Global Climate Change Alliance (GCCA) Project on Climate Change Adaptation and Sustainable Land Management in the Eastern Caribbean, <http://www.gcca.eu/regional-programmes/gcca-eastern-caribbean>
'Greening the Economy' project, http://jncc.defra.gov.uk/pdf/ot_Anguilla_mainstreamingFINAL.pdf

Lionfish Response Strategy Project for Anguilla, http://jncc.defra.gov.uk/pdf/ot_LionfishWorkshopAnguilla_20130602.pdf

Longline Fisheries Development Project, <http://www.ukotcf.org/pdf/charters/WhitePaper99App.pdf>

Organic Soil Amelioration for Enhancing Anguilla's Agricultural Adaptation to Climate Change, <http://www.ukotcf.org/infoDB/infoSourcesDetail2.cfm?refID=276>

Private Islands Online, <http://www.privateislandsonline.com/islands/dogislandanguilla>

Relief Web, <http://reliefweb.int/report/anguilla/government-anguilla-receives-us428m-insurance-payout-following-passage-hurricane>

The Government of Anguilla, Constitutional & Electoral Reform Commission Report, http://www.gov.ai/constitutional_reform.php

The Government of Anguilla, Department of the Environment, <http://www.gov.ai/departments.php?id=3&dept=21>

Terrestrial Habitat Mapping Project, Conservation Gateway, <https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/terrestrial/habitatmap/Pages/default.aspx>

UK Overseas Territories Conservation Forum, *Enhancing capacity for fisheries enforcement and management in Anguilla*, <http://www.ukotcf.org/infoDB/infoSourcesDetail2.cfm?refID=299>

World Atlas, <http://www.worldatlas.com/webimage/countrys/namerica/caribb/anquilla/aifacts.htm>

Aruba

Aruba Single Programming Document, 10th European Development Fund: of Aruba. Signed: 27 October 2011.
http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/spd_final_aruba_en.pdf

Aruba Court of Auditors : "De 'nieuwe' Algemene Rekenkamer: de *Uitkomst*- Strategisch beleidsplan". 29 March 2011.
<http://www.overheid.aw/index.asp?nmoduleid=19&wgid=6&sc=0&spagetype=21&nPageID=1134&nCMSPageType=1>

Aruba Environmental legislation: <http://www.dcnanature.org/resources/policy-law-enforcement/>

Aruba Fondo Desaroyo Arubano (FDA- Aruban Development Fund) "Samenwerking 2000- 2009"- Report on Cooperation with the Netherlands 2000-2009.
https://www.eerstekamer.nl/behandeling/20090109/fondo_desaroyo_aruba_fda/document3/f=/viz7d6183tyj.pdf

Aruba Marine Park Foundation: "You too can help protect Aruba's Marine Life and Reefs Join the Jolly Pirates in creating awareness by supporting the Save the Reefs Bracelet Program" Aruba Daily, May 13, 2013. <http://aruba-daily.com/newspaper/you-too-can-help-protect-arubas-marine-life-and-reefs-join-the-jolly-pirates-in-creating-awareness-by-supporting-the-save-the-reefs-bracelet-program-2/>

Aruba National Integrated Strategic Plan (NISP) 2025
<http://www.nosaruba2025.aw/http://www.slideshare.net/e.erasmus/national-integrated-strategic-plan-nisp-aruba>

Aruba National Oil Spill Contingency Planning Workshop 2011, CEP/UNEP,
http://cep.unep.org/racrempeitc/activities/activities-2010_2011/national-oil-spill-contingency-planning-workshop-in-aruba-16-18-november

Aruba Reef Care: "Castro Perez di Aruba Reef Care Foundation: Sistema di "waterside security" por contribui na preservacion di bida marino" in: 24ora, 15 December 2013. <http://24ora.com/local-mainmenu-5/74192-castro-perez-di-aruba-reef-care-foundation-sistema-di-waterside-security-por-contribui-na-preservacion-di-bida-marino>

Bird International: Important Bird Areas in the Caribbean by Adrian del Nevo, with a Chapter on Aruba by Ebrot et al, 1998. <http://www.arubabirds.com/>

BirdLife International, Country profile for Aruba (2014). <http://www.birdlife.org/datazone/country/aruba>.

CEP (Caribbean Environment Programme) country profile Aruba 2011.
<http://cep.unep.org/racrempeitc/National%20OPRC%20Plans/aruba/Aruba%20Nov2011.pdf/view>

CEP (Caribbean Environment Programme) Aruba Activities attended 1996- 2011.
http://cep.unep.org/racrempeitc/National%20OPRC%20Plans/aruba/Aruba_Activities_May2012.pdf/view

Central Bank of Aruba, press release on: An update of the estimation of Aruba's Gross Domestic Product (GDP) for 2011, 2012 and 2013. www.cbaruba.org/cba/readBlob.do?id=2711

CBS (Centraal Bureau voor de Statistiek= Aruba's Central Bureau of Statistics), Statistical Yearbook 2012.
www.cbs.aw

CBS- Environmental data: <http://www.cbs.aw/index.php/statistics/tables-statistics/50-tables/environment-nature-space>

CIA (Central Intelligence Agency) Report on Aruba: <https://www.cia.gov/library/publications/the-world-factbook/geos/aa.html>

Cuba, Kevin de: "Climate Change and its impact on the livelihood of the Aruban people", October 2007. http://www.ciel.org/Publications/Climate/CaseStudy_Aruba_Oct07.pdf

DCNA (Dutch Caribbean Nature Alliance): "Report on Aruba". 2014. <http://www.dcnanature.org/islands/aruba/>
DCNA-Annual Report 2012. <http://www.dcnanature.org/resources/>

ECLAC (Economic Commission for Latin America and the Caribbean): Country report on Aruba in: Review of the economics of climate change (RECC) in the Caribbean project: phase 1- Climate Change profiles in select Caribbean countries. 23 June 2010. <http://www.eclac.org/publicaciones/xml/8/39188/LCARL.250.pdf>

ECLAC (Economic Commission for Latin America and the Caribbean): Efectos del Cambio Climático en la costa de América Latina y el Caribe: Vulnerabilidad e exposición. April 2012. http://www.eclac.org/publicaciones/xml/0/46750/2011-786-W.460_Vulnerabilidad_y_exposicion_WEB.pdf

"ECLAC Report Examines Vulnerability to Climate Change of LAC Coasts", Article on Phase 2 ECIAC project in: Sidsnet, 21 May 2012. <http://www.sidsnet.org/news/eclac-report-examines-vulnerability-climate-change-lac-coasts>

FIAS (The Investment Climate Advisory Service linked to the World Bank): "ARUBA- Diversification for sustainable growth and reduction of risk- Steps Toward the Design and Implementation of a Strategy". December 2005 with some revisions December 2006. (<http://www.ebooksmagz.com/view/aruba-diversification-for-sustainable-growth-and-reduction-of-risk.html>)

The Gleaner: 'Aruba oil refinery to turn into storage facility' article Sept 4, 2012. <http://jamaica-gleaner.com/gleaner/20120904/business/business5.html>

Green Aruba IV conference and CREF (Caribbean Renewable Energy Forum) 2013. <https://cref2013.pathable.com/#meetings>. In 2014: www.greenaruba.org

Green Aruba III (2012): Aruba is taking a leadership role with the concept of sustainable growth in the deepest sense of the words. <http://www.aruba.com/forum/f7/green-aruba-conferences-60118/>

Henriquez, Raul: Island of the terns: a public secret. In Aruba Forum, 19 Jul, 2008, in: http://www.amigoe.com/artman/publish/artikel_44711.php

International Monetary Fund: IMF Executive Board Concludes 2013 Article IV Consultation with the Kingdom of the Netherlands- Aruba, Press Release No. 13/303, August 9, 2013. <http://www.imf.org/external/np/sec/pr/2013/pr13303.htm>

IUCN – UICN (International Union for the Conservation of Nature): "Changement climatique et biodiversité dans l'outre-mer européen" by Petit, J. and Prudent, G. (editors). Gland and Brussels, UICN, 2010. 192 pp. With a chapter on Aruba. <http://www.cbd.int/islands/doc/idr/Climate%20Change%20and%20Biodiversity%20in%20EU%20overseas%20entities/Reunion%20publication-fr.pdf>

IUCN: "IUCN kritisch over natuurbescherming Caribische eilanden- De natuur op Aruba, Bonaire, Curaçao, Sint Maarten, Sint Eustatius en Saba moet beter worden beschermd.", 2 November 2011. <http://www.iucn.nl/nieuws/nl/?12040/IUCN-kritisch-over-natuurbescherming-Caribische-eilanden>

McGinley, M.: Common coral reef fishes of Aruba, in Encyclopedia of Earth, 7 October 2009, based on REEF Geographic Zone Report of May 27, 2009. <http://www.eoearth.org/view/article/151328/>

Nevo, Adrian del, Important Bird Areas in the Caribbean – chapter on Aruba, <http://www.arubabirds.com/aboutAruba/documents/aruba.pdf>

REEF report on Aruba species in the reefs (1993- 2009). <http://www.reef.org/db/reports/geo/TWA/8501/1993-01-01/2009-05-27/chart/common>

Prins et al: Checklist of the birds of Aruba, Curaçao and Bonaire in: South Caribbean Journal of Netherlands Ornithologists, 97(2) 2009. <http://www.arubabirds.com/>

Proosdi, André van: The Flora of Aruba, Bonaire and Curaçao, in Bionews 5 (May 2013). <http://www.dcnanature.org/flora-of-aruba-bonaire-and-curaçao/>

Sutton, Paul: "The European Union and the Caribbean Region: Situating the Caribbean Overseas Countries and Territories", 2012 http://www.cedla.uva.nl/50_publications/pdf/revista/93RevistaEuropea/93-Sutton-ERLACS-ISSN-0924-0608.pdf

Tweede Kamer: Jaarverslag en slotwet Koninkrijksrelaties 2012- Jaarverslag van Koninkrijksrelaties (iv), 15 May 2013. Report on the relations between the Netherlands and Aruba, Curacao and St Maarten. <https://zoek.officielebekendmakingen.nl/kst-33605-IV-1.html>

Urirama Wind Park Assessments: "Social and Environmental Impact Assessment for Urirama Wind Farm" by Vader Piet Beheer NV, Arnhem, May 8, 2012. <http://savealtovistadotcom.files.wordpress.com/2012/05/sea-report-urirama-rev-1-of-8-may-20121.pdf>

CMER- Commissie voor Milieu Effect Rapportage- Advies van de Commissie m.e.r. inzake Windpark Urirama, Aruba, 8 november 2012 / rapportnummer OS24-B015-53. http://api.commissiemer.nl/docs/mer/diversen/windpark_urirama_definitief.pdf

Vulnerability index for Aruba: <http://www.vulnerabilityindex.net/EVI%20Country%20Profiles/AW.pdf>

Widecast (Wider Caribbean SeaTurtle Conservation Network) on Aruba: <http://www.widecast.org/What/Country/Aruba/aruba.html>

Wild Aruba: Conservation Planning Workshop Final Report 2008. Editors: Barendsen, P., B. Boekhoudt, G. Boekhoudt, L. Carrillo, R. Derix, F. Franken, R.A. Odum, P. Portier, M. Sweerts-de Veer, R. van der Wal, and O. Byers. 2008: Wild Aruba/ IUCN/SSC Conservation Breeding Specialist Group. <http://www.cbsg.org/content/wild-aruba-conservation-planning-workshop-2008>

Wilson, C.M. (Ministry of Transport, Communication and Utilities, Aruba), et al: Status of Coral Reefs in the South Central Caribbean, Proceedings of the 8th International Coral Reef Sym 1:357-362. 1997. http://www.aoml.noaa.gov/general/lib/CREWS/dbjm_22.pdf

Organisation	Website address
Aruba government	www.overheid.aw
Aruba government- Econ. Affairs	http://www.arubaeconomicaffairs.aw
Aruba government- News	http://www.overheid.aw/index.asp?nmoduleid=19&wgid=6&spagetype=21&nPageID=26&nCMSPageType=1
Dutch Ministry of Interior and Kingdom Relations	www.minbzk.nl

Representation of Aruba in the Netherlands	http://www.arubahuis.nl/
Representation of the Netherlands in Aruba (& Curacao and Sint Maarten)	http://www.rijksoverheid.nl/onderwerpen/caribische-deel-van-het-koninkrijk/vertegenwoordiging-van-nederland-in-aruba-curacao-en-sint-maarten
CREF (Caribbean Renewable Energy Forum)	www.caribbeanenergyforum.com
DCNA- Dutch Caribbean Nature Alliance	www.dcna.org
Aruba Bird Conservation	http://www.arubabirds.com/aboutAruba/Arubaislandconservation.htm
Aruba National Park Arikok	http://www.arubanationalpark.org/
Aruba Water and Energy Company (WEB)	http://www.urirama.com/index.php?option=com_content&view=article&id=19&Itemid=27
Sea Around US- Data on fisheries Aruba	http://www.seaaroundus.org/eez/533/11.aspx
Urirama Wind Farm	http://www.urirama.com/index.php?option=com_content&view=article&id=19&Itemid=27
Valero (Aruban Refinery)	http://www.valero.com/ourbusiness/ourlocations/refineries/pages/aruba.aspx

Bonaire

"Bonaire and Endangered Species". 23 Sept. 2012 <http://www.bonairetalk.com/forums/showthread.php?73284-Bonaire-an-endangered-species>

Bonaire Nature Conservation Island Ordinance:

[http://www.stinapa.org/pdfs/Island Ordinance Nature Management Bonaire.pdf](http://www.stinapa.org/pdfs/Island%20Ordinance%20Nature%20Management%20Bonaire.pdf)

Bonaire Masterplan Strategische Ontwikkeling 2010-2025.

<http://www.banboneirubek.com/sites/default/files/Masterplan%20definitief%20zonder%20voorwoord%2015122009.pdf>

Bonaire Spatial Plan (ROP- Ruimtelijk Ontwikkelingsplan 2010 : <http://www.bonairegov.nl/nl/omgeving/ruimtelijke-ontwikkeling/ruimtelijk-ontwikkelingsplan-bonaire-rob>

[http://www.bonairegov.an/sites/default/files/uploads/Ruimtelijk Ontwikkelingsplan Bonaire vastgesteld.pdf](http://www.bonairegov.an/sites/default/files/uploads/Ruimtelijk%20Ontwikkelingsplan%20Bonaire%20vastgesteld.pdf)

Dixon, J. A., L. Fallon Scura, T. van 't Hof, 1993: Ecology and microeconomics as joint products: The Bonaire marine park in the Caribbean, World Bank.

Dohmen, Joep: Onderzoek naar fraude EU-subsidies Antillen, NRC, 11 September 2013.

<http://www.nrc.nl/nieuws/2013/09/11/onderzoek-naar-fraude-eu-subsidies-antillen/>

Dutch Caribbean Nature Alliance (DCNA)- Management Plan for Bonaire's Marine Park- <http://dcnanature.org/wp-content/uploads/2012/08/BonaireNationalMarinePark2006ManagementPlan.pdf>

European Development Fund (EDF): "Netherlands Antilles (including Bonaire) Single Programming Document, 10th EDF. http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/signed-spd-06-2012.pdf

Geelhoed, SCV, Debrot, AO, Ligon, JG, Madden, H, Williams, SR, Verdaat, JP, Wulf, K. (2013): "Important Bird Areas in the Caribbean Netherlands", Imares. <http://www.dcbd.nl/document/important-bird-areas-caribbean-netherlands>

Grimsditch, Gabriel D.; Arnold, Suzanne; Bey, Henry de; Brown, Jeanne B.; Engel, Sabine; Leon, Ramon de; Vermeij, Mark. "Coral reef resilience assessment of the Bonaire National Marine Park, Netherlands Antilles : surveys from 31 May to 7 June, 2009". 2011. IUCN (International Union for the Conservation of Nature)/ STINAPA/ Global Marine Programme; UNEP; Nature Conservancy, US; Caribbean Research and Management of Biodiversity (CARMABI):

<https://portals.iucn.org/library/node/9832>

IUCN- International Union for the Conservation of Nature. Benzaken, D & Renard, Y. : «Perspectives d'action pour la biodiversité dans l'outre-mer européen- Bilan de la mise en oeuvre de la Convention sur la diversité biologique». Dec. 2010. http://www.iucn.org/fr/france_uicn/publications/?uPubsID=4400

J. Petit & G. Prudent (2008) : "Changement climatique et biodiversité dans l'Outre-mer européen". Chapter 2.4. on the Netherlands Antilles (including Bonaire).
<http://www.cbd.int/islands/doc/idr/Climate%20Change%20and%20Biodiversity%20in%20EU%20overseas%20entities/Reunion%20publication-fr.pdf>

IVM (Institute of Environmental Studies): "What's Bonaire's Nature Worth? The Economics of Ecosystems and Biodiversity on Bonaire", Amsterdam, 2001. http://www.ivm.vu.nl/en/Images/2001_TEEB_Bonaire%20total_tcm53-310328.pdf

All other sectoral documents: <http://www.ivm.vu.nl/en/projects/projects/economics/bonaire/index.asp>

Results on Youtube: <http://www.youtube.com/watch?v=zEiPFO8kWKc>

Kooistra, Simon & Mudde Leon: "Breda helpt Bonaire met milieubeleid", VNG Magazine, 25/06/2010, <http://www.vngmagazine.nl/archief/142/breda-helpt-bonaire-met-milieubeleid>

National Marine Park:

Background information: <http://www.bmp.org/pdfs/BNMP-managementplan-part1.pdf>

The management environment: <http://www.bmp.org/pdfs/BNMP-managementplan-part2.pdf>

Management: <http://www.bmp.org/management.html>

History: <http://www.bmp.org/history.html>

Rules and Regulations: <http://www.bmp.org/rulesandregulations.html>

CAMPAM report: http://campam.gcfi.org/CaribbeanMPA/pdfexport/pdf_generator.php?mpaId=127

Selibon (waste management company) plan, Febr 2013. <http://www.bonaire.nu/2013/02/28/seliboon-presenteert-plan-van-aanpak-afvalbeheer/>

Stolte, Wilbert: Report on the 3 special municipalities (Bonaire, Saba and St Eustatius), Kralendijk, January 2014. Netherlands. http://www.eerstekamer.nl/overig/20140110/derde_voortgangsrapportage/document

"Tropical Americas Coral Reef Resilience Workshop Report, April 29 – May 5, 2012. ICRI, UNEP/ IUCN/ GCRMN : http://gcrmn.org/wp-content/uploads/2012/11/Tropical_Americas_Coral_Reef_Resilience_Final_Workshop_ReportC.pdf

Washington Slagbaai National Park:

<http://www.washingtonparkbonaire.org/>

History: <http://www.washingtonparkbonaire.org/history.html>

Management: <http://www.washingtonparkbonaire.org/management.html>

Rules and Tips: <http://www.washingtonparkbonaire.org/rulesandtips.html>

Flora: <http://www.washingtonparkbonaire.org/flora.html>

Fauna: <http://www.washingtonparkbonaire.org/fauna.html>

Tourism: <http://www.tourismbonaire.com/nl/over-bonaire/nature/washington-park>

Wells, Jeff (Boeral Songbird Initiative) & A. Debrot (Carmabi Foundation): "Important Bird Areas - Report on Bonaire" <http://www.washingtonparkbonaire.org/pdfs/ImportantBirdAreasBonaire.pdf>

Wieggers, Mark W., "Impact of Increased Nutrient Input on Coral Reefs on Bonaire and Curacao", University of Utrecht, October 2007. <http://www.nacri.org/greylit/wieggers2007impactnutrientscoralreef.pdf>

<http://www.slideshare.net/Wieggers/impact-of-increased-nutrient-input-on-coral-reefs-on-bonaire-and-curacao>

Laws and policy documents applying to Bonaire and the other 2 special municipalities (Saba and Sint Eustatius):

Nature Policy for the Caribbean Netherlands 2013-2017- <http://www.government.nl/documents-and-publications/publications/2014/02/03/nature-policy-plan-the-caribbean-netherlands.html>

Algemene Rekenkamer (Netherlands Court of Auditors): "Rijksoverheid en Caribisch Nederland: naleving van afspraken 2012". Report on the 3 special municipalities (Bonaire, Saba, St Eustatius) 2012.
[http://www.rekenkamer.nl/Publicaties/Onderzoeksrapporten/Introducties/2012/11/Rijksoverheid en Caribisch Nederland and naleving van afspraken](http://www.rekenkamer.nl/Publicaties/Onderzoeksrapporten/Introducties/2012/11/Rijksoverheid_en_Caribisch_Nederland_and_naleving_van_afspraken)

Caribisch Nederland in beeld- Een fotoverslag van de eerste drie jaar samenwerking tussen VROM, Verkeer en Waterstaat en Rijkswaterstaat met Bonaire, St.Eustatius en Saba. (Publication about the infrastructural works in the 3 Dutch special municipalities).
[http://www.rijksdienstcn.com/rijksdienstcn.com/up1/ZyahqpxIW Fotoboek Caribisch Nederland OPTIMIZED.pdf](http://www.rijksdienstcn.com/rijksdienstcn.com/up1/ZyahqpxIW_Fotoboek_Caribisch_Nederland_OPTIMIZED.pdf)

Environmental Legislation (Wet grondslagen natuurbeheer- en bescherming BES- per 13-12-2011):
http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

Wet maritiem beheer BES (Marine law)
<http://dcnanature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>

Wet grondslagen natuurbeheer- en bescherming BES (Nature protection)
http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

Wet grondslagen ruimtelijke ontwikkelings- planning BES (Spatial Planning) <http://dcnanature.org/wp-content/uploads/2012/09/Wet-grondslagen-ruimtelijke-ontwikkelingsplanning-BES.pdf>

Wet volkshuisvesting, ruimtelijke ordening en milieubeheer BES (Environment, Housing and Spatial Planning):
<http://dcnanature.org/wp-content/uploads/2012/09/Wet-VROM-BES.pdf>

Wet Visserijwet BES (Fisheries), <http://dcnanature.org/wp-content/uploads/2012/09/Visserijwet-BES.pdf>

Organisation	Website address
Bonaire government	http://www.bonairegov.an/
Idem, Nature and Environnement pages	http://www.bonairegov.an/nl/omgeving/natuur-en-milieu
The Netherlands and the Caribbean parts of the Kingdom	http://www.government.nl/issues/caribbean-parts-of-the-kingdom/bonaire-st-eustatius-and-saba
Dutch Ministry of Interior Affairs and Kingdom Relations	www.minbzk.nl
The Netherlands and development of Dutch Caribbean	https://www.rijksdienstcn.com/en/news/bonaire-st-eustatius-saba-and-dutch-government-embrace-development-plans
National Office for the Caribbean Netherlands (RCN- Rijksdienst Caribisch Nederland)	http://www.government.nl/issues/caribbean-parts-of-the-kingdom/national-office-for-the-caribbean-netherlands
Office of the Kingdom Representative (on Saba, Bonaire and St Eustatius)	http://www.rijksdienstcn.com/en/office-of-the-kingdom-representative
NACRI- Netherlands Antilles Coral Reef Initiative	http://www.nacri.org/nacri.html
STINAPA (Stichting Nationale Parken) The National Parks Foundation	http://www.stinapa.org
Carmabi Foundation- Caribbean Research & Management of Biodiversity	http://www.carmabi.org/
DCNA- Dutch Caribbean Nature Alliance	www.dcna.org
DCBD (Dutch Caribbean Biodiversity Data Base)	www.dcbd.nl
CaMPAM- Caribbean Marine Protected Areas Managers and Network Forum	http://www.cep.unep.org/about-cep/spaw/strengthening-and-management-of-protected-areas-in-the-wider-caribbean-region/campam-network-and-forum-1
GCFI- Gulf an Caribbean Fisheries Institute	http://www.gcfi.org/index.php

Info sites	http://www.infobonaire.com/ http://www.bonaireexclusief.nl/ http://www.bonairenet.com/infonl.htm http://www.beautiful-bonaire.nl/index.html http://www.bonaire.nl/
Tourism corporation	http://www.tourismbonaire.com/en/
Nature areas on Tourism site	http://www.tourismbonaire.com/nl/over-bonaire/nature
Bonaire Birds	http://www.bonairebirds.com/contactUs/WhoWeAre.htm

The British Virgin Islands

Anegada Biodiversity Action Plan (2006), <http://www.seaturtle.org/mtrg/projects/anegada/Anegada%20BAP.pdf>

British Virgin Islands Protected Areas System Plan 2007-2017, <http://ess-caribbean.com/wp-content/uploads/2011/08/British-Virgin-Islands-Protected-Areas-System-Plan-2007-2017.pdf>

Department of Disaster Management November 2008, British Virgin Islands (UK) Comprehensive Disaster Management Policy, <http://bviddm.com/document-center/VI%20CDM%20Policy%20Final.pdf>

Eakin, C.M., *et al.*, Caribbean Corals in Crisis: Record Thermal Stress, Bleaching, and Mortality in 2005, November 15, 2010 DOI: 10.1371/journal.pone.0013969

Environmental Profile of Anegada, 2013, Island Resources Foundation
National Environmental Action Plan (NEAP), Conservation & Fisheries Department, Ministry of Natural Resources & Labour, British Virgin Islands, http://www.bvidef.org/main/%20media/NEAP_Draft.pdf

Petit, J. and Prudent, G. (eds). *Climate Change and Biodiversity in the European Union Overseas Entities*. Gland, Switzerland and Brussels, Belgium: IUCN. Reprint, Gland, Switzerland and Brussels, Belgium: IUCN, 2010. 192 pp

Road Town Physical Development Plan 2005-2020, <http://www.tcp.gov.vg/prodfiles/Rationale.pdf>
Sanders S. 2006. Important bird areas in the United Kingdom Overseas Territories. Priority sites for Conservation. Sandy, UK: RSPB

The British Virgin Islands Millennium Development Goals (MDGs): A Plan of Action for Localising and Achieving the MDGs, February 2008,
http://www.eclac.cl/portofspain/noticias/paginas/6/37516/British_Virgin_Islands_MDG_Plan_of_Action_2008.pdf

British Virgin Islands Climate Change Trust Fund Act,
http://issuu.com/bvibeacon/docs/virgin_islands_climate_change_trust

British Virgin Islands Health in the Americas (2012) - Pan American Health Organisation,
http://www.paho.org/saludenlasamericas/index.php?gid=119&option=com_docman&task=doc_view

Websites

British Virgin Islands Environmental CD Atlas and Teaching Resource, UK Overseas Territories Conservation Forum,
<http://www.ukotcf.org/infoDB/infoSourcesDetail2.cfm?module=projects&refID=169>

Caribbean Challenge Initiative, <http://www.cbd.int/cooperation/cci/>
Caribbean lionfish project, <http://jncc.defra.gov.uk/page-5396-theme=textonly>
Caribbean Waterbird Census, <http://ebird.org/content/caribbean/news/join-the-2014-caribbean-waterbird-census-for-a-chance-to-win-new-binoculars/>

Central Intelligence Agency, World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/geos/vq.html>

Development Planning Unit, Government of the British Virgin Islands, <http://www.dpu.gov.vg/>

Darwin Initiative Project, http://en.wikipedia.org/wiki/Darwin_Initiative

Environmental Vulnerability Index Country Profiles, http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

Index Mundi, British Virgin Islands Demographics Profile 2013,
http://www.indexmundi.com/british_virgin_islands/demographics_profile.html

National Parks Trust of the British Virgin Islands, <http://www.bvnationalparkstrust.org/>

Organisation for Economic Co-operation and Development (OECD), Investment for green growth,
<http://www.oecd.org/environment/green.htm>

Rediff Business, 25 most tourism-dependent countries in the world, <http://www.rediff.com/business/slide-show/slide-show-1-25-most-tourism-dependent-countries-in-the-world/20120625.htm#2>

UNdata, British Virgin Islands, <http://data.un.org/CountryProfile.aspx?crName=British+Virgin+Islands>

Cayman Islands

For Cayman Investment Alliance, Enterprise City, Health City Cayman

Reef Monitoring Network, and Reef and Rainforest Research Centre, Townsville, 152 p

The Cayman Islands National Assessment of Living Conditions in 2006/2007, Caribbean Development Bank (2008)

THE NATIONAL CONSERVATION LAW, 2013 (Law 24 of 2013), Supplement No. 1 published with Extraordinary Gazette No. 9 dated 5th February, 2014, http://www.gazettes.gov.ky/sites/default/files/extraordinary-gazettes-supplements/Es052014_web.pdf

Varnham, K, 2006, Non-native species in UK Overseas Territories: a review - JNCC Report 372

Wilkinson, C., Souter, D. (2008). Status of Caribbean coral reefs after bleaching and hurricanes in 2005, Global Coral

Websites

Caribbean Coastal Marine Productivity Centre (CARICOMP), <http://www.unesco.org/csi/act/caricomp/summary14.htm>

Cayman Islands Environmental Project for the Tourism Sector (CEPTS),
<http://www.caymanislands.ky/foi/programmesproductdevelopment.aspx>

Darwin Correspondence Project, <http://www.darwinproject.ac.uk/>

Darwin Initiative Project, http://en.wikipedia.org/wiki/Darwin_Initiative

Earthquake Trak, <http://earthquaketrak.com/>

Economics and Statistics Office, Government of the Cayman Islands, http://www.eso.ky/indicators_page.html#4

Environmental Vulnerability Index Country Profiles, http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

Global Invasive Species Database,

<http://www.issg.org/database/species/search.asp?st=sss&sn=&rn=Cayman%20Islands&ri=19159&hci=-1&ei=-1&lang=EN>

Hurricanecity, <http://www.hurricanecity.com/>

Hurricanecity, Cayman Islands history with tropical systems, <http://www.hurricanecity.com/city/caymanislands.htm>

New Resident, <http://www.caymannewresident.com/cayman-islands-facts-figures>

OECD, Better Policies for Better Lives, <http://www.oecd.org/environment/green.htm>

US AID-funded Environmental Audits for Sustainable Tourism (EAST) project in Jamaica, <http://www.gwp.org/en/ToolBox/CASE-STUDIES/Americas--Caribbean/Jamaica-Implementing-environmental-management-systems-for-sustainable-tourism-153/>

Curaçao

Beumer L., Verster, N. and Velde, I. van de (2012): "A Sustainable Future for Curaçao- Strategic Options for the ISLA and the ISLA". Report by ECORYS for the Oil Refinery. <http://www.stichtingsmoc.nl/uploads/EcoRYS2012Sustainable-future-for-Curaçao.pdf>

Birdlife International Report on Curaçao: by Adolphe Debrot (Carmabi Foundation) and Jeff Wells (Boreal Songbird Initiative). <http://www.birdlife.org/datazone/userfiles/file/IBAs/CaribCntryPDFs/curacao.pdf>

British Broadcasting Corporation Caribbean on Curaçao's debt: "Curaçao's deal", http://www.bbc.co.uk/caribbean/news/story/2010/10/printable/101008_curacao101010.shtml

Bruckner, A. W and Bruckner, R. J. "The recent decline of *Montastraea annularis* (complex) coral populations in western Curaçao- A cause for concern?" Revista de Biología Tropical, 2006, vol.54, suppl.3, pp. 45-58. http://www.scielo.sa.cr/scielo.php?script=sci_abstract&pid=S0034-77442006000600010&lng=en&nrm=iso&tlng=en

Burke, L., Reynter K., Spalding M. and Perry A. (2011): "Reefs at Risk Revisited" With data on Curaçao reefs. WRI (World Resource Institute): <http://www.wri.org/publication/reefs-at-risk-revisited>

Carmabi publications (Caribbean Research and Management of Biodiversity Foundation) on Curaçao:
Annual report 2011. <http://www.carmabi.org/images/stories/file/carmabi%20annual%20report%202011%20def.pdf>
Annual Report 2012 on Coral Reefs:
<http://www.dcbd.nl/?q=document/current-state-cua%C3%A7aos-coral-reefs>
"Curaçao Marine Park". <http://www.carmabi.org/nature-management/Curaçao-marine-park>
"Nature in danger in Curaçao", <http://www.carmabi-educatie.org/images/stories/file/infoblad%20natuur%20in%20gevaar%20voor%20internet.pdf>
"Curaçao Geology". <http://www.carmabi-educatie.org/images/stories/file/de%20geologie%20van%20curaa.pdf>
Curaçao Terrestrial Eco Systems: <http://www.researchstationcarmabi.org/ecosystems/terrestrial-ecosystems>

Central Bank of Curaçao (and Sint Maarten):
Annual Report 2011, December 2013. <http://www.centralbank.an/verslag-van-de-president-2011>
Annual Report 2012 (also for St Maarten). <http://www.centralbank.an/uploads/files/Annual%20Report%202012.pdf>

Curaçao's legislation, plans and services:
<http://www.gobiernu.cw/web/site.nsf/web/639C72C235B593E50425797C00470A57?opendocument&language=nederlands>

Curaçao Plan 2013-17: "Hoop en Vertrouwen/ Speransa i Konfiansa".
[http://www.gobiernu.cw/web/site.nsf/resources/6F1BDFBC2506F11304257C8C0055E030/\\$FILE/REGEEERPROGRAMMA_DEF.pdf](http://www.gobiernu.cw/web/site.nsf/resources/6F1BDFBC2506F11304257C8C0055E030/$FILE/REGEEERPROGRAMMA_DEF.pdf) Summary in English:
[http://www.gobiernu.cw/web/site.nsf/resources/A380A9A1AC44287904257C8C00566641/\\$FILE/RESUMEN%20ENG%2020.pdf](http://www.gobiernu.cw/web/site.nsf/resources/A380A9A1AC44287904257C8C00566641/$FILE/RESUMEN%20ENG%2020.pdf)

"Strategies for Sustainable Long Term Economic Development in Curaçao", 4th Draft report, 10 April 2013. By TAC. http://www.stichtingsmoc.nl/uploads/2013.04.10_Curacao-Report-ook-Isla.pdf

Commission Tsunami Risk Management, Eilandelijk Rampenstaf Curaçao (2010): "Beoordeling Tsunami Gevaar voor het Eilandgebied Curaçao- Deel II: Risicoanalyse". Meteorologische Dienst van de Nederlandse Antillen & Aruba; Aqualectra United Telecommunication Services. http://www.meteo.an/include/Pub/documents/RA_final.pdf

Curaçao Air monitoring service (Luchtmetingen Curaçao): <http://www.luchtmetingencuracao.org/>

Curaçao Ministry of General Affairs: Strategies for Sustainable Long Term Economic Development in Curaçao, April 2013, by TAC. http://www.stichtingsmoc.nl/uploads/2013.04.10_Curacao-Report-ook-Isla.pdf

Curaçao Tourism Office (CTB) / Reefcare: "Economic Value of Diving on Curaçao 2001". http://www.reefcare.org/index.asp?page=http://www.reefcare.org/page.asp?pag_id=410

Curaçao Statistical Office CBS (Centraal Bureau voor de Statistiek): "CBS publiceert cijfers volkstelling". <http://gracao.com/index.php/ouder/1074-cbs-publiceert-cijfers-volkstelling>

ECLAC documents on Curacao (Economic Commission for Latin America and the Caribbean)
2012: Efectos del Cambio Climatico en la costa de America Latina y el Caribe: Vulnerabilidad e exposition. http://www.eclac.org/publicaciones/xml/0/46750/2011-786-W.460_Vulnerabilidad_y_exposicion_WEB.pdf

2012: "ECLAC Report Examines Vulnerability to Climate Change of LAC Coasts", Article on Phase 2 ECLAC project. Sidsnet, 21 May 2012. <http://www.sidsnet.org/news/eclac-report-examines-vulnerability-climate-change-lac-coasts>

2010: Review of the economics of climate change (RECC) in the Caribbean Project: Phase I. Climate change profiles in select Caribbean countries, Report 23 June 2010. <http://www.eclac.org/publicaciones/xml/8/39188/LCARL.250.pdf>

2004: Chapter 7 on Curaçao in "Review of the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (SIDS POA) in the Caribbean Subregion 1994-2003/2004". <http://www.eclac.org/publicaciones/xml/9/13229/lcarq749-10-Chapter07.pdf>

"Curaçao Associated member of ECLAC", Curaçao Chronicle, 3 Sept 2012. <http://curacaochronicle.com/politics/curacao-associated-member-of-eclac/>

Economy Watch: Curaçao Economic Statistics and Indicators. <http://www.economywatch.com/economic-statistics/country/Curacao/>

European Development Fund (EDF): "Netherlands Antilles (including Curaçao) Single Programming Document, 10th EDF. http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/signed-spd-06-2012.pdf

European Overseas Territories Regional Risk Reduction Initiative (R3i), For English and Dutch overseas countries and territories in the Caribbean. http://www.bb.undp.org/content/barbados/en/home/operations/projects/crisis_prevention_and_recovery/R3i/

Gomez, Michelle da Costa: "Rain brings life: rain and people on Curaçao", Caribbean Footprint Magazine, January 3, 2012 <http://www.caribbeanfootprint.com/2012/01/03/rain-brings-life-rain-and-people-on-Curaçao/>

Grainger, Sarah: "Caribbean island Curaçao faces oil refinery dilemma", BBC News, 14 March 2012. <http://www.bbc.com/news/world-latin-america-17290626>

Hoetjes, Paul: "Curaçao Joins EEZ Management". Posted in: Biodiversity Monitoring News, Curaçao News, 17th Apr

2013. <http://www.dcnanature.org/curacao-joins-management-of-eez/>

IUCN documents (International Union for the Conservation of Nature):

Benzaken, D & Renard, Y. (2010): «Perspectives d'action pour la biodiversité dans l'outre-mer européen- Bilan de la mise en oeuvre de la Convention sur la diversité biologique.

http://www.iucn.org/fr/france_uicn/publications/?uPubsID=4400

J. Petit & G. Prudent (2008) : "Changement climatique et biodiversité dans l'Outre-mer européen". Chapter 2.4. on the Netherlands Antilles (including Curaçao).

<http://www.cbd.int/islands/doc/idr/Climate%20Change%20and%20Biodiversity%20in%20EU%20overseas%20entities/Reunion%20publication-fr.pdf>

IUCN (2012), UNEP, GCRMN, Smithsonian, "Tropical reefs resilience workshop 2012- Report" http://gcrmn.org/wp-content/uploads/2012/11/Tropical_Americas_Coral_Reef_Resilience_Final_Workshop_ReportC.pdf or http://www.icriforum.org/sites/default/files/ICRIGM27-OR-GCRMN_presentation.pdf

Horstman, E.M. (2012) "Ontwikkeling van de Rif-mangroven in Otrobanda; Het creëren van een gezond, educatief en recreatief stadspark", Stichting ABC Advies, rapport nr. 159, Willemstad, Curaçao.

<http://www.abcadvis.org/rapporten/ABC%20Rapport%20159.pdf>

ICRI Forum: "Tropical reefs resilience workshop 2012- Report", <http://www.icriforum.org/icri-documents/report-tropical-americas-coral-reef-resilience-workshop> <http://www.dcbd.nl/document/tropical-americas-coral-reef-resilience-workshop-report>

Invasive Species Compendium Report on Curaçao:

<http://www.cabi.org/isc/?compid=5&dsid=108401&loadmodule=datasheet&page=481&site=144>

IMF International Monetary Fund (2012): "Kingdom of the Netherlands—Curaçao and Sint Maarten: 2011 Article IV Consultation—Staff Report; Informational Annex; and Public Information Notice on the Executive Board Discussion", Country Report No. 11/342, December 2011. <https://www.imf.org/external/pubs/ft/scr/2011/cr11342.pdf> and <https://www.imf.org/external/np/ms/2011/091911.htm>

Jhagru, Aruna: "Brand oorzaak uitstoot zwaveldioxide", NIEUWS 360, 4 Febr. 2014.

<http://www.nieuws360.com/lokaal/brand-oorzaak-uitstoot-zwaveldioxide/>

Jhagru, Aruna: "Plasterk levert verslag werkbezoek Curaçao en Bonaire in bij Tweede Kamer", Nieuws 360, 8 October 2013. <http://www.nieuws360.com/laatste-nieuws/plasterk-levert-verslag-werkbezoek-Curaçao-bonaire-tweede-kamer/>

Leidel-Schenk, Leoni: "Wettelijke procedures windmolenpark genegeerd", in Versgeperst, 20-07-2012.

<http://www.versgeperst.com/nieuws/164543/wettelijke-procedures-windmolenpark-genegeerd.html>

Pors, I. and I. A. Nagelkerken (CARMABI): "Curaçao", for Unesco/ CSI paper (Coastal Region and Small Islands) Paper 3 <http://www.unesco.org/csi/pub/papers/pors.htm>

Radio Nederland Omroep: 'Oplossing voor olieramp gevaarlijker dan gedacht. 3 Sept 2012.

<http://archieff.rnw.nl/caribiana/article/oplossing-voor-olieramp-gevaarlijker-dan-gedacht>

RAMSAR (Convention on Wetlands) : "Netherlands names four new Caribbean Ramsar Sites (on Curaçao)". February 2013. http://www.ramsar.org/cda/en/ramsar-news-archives-2013-Curaçao-4/main/ramsar/1-26-45-590%5E26081_4000_0

Reefbase: Economic Analysis of diving in Curaçao [http://www.reefcare.org/index.asp?page=
http://www.reefcare.org/page.asp?pag_id=410](http://www.reefcare.org/index.asp?page=http://www.reefcare.org/page.asp?pag_id=410)

SMOC (Stichting Schoon Milieu op Curaçao): "Plasterk geeft niet thuis", 4 March 2014.
<http://www.stichtingsmoc.nl/2014/03/plasterk-geeft-niet-thuis-2/>

"Tsunami detection station on Curaçao"; Amigoe: 16 January 2011, [http://testing.amigoe.com/english/72686-
tsunami-detection-station-on-Curaçao-](http://testing.amigoe.com/english/72686-tsunami-detection-station-on-Curaçao-)

TNO (2007) Netherlands Geological Survey: "Samenwerkingsverband tussen Milieudienst Curaçao en TNO ter vergroting van expertise Milieuonderzoek", TNO report 2007-U-R0801/B.
[http://www.luchtmetingenCuraçao.org/pool/5/documents/2007-U-R0801B%20ter%20Meer%20-
%20Milieudienst%20Curaçao%20v6.pdf](http://www.luchtmetingenCuraçao.org/pool/5/documents/2007-U-R0801B%20ter%20Meer%20-%20Milieudienst%20Curaçao%20v6.pdf)

UNDP capacity building programme for Curaçao (Dec 2011- Nov 2014):
[http://www.undp.org.tt/NA/Signed%20Capacity%20Development%20for%20Nation%20Building%20of%20Curacao%
20project%20document.pdf](http://www.undp.org.tt/NA/Signed%20Capacity%20Development%20for%20Nation%20Building%20of%20Curacao%20project%20document.pdf)

UNEP/ NOAA: Water temperature Curaçao and Aruba, 2001-2-14. For coral reefs bleaching episodes.
http://www.ospo.noaa.gov/data/cb/TS_vs/vs_ts_multiyr_CuracaoandAruba.png
<http://www.unep.org/ecosystemmanagement/>

"Uitbreiding windpark Tera Kòrá". Knipselkrant Curaçao, 6 Sept 2013: <http://www.kkcuracao.com/?p=36015>

Vermeij, Mark (2012): "The current state of Curaçao's Coral Reefs". CARMABI Foundation/ Univ of Amsterdam.
<http://www.dcbd.nl/?q=document/current-state-cua%C3%A7aos-coral-reefs> ,
[http://www.researchstationcarmabi.org/images/stories/file/Mark%20PDFs/Vermeij%20MJA%20\(2012\)%20Curaçao%20
0State%20of%20the%20reef%202012%20Carmabi%20\(c\)2012.pdf](http://www.researchstationcarmabi.org/images/stories/file/Mark%20PDFs/Vermeij%20MJA%20(2012)%20Curaçao%20State%20of%20the%20reef%202012%20Carmabi%20(c)2012.pdf)

Wieggers, M.W. (2007) : "Impact of Increased Nutrient Input on Coral Reefs on Bonaire and Curaçao", Department of Environment Netherlands Antilles and University of Utrecht, <http://www.nacri.org/nutmon.html>;
<http://www.nacri.org/greylit/wieggers2007impactnutrientscoralreef.pdf>, [http://www.slideshare.net/Wieggers/impact-
of-increased-nutrient-input-on-coral-reefs-on-bonaire-and-curacao](http://www.slideshare.net/Wieggers/impact-of-increased-nutrient-input-on-coral-reefs-on-bonaire-and-curacao)

Wilkinson, C. (ed.). Status of Coral Reefs of the World, 2008. GCRMN (Global Coral Reef Monitoring Network) and Reef and Rainforest Research Center, Townsville, Australia. Chapter 19 on 'Status of Coral Reef Resources of the Lesser Antilles' by Bouchon et al. http://www.reefbase.org/resource_center/publication/statusreport.aspx?refid=27173
Full report http://www.reefbase.org/resource_center/publication/main.aspx?refid=27173&referrer=GCRMN

Organisation	Website address
Government site	http://www.gobiernu.cw/web/site.nsf/web/home?opendocument http://www.gobiernu.cw/web/site.nsf/web/home?opendocument&language=nederlands
Tourist Board	http://www.curacao.com/welkom/nl
Curaçao's Port Authority	http://www.curports.com/
Curaçao Water and Power Company	http://www.aqualectra.com/en/
Curaçao's Representation in The Hague	http://www.gobiernu.cw/web/site.nsf/web/BBE1E7F51AAEA0B10425796600F67F6?opendocument&language=nederlands
Association of Marine Laboratories of the Caribbean	http://www.amlc-carib.org/
CIA on Curaçao	https://www.cia.gov/library/publications/the-world-factbook/geos/cc.html
BBC Curaçao Profile	http://www.bbc.com/news/world-latin-america-20413910 11 October 2013

Organisation	Website address
Reefcare - Foundation Reef Care Curaçao	http://www.reefcare.org/index.asp?page=http://www.reefcare.org/page.asp?pag_id=410 Reef Base: http://www.reefbase.org/main.aspx ,
Reefbase	http://www.reefbase.org/about.aspx
SMOC (Stichting Schoon Milieu op Curaçao)	http://www.stichtingsmoc.nl/
CARMABI (Caribbean Research and Management of Biodiversity)	http://www.carmabi.org/
ICRI I	http://www.icriforum.org/
NACRI- Netherlands Antilles Coral Reef Initiative	http://www.nacri.org/
DCNA- Dutch Caribbean Nature Alliance	http://www.dcna.nl/
GCRMN- Global coral reef monitoring network	http://www.gcrmn.org/
DCBD (Dutch Caribbean Biodiversity Data Base)	www.dcbd.nl

Montserrat

Census 2011, Monserrat at a Glance (PDF).

Government of Montserrat and the Caribbean Development Bank, Final Report, Country Poverty Assessment, Volume 2. Supplementary Material, July 2012

Montserrat Climate Change Adaptation Policy: "Transforming to a Climate Resilient and Low Carbon Economy", <http://dms.caribbeanclimate.bz/php/gateway/eldis.php?id=4168>

Montserrat Sustainable Development Plan (SDP) 2008-2020, <http://www.mnialive.com/externaldocs/mni-sustainable-plan.pdf>

Tourism Development Plan (2012-2020), <http://www.visitmontserrat.com/downloads/Draft%20Final%20Report%2019%20July%202nd%20Edition.pdf>

Websites

Darwin Initiative Project, http://en.wikipedia.org/wiki/Darwin_Initiative

Darwin Initiative Mountain Chicken Project, <http://www.mountainchicken.org/resources/reports/>

Environmental Vulnerability Index Country Profiles, http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

European Commission, Maritime Affairs, Blue Growth, http://ec.europa.eu/maritimeaffairs/policy/blue_growth/
Montserrat Environmental Education Project, <http://www.ukotcf.org/infoDB/infoSourcesDetail2.cfm?module=projects&refID=208>

Organisation for Economic Co-operation and Development (OECD), Investment for green growth, <http://www.oecd.org/environment/green.htm>

Species Action Plan for the Montserrat Galliwasp, http://www.durrell.org/library/Document/Galliwasp_SAP.pdf

Travel2the Caribbean, <http://www.travel2thecaribbean.com/montserratislandvacation.html#sthash.1f9kDZVK.dpuf>

Saba

Bird Life International Report on Saba: <http://www.birdlife.org/datazone/sitefactsheet.php?id=19913>

"Company tries again to seek oil near Saba Bank", Saba- News, 21 March 2014. <http://www.saba-news.com/company-tries-look-oil-near-saba-bank/>

Debrot et al, 2013, "Predation threats to the Red-billed Tropicbird breeding colonies of Saba: Focus on cats". DCNA: <http://www.dcnanature.org/invasive-predator-research-on-saba/>

Depondt, F.: "Saba Bank gains PSSA status (Particularly Sensitive Sea Area)", Saba News, 9 July 2013. <http://www.dcnanature.org/saba-banks-pssa-status-fully-implemented/>

DCNA Dutch Caribbean Nature Alliance on Sint Maarten: <http://www.dcnanature.org/islands/st-maarten/>
Esteban, N., Kooistra, D., Ocean Care Sint Maarten (2005): "Report on observations of coral bleaching St Eustatius Marine Park, Saba Marine Park, Sint Maarten Marine Park". <http://www.nacri.org/BleachingreportSSSislandsNov05.pdf>

European Development Fund (EDF): "Netherlands Antilles (including Saba) Single Programming Document, 10th EDF. http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/signed-spd-06-2012.pdf

Geelhoed, SCV, Debrot, AO, Ligon, JG, Madden, H, Williams, SR, Verdaat, JP, Wulf, K. (2013): "Important Bird Areas in the Caribbean Netherlands", Imares. <http://www.dcbd.nl/document/important-bird-areas-caribbean-netherlands>

Hoetjes, P., A. L. Kong, R. Juman, A. Miller, M. Miller, K. De Meyer and A. Smith (2002): "Status of Coral Reefs in the Eastern Caribbean: The OECS, Trinidad and Tobago, Barbados, and the Netherlands Antilles" Chapter 17 in: C.R.

Wilkinson (ed.) 2002: Status of coral reefs of the world. GCRMN Report, Australian Institute of Marine Science, Townsville. pp 325-342

IUCN- International Union for the Conservation of Nature
Benzaken, D & Renard, Y. (2000): «Perspectives d'action pour la biodiversité dans l'outre-mer européen- Bilan de la mise en oeuvre de la Convention sur la diversité biologique». (2000) Dec. 2010.
http://www.iucn.org/fr/france_uicn/publications/?uPubsID=4400

J. Petit & G. Prudent (2008) : "Changement climatique et biodiversité dans l'Outre-mer européen". Chapter 2.4. on the Netherlands Antilles (including Saba).
<http://www.cbd.int/islands/doc/idr/Climate%20Change%20and%20Biodiversity%20in%20EU%20overseas%20entities/Reunion%20publication-fr.pdf>

Lundvall, Shelley: "Saba Bank-Special Marine Area Management Plan 2008", based on a DCNA template and financed by the Foundation for Development of the Netherlands Antilles (SONA).
<http://dcnanature.org/wp-content/uploads/2012/08/SabaBank2008ManagementPlan.pdf>

Meesters, E., Slijkerman, D. Graaf, M. de & Debrot, D. (2010) "EEZ and Saba Bank Marine Park Management Plan". IMARES (Institute for Marine Resources & Ecosystem Studies), Wageningen University Research.
<http://www.sabapark.org/downloads/EEZ%20Management%20Plan.pdf>

"New Spiders for Saba", DCNA News (Dutch Caribbean Nature Alliance), 3 Dec 2013, <http://www.dcnanature.org/new-spiders-for-saba/>

Rojer, Anna, "Biological Inventory of Saba", Carmabi Foundation, November 1997.
<http://www.dcbd.nl/sites/www.dcbd.nl/files/documents/Rojer%201997%20Biological%20Inventory%20Saba.PDF>

SABA CONSERVATION FOUNDATION documents: <http://www.sabapark.org/index.php>
On Saba Marine Park: http://www.sabapark.org/marine_park/
On zoning: http://www.sabapark.org/marine_park/zoning_system/

On Lionfish: "Saba National Marine Park Lionfish Response Plan", July 2010.

<http://www.sabapark.org/downloads/SCF%20Lionfish%20Response%20Plan%202010.pdf>

"Tourism Strategic Plan for Saba 2011 –2014" by CHL Consulting (Ireland), 14. April 2011.

<http://sabatourism.com/pdf/Tplan2011.pdf>

"Verwilderde katten bedreigen zeevogels op Saba" Wageningen University Research/ Imares, March 2014. (Cats on Saba a threat for sea birds) <http://www.wageningenur.nl/nl/Expertises-Dienstverlening/Onderzoeksinstituten/imares/Nieuws-Agenda/Show/Verwilderde-katten-bedreigen-zeevogels-op-Saba.htm>

Vogel bescherming Nederland: Report on Saba (birds).

http://www.vogelbescherming.nl/vogels_beschermen/internationaal/dutch_caribbean/saba

Laws and policy documents applying to Bonaire, Saba and Sint Eustatius:

Nature Policy for the Caribbean Netherlands 2013-2017- <http://www.government.nl/documents-and-publications/publications/2014/02/03/nature-policy-plan-the-caribbean-netherlands.html>

Algemene Rekenkamer (Netherlands Court of Auditors): "Rijksoverheid en Caribisch Nederland: naleving van afspraken 2012". Report on the 3 special municipalities (Bonaire, Saba, St Eustatius) 2012.

http://www.rekenkamer.nl/Publicaties/Onderzoeksrapporten/Introducties/2012/11/Rijksoverheid_en_Caribisch_Nederland_naleving_van_afspraken

Caribisch Nederland in beeld- Een fotoverslag van de eerste drie jaar samenwerking tussen VROM, Verkeer en Waterstaat en Rijkswaterstaat met Bonaire, St.Eustatius en Saba. (Publication about the infrastructural works in the 3 Dutch special municipalities).

http://www.rijksdienstcn.com/rijksdienstcn.com/up1/ZyahqpxIW_Fotoboek_Caribisch_Nederland_OPTIMIZED.pdf

Environmental Legislation (Wet grondslagen natuurbeheer- en bescherming BES- per 13-12-2011):

http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

Wet maritiem beheer BES (Marine law)

<http://dcnanature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>

Wet grondslagen natuurbeheer- en bescherming BES (Nature protection)

http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

Wet grondslagen ruimtelijke ontwikkelings- planning BES (Spatial Planning) <http://dcnanature.org/wp-content/uploads/2012/09/Wet-grondslagen-ruimtelijke-ontwikkelingsplanning-BES.pdf>

Wet volkshuisvesting, ruimtelijke ordening en milieubeheer BES (Environment, Housing and Spatial Planning):

<http://dcnanature.org/wp-content/uploads/2012/09/Wet-VROM-BES.pdf>

Wet Visserij BES (Fisheries), <http://dcnanature.org/wp-content/uploads/2012/09/Visserijwet-BES.pdf>

Organisation	Website address
Saba Government	https://www.sabagov.com/temp/
Saba Tourist Bureau	http://www.sabatourism.com/
Office of the Kingdom Representative (for Saba, Bonaire and St Eustatius)	http://www.rijksdienstcn.com/en/office-of-the-kingdom-representative
Government of the Netherlands- Caribbean parts of the Kingdom	http://www.government.nl/issues/caribbean-parts-of-the-kingdom/bonaire-st-eustatius-and-saba
Dutch Ministry of Interior Affairs and	www.minbzk.nl

Organisation	Website address
Kingdom Relations	
National Office for the Caribbean Netherlands (RCN- Rijkdienst Caribisch Nederland)	http://www.government.nl/issues/caribbean-parts-of-the-kingdom/national-office-for-the-caribbean-netherlands
The Netherlands and development of Dutch Caribbean	https://www.rijksdienstcn.com/en/news/bonaire-st-eustatius-saba-and-dutch-government-embrace-development-plans
DCNA Dutch Caribbean Nature Alliance	www.dena.nl
Saba conservation foundation	http://www.sabapark.org/index.php
DCBD (Dutch Caribbean Biodiversity Data Base)	www.dcbd.nl
Carmabi Foundation- Caribbean Research & Management of Biodiversity	http://www.carmabi.org/

Saint Barthelemy

Association Saint Barth environnement et développement durable : <http://saintbarthenvironnement.over-blog.com/>

Association St-Barth Essentiel : <http://stbarthessentiel.fr/> Rapport d'activité 2009-2012 : <http://stbarthessentiel.fr/wp-content/uploads/2012/07/StBarthEssentiel-Mission-Report-2009-2012.pdf>

Birdlife: "Profil Saint Barthelemy" by A. Levesque, A. Mathurin, F. le Quellec.
[http://www.birdlife.org/datazone/userfiles/file/IBAs/CaribCntryPDFs/St_Barth%C3%A9lemy_\(to_France\).pdf](http://www.birdlife.org/datazone/userfiles/file/IBAs/CaribCntryPDFs/St_Barth%C3%A9lemy_(to_France).pdf)

DEAL (Department of Environment, Land Planning and Housing: Guidelines and Strategic Missions to address the issues at stake in the archipelago of Guadeloupe. <http://www.guadeloupe.developpement-durable.gouv.fr/IMG/pdf/DEAL-ENG.pdf>

IEDOM: Rapport annuel 2012 Saint Barth. http://www.iedom.fr/IMG/pdf/ra_2012_saint-barthelemy.pdf

Spalding, M. "Mangroves in Saint Barth", in World Atlas of mangroves".
<http://books.google.nl/books?id=Mm6O0ab7uaMC&pg=PT292&lpg=PT292&dq=mangroves+st+bart>

Websites:

Collectivité : <http://www.comstbarth.fr/>

Préfecture : www.saint-barth-saint-martin.pref.gouv.fr
<http://www.senat.fr/ue/pac/E5608.html>

Ministère de l'Outre-Mer : <http://www.outre-mer.gouv.fr/?presentation-saint-barthelemy.html>; <http://www.outre-mer.gouv.fr/?philippe-chopin.html>

St Barth Online: <http://www.st-barths.com/en/saint-barthelemy-guide/wildlife-st-barts.html>

Other publications :

Lettre mensuelle de la Réserve Naturelle, 2009-2014

La faune terrestre et aquatique de Saint-Barthélemy, 2013

Bilan 2011-2012 de la Réserve Naturelle, Comité Consultatif du 08 février 2013

Cartographie des biocénoses marines, TBM 2013

Evolution des communautés récifales de Saint-Barthélemy, Université Antilles Guyane 2012

La Réserve fête ses 15 ans, 2011

Plan de gestion de la Réserve Naturelle 2010-2014

Cartographie du patrimoine naturel et culturel de Saint-Barthélemy, 2010

La Réserve Naturelle, un atout pour Saint-Barthélemy, Le Courrier du Parlement 2010 (N° sur St-Barth)

Sint Eustatius

Bervoets, Tadzio: "Report on the Economic Valuation of St Eustatius" Stenapa - Coral Reef Resources. March 2010.
<http://www.statiapark.org/downloads/downloads/2010%20Statia%20National%20Marine%20Park%20Economic%20V>

aluation.pdf

Bird Life International report on Sint Eustatius:

http://www.birdlife.org/datazone/userfiles/country_summary_pdfs/bonaire.pdf

Bouchon, C. et al: "Status of Coral Reef Resources of the Lesser Antilles: The French West Indies, The Netherlands Antilles, Anguilla, Antigua, Grenada, Trinidad and Tobago". In: Wilkinson, C. (ed.). Status of Coral Reefs of the World: 2008. Global Coral Reef Monitoring Network and Reef and Rainforest Research Center, Townsville, Australia. pp. 265-280

http://www.reefbase.org/resource_center/publication/statusreport.aspx?refid=27173

Crowfoot, Betsy: "New Worries About Oil Terminal Risks on St. Eustatius Island", 2 January 2012,

<http://www.ecology.com/2012/01/02/oil-terminal-risks-st-eustatius/>

Crowfoot, Betsy: "Tarnish on the Golden Rock: Will the Tiny Caribbean Isle of St. Eustatius Surrender to Oil Multinationals?"

6 Dec 2011. <http://www.ecology.com/2011/12/06/st-eustatius-statia-nustar-oil/>

Crowfoot, Betsy: How "Green" is the Golden Rock?, 19 Dec 2011. <http://www.ecology.com/2011/12/19/green-golden-rock/>

Debrot, A.O. and Erik Boman: "The Lesser Antillean Iguana on St Eustatius: 2012- Status update and review of limiting factors" IMARES Report number C166/12. <http://www.dcbd.nl/document/lesser-antillean-iguana-st-eustatius-2012-population-status-update-and-cause-concern>

Debrot, A., Madden, H., Becking, L. Rojer, A. & Miller, J. "Butterflies of the Windwards", BioNews 9 – October 2013

<http://www.dcnanature.org/butterflies-of-the-windwards/>

DCNA- Dutch Caribbean Nature Alliance- <http://www.dcnanature.org/>

On St Eustatius:

<http://www.dcnanature.org/islands/st-eustatius/>

Management Plan for St Eustatius Marine Park. <http://dcnanature.org/wp-content/uploads/2012/08/StEustatiusMarinePark2007ManagementPlan.pdf>

On the Lesser Antillean Iguana. <http://www.dcnanature.org/lesser-antillean-iguana/>

On New Plant Species, 23 Jan 2014. <http://www.dcnanature.org/new-plant-species-on-st-eustatius/>

Duijnmeijer, David: "Verhagen: Saba en Sint Eustatius zijn het beste af met eigen energiebedrijven", Energiea, 6 Dec 2011, <http://www.energiea.nl/preview/1504-Verhagen-Saba-en-Sint-Eustatius-zijn-het-beste-af-met-eigen-energiebedrijven.html>

Esteban, N., D. Kooistra, 2005: Ocean Care Sint Maarten: Report on observations of coral bleaching St Eustatius Marine Park, Saba Marine Park, Sint Maarten Marine Park.

European Development Fund (EDF): "Netherlands Antilles (including St Eustatius) Single Programming Document, 10th EDF. http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/signed-spd-06-2012.pdf

GEBE: Power Company for St Eustatius, Saba and Sint Maarten <http://www.nvgebe.com/>

"GEBE fully owned by St. Maarten, Lake lauds all who made it possible", *Dutch Caribbean Legal Portal*, 16 Dec 2013.

<http://www.dutchcaribbeanlegalportal.com/news/business-financial/3685-gebe-fully-owned-by-st-maarten-lake-lauds-all-who-made-it-possible>

Geelhoed, SCV, Debrot, AO, Ligon, JG, Madden, H, Williams, SR, Verdaat, JP, Wulf, K. (2013): "Important Bird Areas in the Caribbean Netherlands", Imares. <http://www.dcbd.nl/document/important-bird-areas-caribbean-netherlands>

Hoetjes et al, 2002, chapter 17 (Status of Coral Reefs in the Eastern Caribbean: The OECS, Trinidad and Tobago, Barbados, and the Netherlands Antilles in Wilkinson (ed.): Status of coral reefs of the world: 2002. GCRMN Report. IUCN- International Union for the Conservation of Nature

On Netherlands Antilles (incl. Sint Eustatius):

http://iucn.org/about/union/secretariat/offices/europe/activities/overseas/overseas_list/overseas_natilles.cfm

Benzaken, D & Renard, Y. (2000): «Perspectives d'action pour la biodiversité dans l'outre-mer européen- Bilan de la mise en oeuvre de la Convention sur la diversité biologique». (2000) Dec. 2010.

http://www.iucn.org/fr/france_uicn/publications/?uPubsID=4400

J. Petit & G. Prudent (2008) : "Changement climatique et biodiversité dans l'Outre-mer européen". Chapter 2.4. on the Netherlands Antilles (including Sint Eustatius).

<http://www.cbd.int/islands/doc/idr/Climate%20Change%20and%20Biodiversity%20in%20EU%20overseas%20entities/Reunion%20publication-fr.pdf>

Madden, H. & Ellis, A. (2013): "Assessment of the Breeding Success of Red-billed Tropicbirds on St. Eustatius",

Stenapa (St. Eustatius National Parks),

<http://www.statiapark.org/downloads/downloads/Assessment%20of%20the%20Breeding%20Success%20of%20Red-billed%20Tropicbirds%20on%20St.%20Eustatius%20-%20final%20report%20HM%20AE.pdf>

Roger, Anna (1997): "Biological Inventory of Sint Eustatius", Carmabi Foundation. <http://www.bio-diversity-nevis.org/Documents/Biodiversity%20of%20Statia.pdf>

"Samen verder bouwen", Eénmeting Belevingsonderzoek Caribisch Nederland, Curconsult, Oct. 2012.

<http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/10/31/samen-verder-bouwen.html>

STENAPA documents (St Eustatius National Parks Foundation): <http://www.statiapark.org/>

All reports: <http://www.statiapark.org/downloads/index.html>

Annual Report 2012:

<http://www.statiapark.org/downloads/downloads/2012%20St%20Eustatius%20National%20Parks%20Annual%20Report.pdf>

On Statia National Marine Park: <http://www.statiapark.org/parks/marine/index.html>

On Quill Boven National Park: <http://www.statiapark.org/parks/quill/index.html>

On Miriam C. Schmidt Botanical Garden: <http://www.statiapark.org/parks/garden/index.html>

On the Quill/Boven National Park and Miriam Schmidt Botanical Garden Management Plan 2009

On sea turtles: <http://www.statiapark.org/projects/seaturtle.html>

On roaming livestock: <http://www.statiapark.org/projects/livestock.html>

On reefs project: <http://www.statiapark.org/projects/reefprojects.html>

On fish population survey: <http://www.statiapark.org/projects/fishpopulation.html>

On Lionfish Response Plan 2009: <http://www.nacri.org/downloads/STENAPALionfishResponsePlan2009.pdf>

On Corallita (Mexican creeper) invasive species. <http://www.statiapark.org/projects/corallita.html>

<http://www.statiapark.org/downloads/downloads/Corallita%20pilot%20project-results%20recommendations-jan07.pdf>

On the Sea Turtle Conservation Program - Annual Report 2012-

<http://www.statiapark.org/downloads/downloads/2012%20Sea%20Turtle%20Conservation%20Program.pdf>

Krings, A.; Axelrod, F.S. (2013) *Gonolobus aloiensis* (Apocynaceae, Asclepiadoideae), a New Species from St.

Eustatius. Systematic Botany 38(4): 1132–1137. <http://www.natuurbericht.nl/mobi/mobielbericht.php?id=12138> and <http://www.natuurbericht.nl/?id=12138>

Vogelbescherming Nederland: Report on Sint Eustatius (Birds)

http://www.vogelbescherming.nl/vogels_beschermen/internationaal/dutch_caribbean/sint_eustatius

Laws and policy documents applying to Bonaire, Saba and Sint Eustatius:

Nature Policy for the Caribbean Netherlands 2013-2017- <http://www.government.nl/documents-and-publications/publications/2014/02/03/nature-policy-plan-the-caribbean-netherlands.html>

Algemene Rekenkamer (Netherlands Court of Auditors): "Rijksoverheid en Caribisch Nederland: naleving van afspraken 2012". Report on the 3 special municipalities (Bonaire, Saba, St Eustatius) 2012.
[http://www.rekenkamer.nl/Publicaties/Onderzoeksrapporten/Introducties/2012/11/Rijksoverheid en Caribisch Nederland and naleving van afspraken](http://www.rekenkamer.nl/Publicaties/Onderzoeksrapporten/Introducties/2012/11/Rijksoverheid_en_Caribisch_Nederland_and_naleving_van_afspraken)

Caribisch Nederland in beeld- Een fotoverslag van de eerste drie jaar samenwerking tussen VROM, Verkeer en Waterstaat en Rijkswaterstaat met Bonaire, St.Eustatius en Saba. (Publication about the infrastructural works in the 3 Dutch special municipalities).
http://www.rijksdienstcn.com/rijksdienstcn.com/up1/ZyahqpxIW_Fotoboek_Caribisch_Nederland_OPTIMIZED.pdf

Environmental Legislation (Wet grondslagen natuurbeheer- en bescherming BES- per 13-12-2011):
http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

Wet maritiem beheer BES (Marine law)
<http://dcnanature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>

Wet grondslagen natuurbeheer- en bescherming BES (Nature protection)
http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

Wet grondslagen ruimtelijke ontwikkelings- planning BES (Spatial Planning) <http://dcnanature.org/wp-content/uploads/2012/09/Wet-grondslagen-ruimtelijke-ontwikkelingsplanning-BES.pdf>

Wet volkshuisvesting, ruimtelijke ordening en milieubeheer BES (Environment, Housing and Spatial Planning):
<http://dcnanature.org/wp-content/uploads/2012/09/Wet-VROM-BES.pdf>

Wet Visserij BES (Fisheries), <http://dcnanature.org/wp-content/uploads/2012/09/Visserijwet-BES.pdf>

Organisation	Website address
Government of Sint Eustatius	http://www.statiagovernment.com/
Office of the Kingdom Representative on Sint Eustatius	http://www.rijksdienstcn.com/en/office-of-the-kingdom-representative
St Eustatius Tourist Office	http://www.statiatourism.com/ http://www.statiatourism.com/ecotourism.html
Office of the Kingdom Representative (for Saba, Bonaire and St Eustatius)	http://www.rijksdienstcn.com/en/office-of-the-kingdom-representative
Government of the Netherlands- Caribbean parts of the Kingdom	http://www.government.nl/issues/caribbean-parts-of-the-kingdom/bonaire-st-eustatius-and-saba
Dutch Ministry of Interior Affairs and Kingdom Relations	www.minbzk.nl
National Office for the Caribbean Netherlands (RCN- Rijksdienst Caribisch Nederland)	http://www.government.nl/issues/caribbean-parts-of-the-kingdom/national-office-for-the-caribbean-netherlands
The Netherlands and development of Dutch Caribbean	https://www.rijksdienstcn.com/en/news/bonaire-st-eustatius-saba-and-dutch-government-embrace-development-plans
DCNA Dutch Caribbean Nature Alliance	www.dcna.nl
STENAPA (St Eustatius National Parks Foundation):	http://www.statiapark.org/
DCNA Dutch Caribbean Nature Alliance	www.dcna.nl
DCBD (Dutch Caribbean Biodiversity Data Base)	www.dcbd.nl
Carmabi Foundation- Caribbean Research & Management of Biodiversity	http://www.carmabi.org/

Sint Maarten

Birdlife International- Profile of Sint Maarten. <http://www.birdlife.org/datazone/country/sint-maarten/marine>

Chavich, Cinda: "Preserving paradise- A nature foundation in St. Maarten is one of several groups struggling to safeguard the island's environment and heritage in the face of a tourism tsunami". The Globe and Mail, 27 November 2004, page T4. <http://www.artificialreefs.org/Articles/The%20Globe%20and%20Mail%20Preserving%20paradise.htm>

CIA World Fact Book on Sint Maarten: <https://www.cia.gov/library/publications/the-world-factbook/geos/sk.html>

"Country still in Denque Fever Epidemic Phase; Community requested to continue to actively take measures to mitigate mosquito population" St Martin News Network, 21 OCT 2013. <http://www.smn-news.com/st-maarten-st-martin-news/13575-minister-de-weever-country-still-in-denque-fever-epidemic-phase-community-requested-to-continue-to-actively-take-measures-to-mitigate-mosquito-population.html>

"Critical Questions Asked About Waste Management Facility---Island Council Concerned about Negative Impact to Community", S Maarten news network, 26 April 2010. <http://www.smn-news.com/st-maarten-st-martin-news/5198-critical-questions-asked-about-waste-management-facility-island-council-concerned-about-negative-impact-to-community.html>

DCNA documents (Dutch Caribbean Nature Alliance) on Sint Maarten:

<http://www.dcnanature.org/islands/st-maarten/>

On eco systems: <http://www.dcnanature.org/ecosystems-tag-archive/?ecosystems=St.%20Maarten>

On Man of War Shoal National Marine Park: <http://www.dcnanature.org/man-of-war-shoal-national-marine-park/>

On the Emilio Wilson Estate Foundation (EWEF): <http://www.dcnanature.org/emilio-wilson-estate-purchase-pending/>

On the Database DCBD: <http://www.dcnanature.org/tool-for-conservationists/>

Esteban, N; Kooistra, D. (2005) "Report on observations of coral bleaching St Eustatius Marine Park, Saba Marine Park, and St Maarten Marine Park". Ocean Care St. Maarten, <http://www.nacri.org/BleachingreportSSSislandsNov05.pdf>

European Development Fund (EDF): "Netherlands Antilles (including Sint Maarten) Single Programming Document, 10th EDF. http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/signed-spd-06-2012.pdf

Government of Sint Maarten documents: www.sintmaartengov.org

Ministry of Public Housing, Spatial Development, Environment and Infrastructure (VROMI):

<http://www.sintmaartengov.org/government/VROMI/Pages/default.aspx>

VROMI Action Plan 2012 – 2014:

<http://www.sintmaartengov.org/Policy%20and%20Reports/VROMI%20Ministry%20Plan%202012%20-%202014.pdf>

VROMI Annual report 2011:

<http://www.sintmaartengov.org/Policy%20and%20Reports/Jaarrapport%20VROMI%202011.pdf>

Parliament Annual Report 2012-2013: <http://www.sxmparliament.org/documents/parliament-annual-reports.html?task=document.viewdoc&id=63>

The Governor of Sint Maarten Annual Overview 2010-2011. <http://www.kabqsvm.com/Annual%20Overview%202010-2011.pdf>

Central Bank of Sint Maarten (and Curaçao), Report 2011, Dec 2103. <http://www.centralbank.an/verslag-van-de->

president-2011

St Maarten Nature legislation: <http://www.naturefoundationsxm.org/downloads/index.htm>

Cooperation with the city of Amsterdam (2013-2017)

http://www.google.nl/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&uact=8&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.amsterdam.nl%2Fpublish%2Fpages%2F568695%2Fsamenwerkingsovereenkomst_2013_sxm.pdf&ei=sL0cU_7RCovnyqOWwoH4Cw&usq=AFOjCNFGMnFP3QF9iVePOEIGfBEHsPFpDA

IUCN documents (International Union for the Conservation of Nature):

Benzaken, D & Renard, Y. (2010): «Perspectives d'action pour la biodiversité dans l'outre-mer européen- Bilan de la mise en oeuvre de la Convention sur la diversité biologique».

http://www.iucn.org/fr/france_uicn/publications/?uPubsID=4400

J. Petit & G. Prudent (2008) : "Changement climatique et biodiversité dans l'Outre-mer européen". Chapter 2.4. on the Netherlands Antilles (including St Maarten).

<http://www.cbd.int/islands/doc/idr/Climate%20Change%20and%20Biodiversity%20in%20EU%20overseas%20entities/Reunion%20publication-fr.pdf>

IMF International Monetary Fund (2012): "Kingdom of the Netherlands—Curaçao and Sint Maarten: 2011 Article IV Consultation—Staff Report; Informational Annex; and Public Information Notice on the Executive Board Discussion", Country Report No. 11/342, December 2011. <https://www.imf.org/external/pubs/ft/scr/2011/cr11342.pdf> and <https://www.imf.org/external/np/ms/2011/091911.htm>

"Lionfish population under control near-shore but increasing in deep water" in Today, 7 May 2012:

<http://www.todaysxm.com/2012/07/05/lionfish-population-under-control-near-shore-but-increasing-in-deep-water/>

Nature Foundation St Maarten documents: <http://www.naturefoundationsxm.org/>

On sharks: <http://www.dcnanature.org/shark-research-st-maarten/>

On seas grasses by Andy Caballero (2000). <http://www.thescubashop.net/OldWebsite/seagrass.htm>

On lionfish by Tineke van Bussel (6 May 2012): <http://www.todaysxm.com/2012/07/05/lionfish-population-under-control-near-shore-but-increasing-in-deep-water/> <http://www.todaysxm.com/2012/06/05/ocean-explorers-wins-lionfish-hunt/>

On the Lionfish Response Plan 2010:

http://www.icriforum.org/sites/default/files/Lionfish_Response_Plan%20final%20SXM.pdf

On coral reefs in St Maarten: http://www.naturefoundationsxm.org/education/coral_reefs/threats_to_coral_reefs.htm

On Proposed Land Parks Management Plan 2009:

<http://dcnanature.org/wp-content/uploads/2012/08/StMaartenTerrestrialParks2009ManagementPlan.pdf>

On St. Maarten Marine Park Management Plan 2007, <http://dcnanature.org/wp-content/uploads/2012/08/StMaartenMarinePark2007ManagementPlan.pdf>

"St. Maarten Nature Foundation Carries Out Water Quality Tests in Emilio Wilson Park - Shows Concerning Levels of Pollution". St Martin News Network, 11 Jan. 2013. <http://www.smn-news.com/st-maarten-st-martin-news/11006-st-maarten-nature-foundation-carries-out-water-quality-tests-in-emilio-wilson-park-shows-concerning-levels-of-pollution.html>

"New solid waste management facility on the cards for Sint Maarten". May 13, 2010, Green Antilles,

<http://www.greenantilles.com/2010/05/13/new-solid-waste-management-facility-on-the-cards-for-st-maarten/>

"Philipsburg residents save Sea turtles - Light pollution must be reduced". St Martin News Network, 11 OCT. 2013.

<http://www.smn-news.com/st-maarten-st-martin-news/13486-philipsburg-residents-save-sea-turtles-light-pollution-must-be-reduced.html>

"Princess Juliana Int'l Airport believes in the 'greening and re-greening' of St. Maarten", in Truly Caribbean, 17 Dec 2012. <http://www.trulycaribbean.net/blog/2012/05/13/princess-juliana-intl-airport-believes-in-the-greening-and-re-greening-of-st-maarten/>

"Plasterk: Financiën Sint Maarten moeten snel op orde", Caribisch Netwerk, 30 Aug 2013. <http://caribischnetwerk.ntr.nl/2013/08/30/plasterk-financien-sint-maarten-moeten-snel-op-orde/>

"St Maarten's reefs valued at \$ 57.7 million", 7 Dec. 2010. http://www.stmaartendiving.com/sxm_diving_reviews

"St. Maarten's Sustainable Energy Assessment – A Study of Electric Supply Options by KEMA". The Daily Herald, 19 May 2012. <http://news.caribseek.com/index.php/caribbean-islands-news/sint-maarten-news/the-daily-herald-news/item/13389-green-energy-report-ready-for-discussion>

Sluis, M.: « Het vriendelijke eiland is gestrest geraakt", NRC 5 Sept 2006. <http://vorige.nrc.nl/nieuwsthema/antillen/article1720356.ece>

Sutton, Paul (2012): "The European Union and the Caribbean Region: Situating the Caribbean Overseas Countries and Territories", European Review of Latin American and Caribbean Studies 93, October 2012 | p. 79-94. http://www.cedla.uva.nl/50_publications/pdf/revista/93RevistaEuropea/93-Sutton-ERLACS-ISSN-0924-0608.pdf

Wilkinson, C. (ed.). Status of Coral Reefs of the World, 2008. GCRMN (Global Coral Reef Monitoring Network) and Reef and Rainforest Research Center, Townsville, Australia. Chapter 19 on 'Status of Coral Reef Resources of the Lesser Antilles' by Bouchon et al. http://www.reefbase.org/resource_center/publication/statusreport.aspx?refid=27173
Full report http://www.reefbase.org/resource_center/publication/main.aspx?refid=27173&referrer=GCRMN

Organisation	Website address
Government site	http://www.sintmaartengov.org/Pages/default.aspx
The Governor of St Maarten	http://www.kabgsxm.com/?language=EN
Cabinet of the Minister Plenipotentiary in The Hague also known as the St. Maarten House	http://www.kgmsxm.com/
Netherlands Representation on St Maarten	http://www.rijksoverheid.nl/onderwerpen/caribische-deel-van-het-koninkrijk/vertegenwoordiging-van-nederland-in-aruba-curacao-en-sint-maarten
Emilio Wilson Park, Estate and Foundation	http://ewef.sxmconservationfoundations.org/managementPlan.php
St Martin News Network	http://www.smn-news.com/st-maarten-st-martin-news.html
Reefbase	http://www.reefbase.org/global_database/default.aspx?section=s1
Reef Keeper International on St Maarten	http://reefguardian.org/CRM/DownloadSite/STMAARTEN/StMaarten.html
Ocean Care	https://www.oceancare.org/en/
Environmental Protection in the Caribbean (EPIC)	http://www.epicislands.org/
NOAA	http://www.coral.noaa.gov/reef_maps/volume1/stmartin_stbarthelemy.jpg
Info site	http://www.st-maarten.com/

Turks and Caicos Islands

Climate Change Green Paper (February 2011): http://www.caribbeanelections.com/eDocs/strategy/tc_strategy/tc_Climate_Change_Green_Paper.pdf

Clerveaux, W., J. Garland- Campbell, M. Fulford-Gardiner, R. wild, & D. Jones, The Turks And Caicos Conservation Fund: Towards Sustainable Financing of Sustainable Financing of Marine Protected Areas Marine Protected Areas, www.onecaribbean.org/content/files/Wesleystc10.pdf

Country Poverty Assessment for the Turks and Caicos Islands, 2012, Press Briefing,
http://www.gov.tc/pressoffice/sites/default/files/TCI%20CPA_DFR%20Press%20briefing%20v1.pdf

National Socio-Economic Development Framework (2008-2017) Implementation Plan,
http://www.depstc.org/ndp/ndp_downloads/NDP_draft_reports/NSEDF%20Implementation%20Plan1.pdf

Preliminary 2012 TCI Census Data Published, Government Press Office, Grand Turk, Turks and Caicos Islands,
<http://www.eneews.tc/sites/default/files/files/Document1a2.pdf>

Preliminary findings of the 2012 TCI Government Population and Housing Census

Turks and Caicos Development Strategy 2013-2017,
http://www.tcnewsnow.com/documents/development_strategy2013-2017.pdf

Turks and Caicos Islands Pine Recovery Project, http://fl.biology.usgs.gov/pineland/2008conf/Hamilton-Scale_insect-pine_recovery_project.pdf

Turks and Caicos Islands Tourism Statistics 2013,
<http://www.turksandcaicostourism.com/content/root/File/Turks%20and%20Caicos%20Islands%20Tourism%20Statistics%202013.pdf>

Websites

Caicos Ramsar Site: http://www.ukotcf.org/pubs/tci_ramsar.htm

Caribbean Regional Fisheries Mechanism, <http://www.crfm.net/>

EEZ Waters of Turks & Caicos Isl. (UK), The Pew Charitable Trusts, Sea Around Us Project, Fisheries Ecosystems & Biodiversity, <http://www.seaaroundus.org/eez/796.aspx>

Environmental Vulnerability Index Country Profiles, http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

European Commission, Maritime Affairs, Blue Growth, http://ec.europa.eu/maritimeaffairs/policy/blue_growth/

European Union, EEAS (European External Action Service), REGIONAL - Management of Protected Areas to Support Sustainable Economies, http://eeas.europa.eu/delegations/jamaica/projects/list_of_projects/20229_en.htm

Joint Nature Conservation Committee, <http://jncc.defra.gov.uk/>

Millennium Seed Bank Project, http://en.wikipedia.org/wiki/Millennium_Seed_Bank_Project

Organisation for Economic Co-operation and Development (OECD), Investment for green growth,
<http://www.oecd.org/environment/green.htm>

Plan for Biodiversity Management and Sustainable Development around the Turks and & Caicos Ramsar Site,
http://www.ukotcf.org/pubs/tci_ramsar.htm

The School for Field Studies (SFS), After 6,000 km Suzie Comes Home, http://www.fieldstudies.net/news/After-644000-km-Suzie-Comes-Home_1642

Turks & Caicos Islands, Financial Services Commission, <http://www.tcifsc.tc/>

Turks & Caicos National Trust, <http://www.tcinalnationaltrust.com/>

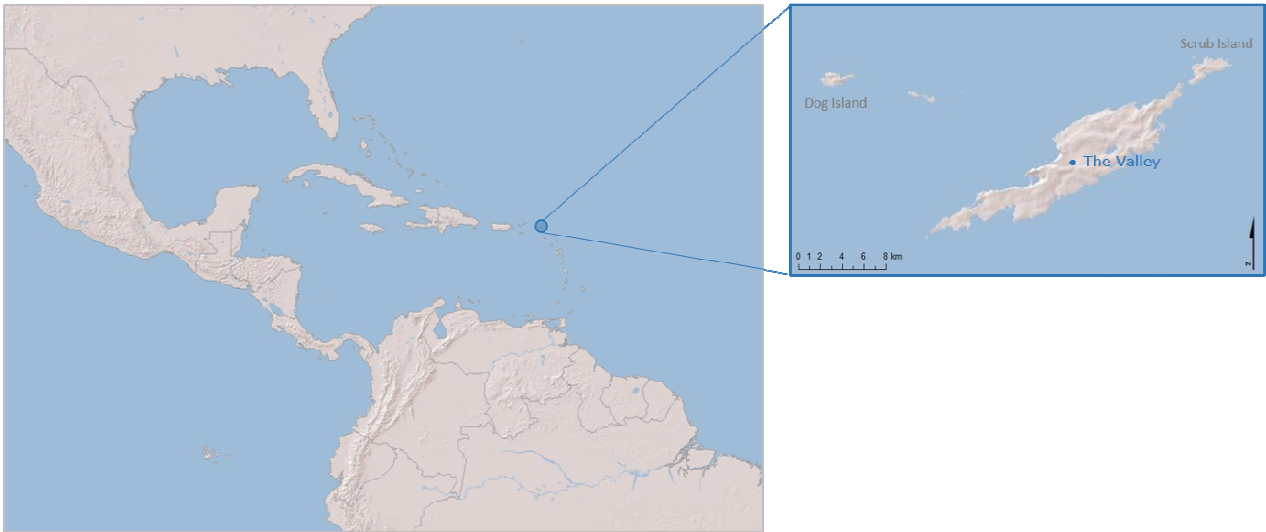
Turks & Caicos Reef Fund, <http://www.tcreef.org/>

UK Overseas Territories Conservation Forum, www.ukotcf.org

ANNEX A : ANGUILLA

ENVIRONMENTAL PROFILE

ANGUILLA



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SUMMARY

Anguilla's tourist industry is presently undergoing rapid growth, and is the territory's dominant economic activity. The quickened pace of investment activity and heightened investor interest are prompting concerns about sustainability. Anguilla is in the nascent stage of developing solid instruments to ensure the protection of its natural beauty and richness of marine and terrestrial habitats and life. These are crucial factors to safeguard Anguilla's attractiveness as a tourist destination. The main immediate environmental concerns are water, wastewater and solid waste issues, coastal zone management and invasive species.

1 BACKGROUND INFORMATION

Name of Territory	Anguilla
Region	Caribbean
Land area	100 km ²
Exclusive economic zone	92,178 km ²
Population	15,754 (July 2013 est.) 12.7 migrant(s)/1,000 population (2013 est.) ¹
GDP/capita	\$20,048 (2011 est.) ²
Literacy rate	95% age 12 and over can read and write
Unemployment rate	8% (2002)
% below poverty line³	5.8% and below vulnerability line 17.7%

Anguilla is the most northerly of the Leeward Islands in the Eastern Caribbean, comprising of a main island and 22 offshore islands and cays. The largest of the outlying islands include Anguillita, Dog Island, Prickly Pear Cays, Scrub and Little Scrub islands, Seal Island, Sombrero and Sandy Island. They are mostly rocky, with limestone, corals and sandstone predominating, and have generally thin, poor soils⁴.

The main island is 26 km long and a maximum of 5 km wide. Is it just 8 km north of the island of St Martin. It enjoys clear seas and some of the best beaches in Caribbean the region. The island itself is predominantly flat. Anguilla's capital and administrative centre is The Valley (population 2,053⁵).

Anguilla has one of the most important largely unbroken coral reefs in the Eastern Caribbean⁶. The coastline consists of coral sand beaches, low rock outcrops and limestone cliffs, surrounded by coral reefs with an extensive barrier reef off the north coast. There are extensive sand dunes behind some of the beaches and several salt ponds. Several small uninhabited islets and sandy cays mostly near the main island - including Dog Island, Scrub Island, Sombrero Island, and the Prickly Pear Cays - form part of its territory.

The climate is tropical, moderated by the north-east trade winds. The wet season extends from October to November, coinciding with the North Atlantic hurricane season that extends from June to November. Average annual rainfall is 970 mm but can range from 460 to over 2,050 mm, and most of the rain falls within a few weeks, causing flooding in low-lying areas.

Anguilla is highly vulnerable to natural disasters – such as storms, hurricanes, flooding, storm surges, tsunamis, and earthquakes - and is at risk in the face of the negative impacts of global climate change

1 The information provided by the official Anguilla Statistics Department is outdated.. This data was updated based on the World Factbook <https://www.cia.gov/library/publications/the-world-factbook/geos/av.html>

2 Anguilla Statistics Department http://www.gov.ai/statistics/NA_Publi_11.htm

3 Anguilla Country Poverty Assessment 2007/09

4 Wege, D. C. and Anadon-Irizarry, V. (2008) Important Bird Areas in the Caribbean: Key Sites for Conservation. BirdLife International.

5 <http://www.worldatlas.com/webimage/countrys/namerica/caribb/anguilla/aifacts.htm>

6 The Overseas Territories: Security, Success and Sustainability, FCO, 2012

and sea level rise. Category 4 hurricanes have a returning period of 18 years; earthquakes magnitude > 6 have a return period of 13 years. Tropical storms and hurricanes are common in this region. Major hurricanes have been Donna in 1960, Luis (and the effects of Marilyn which was close to Anguilla only a week or so apart) in 1995, Lenny in 1999 which caused extensive erosion, flooding, and sedimentation, and closed most hotels, Omar (2008), and more recently Earl (2010) has caused considerable damage following which the Government has received US\$4.28M insurance pay out⁷. Housing on the island is generally solidly built (hurricane-proof), provided with safe water, electricity and good sanitation.

The population has been growing at an average rate of 2.11% (2013 est.), in part due to net inward migration. Several thousand Anguillians live and work on other Caribbean islands, in Britain and in the US. The island has experienced rapid economic development over the last decade. The economy is very dependent on luxury tourism, offshore banking, lobster fishing, and remittances from emigrants.

With generally poor soils, Anguilla is largely unsuitable for agriculture (although several pockets of rich soil are cultivated). Fisheries annual value is about 1-2.5% GDP and much of the value-added is market driven by local tourism. About 300-400 fishers on less than 200 vessels target mainly spiny lobster, reef fish (including snapper and grouper), conch, plus a small quantity of large pelagic. Since the mid-1980s lobsters and finfish have been declining in catches and fishers have to travel further distances to maintain or increase their catches⁸. In 2010 total catch was about 461 tonnes with a value of EC\$15M⁹. Other reports account for a total 643 tonnes of fish, lobster and crayfish were caught in 2011 (fish corresponded to 459 tonnes). This provides an important source of protein to many Anguillians and are exported to neighbouring islands¹⁰. The UK supported the Longline Fisheries Development Project, aimed at improving Anguilla's fishing industry while relieving pressure on inshore fish stocks.

In 2010 tourism represented more than 118,000 arrivals accounting for 56% of GDP, 41% of direct employment and over 60% of total employment (when the jobs which are indirectly dependent on tourism, such as in shops, construction etc., they are also taken into account) and 56% of government revenue collections when the direct and indirect impacts are taken into account¹¹. Anguilla is commonly referred to as "Tranquillity Wrapped in Blue", given its turquoise seas washing some of the best beaches in the World, gracious and friendly people and peaceful crime-free community..

The international financial services industry has steadily grown over the last decade and Anguilla is now a major location for captive insurance vehicles – "Anguilla has cemented its position in the global top five of captive domiciles with a regulatory approach that is responsive and individually tailored to the needs of each captive"¹². The Financial Services Commission (FSC)¹³, the island's regulatory body, was established as an independent, self-funded statutory authority in 2004 and oversees all Anguilla's international financial services activities. Anguilla is a truly zero tax jurisdiction. It has recently adopted the Anti-money laundering and terrorist-financing Act (11th December 2013).

Anguilla is a highly open economy and imports virtually everything (energy products, food, consumer goods and intermediary goods). The value of imports represented approximately 111% of GDP with exports representing less than 8% of GDP in 2006. The balance of visible trade was approximately 3.0% higher than the amount of GDP the same year. In recent years, Anguilla has steadily developed the agricultural outputs and engaged in many discussions towards adopting renewable energy concepts.

The global financial crash has hit Anguilla particularly hard due to its reliance on the tourism sector, which depends heavily on income growth in industrialised nations. According to the East Caribbean

7 <http://reliefweb.int/report/anguilla/government-anguilla-receives-us428m-insurance-payout-following-passage-hurricane>

8 Simpson, M. C., Clarke, J. F., Scott, D. J., New, M., Karmalkar, A., Day, O. J., Taylor, M., Gossling, S., Wilson, M., Chadee, D., Stager, H., Waithe, R., Stewart, A., Georges, J., Hutchinson, N., Fields, N., Sim, R., Rutty, M., Matthews, L., and Charles, S. (2012). CARIBSAVE Climate Change Risk Atlas (CCCRA) - Anguilla. DFID, AusAID and The CARIBSAVE Partnership, Barbados, West Indies.

9 Gumbs, J, 2013, Anguilla National Report, The 11th Meeting of the Caribbean Fisheries Forum

10 Caribbean Regional Fisheries Mechanism:

<http://www.caricom-fisheries.com/Members/MemberStates/Anguilla/tabid/65/Default.aspx>

11 Sustainable Tourism Master Plan (2010-2020), October 2011

12 US Captive, 2012, Newton Media Limited

13 <http://www.fsc.org.ai/>

Central Bank (ECCB) figures, Anguilla's economy is projected to grow 0.93% in 2013. This after a large contraction in 2012 of 6.8%, and a 29% contraction in 2009. In the medium term, prospects for the economy will continue to depend largely on the tourism sector and, therefore, on revived income growth in the industrialized nations as well as on favourable weather conditions.

As Anguilla transposed the Framework for Fiscal Sustainability and Development (FFSD) into its legislation (via the Fiscal Responsibility Act 2013), it is eligible to receive Grants from the UK Government for Capital Development – a grant of £3 million is under discussion.

2 BIOGEOGRAPHY, ENDEMISM AND IMPORTANCE FOR GLOBAL BIODIVERSITY

Anguilla is rich in biological diversity. The habitats of the main island and its offshore cays range from coral reefs to coastal cliffs, degraded evergreen woodland with scattered areas of grassland and scrub to small areas of mangrove, and brackish and freshwater ponds.

The draft report 'Status of Anguilla's Marine Resources 2010' recognises the diversity and fragility of Anguilla's coastal and marine ecosystems. The island's nearshore coral reefs, sea grass beds, mangrove forests, beaches, and sand dunes comprise an interconnected but highly vulnerable system on which Anguilla is reliant. These ecosystems and habitats provide critical shoreline protection from storms and ground seas¹⁴, sand for beaches, food, construction material, and potentially contain valuable medicinal properties. These ecosystems are under threat with their health and integrity on the decline over the last twenty years¹⁵.

The wetlands are a habitat for various bird species, including the endangered roseate terns, least terns and red-billed tropic birds, and act as flood control areas during hurricanes and heavy rains. These habitats are home to some 139 bird species and 21 species of reptile such as the Lesser Antillean iguana. The beaches are important nesting areas for worldwide vulnerable turtles such as Hawksbill (CR), Green (EN) and Leatherback (EN). Bats are Anguilla's only native terrestrial mammals

The reptiles found on Anguilla and its offshore cays consist of twelve lizard species, one species of snake and one species of land tortoise. The endemic reptiles are: black or ground lizard *Ameiva corvine* (endemic to Sombrero) and a Little Scrub ground lizard *Ameiva corax* (endemic to Little Scrub Island).

Vegetation on the arid territory is characterised by scrubland and sparse scrub oak with a few trees. Over 550 plant species have been recorded on the islands (321 indigenous), with *Rondeletia anguillensis* classified as an endemic. The current vegetation/landcover map is being revised and categorised in a new draft Habitat Map depicting vegetation types based on productivity, height and other ecological correlates giving not only a more descriptive but illustrative application to environmental management.

Anguilla is important for seabirds in a regional context, and for waterfowl and migratory shorebirds. To date, 139 bird species have been recorded on Anguilla (38 breeding, 101 as regular visitors). At least 15 species of seabird currently breed on Anguilla, mostly on the uninhabited islands.

¹⁴ Winter storms in the North Atlantic generate high swell waves or 'groundseas' which especially affect the northern coasts of Anguilla and her cays

¹⁵ A 1990 Bellairs Research Institute in Barbados, report indicates that Anguilla's marine environment has a 'variety of diverse and attractive marine habitats which are in relatively good condition, with little apparent impact from human activities, while the Status of Anguilla's Marine Resources 2010 describes the current degradation..

Key bird species at Important Bird Areas in Anguilla

Key bird species	Criteria	National population	Criteria	Anguilla IBAs						
				AI001	AI002	AI003	AI004	AI005	AI006	AI007
Red-billed Tropicbird <i>Phaethon aethereus</i>	■	129		■	■	■	■	■	■	■
Magnificent Frigatebird <i>Fregata magnificens</i>	■	930			■					
Brown Pelican <i>Pelecanus occidentalis</i>	■	87				■				
Masked Booby <i>Sula dactylatra</i>	■	210		■	■					
Brown Booby <i>Sula leucogaster</i>	■	6,669		■	■	■	■			
Laughing Gull <i>Larus atricilla</i>	■	9,870			■	■	■			600
Royal Tern <i>Sterna maxima</i>	■	381								345
Roseate Tern <i>Sterna dougallii</i>	■	630								210
Least Tern <i>Sterna antillarum</i>	■	978				■	■	■	■	60
Bridled Tern <i>Sterna anaethetus</i>	■	1,390		■	■	■				
Sooty Tern <i>Sterna fuscata</i>	■	340,000			■	■				
Brown Noddy <i>Anous stolidus</i>	■	1,815		■	■	■				
Green-throated Carib <i>Eulampis holosericeus</i>	■	75					■	■	■	
Caribbean Elaenia <i>Elaenia martinica</i>	■							■	■	■
Pearly-eyed Thrasher <i>Margarops fuscatus</i>	■									■
Lesser Antillean Bullfinch <i>Loxigilla noctis</i>	■						■			

All population figures = numbers of individuals.
Restricted-range birds ■. Congregatory birds ■.

Source: Wege, D. C. and Anadon-Irizarry, V. (2008) Important Bird Areas in the Caribbean: Key Sites for Conservation. BirdLife International.

Anguilla has seven marine areas (MPAs); Dog Island, Junks Hole, Little Bay, Prickly Pear Cays, Sandy Island, Shoal Bay/Island Harbour, and Sombrero Island Nature Reserve Marine Park. These were designated under the Marine Parks Ordinance in 1982, but were not managed until the implementing regulations came into force in 1993. Management responsibility for the MPAs lies with the Department of Fisheries and Marine Resources.

The government has maintained ownership but in the late 1990's transferred administrative control of two sites (East End Pond Conservation Area and the Big Spring Heritage Site) to the Anguilla National Trust (ANT), making these the first terrestrial protected areas in the Territory, as at that moment appropriate national legislation on this subject was non-existent.

Summary of the 2008 IUCN red listed species for Anguilla

Critically endangered	Endangered	Vulnerable	Near Threatened	Extinct (Extinct in the wild)	Lower risk/ conservation dependent	Data Deficient
3	8	20	12	0	1	16

Source: 2011 Biodiversity Snapshot – Anguilla, JNCC

3.1 OVERVIEW

Rapid development and a growing tourist industry are placing multiple strains on Anguilla's environment. More than ever before, the richness of Anguilla's habitats and biodiversity is also under serious threat. A surge in development connected with housing and tourism-related activities is placing severe pressure on an already stressed environment.

As cited at the background of the project *Enhancing capacity for fisheries enforcement and management in Anguilla*¹⁶ "an in-depth report on the status of Anguilla's marine resources has indicated that shallow reef benthic habitats are generally in a poor state of health, with an overall low hard coral cover and areas dominated with high levels of macro-algae. In 1990, the mean percentage cover of hard coral was 13.95 (an average over 9 sites). By 2010, however, hard coral percentage cover has dramatically declined to about 4.1 (an average over 10 sites)".

Major threats according to Anguilla's environmental officers are: i) absence of national consensus on the removal of vegetation, including mangroves that serve as coastal defence - it is a customary practice for land plots to be deforested without any relevant guidance; ii) infilling of ponds for the construction of roads and other development; iii) no management on the use of herbicides/pesticides in the terrestrial environment and possibly diffuse source pollution of the marine environment is possibly occurring.

Traditionally the island's water resources derive from groundwater captured by porous rocks. Anguilla and three other islands have brackish coastal lagoons, and a few ponds on the mainland are fed by springs from the water table. However, fresh Water scarcity is a reality in Anguilla. To reduce this pressure, a desalination plant has been built and is operating since 2010. However, reportedly the plant, originally set up to supply potable water to households and businesses, eventually also provided water for sanitation and food production and has been decommissioned. Various companies imported their own water processing equipment and sell water to the public. Others, such as the hotels, process water for their own use. Promotion of drawing water from wells on the island is also on going.

Domestic solid waste is collected twice weekly, free of charge. Department of Health Protection collects refuse from government institutions, public roads, and beaches. The total metric tonnage of solid waste increased from 10,452.85 in 2006 to 13,442.36 in 2010. Household waste increased from 3,429.98 metric tons in 2006 to 6,031.24 in 2010. Industrial waste also increased, from 523.74 metric tons in 2006 to 1,059 in 2010. All waste is disposed of daily at the 10-acre landfill, where waste is placed in pre-excavated trenches and covered with fill. No provision is made for the removal of construction waste, old appliances, and derelict vehicles. Hotels and other commercial establishments are required to make their own arrangements for collection of waste.

On a recent assessment¹⁷ it is stated that there is no documented integrated national approach to guide how environmental mainstreaming is to be implemented. Further, the various legislative instruments do not seem to have any formal connection to enable the sharing of information and coordination of environmental management activities among them. Anguilla has some sound legislation on protecting sites and species, but land-use planning and development continues weak.

Furthermore, as a small and low-lying island dependent on tourism and therefore on the quality of its beaches, its coral reefs, its fish and its wildlife, Anguilla is highly vulnerable to the effects of climate change, as well as vulnerable to hurricanes and earthquakes. The hurricanes resulted in 6 ½ miles of the northern coastline experiencing severe slope instability and beach erosion, and in the loss of 20% of the

¹⁶ <http://www.ukotcf.org/infoDB/infoSourcesDetail2.cfm?refID=299>

¹⁷ March 2013, Greening the Economy' project in the UK Overseas Territory of Anguilla, Caribbean Natural Resources Institute (CANARI) and Joint Nature Conservation Committee Support Co.

seagrass beds. Anguilla also lies in a seismically active area: earthquakes are typically in the range Richter 4-5. Tsunamis are also a possibility (see regional section).

3.2 MAIN CHALLENGES

In 2005, the Environmental Vulnerability Index¹⁸ indicated Anguilla as *Vulnerable*, even with significant information gaps as only 52% of topics were covered. The most pressing issues identified were the percentage of land lower than 50m above sea level; Number of known species that migrate outside the territorial area at any time during their life spans (including land and all aquatic species) / area of land; Number of endangered and vulnerable species per 1000 km² land area (IUCN definitions); Number of species known to have become extinct since 1900 per 1000 km² land area (IUCN definitions); annual average SO₂ emissions and Number of environmental treaties in force in the country.

The main environmental challenges faced by Anguilla were also identified in the 2006-07 Environmental Profiles and their gravity is provided in the table below. Since then, several issues have been addressed with some results that changed its gravity.

Issues	Situation in 2006-07	Current Situation
Climate Change	Severe	Moderate
Habitat Degradation due to development	Severe	Severe: there has been extensive coral reef and seabed grass die off. Measures are being sought that can be used to address this issue
Beach Erosion	Moderate	Severe: Although illegal sand mining continues. There is a need to amend the regulation to allow better enforcement

Moreover, water quantity and quality, wastewater and solid waste were referred as significant pressures.

New Emerging issues are:

Issues	Current situation
Coastal Zone Issues	In recent years, it has been noticed that there has been some land spillage occurring in Anguilla. This is mainly due to the construction of certain developments in areas where the geology is not appropriate. As a consequence of extensive coastal erosion in some sectors of the island, some coastal lands have eroded. There is no land use plan and as a consequence, development to an extent occurs in an ad-hoc manner. For instance, land is cleared before approval is provided therefore important terrestrial plant and animal species are impacted without due consideration. Outdate legislation continues to affect the proper land management and developmental patterns in Anguilla
Water and Waste Management	There is a water shortage issue. This has been compounded due to the closure of the desalination plant. At present, the plant is being decommissioned and water for national distribution is solely sourced from the groundwater aquifer. Sewage is through septic tanks and there is no regulation on package plants for hotels sewage treatment. Due to the growing population there is an increase in waste. This causes a concern regarding the holding capacity of the lone landfill site to accommodate the growing waste. There are no large recycling regimes in place however efforts are being made towards improving on the management strategies currently applied.

¹⁸ http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

Invasive Species	<p>Marine invasive Lion Fish: This was first sighted in Anguilla in late 2010. Studies conducted complimented by local fishermen's knowledge on this invasive species have concluded that the population is increasing. The Lionfish poses a major threat to Anguilla's fishing industry that contributes largely to the island's GDP as well as the coral reefs habitat.</p> <p>Terrestrial: There has been a noticeable increase in the invasive <i>Iguana Iguana</i> species in Anguilla native <i>Iguana delicatissima</i> species' habitat. The <i>Iguana delicatissima</i> is endemic to the Leeward Islands. In many of the islands of its native range, the <i>Iguana delicatissima</i> is extinct. Anguilla is the most northern range where this species still exist.</p>
Energy Security	<p>The cost of energy is escalating and this is primarily due to the use of only the fossil fuel; oil. It is anticipated that as the global cost of this non-renewable resource continues to rise so will be the production of electricity in meeting Anguilla's growing energy demand. The Castalia Report, 2012 has provided detailed recommendations and a road map for the development and implementation of renewable energy in Anguilla.</p>

Challenge 1 - Climate change - Severe

Anguilla is particularly vulnerable to erosion and the long-term risks associated with rising sea-level and climate change given its location, smallness, low altitude, geography. Besides, anthropogenic activities are provoking erosion at the coast, as well as coral reef destruction – coral reefs act as a natural buffer area protecting the islands from sea damage during storms.

A Climate Change Policy has been developed and efforts have been made towards building climate change awareness and a resilient natural resource base in Anguilla.

Challenge 2 - Coastal Zone Issues - Severe

The high rate of growth of the tourist industry, coupled with the lack of strong physical planning legislation, means that the characteristic habitats of Anguilla are coming under increasing threat. Examples of this are:

- wetlands are being dredged out for marina development;
- scrub and grassy savannahs is constantly being cleared and salt ponds filled in and reclaimed. Removing vegetation from the dunes destabilises these protective sand barriers; and clearing sites inland results in increased soil and dirt particles being washed offshore and smothering coral reef systems;
- sand is being mined, bays are being dredged;
- Coral reefs are coming under multiple threat, mainly coastal development., overfishing, anchor damage and breakage of shallow corals by snorkelers;
- seagrass beds are being suffocated by excessive algal growth;
- Pollution from the shore, particularly the discharge of sewage seepage and dumping.

Data from the Department of Fisheries and Marine Resources (DFMR) Anguilla Marine Monitoring Programme (AMMP) reveal a 70 percent decline in hard coral cover in just 20 years. In some areas such as the Forest Bay and Sandy Hill Bay, the decline in coral cover is 90 percent and 74 percent, respectively. One detail that has not change since 1990 is that the southern coastline of Anguilla is in a worse condition than the northern coastline. The Dog Island reefs are still almost pristine, and visitors are discouraged. However, the ownership of Dog Island is receptive to offers of joint-venture development, and the master development plan suggests 95 large (1.5 - 3.5 acres each) home sites and a hotel.¹⁹

If the reefs are damaged then (i) they will provide beaches with less sand, and (ii) there will be less

¹⁹ <http://www.privateislandsonline.com/islands/dogislandanguilla>

protection for the beaches from high wave energy.

The Anguilla many superb pristine beaches are essential to social, and economic well-being. They provide an important recreational resource for tourists and local residents, are a source of fine aggregate for construction, and are an aesthetically pleasing - and culturally important - part of the environment. Beaches are being subject to various pressures which endanger them:

- Badly planned sea defences may cause or exacerbate loss of the beach, or neighbouring beaches.
- Building too close to the beach interferes with the natural sand movement, may disturb fragile beach ecosystems, accelerate erosion and worsen the impact of natural disasters.
- Sand extraction from beaches and dunes is a major cause of erosion. Heavily mined sites such as Sile Bay and Meads Bay were especially vulnerable to the waves of Hurricane Luis. Sand mining is now prohibited on all beaches and dunes except at Windward Point.

The instruments needed to protect habitats and wildlife, on the other hand are largely missing:

- Land Development Control Act 2008 and Regulations are not adequate to deal with development planning²⁰. There is no comprehensive development plan.
- There are no enacted Environmental impact assessment (EIA) procedures and there is no Strategic environmental Assessment²¹.

The Physical Planning Bill 2001 that would address some of the problems has never been enacted. Funding has been sourced towards updating the Physical Planning Act.

No effective national parks and protected areas system has been established.

Challenge 3 - Water and Sanitation (including solid waste) - Severe

The two main aquifers supplying water are located in the Valley, and contain 70% of the island's groundwater resources. As these are not enough to meet Anguilla's needs, and are supplemented by rainwater collected in cisterns (28% of consumption) and desalination plants (private small scale and a large one build by the government). However the main desalination plant is being decommissioned. Besides the desalination, the 2006–2010 project funded by British Government and the European Union included the replacement of galvanized piping by polyvinyl chloride (PVC) pipelines and improvement of water distribution system. Most homes have access to piped water within or close to the home. The commercial sector (restaurants, bars, shops, and some hotels) is the largest consumer of public water. The distribution system was poor, but the GoA received funding from the for a water development project that includes new storage and distribution facilities and upgrading the abstraction system.

There are also concerns about the contamination of groundwater. There is no sewerage system in Anguilla. The majority (80%) of the households' wastewater is treated and disposed of on-site by means of septic tanks, soakaways, and pit latrines. Most hotels, commercial establishments and government institutions use package treatment plants.

There is evidence of degradation of the coastal and marine environment due to pollution caused by the discharge of sewerage from hotels and restaurants and the discharge of sewerage and oil from visiting yachts and ships. The extent is not known because there is no monitoring of coastal water. The Department of Health Protection lacks the expertise and means to monitor ground water quality or the effluent from package treatment plants. The groundwater is at risk of contamination from direct discharges of effluents (poorly designed septic tanks), as well as from chemicals and pesticides in areas near the aquifer. Intrusion of salt water; and uncontrolled disposal of solid waste.

20 March 2013, Greening the Economy' project in the UK Overseas Territory of Anguilla, Caribbean Natural Resources Institute (CANARI) and Joint Nature Conservation Committee Support Co.

21 An assessment of environmental protection frameworks in the UK Overseas Territories, 2013, The Foundation for International Environmental Law and Development and The Royal Society for the Protection of Birds (http://www.rspb.org.uk/Images/EnvironmentalGovernanceReviewFeb2013_tcm9-342020.pdf)

Waste production is increasing and the landfill will soon be filled. Also of particular concern are the disposal of derelict vehicles, waste oil treatment on the island, dumping. No consolidated list of hazardous waste materials prohibited in/for Anguilla, no large recycling regimes in place, no documented policy statement on recycling or reduce imports generating waste and no reference in the draft Environmental Protection Act 2005. The final report of the 'Greening the Economy' project, funded by JNCC, indicates some actions to be taken: Explore the economic feasibility of recycling options; explore the economic feasibility of exporting some added value waste; Formulate and implement an awareness program on waste management; Increase enforcement of the Litter Act through specific training of Police Officers and provision of resources to the Department of Health Protection for the commencement of the voluntary warden programme.

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

Anguilla is a United Kingdom overseas territory. The 1982 Anguilla Constitution (with amendments) provides for a governor who exercises executive authority. The Governor has special responsibility for defence, external affairs, internal security (including the police) and the public service. In other areas the governor follows the advice of the Executive Council, comprising the Chief Minister and three other elected Ministers, the Attorney General and the Deputy Governor. Following legislative elections, the leader of the majority party or the leader of the majority coalition is usually appointed chief minister by the governor. The legislative body is the House of Assembly, comprising a total of 11 seats, of which 7 elected by direct popular vote, 2 *ex officio* members and 2 appointed Members serve five-year terms. Elections are held every five years and last took place in February 2010.

In 2006 a process of constitutional and electoral reform took place²², and the concept of 'free association' with the UK has received quite some attention. Essentially, it has been recommended a "half-way house" towards full independence whereby Anguilla would attain full internal self-government, with defence and external relations remaining the preserve of the UK.

4.2 REVIEW OF CURRENT INSTITUTIONS

Environmental governance in Anguilla is performed by several entities (see table below). The National Environmental Management Strategy and Action Plan for 2005–2009 states that the roles and responsibilities of the different entities require clarification in order to maximize efficiency and accountability in managing the environment and natural resources, and to reduce duplication and maximize cost effectiveness. It also emphasizes the need for governmental agencies to collaborate with one another and with nongovernmental agencies. To this end specific activities are identified under the NEMS.

The *Department of Environment* (DoE) was approved in 2005 and formally established in 2006 under the Ministry of Home Affairs, Natural Resources, Lands and Physical Planning²³. DoE has six technical staff and one clerical and is in charge of providing the framework for holistic environmental management and conservation of biodiversity working to improve and maintain the quality of life and the sustainable use of natural resources.

²² http://www.gov.ai/constitutional_reform.php

²³ <http://www.gov.ai/departments.php?id=3&dept=21>

Also within the Ministry of Home Affairs, Natural Resources, Lands and Physical Planning falls:

- The Department of Fisheries and Marine Resources (DFMR) created in 1991 which is responsible is responsible for: fisheries management (including data collection, fish stock assessment, Monitoring, Control and Surveillance (MCS)); coastal resources management including Identification and analysis of threatened habitats and species. At present DFMR also carry out marine parks management functions, but it is not legislated. DFMR has nine staff of which seven have secondary education;
- The Department Physical Planning (DPP) created in 1991 as a unit within the Lands and Survey Department in charge of issuing planning permissions for land development including building or rebuilding operations, engineering operations, mining operations (including the removal of sand) the sub-division of any land, the laying out roads, the filling of ravines or swamps, or any other preparatory work which indicates an intention thereby to change or alter the existing nature or character of any land develop shall be constructed accordingly (as defines by the Land Development (Control) Ordinance 1966 amended by Ordinances of 1980, 1988,1989);

The Department of Health Protection is responsible for waste management, food hygiene, vector control, liquid waste management, the monitoring of drinking water, environmental sanitation, beach and roadside cleaning, building better hygiene practices, occupational health and safety, and the provision of low-cost sanitation services. With specific reference to tourism, the Department operates the Government Laboratory, is responsible for monitoring of drinking and recreational water quality, approves permits for tourism facilities (sewage treatment, food, etc.), and is responsible for solid waste management.

The *Water Corporation of Anguilla* was established in 2008 and is responsible for the implementation of the Water Corporation of Anguilla Act (2008) including provision of services and water supply. They supply all public water and they test their own water.

The *Department of Disaster Management* (DDM) is responsible for disaster-preparedness and response. Staff comprises a single full-time person, the National Disaster Coordinator (NDC). The annual operating budget for the National Disaster office is about €3000 excluding the contribution to CDERA. Its activities focus on hurricane awareness, capacity building and the annual field exercise for utility services and related government departments. The Comprehensive Disaster Management Policy has recently been approved (2013) providing a framework through which DDM and the National Disaster Management Committee operate with the aim of incorporating comprehensive disaster management and climate change adaptation initiatives.

The *Department of Agriculture* (DoA) is in charge of, *inter alia*, promoting *the use of natural resources through sustainable management to achieve import substitution* (Strategic Plan of DoA, 2008) and inspecting plants and animal materials and issuing Phytosanitary Certificate and import permits for plants.

The *Anguilla National Trust* (ANT) office was established in 1995 based on the Anguilla National Trust Ordinance of 1988 which was revised in 2009. It is charged with protecting the territory's natural resources and preserving Anguilla's historical and cultural heritage. It receives an annual subvention from the government, and collaborates with the relevant government agencies. The ANT is staffed by an Executive Director, a Protected Areas Manager, and an Administrative Manager along with project staff. More recently in December 2013, ANT published the Report on the State of Anguilla's Ocean and Coastal Governance Mechanism. As an independent body, the views of ANT do not always reflect those of the Government.

4.3 POLICY, STRATEGY, PLANS, PROGRAMMES

The Government of Anguilla has signed two agreements with the Government of the UK that provide overall policy guidance on environmental mainstreaming. These are the Anguilla Environment Charter (September 2001) and the Strategic Country Programme (SCP) revised in March 2003. Under the Environment Charter Anguilla commits, *inter alia*, to ensure that environmental considerations are integrated into social and economic planning processes; undertake environmental impact assessment (EIA), in consultation with stakeholders, before approving major projects; ensure that legislation and policies reflect the polluter pays principle and establish effective monitoring and enforcement mechanisms. Under the SCP Anguilla commits to the protection and sustainable use of the coastal and terrestrial habitats and the terrestrial and inshore and offshore marine resources, and the adherence to the obligations of applicable regional and international environmental treaties and agreements.

Besides, in April 2001, the St. George's Declaration of Principles for Environmental Sustainability in the Organisation of Eastern Caribbean States was signed which led to the development of the National Environmental Management Strategy and Action Plan (NEMS) approved in 2005.

The table below summarises the main policy instruments adopted to date:

Policies	Comments / detail
Native Plant and Animal Habitat Conservation (Biodiversity) Policy (2001)	Establishes the need for protection of key habitats and species, selected by adequate criteria, the need for public participation in planning and management, and the need to establish agreements with the landowners, acquire lands, avoid invasive species, and promote access to information on biodiversity.
The National Environmental Management Strategy (NEMS) and Action Plan (2005-2009)	Originally adopted in 2001, the NEMS was revised and adopted in 2005. The NEMS establishes the key strategies and priority areas and prescribes the activities to be developed by the different agencies with indicative budget and indicators over a period of four years. A third version is currently (2014) near completion.
The National Biodiversity Strategy and Action Plan (NBSAP) for Biodiversity Conservation in the Fisheries, Marine, and Coastal Sector of Anguilla	Adopted in 2012 the NBSAP provided a further mechanism for Anguilla to discharge its obligations under the Environmental Charter and the National Environmental Management Strategy and Action Plan.
Lionfish Response Plan (2009)	Developed by the Department of Fisheries and Marine Resources it is a long-term plan to deal with the social, economic, and ecological impacts of the invasion of the lionfish into Anguilla's waters. The Plan includes: Developing and implementing invasive species policies; Collecting and managing information about the lionfish in Anguilla's waters; Controlling lionfish populations through active management; Developing and implementing public outreach as well as education materials and initiatives, directed at those fishing commercially, dive operators, and the general public
National Energy Policy 2009	Aims at establishing Anguilla as a centre of excellence on sustainable energy self-reliance and independence among very small island state communities. It promotes energy efficiency, foster the use of renewable energy resources, and facilitate the transition to and adoption of renewable energy technologies. This by changes in regulatory framework and standards, integrating sustainable energy in country development planning, promoting awareness and participation of the stakeholders, establishing research and development facilities, and enable access on a competitive basis to the emerging global carbon credit market by all stakeholders in Anguilla.
Climate Change Policy (2012)	

Comprehensive Disaster Management Policy 2013	It aims at incorporating comprehensive disaster management and climate change adaptation into all aspects of development and daily lives, creating a culture of safety and sustainability. This is done through implementation of structural and non-structural measures to limit the adverse impact of hazards, to prevent social, economic and environmental degradation and build resilience and reduce risk; developing policies and legislations and build institutional capacity for effective knowledge management; developing guidelines to incorporate risk reduction and resilience initiatives into all levels of the society; and include training options for communities and non-governmental organisations; provide training and sensitisation on the CDM Approach and the CDM system and tools.
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In addition, the draft Anguilla Invasive Species strategy provides specific recommendations regarding ports of entry, new invasive species, management of established invasive species, community involvement and assessment of the marine environment.

The integration of Social, Economic and Environmental Considerations into National Development Policies, Plans and Programmes is lacking and has been identified under the NEMS as a priority. The Ministry of Environment has just secured funds under the Darwin Plus to conduct a National Ecosystem Assessment. This assessment is intended to allow determine the value of Anguilla's natural environment (ecosystem's services) to the society wellbeing and the country's economy, and will serve to develop a framework for Anguilla's National development plan.

4.4 LEGISLATION

In relation to environmental protection, management and biodiversity conservation, the UK Government has signed or acceded to the following Multilateral Environmental agreements which were subsequently extended to Anguilla:

MEA	Remarks
Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention)	This Convention was adopted in 1972. There are currently no designated World Heritage sites in Anguilla - the Fountain Cavern was removed from UK tentative list
Ramsar Convention	No RAMSAR sites have been selected to date
International Convention on the Regulation of Whaling	This Convention was signed in 1946. Whaling has not been carried out in Anguilla for several decades.
Convention on International Trade on Endangered Species	CITES has recently been extended

The main relevant local legislation for environmental protection and management in Anguilla is identified in the table below:

Legislation	Comments / detail
Revised Comprehensive Disaster Management Act (2013)	Provide for the effective organisation of the preparedness, management, mitigation of, response to and recovery from emergencies and disasters, natural and man-made, in Anguilla and for related purposes
Beach Control Act (amended 2012) Beach Protection Order	The foreshore and floor of the sea are declared as vested in the Crown. Use of these areas is prohibited except by license granted by the Minister. Compulsory acquisition of adjoining lands for the public good can be determined by the Governor in Council. This Act provides for the declaration of protected beaches and foreshores and the prohibition of sand mining and aggregate removal from such beaches. The Beach Protection Order identifies 18 beaches as protected under this Act.

Land Development Control Act (2010)	Prescribes the establishment and function of the Land Development Control Committee and the Regulations specify the procedures for land development permission, as well as the powers of the Director. The Act also provides for the declaration of Special Development Areas.
Biodiversity and Heritage Conservation Act (2009)	The purpose of this Act is: to support and promote the conservation of wildlife species, their habitats and the ecosystems of which they form a part, in Anguilla , the Caribbean and the world; to prevent wildlife species from being extirpated or becoming extinct and to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; to prevent vulnerable species from becoming endangered or threatened; to support and promote the conservation of heritage sites and listed buildings in Anguilla; and to protect heritage objects in Anguilla and to prevent heritage objects or types of heritage objects from being exported.
Trade in Endangered Species Act (2009)	An Act to further the protection and conservation of endangered, threatened and exploited species of wild fauna and flora by regulating the export and import of specimens of those species and thereby enable Anguilla to fulfil its obligations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora
Water Corporation of Anguilla Act (2008)	Defines the rights and responsibilities of the cooperation and establishes the rules for the supply of water service
Marine Parks Act (2000) and amended regulations (2007)	Prescribes the procedures for the designation of marine parks, appointment and powers of a Controlling Officer, and acquisition of land for marine parks. The regulations specify offences, prohibitions, enforcement, and acquisition of permits. Seven marine parks were designated in the amended regulations of 2007. The Marine Parks are: Junks Hole; Dog Island; Prickly Pear Cays and Seal Island Reefs; Sandy Island; Little Bay; Shoal Bay and Island Harbour Reefs; and the Sombrero Island.
Physical Planning Act (2001)	This Act has not yet been formally enacted neither the regulations that determine the content and format of the environmental impact statements. It creates a Physical Planning Board and requires an EIA for certain prescribed types of development or when the Board so considers and establishes offences relating to the destruction of land and the environment.
Beach Protection Act (2000)	This Act provides for the declaration of protected beaches and foreshores and the prohibition of sand mining and aggregate removal from such beaches. The Beach Protection Order identifies 18 beaches as protected under this Act.
Anguilla National Trust Act (2000)	Provides for the establishment and operation of the ANT, including the powers of its Council. The Anguilla National Trust Regulations provides further guidance on operational procedures and roles.
Anguilla National Trust Act (1988); revised and updated in 2009	Established the Anguilla National Trust
Plant Protection Act	Provisions are made for the prohibition of importation of plants, seizure, inspection, registration, and quarantine of nurseries, procedures for eradication of pests and diseases, and compensation. Fruit trees and other plants are identified in the Regulations for inspection of pests.
Protection of Animals Act (1962) last amended in 1997	Establishes rules for the protection of animals.
Fisheries Protection Ordinance (1988)	Regulates the taking and killing of certain marine species and establishes close seasons
Fisheries Protection (Amendment) Regulations 1995	Provide for licensing, registration, conservation, fisheries management and development, and enforcement of regulations. Enforces a moratorium on the harvesting of sea turtles and their eggs.
The Wild Birds Protection Ordinance (1913)	Protects listed wild bird species and their eggs. It needs to be repealed and replaced with appropriate legislation. A protection season for birds, offences and reporting procedure are specified. The Regulations provide details of the closed season for the Mountain Dove and Wild Pigeon.

Generally the existent legal framework is made up of a several laws and regulations developed in absence of an approved integrated approach to environmental management. A better integration with the obligations from the MEAs is also lacking. Besides, a number of key environmental legislation has not yet been enacted, so that enforcement does not yet arise. This is the case for illegal sand mining operations, as prosecution of persons performing this act continues to be ineffective.

In 2012 the GoA acquired funding (US\$245,812) from the Caribbean Development Bank to complete the draft bill for Environment Protection²⁴ and draft bill for Physical Planning. This is regarded as a good practice as these are coexisting documents, i.e., one cannot be deemed effective without the other being in place. According to the Department of Environment these pieces of legislation will be modernized to capture the current realities, which will allow for more effective environment management.

4.5 MONITORING

The Department of Environment monitors Marine Ecosystems, Terrestrial ecosystems, Wetland ecosystems and Species and their habitats are monitored. Water quality monitoring is the responsibility of the Department for Health Protection. The DFMR is mandated to monitor the activity of fishers and to collect fish catch and other data pertinent to the fishing industry.

There are a number of sound scientific studies, done over the years, available on the natural resources in Anguilla. Most available studies are scattered through various government offices or included in regional studies hosted on the websites of external agencies and it is difficult to make use of it.

A Terrestrial Habitat Mapping project was recently undertaken as an action to update the National GIS database on the existing vegetation types and also to highlight potential flood zone areas. The flood maps produced by the Department of Disaster Management further complemented this system. Remapping of the marine ecosystem habitats

As a part of the FOR- Anguilla project carried out by University of Newcastle, a social and ecosystem assessment of Anguilla's coral reefs was done. A database on the status of the Anguilla coral reefs is being updated.

4.6 ENVIRONMENTAL AWARENESS

Access to information is provided by ANT. Access to information is made available at any of the relevant natural resources. Other local organisations, such as the Anguilla Beautification Club and the School Environment Clubs also play a part in promoting environmental awareness.

One of the goals established by the Climate Change Policy is the education of key stakeholders namely to conserve and ensure a sustainable supply of fresh water while addressing climate change risk/threats to resilience of water resources and to coastal marine resources.

Examples of recent environmental awareness activities include:

- 5 Minute DVD titles " Biodiversity is our Business" and a Poster
- Department of Environment on Radio programme, The Zone (weekly) and In Touch Radio (Monthly) Programmes on Environment by the various Natural Resource Dept
- Department of Environment Open House Week for Environment 2010, 2011, 2012
- Department of Environment Kids Environment Camp
- Department of Environment Public presentations on National Ecosystem Services

²⁴ The Environmental Protection Act 2008 has always remained a draft.

- Redevelopment of the Department of Environment Website
- Anguilla National Trust Annual Summer Programme for Kids
- Anguilla National Trust Weekly Environment Programme
- Environmental Education Programme for Youth, launched by the ANT in 2011
- Environment in the Classroom Initiatives with Department of Education
- Creation of Publication Entitled, " Geography of Anguilla" and "Cartographic Illustrations of Anguilla"
- Climate Change Public Awareness Initiatives
- Nature Fest 2011 Two weeks programme
- Pesticide and Toxic Chemical Awareness week in 2010, 2011 and 2012

The decision making process and the engagement of the stakeholders participation are limited by lack of political accountability and the current absence of mandatory EIA procedures. According to the Department of Environment, there continues to be no standardized process for decision making regarding development, and improper development is still occurring even when appropriate information is provided. The establishment, strengthening and promotion of structures and procedures for the broad participation by Civil Society in the design, implementation and evaluation of decision making processes and programmes is identified as a priority by NEMS.

4.7 FINANCE FOR THE ENVIRONMENT

Access to material resources and staffing is anchored into the yearly budgeting procedure which is managed by a Finance Department whose operation is understandably driven by financial considerations dictated to it by the Executive Council. Unplanned requests for contingencies can be taken to the Executive Council by the Minister with responsibility for the Environment. In the absence of an agreed documented integrated approach to national development, each Department formulates the strategic plans for submission to the Finance Department in isolation. There is no systematic policy or procedure to ensure that environmental considerations are included in decision- making on funding or general management.

5 INTERNATIONAL COOPERATION

Anguilla is a full member of the Eastern Caribbean Central Bank (ECCB) and its initiatives such as the Eastern Caribbean Securities Exchange (ECSE). It participates in the Caribbean Development Bank (CDB), and is a member of the Caribbean Disaster and Emergency Response Agency (CDERA).

Anguilla comes under the jurisdiction of the Eastern Caribbean Supreme Court. Anguilla is an associate member of: the Caribbean Community (CARICOM), so not subject to the common external tariff; the Association of Caribbean States (ACS); the Economic Commission for Latin America and the Caribbean (ECLAC); and the Organisation of Eastern Caribbean States (OECS).

The OECS and the Government of Anguilla launch in 11 March 2014 the new EU Global Climate Change Alliance (GCCA) Project on Climate Change Adaptation and Sustainable Land Management in the Eastern Caribbean. The project, to the tune of 10.6 million Euros, targets all nine OECS Member States and is geared at improving the region's natural resource base resilience to the impacts of climate change through: Effective and sustainable land management policy, capacity, awareness, and practices; and Implementation of specific physical adaptation measures, including soil & land stabilization, river & sea defense, forest & ecosystem restoration.

Total aid to Anguilla under the 4th to the 9th EDFs was about €20 million. This was mainly for infrastructural projects - water, roads, port facilities, airport expansion, electricity generation, as well as

aid to tourism. In addition, Anguilla benefited from a number of activities carried out by regional organisations with funding from EDF's regional resources. Under the 10th EDF (2008 - 2013) 11,7 million EUR were allocated to support the implementation of the Medium Term Economic Strategy 2010-2014 (MTES) of the Government of Anguilla based in the following pillars: Restoring Macroeconomic Stability; Stimulating Sustainable and Diversified Economic Growth; Providing Supporting Social Development and Social Protection; and Reducing Environmental Vulnerability²⁵. For the 11th EDF about € 14 M are foreseen (2014-2020).

The UK is also a very active cooperation partner. The Department of Environment has completed a wide range of projects successfully. A list of projects can be found in the appendix.

Anguilla's other remaining significant donor is the Caribbean Development Bank (CDB) which has financed port development, road development and electricity development projects in the past. As stated above CDB is financing the Study to Reform Anguilla's Environment, Land Planning and Legislation - US\$245,812 (2012).

Other donors include the UNDP, Canadian International Development Agency (CIDA), Organisation of Eastern Caribbean States-Environment & Sustainable Development Unit (OECS-ESDU), UK Royal Society for the Protection of Birds (RSPB), and the Wider Caribbean Sea Turtle Conservation Network (WIDECAST) and the Caribbean Natural Resources Institute (CANARI).

6 CONCLUSIONS AND RECOMMENDATIONS

Anguilla hosts natural beauty and richness of marine and terrestrial habitats and life, which attract many tourists. The territory is facing several environmental pressures such as climate change, water and waste, loss of habitats and biodiversity, and invasive species. Part of the pressures are imposed by development due to the rapid growth of tourist industry, lack of utility infrastructures, very weak coastal zone management, weak integration of environment into planning of the country, lack of EIA procedures and of an effective protected areas network management system. However, Anguilla is in the nascent stage of developing solid instruments to ensure environmental protection. This is a crucial factor to safeguard Anguilla's attractiveness as a tourist destination, and the livelihoods of the population. From September 2012 to March 2013 Anguilla has implemented the Greening the Economy study to identify short, medium and long term actions necessary to promote and establish a common understanding of what is needed to integrate environmental issues into the planning processes in Anguilla and promote green economic growth. It is recommended that a list of priorities is produced as well as a road map to facilitate fund mobilization.

Similarly, the recent Anguilla's Climate change policy has many recommendations which should be implemented after a prioritization and action plan is performed.

²⁵ Single Programme Document of Anguilla - 10th EDF (March, 2012).

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Increase public health and pollution control	Improve the Water, wastewater and solid waste management	There is a water shortage issue. This has been compounded due to the closure of the desalination plant. At present, the plant is being decommissioned and water for national distribution is solely sourced from the groundwater aquifer. Sewage is through septic tanks and there is no regulation on package plants for hotels sewage treatment. Due to the growing population there is an increase in waste. This causes a concern regarding the holding capacity of the lone landfill site to accommodate the growing waste. There are no large recycling regimes in place however efforts are being made towards improving on the management strategies currently applied.	5 years	Anguilla government, private sector			EU, UK, Regional Development Banks, private investment
	Activities Assess the needs and possibilities for increased water mobilization. Develop water safety plans, catchment management plans, water resource management plans – considering the different uses. Work on cost recovery, and promotion of sustainable use, having in mind access to water of vulnerable people. Organise a structured business dialog with the stakeholders and decision makers in order to fix realistic plans (ready to be implemented) on water distribution and wastewater treatment, on different waste streams in order to achieve valorisation of waste, and to manage more efficiently some sorts of hazardous waste. Develop a national groundwater quantity and quality monitoring network. Improve efforts to address the issue of leakage of water in the public system. Collect experiences from different small island countries on solutions to increase wastewater management when majority of households use septic tanks. Increase the capacity of wastewater treatment. As significant funding to improve inadequate wastewater treatment is required, make all the necessary studies and design road map for improvement. Assess the waste streams and the installed infrastructure and process to identify the model of management of different waste streams. This should be done having also in mind the regional context, in particular the planned St. Maarten waste to energy plant. Study the several options and strategies for waste valorisation through recycling and exporting some added value waste. Work on cost recovery of waste management – e.g. a tax on imports of products that can generate waste with fiscal benefits on recycling or returning the waste to origin. Update standards and regulations for water, wastewater and waste management. Extend some multilateral environmental agreements on waste to increase protection. Establish agreement with other countries to receive sorts of waste that cannot be adequately managed.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Integrated Coastal zone Management	Develop and implement coastal zone management plan.	There are many pressures on coastal zones resulting in the destruction of corals, seagrass and mangroves. Income generating activities in the coastal area including in the sea are to not being fully explored.	5 years	Government of Anguilla			EU, UK
	Activities Involve and coordinate the various actors (environment, land, fishing, police, defense, ports, tourism, rural development, local authorities) Develop a study on the economic potential and environmental risks in coastal areas including climate change. Develop studies on income generating activities in the coastal areas, with a view also to support activities at sea. Conduct workshops to discuss options both at national and regional level. Develop an integrated coastal zone management plans integrating the several uses and the needs for protection, and take into account prospective scenarios and climate change. Tackle the issue of sand mining, by enforcement, finding alternatives for “legal” sand availability – license possible areas, produce if possible mechanical sand, study the potential of offshore exploration, if needed import sand. Drafting legislation necessary to implement the plan. Promote co-management, eco-tourism, renewable energies, wherever possible. Coordinate regionally for whatever harmonization and collaboration.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Invasive Species	Combat invasion lionfish and <i>Iguana</i>	Marine: invasive lion fish was first sighted in Anguilla in late 2010. Studies conducted complimented by local fishermen’s knowledge on this invasive species have concluded that the population is increasing. The lionfish poses a major threat to Anguilla’s fishing industry that contributes largely to the island’s GDP as well as the coral reefs habitat. Terrestrial: There has been a noticeable increase in the invasive <i>Iguana iguana</i> species in Anguilla native <i>Iguana delicatissima</i> species’ habitat. The <i>Iguana delicatissima</i> is endemic to the Leeward Islands. In many of the islands of its native range, the <i>Iguana delicatissima</i> is extinct. Anguilla is the most northern range where this species still exist.	Long term				
	Activities Generate more data on the marine and terrestrial ecosystems and species worth to protect. Build on experience from OCTs and other countries affected. Mobilize funds to support the implementation of the Lion Fish Response Plan. Elaborate and implement a response plan for <i>Iguana iguana</i> . Reinforce biosafety measures. Enact regulations for the control of ballast water from ships in the Caribbean and promote the adoption of regulations at global fora. Engage on European and worldwide awareness raising campaigns for fund mobilization and tourist attraction as ways to ensure long time financing. Harmonize legislation with the international environmental obligations (MEAs) extended to the territories.						

List of environmental projects undertaken in Anguilla

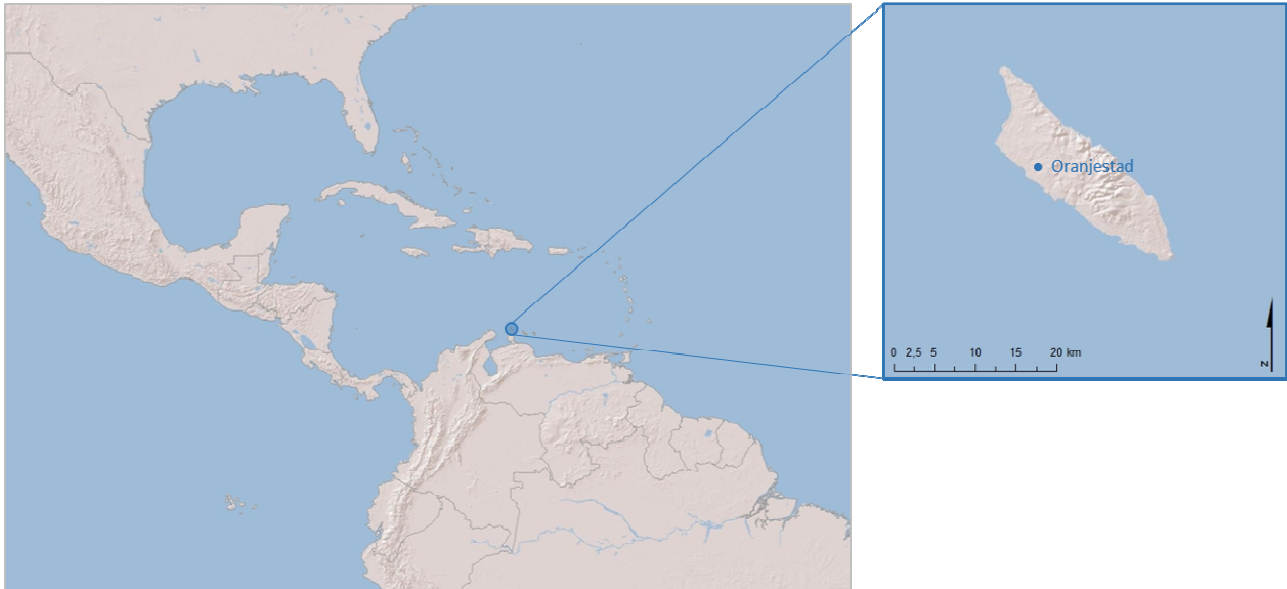
Description	Budget	Funding Source
2004-6: Technical assistance for drafting environmental/conservation legislation that will enable affordable and appropriate Multilateral Environmental Agreements to be extended to Anguilla	£ 82,000	??
2006: Anguilla Biodiversity Strategy and Action Plan Scoping Study and Workshop	£ 5000	OTEP
2004-7: Anguilla Coastal Resources Assessment Monitoring and Management Project (ACRAMAM).	£ 183,000	OTEP
2007-8: Anguilla National Biological Diversity Strategy and Action Plan)	£ 81,000	??
2008-10: Anguilla National Energy Policy	US\$ 200,000	??
2009: Anguilla Invasive Species Project	£ 20,000.00	JNCC
2010: Ecological assessment of Little Scrub Island	£ 3000	OTEP, with JNCC
2010: Enhancing CITES implementation in Anguilla.	£ 44,200	OTEP
2010: Organic Soil Amelioration for Enhancing Anguilla's Agricultural Adaptation to Climate Change	£ 27,000	OTEP
2011-2012: Terrestrial habitat mapping for Anguilla	£ 30,000	JNCC
2011-2012_ Wetlands Ecosystem Assessment	3,000 ?	JNCC ?
2012-2013: Marine habitat mapping for Anguilla	30,000 ?	Defra
2013-2014- Lionfish Response Strategy Project for Anguilla	£ 15,000	JNCC
2012-2013: Anguilla National Ecosystem Assessment – A Foundation for Green Economy	£ 22,200	DCF ?
2013-2014: Environmental Economics	£ 25,000	FCO/JNCC

ANNEX B :

ARUBA

ENVIRONMENTAL PROFILE

ARUBA



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SUMMARY

Aruba is an autonomous country within the Kingdom of the Netherlands and has a prosperous economy, based on tourism, off-shore financial services, oil refining and shipping. The oil refinery has been a major employer for almost 100 years but also a source of pollution. The refining process has been suspended and further activities will be confined to storage and fuel transshipment.

About 352 registered flora species live in a semi-desert landscape, of which nine are endemic. The Aruban Island rattlesnake is threatened of extinction.¹

Many nature protection and environmental laws are in place and a long term National Integrated Strategic Plan was launched in 2010 in a participatory manner.

However, a decree for the implementation of spatial plans is needed so that 'nature areas' may also be protected if needed. There is legislation about pollution but not on waste and the management of the increasing volumes of waste still leaves room for improvement. A draft nature and environment policy note, with a chapter on solid waste, will be discussed with the stakeholders in June 2014.

New plans are being made and implemented in favour of renewable energy (wind mills) but climate change risks are not being properly assessed.

1 BACKGROUND INFORMATION

Situated in the Caribbean region, west of Curaçao (also an autonomous country in the Kingdom) and Bonaire (a Public Entity or Dutch 'special' municipality). Aruba is the smallest, driest, windiest and richest of the three islands.

Relations with the Netherlands are regulated by a Charter of the Kingdom and Aruba. Aruba obtained *status aparte*² in 1986, at its request. It has an elected parliament which appoints the cabinet of ministers and the prime minister. A Governor General is appointed by and represents the Dutch King. The Dutch government is responsible for defence, foreign affairs and the Supreme Court.

Name of Territory	Aruba
Region	Caribbean
Land area	180 km ²
Maritime claims	EEZ: 2200 km ² Territorial sea: 2800 km ²
Population	109,153 (est. 2013) density 566 inhab/km ²
GDP/capita	€ 17,862 (est. 2011)
Literacy rate	97 % of population 15 and older
Unemployment rate	10.6% (Dep. of EACI, 2010)

Aruba has a population density of 566 inhabitants per km² (2013). There is emigration to the Netherlands where 14,000 Arubans live plus 65,000 Dutch citizens who were born in Aruba. There is also immigration from neighbouring Latin American and Caribbean nations. Many immigrants work in the hotel and restaurant sector, in commercial services and the construction industry. In 2012 the net migration was + 1,108.³

1 <http://www.dcnanature.org/flora-of-aruba-bonaire-and-curaçao/>

2 i.e. status as a separate national entity within the Kingdom of the Netherlands.

3 CBS, Statistical Yearbook 2012

The two official languages are Dutch and Papiamentu (a local language). Islanders can often speak four or more languages and are mostly Roman Catholic.

Physical geography

The Aruban countryside is a little undulating and the island is slightly tilted along its length at the northeast coast. Aruba has a diverse geological landscape that includes weather-shaped quartz-diorite boulders, basalt rocks from volcanic origin that find its origin beneath the sea, as well as limestone terraces, grottos and caves along the coast.

The highest point of the island is the Yamanota hill, on the southern part of the island (189 m above sea level) just a little higher than nearby Arikok that comes close with 184 m. The highest 'peak' is located centrally on the island, called the Hooiberg (just 166.5 m).

Yearly average temperatures fluctuate between 27°C in December and January and up close to 30°C on average during the months of June, July and August. Water temperature fluctuates even less and is about 28°C year round. The climate is dry and the land generally arid. Average wind speed at a height of 10 meter is about 7-8 m/s with little variation over the year but generally lower wind speeds during October, November and December (approx. 5 m/s) and higher wind speeds around June and July.

Aruba has extensive white beaches on the west side of the island. The south and west coastlines are sheltered from fierce ocean currents. The calm sea and the constant wind attracts windsurfers. The northern and eastern coasts, lacking protection, are considerably more battered by the sea and have been left largely untouched by humans. The waters around Aruba are shallow and very clear with a single coastal lagoon and extensive sea grass beds. Coral is found in most parts along the coastline. At a short distance from the southeast coastline stretch a number of small islets that are grown with mangrove vegetation. Most of the islets remain largely untouched and some have become important breeding spots, like for the endangered Stern. Others are used for tourism.

Although outside the hurricane belt, three hurricanes have affected Aruba in recent years: Lenny (1999), Ivan (2004) and Felix (2007). The first two led to a plan (2006-09) to improve rainwater drainage. Strong rains, even outside the hurricane season, cause flooding in the lower areas of the island due to the sun-dried soils that cannot absorb the rain water. Unconstrained construction in natural dry-river beds turn downhill roads in artificial water streams. Felix passed Aruba at a distance as close as 85 km north, but personal damage was restricted despite the strong winds, mainly because most houses are built in stone.

Precipitation in Aruba is generally low but annual variation in rainfall can be considerable between and within years (year total on average around 409 mm). Showers occur mainly during the small rainy season around Jan-Feb and during the major rainy season in October-November, but never last for long and can be found all year through. On average there are 60 rainy days per year.

Aruba has limited freshwater sources. A series of man-made groundwater wells still exist today but receive little attention. A natural groundwater well is still existent in Park Arikok, rainwater, predominantly used for agricultural purposes, is collected in artificial basins (tanki's) that also serve to relieve the lower areas from water during the heavy rainfalls.

Economy

Aruba has a high income compared with many Caribbean countries but the economy faced two major shocks in the last four years: the global financial crisis (which hit Aruba's tourism sector in 2009) and the shutdown of Valero oil refinery for a total of 27 months during 2009-12 reflecting poor profitability.⁴ Although tourism, the mainstay of Aruban economy, rebounded quickly, Valero's shutdown has left harder-to-fill gaps in investment and non-tourism exports, with real GDP projected to reach its pre-crisis level only in 2018.⁵

⁴ Whole paragraph from IMF August 2013, <http://www.imf.org/external/np/sec/pr/2013/pr13303.htm>

⁵ IMF report on Aruba, august 2013. <http://www.imf.org/external/np/sec/pr/2013/pr13303.htm>

Over 80% of the economy depends directly or indirectly on tourism making Aruba the second highest tourism-dependent country in the world. There were 903,934 visitors in 2012 plus 582,313 cruise ship passengers.⁶ The hotel/restaurant sector employs 9,526 people, 20% of the workforce.

The oil industry has declined in economic importance. The oil refinery on the island closed in 1985, reopened in 1991 with a capacity of 275,000 barrels per day but suspended the refining activities in 2012. The wholesale and retail trade employs 16.2% of the workforce, the real estate, renting and business activities 9.1 % and the construction industry 8.3%.⁷ Other important sectors are marine transshipment and offshore financial services.

Because of its aridity and poor soil, typical (colonial) plantations did not occur. Only 10% of the land is arable.

2 BIOGEOGRAPHY, ENDEMISM, IMPORTANCE FOR GLOBAL BIODIVERSITY

The strong salt-laden winds from the Northeast Passat, the dry and hot weather conditions and the erosion of soils during heavy rains create a challenging climate for plants and animals. Along the east coast the land is barren and vegetation is scarce. Divi-divi trees (*Caesalpinia coriaria*) grow flattened to the ground by the constant winds, but more off-wind, along the dry-river beds and inland, nature reveals itself and can be quite abundant.

The National Park Arikok is located centrally on the island, covers most of the hilly interior and harbours many of the various exotic cacti species as well as some 50 different species of tree, some of which are threatened with local extinction on the other parts of the island.⁸ In this semi-desert landscape, 352 registered flora species still live, of which nine are endemic.⁹ The presence of invasive plant species poses a threat to the local plant communities.

Despite its small size, Aruba counts over 200 different bird species, amongst which 70 resident breeders. The majority of bird species are migrants and thus interesting observations can be made in all months of the year.^{10,11} A number of bird species have gone extinct and there is a real threat for other species to follow. A small endemic subspecies of the burrowing owl has the official status of national bird of Aruba, but also the brown-throated parakeet is an endemic subspecies¹² that faces increasing difficulty to adapt to the urbanisation of the landscape and many are being kept as pets.

Several internationally recognised bird refuges or bird sanctuaries exist in Aruba, amongst which a significant breeding colony of stern species and the Spanish Lagoon and the Bubali Plas, but they are not legally protected.

The coastal waters, the coral reef, the mangroves and the sea grass beds are home to various vertebrate and invertebrate marine species that play a dominant role in the ecosystem. Over 165 species of fish have been identified during fish surveys on Aruba¹³ and an estimated 14 mammal marine species have been identified as more or less common to the Aruban waters. Amongst these are the Bryde's Whale, the

6 2012, CBS- Centraal Bureau voor de Statistiek- Statistical Office.

7 CBS, SVB 2012

8 DCNA (Dutch Caribbean Nature Alliance) Island Profiles, www.dcnanl.nl

9 André van Proosdi in BioNews 5 – May 2013: The Flora of Aruba, Bonaire and Curaçao: <http://www.dcnanature.org/flora-of-aruba-bonaire-and-curaçao/>

10 BirdLife International (2013) Country profile: Aruba (to Netherlands). Available from: <http://www.birdlife.org/datazone/country/aruba>.

11 Prins et al: Checklist of the birds of Aruba, Curaçao and Bonaire in: South Caribbean Journal of Netherlands Ornithologists, 97(2) 2009. <http://www.arubabirds.com/>

12 Source <http://www.nciucn.nl>. See also www.sidsnet.org/eco-tourism/arikok.html

13 McGinley, M. (2009). Common coral reef fishes of Aruba: <http://www.eoearth.org/view/article/151328/> based on REEF Geographic Zone Report, May 27, 2009

Antillian beaked whale, the goosebeak whale and several dolphins.¹⁴

Four endangered sea turtle species breed on Aruban beaches.^{15,16} Additionally, on land 17 reptile species are found, amongst which the green iguana and several gecko and lizard species as well as some 4 types of snake:

- the small Aruban cat-eyed snake that feeds on insects and lizards;
- the endemic but highly threatened Aruban Island rattlesnake;
- the very invasive boa constrictor;
- the introduced small blind snake.

The rare, endemic and threatened Aruban rattlesnake (cascabel) is found in the National Park Arikok and the park serves as a protection shield/area for the survival of this snake.¹⁷

Furthermore, in Aruba three amphibian species are found; the Columbian four-eyed frog that has become more or less endemic over history, the invasive cane toad and the more recently introduced Johnstone's frog.

The Arikok National Park has been established in 2000¹⁸. It reserves 34 km² (18% of the island) for nature conservation, which covers Hill Jamanota and significant areas of cactus scrub.

There are four IBAs (Important Bird Area) that cover 610 ha (9% of area) but support over 30,000 seabirds and a number of other significant bird populations. Bubali Wetlands IBA (AW001), Oranjestad Reef Islands IBA (AW003), and San Nicolas Bay Reef Islands IBA (AW004) are all state owned but there is no formal protection. Tierra del Sol Salina IBA (AW002) is set within a privately-owned golf course and is unprotected by local legislation. A number of other "protected areas" such as the Het Spaans Lagoen (Spanish Lagoon) exist. This site is appointed as a wetland (Ramsar) but has not received a legally protected status yet.

3 STATE OF THE ENVIRONMENT

In 2012 the Directorate of Nature and Environment (DNE) was established to develop policy, do research and enforce legislation on nature and environment. On conservation of species and nature areas (marine or terrestrial), volunteer organisations play an important role.

Air quality may have improved as the oil refinery installation that previously emitted sulphur dioxide, nitrogen oxides and particles (as well as carbon dioxide) has stopped functioning and plans are to make it a storage facility. Today's air pollution mainly originates from the desalination plant, the inadequate removal of air conditioning systems (containing ozone depleting substances) and daily motorized traffic use. There is a constant increase in the number of cars (531 passenger cars per 1000 inhabitants in 2012 versus 439 passenger cars in 2000).¹⁹

Drinking water in Aruba is produced by desalination of seawater since 1930. Seeking energy efficiency Seawater Reverse Osmosis (SWRO) plants are being introduced, these plants use 75% less energy compared to the traditional thermal evaporation plants. The Water and Energy Company WEB put a first plant in into operation in 2008 and a second came into operation in July 2012, and WEB plans more SWRO plants.²⁰

To cope with population growth and tourism, Aruba is fully equipped to handle the entire country's

14 Bird International: Important Bird Areas in the Caribbean by Adrian del Nevo, with a Chapter on Aruba by Ebrot et al, 1998.

<http://www.arubabirds.com/>

15 Widecast Reports, 1992, 2007. <http://www.widecast.org/What/Country/Aruba/aruba.html>

16 IUCN: Petit & Prudent: Changement climatique et biodiversité dans l'outre-mer européen. Chapter on Aruba. 2010.

17 www.sidsnet.org/eco-tourism/arikok.html

18 <http://www.arubanationalpark.org/>

19 For comparison: 483 in 2011 and 487 in 2008

20 <http://www.webaruba.com/en/component/content/article/46-slide-show/133-swro-iii.html>

wastewater flow. The expansion of the Bubali plant and the installation of two new state of the art treatment plants are now successfully treating 100% of Aruba's centrally collected or trucked wastewater.²¹ The system was completed in September 2008. These projects are being financed by the Aruban Development Fund as part of a multi-annual investment plan to implement the LBS (land bases pollution) protocol (Cartagena convention).

Waste disposal at Parkietenbos (until 2004 open burning) is causing less odour pollution as it was converted to landfill. The existing landfill has reached its capacity and other methods for waste management are being considered. A draft nature and environment policy note, with a chapter on solid waste, will be discussed with the stakeholders in June 2014.

In 2010, 89% of the electricity production (880 million kWh) came from fossil fuels and 10% from renewables.²²

3.1 THREATS / CHALLENGES / VULNERABILITY

The natural wealth of Aruba attracts tourists but is under threat on a number of fronts: degradation of the natural environment, challenges to reduce dependence on imported fossil fuels and stimulate renewable energy and climate change.

The environmental vulnerability index²³ made for Aruba in 2005 indicated that Aruba environment is Vulnerable. The identified greatest risks for Aruba were:

- lowlands (the percentage of land lower than 50m above sea level);
- migrating species (number of known species that migrate outside the territorial area at any time during their life spans (including land and all aquatic species) / area of land;
- the number of endangered and vulnerable species per 1000 km² land area (IUCN definitions);
- air quality (average annual SO₂ emissions over the last 5 years).

Challenge 1 - Climate change - Severe

Climate change is expected to have a whole raft of adverse effects in many countries, but these effects are likely to be particularly severe in small tropical islands. The table below applies this general analysis to the specific circumstances of Aruba.

Impact	Severity	Comments
Inundation of coastal land	●	Aruba is generally low-lying, with populous coastal zones and thus vulnerable to rising sea-level. The beaches and hotels are particularly vulnerable and the salt margins on the southwest side of the island. The potential loss of beaches is a serious threat for the turtles (nesting ground) and the tourist industry.
Stressed fisheries	○	The fishing industry is small in Aruba.
Coral reefs threatened (bleaching, decreasing pH)	●	Coral reefs on the North coast, still in good condition, may be subject to bleaching due to water temperature rise and destruction from more intense storms. This may also apply to the other coral reefs around the island.
Salination of groundwater	●	Groundwater use is marginal. Due to seawater infiltration it is brackish, and further contamination of the groundwater will put more stress on the flora land inwards. Some groundwater is being used for agricultural purposes.
Agriculture	○	More intense sunshine has led to an increased use of shade-house agriculture to protect crops ²⁴ .

²¹ <http://www.cstindustries.com/cdn/pdf/SUCCESS-STORY-Nation-of-Aruba.pdf>

²² CIA: <https://www.cia.gov/library/publications/the-world-factbook/geos/aa.html>

²³ <http://www.vulnerabilityindex.net/>

²⁴ ECLAC - Study Climate change and Caribbean countries 2010, <http://www.eclac.org/publicaciones/xml/8/39188/LCARL250.pdf>

Tourist industry	●	Tourist industry accounts for 80% of GDP. Reef tourism and fishing are important attractions. All the resorts are within 50 meters of the shoreline and some tourism facilities (restaurants and malls) are within 300 m of the shoreline and built on the salt margins.
Finances	●	The government wants to diminish the dependency on fossil fuels (and promote renewable energy) but international loans are easier to attain for the development of fossil fuel industry than for investment in renewable energy.
More frequent and more intense storms	○	Increased destruction from storms, flooding of urban areas. The strong rains, even those outside the hurricane season, repeatedly cause flooding in the lower areas.
○ Nil ○ Slight ○ Moderate ● Heavy		

Challenge 2 - Nature conservation / biodiversity - Moderate to severe

There are many laws to protect the environment but implementation lags behind. The Department of Economic Affairs (DEACI) announces on its site under "environment" that Aruba is updating its environmental laws.

The typical cactus scrub vegetation, columnar cacti fields and a cacti-woodland mix were once abundant but are threatened by land clearances as they have to make way for new construction and developments. Similarly, only few pockets with mangrove vegetation remain along the southwest coast.

The coral communities in Aruba are threatened by human interference (intensified touristic and economic activities), emerging coral diseases, some very invasive species, as well as the silty and polluted rainwater runoff (from construction, land clearances, polluted soils and economic and household waste), combined with the effects of seawater temperature rise and the acidification of marine waters.

Marine turtles breeding on Aruban beaches receive full protection (including nest protection) but the direct and indirect disturbances through intensified touristic and economic activities along the coastline is brought less under control.

Damage: corals	Severity	Impacts
Tourism	●	Damage resulting directly by tourism includes mechanical breakage by scuba divers and snorkelers, ships' anchors and fishing tackle.
Coastal zone development and activities	●	Increased coastal development has resulted in pollution of near shore waters through the release of (untreated) sewage, nutrients and chemicals, resulting in algae growth and death of coral reefs.
Pollution	○	Non treated waste water caused a decrease in the abundance of corals on the island in the last 25 years.
Several causes, overfishing	○	Bleaching events and disease can derive from a series of factors, from difference in water temperature to the sun skin-protectors used by sea users.
Damage: sea grass beds	Severity	Comments
Degradation of coral reefs	○	Coral reefs protect the sea-grass beds lying on their shoreward side, so their degradation can adversely affect the sea grass. Degradation of sea-grass can affect the coral reefs by capturing less sediments coming from the land, causing more turbid waters which on the long term will kill the corals.
Anthropogenic activities	○	Physical removal, siltation and turbidity.
Damage: mangroves and terrestrial habitats	Severity	Comments
Construction and development	○	Mangroves continue to be cleared and drained for construction and development due to inadequate planning

		and conservation legislation. Terrestrial habitats are also undergoing loss and fragmentation as a result of expansion of residential / commercial areas and infrastructure.
Damage: biodiversity	Severity	Comments
Non-native species	●	Lionfish is an invasive species, not native to the Caribbean. They reproduce quickly as they have no natural enemies except for large groupers which are practically extinct because of overfishing. They eat small and juvenile fish and reduce recruitment of new reef fish such as snappers, groupers, grunts and parrotfish. Boa constrictors pose a serious threat to native wildlife, particularly birds. There are around 8,000 boa constrictors on Aruba, which compete with local rattlesnakes for food and habitat. There is also non-native flora, their impact is not yet known.
○ Nil ○ Slight ● Moderate ● Heavy		

Compared to 2006, there is now an air and water quality monitoring system, but the air monitoring has been temporarily suspended.²⁵

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

As an autonomous country within the Kingdom of the Netherlands, Aruba has had the obligation and the opportunity to develop and implement many policy plans concerning nature and environment.

The Government of Aruba is transferring the environmental care strategy from mainly governmental responsibility to other actors (including the polluters). In the bill for an integrated environmental protection legislation this new strategy has been introduced, and it plays a major role in the draft nature and environment policy. The new National Integrated Strategic Plan (NISP) for Aruba adopts a very interactive way of working and involvement of civil society.²⁶

4.2 REVIEW OF CURRENT INSTITUTIONS

Some key departments for environmental governance have recently been established in Aruba.

The Directorate of Nature and Environment (DNE) created in 2012 develops policies, does research and enforces legislation on nature and environment. Since January 2014 the DNE is part of the Ministry of Economic Affairs, Communication, Energy and Environment. The establishment of this directorate strengthened a previously noted (in the 2006 profile) weakness by establishing an entity in charge of policy-making and coordination of execution of management tasks regarding the environment.

The Meteorological Service of Aruba received its autonomous status in 2010. Before this the Meteorological Services was part of Curaçao /Netherlands Antilles

In 2012 Bureau of City Inspectors has been established to enforce the relatively simple environment regulations in the General Police Ordinance.

²⁵ Info from the environmental service on Aruba.

²⁶ See special participatory website: <http://www.nosaruba2025.aw/>

As of January 2013, the Central Bureau of Statistics Aruba has installed a section Environmental Statistics.²⁷

These newly established departments are receiving gradually qualified personnel and additional budgets, but there is a need for more personnel with environmental qualifications and the need for financial resources are there.

Important to note is that the recent National Integrated Strategic Plan (NISP) for Aruba adopts a very interactive way of working and involvement of civil society and has created twelve commissions among others: energy management, environment, sustainable tourism, sustainable food supplies²⁸.

The Green Conference is an annual event organised by the government and in which private companies participate in knowledge sharing, research and marketing. Sustainable energy provision is the basis for the conference and the motor for pushing the economy forward, for human development and the environment.

The Arikok National Park is administered by the Fundacion Parke Nacional Arikok. The park is funded by the government and generates some revenue such as entrance fees. The WWF helped prepare the regulations for the Arikok National Park.

4.3 POLICY, STRATEGY, PLANS, PROGRAMMES

The new National Integrated Strategic Plan (NISP) Aruba – Action Plan 2010-2013 of February 2010²⁹ aims at an integrated and strategic planning process where the coordination between the relevant stakeholders is encouraged, taking into consideration guidelines for sustainable development.

The Directorate of Nature and Environment (DNE) is drafting a new nature and environmental policy, which includes 16 different themes. The intention is to present and discuss this draft policy document in a multi-stakeholders meeting in June 2014. The stakeholders are other government departments, commercial and environmental organisations.

Energy

One of the main goals of Aruba's development policy is to maximize the use of local renewable energy sources and to minimise the use of environmentally unfriendly fossil fuels.³⁰ The ambition stated in the NISP is to have a reduction of imported fuels of 50% in 2025 (compared to 2009). This target has recently been adjusted to becoming independent of fossil fuel by 2020.

As part of the road map to 2020³¹ the Aruba Water and energy Company (WEB)³² introduced renewable energy technology. The wind farm "Vader Piet" (30 MW) meets 18% of the islands current electricity demand (2010). The ambition is to expand the current 30 MW wind energy with additional capacity at another location (Urirama). The government asked for a SEIA for this new wind farm.³³ It will consist of 10 turbines of about 3 MW situated in one line along the northeast coast. The farm will generate on average 170 GWh per year, which is about 18% of the power generated by WEB in 2010. Realisation is expected in 2015.

Besides, Aruba co-hosted the 2013 Caribbean Renewable Energy Forum (CREF 2013)³⁴, the region's largest gathering of regional and international energy stakeholders. A Green Aruba IV Conference took

²⁷ www.cbs.aw

²⁸ http://www.nosaruba2025.aw/index.php?option=com_content&view=article&id=11&Itemid=61&lang=en

²⁹ <http://www.slideshare.net/e.erasmus/national-integrated-strategic-plan-nisp-aruba>

³⁰ <http://www.slideshare.net/e.erasmus/national-integrated-strategic-plan-nisp-aruba>

³¹ <http://www.webaruba.com/en/news/awaelectra-newsletter-july-2013/182-pelicula-cortico-web-semper-riba-dje.html>

³² <http://www.webaruba.com/>

³³ <http://savealtovistadotcom.files.wordpress.com/2012/05/sea-report-urirama-rev-1-of-8-may-20121.pdf>

³⁴ www.caribbeanenergyforum.com

also place in 2013³⁵, and the minister of the Department of Finance, Communication, Utilities and Energy officially announced at this occasion that a new solar and biogas project will be realised in 2014.

Water

At the Green Aruba IV Conference³⁶, WEB presented a sustainable water concept. The goals are a reduction of the use and loss of 'good' quality drinking water by 64% and production of water for irrigation, also from water treatment facilities. The latter is still controversial worldwide, as use of WWTP treated water for irrigation may pose serious health problems if not conveniently treated and monitored, and to the high costs involved in producing good quality water this way.

Nature

The Arikok National Park focuses its conservation efforts among others on the control of invasive boa constrictors inside and outside of the park.³⁷ It also launched a bat monitoring and cave mapping programme, linked to a programme initiated by their colleagues at STINAPA³⁸ Bonaire. Bats are a critical part of the pollination process, particularly for cactus. A reforestation project was launched as a first step towards counteracting the effects of overgrazing by livestock, which is a serious threat to nature throughout the Dutch Caribbean. The park began a study of the re-growth of vegetation in areas where grazing animals have been excluded. The next step will be the construction of tree nurseries.

The park is also planning on the execution of a monitoring program for local birds. There are four IBAs (Important Bird Areas): Bubali Wetlands IBA (AW001), Oranjestad Reef Islands IBA (AW003), and San Nicolas Bay Reef Islands IBA (AW004). These areas are not formally protected. Tierra del Sol Salina IBA (AW002) is set within a privately-owned golf course and is unprotected.

An island-wide Zoning Plan is being developed and aims to identify areas of importance and those requiring protection and conservation. The Plan includes the Linear Park which is a recreational and tourist park, starting at the airport, going to Oranjestad and further to the low rise and high rise resorts till the Arashi beach and California light house.

Waste

In its first solid waste management policy plan of 1996³⁹ a framework was set out and this policy plan was followed by an Agenda 21 in 2003.⁴⁰ Waste management for Aruba is now a set of actions listed in the National Development Plan 2003-2007.

The National Integrated Strategic Plan (NISP) for 2010-2013 has a chapter on waste, and lists the following actions:

- implement the 5 R behaviour (refuse, reuse, reduce, recycle and restore);
- introduce recycle bins for cans, bottles, paper, plastic; and
- convert waste to energy, if feasible within environmental policy.

The recycling facilities Ecotech⁴¹, Serlimar and other parties are interested in participating in new policy development. Ecotech is running a recycling facility and will extend its facility with a waste-to-energy installation, which will be operational in 2015. Serlimar has improved the waste collection by introducing additional services next to the seminal household waste collection, among other monthly bulky waste collection with 20 foot containers and the blue bag waste collection service.

The draft nature and environment policy note, with a chapter on solid waste, will be discussed with the stakeholders in June 2014.

35 www.greenaruba.org

36 Held on October 9th 2013, <http://www.greenaruba.org>

37 Dutch Caribbean Nature Alliance (DCNA), Annual Report 2012)

38 Stichting Nationale Parken

39 Ondernemend afvalverwerken

40 "Aruba: op weg naar een duurzame ontwikkeling; middels een op agenda 21 gebaseerd milieubeleid" (2003)

41 Ecotech is running a recycling facility and will extend its facility with a waste-to-energy installation, which will be operational in 2015.

Internal Environmental Care System

Some companies have ISO 14000 certification. Seven hotels are Green Globe Certified, others have their own internal environmental management system in place.

4.4 LEGAL FRAMEWORK AND ENFORCEMENT

The Kingdom of the Netherlands is signatory and party to various multilateral environmental agreements. The Dutch Minister of Foreign Affairs represents the Kingdom and signs. Each country or territory can decide independently whether to join and implement such agreements. Aruba is autonomous when it concerns internal affairs and the environment.

Aruba participates in the following MEA:

MEA	Remarks
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)	Aruba plans to have the Convention plus its three protocols (Oil Spills), SPAW and Land-Based Sources Protocol extended to Aruba in 2007. Its obligations include the preparation of a national oil spill plan and the appointment of an oil spills coordinator, legislation on special protected areas and ending the discharge of untreated sewage into the sea. The costs are estimated to be about € 50 million. In the FDA the specific funds were reserved and implemented for these activities.

Aruba would also like to participate in the Kyoto Protocol to the UNFCCC, but some further legislation will be required for this.

Besides, Aruba has the following national legislation:⁴²

1. Nature Conservation Ordinance of 1995⁴³

This ordinance is a framework act aiming to protect local flora and fauna as well as internationally protected flora and fauna. Under this ordinance nature reserves can be designated and established.

The ordinance is the basis for the implementation of the Cartagena Convention (SPAW Protocol) and the CITES Convention. It is supplemented by a number of implementing decrees of which the designation of the national Park Arikok. The implementing decrees:

- National Decree that prohibits spearfishing⁴⁴
- National Decree National Park Arikok ⁴⁵
- National Decree CITES-register⁴⁶
- National Decree about general rules performing supervision ⁴⁷
- National Decree with dispensation to protect non-native flora and fauna⁴⁸

A new decree is being drafted that will identify flora and fauna specimens that need special protection. Only by exemption of the minister these flora and fauna species would be allowed to be removed.

⁴² All to be found on this page: <http://www.dcnanature.org/resources/policy-law-enforcement/>

A good description in English of the laws is also found in this SEIA study: <http://savealtovistadotcom.files.wordpress.com/2012/05/sea-report-urirama-rev-1-of-8-may-20121.pdf> Chapter 5: Laws and regulations

⁴³ Natuurbeschermingsverordening (AB 1995 no.2)

<http://dcnanature.org/wp-content/uploads/2012/09/0603AB95.002.pdf>

⁴⁴ LB verboden onderwaterjachtmiddelen (AB 2001 no. 115):

<http://dcnanature.org/wp-content/uploads/2012/09/0603ab01.115.pdf>

⁴⁵ <http://dcnanature.org/wp-content/uploads/2012/09/0603AB00.059.pdf> LB natuurreserveaat Parke Nacional Arikok) (AB2000 no. 59)

⁴⁶ LB CITES-register (AB 1995 no. 69: <http://dcnanature.org/wp-content/uploads/2012/09/0603AB95.069.pdf>

⁴⁷ LB algemene bepalingen toezichtuitoefening (AB 1998 no. 70)

<http://dcnanature.org/wp-content/uploads/2012/09/0603AB95.069.pdf>

⁴⁸ LB ontheffing beschermde niet-inheemse flora en fauna (AB 1996 no.1)

<http://dcnanature.org/wp-content/uploads/2012/09/0603AB96.001.pdf>

2. Marine Environment Ordinance of Aruba⁴⁹ with implementing decrees:

- National Decree concerning general provisions of article 5 regarding tortoise⁵⁰
- National Decree concerning general provisions of article 5 regarding calco⁵¹
- National Decree prohibiting hunting coral fish⁵²
- National Decree concerning general provisions of article 13, third section regarding corals protection⁵³

Other ordinances:

- National Ordinance about public waters and beaches⁵⁴ Regulates clean beaches and waste disposal.
- National Ordinance about Prevention of Pollution from Ships⁵⁵
- National Ordinance about Compensation Fund of injuries made by oil tankers⁵⁶
- National Ordinance about responsibility of oil tankers⁵⁷
- National Ordinance about petroleum in the sea area of Aruba⁵⁸

3. Nuisance Ordinance ⁵⁹ The scope of action is limited to "nuisance" (i.e. stench, dust, smoke, noise, etc.). As more sophisticated legislation is lacking, this permit system is currently the main instrument for the government for inhibiting and mitigating pressure on the environment.

The National Decree about Nuisance ⁶⁰ describes industrial and commercial activities subject to a (basic) environmental permit. A wind farm is not appointed as such.

We note that this legislation about pollution is not a legislation on waste.

4. Police Ordinance.⁶¹ Building activity on or next to the public road is prohibited without a permit by the Minister of Public Works.

5. Spatial or zoning legislation:

The new National Integrated Strategic Plan (NISP) Aruba– Action Plan 2010-2013 of February 2010 asks for the Implementation of the Spatial Plan (ROP= 'Ruimtelijk Ontwikkelingsplan'), laid down in May 2009. But the ROP does not contain legally binding conditions for the use of the land. A so called ROPV (ROP with 'conditions'= 'Voorwaarden') has to be drafted and implemented.⁶² Such a Spatial Development Ordinance is being drafted but not yet approved/ ratified by Parliament. So in fact even when an area is described as 'nature area' ("natuurgebied") there are no conditions unless it is a 'nature reserve' which is the case only for the National Park Arikok.

Of particular interest is the moratorium on investment in hotel development on the west coast. Expansion in room capacity is only allowed under the following conditions:

- For luxury units if realised entirely by the local labour force.
- The contribution to the Aruban economy must be maximised. At least 25% of the construction materials should be purchased locally and only local builders should be used.
- The hotel should be operated by local personnel recruited from the local labour pool

Aruba has a strong commitment to implement the Cartagena convention: the oil spill protocol has been implemented and Aruba has a National Oil spill contingency plan since 1997 (needs to be updated); the SPAW protocol has been implemented partially; need to establish Marine Protected Areas; the LBS

49 Marien Milieuverordening (AB 1980 no. 18)

50 LB ham t.u.v. art.5 m.b.t. schildpadden (AB 1987 no. 51) <http://dcnanature.org/wp-content/uploads/2012/09/0603AB87.051.pdf>

51 LB ham t.u.v. art. 5 m.b.t. calco (AB 1987 no. 52) <http://dcnanature.org/wp-content/uploads/2012/09/0603AB87.052.pdf>

52 LB verbod jacht op koraalvissen (AB 1992 no. 70) <http://dcnanature.org/wp-content/uploads/2012/09/0603AB92.070.pdf>

53 LB ham t.u.v. art. 13, derde lid (bescherming koralen) (AB 1988 no.52)

54 Lv openbare wateren en stranden (AB 1987 no. 123)

55 Lv Voorkoming van Verontreiniging door Schepen (AB 1993 no.72)

56 Lv schadefondsolietskopen (AB 2005 no. 16)

57 Lv aansprakelijkheid olietankschepen (AB 2005 no. 17)

58 Petroleumverordening zeegebied Aruba (AB 1987 no. 89)

59 Hinderverordening (AB 1988 GT 27) <http://dcnanature.org/wp-content/uploads/2012/09/0602GT88.027.pdf>

60 Hinderbesluit (AB 1995 GT 20)

61 Algemene Politieverordening, AB 1995 GT8, wijzigingen 1997 no. 18, AB 1997 no. 34; AB 2005 no. 5; AB 2011 no.23.

62 <http://www.dip.aw/ROP%20planbeschrijving.pdf>

protocol has been implemented (see paragraph (waste) water and paragraph waste) and needs to be ratified. A bill to establish the Spaans Lagoen as a Ramsar site is in process.

4.5 MONITORING AND ENFORCEMENT

The Bureau City Inspectors (BCI) enforces the General Police Act and has six inspectors. The Directorate of Nature and Environment (DNE) enforces the more complex environmental laws and has five inspectors.

Under the guidance of the Public Prosecutor, the Police, Inspectors of DNE and BCI work closely together to enforce illegal dumping of waste. A taskforce of these four entities enforces the action plan: "Sushi na su lugar!" (Waste on its place!).

An air and water quality monitoring network⁶³ was set up with funds from the Aruban Development Fund (ADF). Water monitoring began in 2007 and is collecting data from seawater, irrigation water (collected from rainwater) and effluent from the sewage water treatment plant. Air monitoring is currently on a halt due to technical drawbacks.

Seawater is monitored to maintain a high quality level for swimming water. The rainwater collected in eight basins spread throughout the island is also monitored and finally the effluent from the WWTP are monitored. The Sanitation Department collects the samples, the National Laboratory analyses and the Directorate of Nature and Environment interprets the results. The samples are checked for faecal coliforms, *E. coli* and *Enterococcus faecalis*.

An early warning system for disasters is operated by the Meteorological department.

4.6 ENVIRONMENTAL AWARENESS

Private and public companies, as well as several NGOs and foundations are active on environment.

In the tourism sector:

- Bucuti & Tara Beach Resorts support community eco-efforts;
- Seven hotels in Aruba are Green Globe certified. With the growth in popularity of the environmentally-friendly tourism product in the marketplace, "green management" is now a key marketing tool. One luxury hotel is also using solar energy for electricity generation, rather than for water heating alone.⁶⁴

The Aruba Birdlife Conservation founded in 2010, voiced its serious concerns about Aruba's arrears in ratifying and implementing international nature treaties. It says that at the local level insufficient attention is given to nature, and that Aruba's nature protection legislation is not being implemented. The foundation intends to focus on ensuring enforcement of this legislation to prevent further structural damage to Aruba's nature.

In 2010 the Aruba Marine Park Foundation was created by volunteers.⁶⁵ The foundation seeks to protect Aruba's marine environment through the establishment of a marine park to ensure the sustainable use of the island's marine resources. The foundation concentrates efforts on the national lionfish control programme⁶⁶ and the implementation of a new public mooring programme in cooperation with local water sport operators and Serlimar, the garbage disposal company of Aruba. The Aruba Marine Park Foundation has no legal protected area under its management.

⁶³ Regional level evaluation OCTS EU 2011:

⁶⁴ ECLAC - Study Climate change and Caribbean countries 2010, <http://www.eclac.org/publicaciones/xml/8/39188/LCARL250.pdf>

⁶⁵ Annual Report 2012 - Dutch Caribbean Nature Alliance (DCNA), www.dcnanature.org

⁶⁶ <http://aruba-daily.com/newspaper/you-too-can-help-protect-arubas-marine-life-and-reefs-join-the-jolly-pirates-in-creating-awareness-by-supporting-the-save-the-reefs-bracelet-program-2/>

The Aruba Reef Care (voluntary) Project is an annual clean-up (since 1994) of the island's most popular beaches, dive and snorkel sites. It also helps raise awareness for a clean marine environment in Aruba.⁶⁷ With over 800 participants including local residents and visitors from around the world, it is the largest volunteer environmental event in Aruba. It is sponsored by the Aruba Tourism Authority.

Turtugaruba is a local NGO that gives awareness and helps with the protection of sea turtles nests. They monitor the nests every year for the four different sea turtle species that visit the beaches of Aruba.

Stimaruba is a nature NGO that gives information and organize other educational activities for the local community regarding Aruba's nature.

DCNA, the Dutch Caribbean Nature Alliance, is a well-established Foundation that informs about nature and the environment in the six Dutch OCTs.⁶⁸

4.7 FINANCE FOR THE ENVIRONMENT

Concerning own resources for financing nature and environmental investments and running costs, a solid waste management tax on collection and disposal will soon be introduced. There are no deposit /refund systems in place.

5 COOPERATION

5.1 INTERNATIONAL

Aruba is a member of the Alliance of Small Island States (AOSIS). Aruba is an active participant in the Regional UNEP, the Caribbean Environmental Programme.

Organisations in which Aruba is represented: Caribbean Community CARICOM⁶⁹ (observer), Economic Commission for Latin America and the Caribbean (ECLAC)⁷⁰ (associate), UNESCO (associate), WTO (associate) and Caribbean Tourism Organisation.

5.2 WITH THE NETHERLANDS

There is a co-operation agreement (of May 2000) with the Netherlands through a special development fund (*Fondo Desaroyo Arubano, FDA*). Two multi-year programmes were financed (up to 2009).

The first programme (2001-2005) concentrated on the implementation of the LBS protocol (Land-Based Sources of pollution) of the Cartagena Convention⁷¹ which includes waste water, air and water monitoring, solid waste management, beach improvement and an awareness campaign.

The funds for 2006-2009 in the FDA amounted to € 200 million (equally contributed by the Dutch and Aruban governments). Its priorities are good governance, sustainable economic development, education and the social sector.⁷²

⁶⁷ <http://24ora.com/local-mainmenu-5/74192-castro-perez-di-aruba-reef-care-foundation-sistema-di-waterside-security-por-contribui-na-preservacion-di-bida-marino>

⁶⁸ www.dcna.nl or www.dcnanature.org

⁶⁹ <http://www.caricom.org/>

⁷⁰ <http://www.cepal.org/default.asp?idioma=IN>

⁷¹ Protocol Concerning Pollution from Land-Based Sources and Activities (or LBS Protocol).

<http://www.cep.unep.org/cartagena-convention/lbs-protocol/the-lbs-protocol-overview.pdf>

⁷² http://www.vertegenwoordiging-aruba.nl/algemene_onderdelen/persberichten/overeenstemming

Up to 2009, the programs focused on: ⁷³restoration of downtown Oranjestad, including offices of Aruba's administration; revitalisation of San Nicolas (2nd city of Aruba) and renovation and repair of schools.

Some projects of the Program 2006-09 were executed later (in 2011), including those dealing with good governance, sustainable economic development, education, social sector and public health.

5.3 COOPERATION WITH THE EU⁷⁴

The EU Council Overseas Association Decision supports co-operation and development projects.

In the 9th EDF two projects were financed: the National Park (construction of roads in the park and visitor's centre and offices) and the National archaeological museum (€ 9.8 million).

The Single Programming Document under the 10th EDF (signed in 2011) has a budget of € 8.8 million. ⁷⁵ Focus is on education and how extra investments are needed for urban renewal, neighbourhood enhancement, modernisation of roads.

On the environment, the following needs are mentioned:

- Expansion and updating of the environmental legislation;
- Polluter pays principle was adopted but prevention of pollution should be improved;
- Promotion of investments in energy efficiency and conservation, 10 wind mills are installed plus new ones are planned;
- Monitoring system for air and water quality was introduced (funds from NL);
- Efficient waste management, the use of environmental products.

In terms of regional cooperation, Aruba collaborates with all the other OCTs in the region, neighbouring ACP countries and EU outermost regions through the different EU/OCT Regional programmes such as: 'Strengthening the Integration of the British and Dutch OCTs in the Regional Response to HIV/AIDS through "PANCAP" ⁷⁶ , "Regional Risk Reduction Initiative (R31) Disaster Management" ⁷⁷ and "Strengthening the Development of Small and Medium Enterprises of the British and Dutch OCTs in the Caribbean Region".⁷⁸

⁷³ http://www.arubaeconomicaffairs.aw/index.php?option=com_content&task=view&id=75&Itemid=60

⁷⁴ See also: Paul Sutton: The European Union and the Caribbean Region: Situating the Caribbean Overseas Countries and Territories, 2012
http://www.cedla.uva.nl/50_publications/pdf/revista/93RevistaEuropea/93-Sutton-ERLACS-ISSN-0924-0608.pdf

⁷⁵ http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/spd_final_aruba_en.pdf

⁷⁶ <http://www.pancap.org/en/>

⁷⁷ http://www.bb.undp.org/content/barbados/en/home/operations/projects/crisis_prevention_and_recovery/R3i/

⁷⁸ http://www.arubaeconomicaffairs.aw/index.php?option=com_content&task=view&id=61&Itemid=80

6 CONCLUSIONS AND RECOMMENDATIONS

Aruba has undertaken many new initiatives aiming at a more sustainable development since 2006 (the last environmental profile). It has created a nature and environment directorate and has developed a forward looking strategy, focusing among others on renewables and in a new participatory manner.

Many Arubans would like to see a significant improvement in public transportation in order to encourage its wider use⁷⁹.

The legislation on zoning has to be further developed and the nuisance legislation deals with pollution but there is yet no concrete plan for dealing with waste.

In the next two tables we present identified issues and responses and on the following pages, proposed action plans.

Environmental Issues	Current Situation	Replies being given
Pressures on Aruba's habitats and biodiversity	Only Parke Nacional Arikok is protected. The Marine Park is not protected. Various flora and fauna species are not protected or partially protected. Lack of enforcement of local nature laws.	Bill to protect endangered species. Bill to protect Spaans Lagoen as a bird sanctuary (Ramsar area) In physical policy and project design to incorporate green area's
Invasive species	Boa and lionfish are threatening local species	Intensify action to catch these invasive species, develop a national strategy plan and task force for the execution.
Climate Change / Sea Level Rise	Some inundation measures were taken	Linear park as an adaptation measure further executed Road map 2020 to become 100% fossil fuel independent
Natural and Environmental Disasters	Early warning system in place and some Tsunami scenarios are written	Training and further amplification of disaster preparedness plans
Waste management	Landfill	Waste to energy and resource recovery. Clean up work at old landfill areas.

Governance issues	Main Gaps	Replies being given
Institutional	Recently established Directorate of Nature and Environment	Fulfilling vacancies
Policy	Need of a nature and environment policy document	Draft policy to be discussed in a multi stakeholders meeting
Legislation	Missing an integrated environment protection act	Bill on Environmental Management is in the legal process
Financing	Limited investment funds and limited operational funds	Searching for other finance possibilities for different nature and environment projects
Regional and Intl. integration	Exchange of knowledge and best practices	Expand professional network and the usage of internet facilities.

⁷⁹ The Economic Commission for Latin America and the Caribbean (ECLAC) - Study Climate change and Caribbean countries 2010, <http://www.eclac.org/publicaciones/xml/8/39188/LCARL250.pdf>

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Improve waste management	Develop legislation on waste	There is legislation about pollution but not on waste. The management of the increasing volumes of waste still leaves room for improvement.		DNE Serlimar NGOs Hotels, etc.			
	Activities Investigate waste streams and disposal (air, soil and water) in relation to household and economic activities. The draft nature and environment policy note (with a chapter on solid waste) will be discussed with the stakeholders in June 2014. Consider waste to energy creation and cooperation with other OCTs in region. Draft legislation. Adopt legislation. Finance eventual new installations. The legislation on zoning has to be further developed.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Generate more knowledge on nature and environment (ECLAC recommends)	Improve monitoring, undertake baseline studies, and strengthen experience sharing with CARICOM countries	ECLAC says: ¹ policymakers do not have enough information about impacts/ costs and benefits of country and sectoral policies					
	Activities Convene a regional consultation to establish a framework for defining national and regional priorities for data collection and knowledge generation. Gather data on sea level, sea surface temperature, bathymetry and tides. Undertake Baseline studies on terrestrial and marine ecosystems, species/habitat and distribution. Investigate Habitat (ecosystem) fragmentation in relation to the preservation of natural corridors for flora and fauna, to prevent loss of biodiversity. For instance the loss of mature fruit and seed-bearing trees and columnar cacti in relation to keystone species such as bats and parakeets, but also the role of household garden systems in relation to wildlife ecosystems. Studies of biological, physical-chemical, ecosystems on water courses (groundwater, runoff, remaining dry-river beds and water basins) and their connection to surrounding marine ecosystems. Share experiences with other CARICOM countries in their efforts to respond to climate change.						

¹ Review of the Economics of climate change (RECC) in the Caribbean project. <http://www.eclac.org/publicaciones/xml/8/39188/LCARL.250.pdf> On Aruba: page 9-19

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Protect the environment and biodiversity	Develop and implement a network of protected areas	Coral reefs on the north side are still in good state. In other (populated) areas) impact from pollution					
	Activities						
	<p>Discuss the draft 'Nature and Environment policy plan' and the draft 'Nature and Environment Research and Monitoring Programme' with stakeholders.</p> <p>Investigate the soil quality of the different soil types as a baseline, in order to be able to distinguish clean and polluted areas and make an intervention plan to remediate polluted areas.</p> <p>WildAruba recommends (2008)² :</p> <p>Establish a Marine Park (implement protected marine areas leading to this).</p> <p>Gather information on species/habitat and distribution (to be used in the new plans) (see previous action plan).</p> <p>Work on environmental awareness (see next action plan).</p>						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Increase environmental awareness	Improve population's behaviour towards environment and efficient use of resources	Aruba's population environmentally awareness is limited					
	Activities						
	<p>Create a permanent education committee of key stakeholders involved in Aruba's natural history and heritage.</p> <p>Organise a national awareness campaign that leads to a permanently clean Aruba.</p> <p>Create a campaign of information about the impacts (environmental and socio-economic) of less tourism if the environment is degraded.</p> <p>Promote extension programmes on organic farming and on the use of pesticides/ herbicides.</p>						

² <http://www.wildaruba.org/Documents/Press%20release%201-09%20English.pdf>

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Establish a fund	Develop a system of micro-funding to enable small and local environmental initiatives	Many idea and initiatives but not enough funding					
	Activities						
	Investigate possible sources for the fund – can be subsidies, private or business donations, from territorial entities, from fines, from taxes, etc. Assess whether smaller and local entities developing initiatives need help to prepare proposals. Prepare the rules and formularies for the distribution of the funds, under competitive process. Prepare legal framework of the fund.						

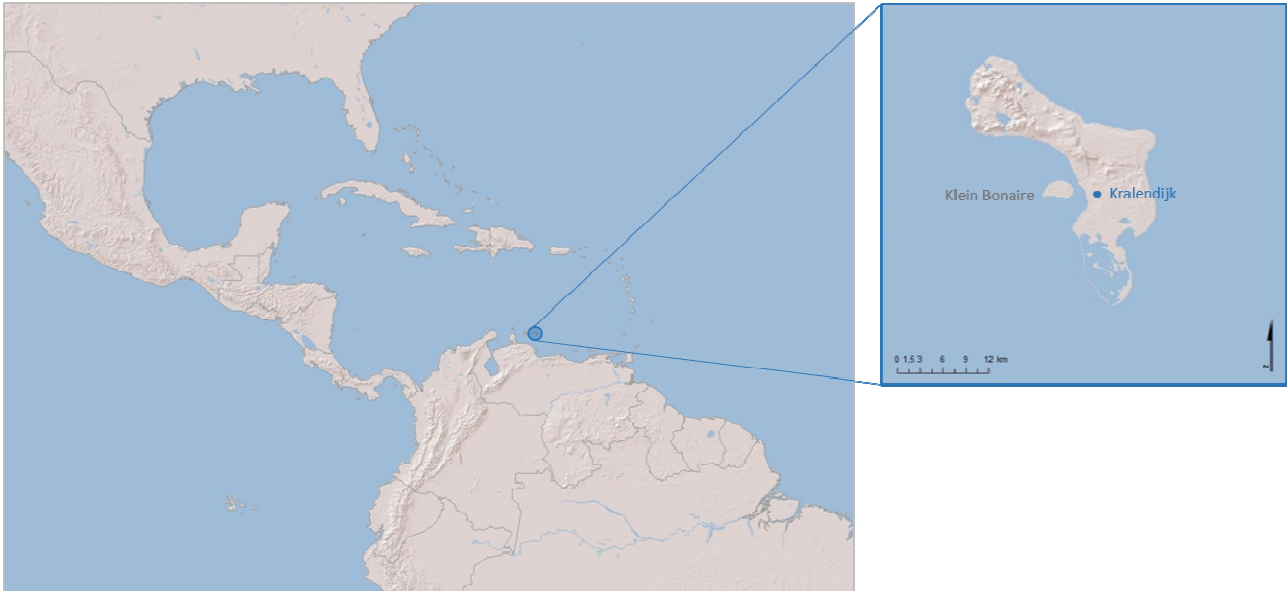
Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Reduce the dependence on fossil fuels							
	Activities						
	Continue and enhance the programme towards less dependency on imported fuels. Continue and enhance the programme towards more renewable energy. Establish a programme on information and advice on energy efficiency – e.g. use the labels. Many Arubans would like to see a significant improvement in public transportation in order to encourage its wider use ³ .						

3 The Economic Commission for Latin America and the Caribbean (ECLAC) - Study Climate change and Caribbean countries 2010 , <http://www.eclac.org/publicaciones/xml/8/39188/LCARL250.pdf>

ANNEX C : BONNAIRE

ENVIRONMENTAL PROFILE

BONAIRE



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SUMMARY

On October 10, 2010, the Netherlands Antilles were dissolved and the status of Bonaire, Sint Eustatius and Saba¹ changed. These three territories of the former Netherlands Antilles became Public Entities² or 'municipalities' with a special status. Curaçao and Sint Maarten, previously also part of the Dutch Antilles, are now independent countries in the Kingdom of the Netherlands, like Aruba already was.

The economy is largely dependent on tourism (80% of GDP) with 70,000 stay-over visitors arriving each year. An economic study assesses the value of nature in Bonaire at US\$ 105 million per year.³

Despite its small size, nature conservation is high on Bonaire's agenda: more than 20% of the total land area of Bonaire and 100% of the waters surrounding Bonaire and Klein Bonaire are protected as parks since 1977 and 1979 respectively.

Bonaire's coral reefs are healthy, but at places they are at a threshold due to (nutrients) pollution. Degradation of water quality due to land based activities thus appears to be an acute threat to Bonaire's reefs.⁴

The natural marine environment is under pressure from water pollution (a wastewater collection and treatment project is not yet completely operational⁵), sedimentation and from coastal construction.

Having most land below 2 meter, Bonaire is vulnerable to climate change.

Overgrazing by goats and donkeys and bad forestry management practices have had a major negative impact on the terrestrial vegetation and indirectly on the marine ecosystems due to erosion and sedimentation.

1 BACKGROUND INFORMATION

Name of Territory	Bonaire
Region	Caribbean
Land area	294 km ² (incl. Klein Bonaire (6km ²))
Exclusive economic zone	3,198 km ²
Population	18,250 (2013) ⁶ Density: 62 inhab/km ²
GDP/capita	GDP total: \$ 4.04 billion. GDP per capita: \$19,000 (2009 est.) ⁷ = € 13,808
Literacy rate	n.a.
Unemployment rate	5,8% ⁸
% below poverty line	n.a.

The Southern part of the island of Bonaire is relatively flat and the middle and northern parts are mountainous. The Island is arid and formed from volcano rocks 120 million years ago with a gradual build-up of coral. It lies 80 km off the Venezuelan coast. Both Bonaire and Klein Bonaire are surrounded by continuous, fringing coral reefs⁹. Starting from the shoreline in very shallow water, the reef slopes

1 Now called Caribbean Netherlands or, the BES islands.

2 Openbaar Lichaam.

3 TEEB study: http://www.ivm.vu.nl/en/Images/2001_TEEB_Bonaire%20total_tcm53-310328.pdf

4 http://www.dcbd.nl/sites/www.dcbd.nl/files/documents/IUCN%25202011%2520Bonaire_coral_reef_resilience_report.pdf

5 Built with EDF and Dutch funding

6 CBS, Statistical Office

7 WorldAtlas.com

8 CBS, Statistical Office

9 Reefs which form close to land, following the contours of the coastline.

down to around 10m before dropping further seaward to depths in excess of 70 m.¹⁰ The reefs being so close to the shoreline, make them very attractive for scuba diving and snorkelling. The island also has mangroves, wetlands, salinas and dry forests.



The highest point on Bonaire - Brandaris in the Washington Slagbaai National Park - is a mere 238 m. The rest of the island is low lying.

Earthquakes can happen on Bonaire¹¹. Hurricanes events are relatively sporadic.

The economy is largely dependent on tourism (80% of GDP) with 70,000 tourists arriving each year by air and approximately 200,000 tourist by cruise ships. A Dutch study assesses the value of nature in Bonaire at 105 million US\$ per year.¹² About 60,000 tourists a year make use of the marine environment on Bonaire, 38,000 for scuba diving. A total of around 80 cruise ships per year visit and the passengers disembark for tours of the island and the marine park.¹³

Two industries, Cargill and Bopec, also generate income.¹⁴ Cargill, one of the world's largest privately held companies, leases the southern part of Bonaire from the government and uses it as a solar salt farm. They have giant man-made ponds, which they fill with sea water, seal off, and then over a period of months, let the sun and warm climate evaporate the water, leaving only minerals behind. Bopec (Bonaire Petroleum Corporation) is a fuel oil storage terminal that is owned by Venezuelan oil company PDVSA. Functioning primarily as a storage facility for multiple grades of refined and non-refined oils from Venezuela and refineries on Curaçao and Aruba, Bopec also has mixing and blending capabilities for its stored fuels. Built with two loading piers and deep-water sheltered access, Bopec's first pier can receive tankers up to 500,000 DWT with a 95ft draft restriction while the second pier can receive tankers up to 80,000 DWT with a 48ft draft restriction.¹⁵

Government and the tourism sector are the largest employers.

2 BIOGEOGRAPHY, ENDEMISM AND IMPORTANCE FOR GLOBAL BIODIVERSITY

Bonaire has 5 internationally recognised Ramsar Sites: Lac, Klein Bonaire, Slagbaai, Gotomeer and Pekelmeer. These sites are a hub of biological activity and they demand special attention and integrated management since they include terrestrial, intertidal and marine habitats.

More than 340 fish species live in the coral reefs of Bonaire. The reefs are also home to barracudas, manta (giant) rays, sea turtles and sharks.

There are more than 170 species of birds recorded on Bonaire. The hyper saline lakes on the southern coast are breeding and foraging ground for the endangered greater Caribbean flamingo and migratory shore birds.¹⁶ The large semi-enclosed bay (Lac Bay) is a habitat for flamingos, frigate birds, herons, and pelicans.

The most significant sea grass fields are found at Lac Bay. The sea grasses in this area are important for

10 Background information BNMP Bonaire national marine park: <http://www.bmp.org/pdfs/BNMP-managementplan-part1.pdf> and Nutrients study: <http://www.nacri.org/greyllit/wiegers2007impactnutrientscoralreef.pdf>

11 <http://earthquaketrack.com>

12 <http://www.ivm.vu.nl/en/projects/Projects/economics/Bonaire/index.asp>

13 Description of the marine park: <http://www.bmp.org/pdfs/BNMP-managementplan-part1.pdf>

14 Cargill produces 400,000 ton of industrial salt p.a.

15 <http://wikimapia.org/1496625/BOPEC-Terminal>

16 Description of the marine park: <http://www.bmp.org/pdfs/BNMP-managementplan-part1.pdf>

fish spawning, green turtles and the endangered queen conch. The bay is protected from the open ocean by exposed fringing coral reefs that protect it from wave action. Waves break over the reef, flood the bay, driving a clockwise circulation pattern with water flowing out through a deep water channel at the northernmost tip of the bay adjacent to Lac Bay creating a rip current.¹⁷ Lac Bay has the most significant stand of mangroves of Bonaire with about 2.5 km².

Bonaire has over two hundred endemic species and subspecies of beetle, spider (incl. scorpion), snake, snail, bat (8 species), lizard (7 species, 2 are endemic), crustacean (crab) and sea snail. Mammals (mostly goats and donkeys) and the only amphibian species (frogs) have been introduced by man and are considered a threat to the terrestrial environment.

Endangered species: Bonaire is a home, breeding site or migratory stop-over for 6 IUCN Red list species, 11 CITES Appendix I species and 94 Appendix II species, including many fish, crustaceans and all of the corals that can be found in the surrounding waters.¹⁸

3 STATE OF THE ENVIRONMENT

3.1 BACKGROUND DATA

There is general agreement that the coral reefs on Bonaire are well preserved. There are however problems with wastewater, unhealthy land-fill and loss of habitats and species.

Water is desalinated and distributed by pipeline and vehicle transport. Operated by Ionics Aquadesign, Bonaire's desalination plant provides fresh water for most of the island.

Until 2004, the desalination plant was also the site of the islands only power plant, consisting of several large diesel generators. After a fire destroyed several generators, the facility was replaced by a fully modernised hybrid fossil fuel plant built in the vicinity of the BOPEC facility and a wind turbine park on the islands northern windward side.

A European Development Fund (EDF) project financed the construction of wastewater collection and sewerage facility (€ 20 million). The Dutch government also contributed an extra € 10 million to this project, linking homes and firms to the collectors.

Waste is collected by a private company, Selibon N.V. The island generates 17,000 – 20,000 tonnes of solid waste per year, this relatively high (*per capita*) figure being partly due to the size of the tourist industry. A new policy plan has just been made (see further on).

3.2 MAIN CHALLENGES

The Environmental Vulnerability Index¹⁹ for the (former) Dutch Antilles (i.e. including Bonaire) indicates Highly Vulnerable. The most pressing issues identified for Bonaire were: the percentage of land lower than 50 m above sea level and the number of endangered and vulnerable species per 1000 km² land area (IUCN definitions).

Challenge 1 - Loss of natural habitats and species – Severe

There is a well-structured network of marine protected areas and places where tourists can dive or snorkel and pay a fee to STINAPA²⁰, the foundation that manages the marine park.

¹⁷ Nat park study: <http://www.bmp.org/pdfs/BNMP-managementplan-part1.pdf>

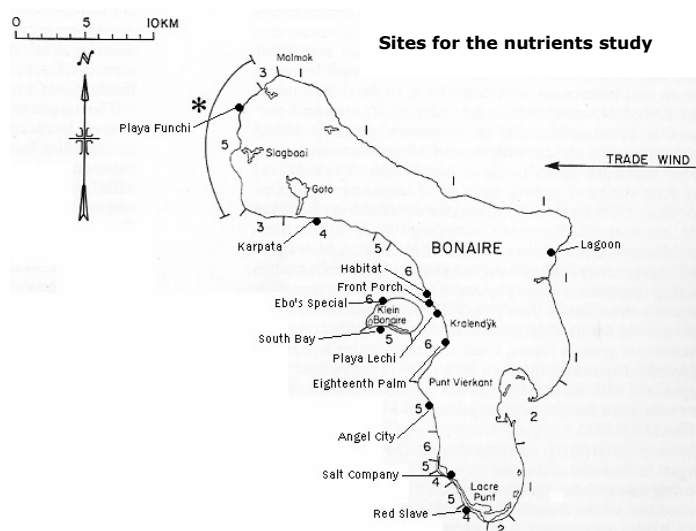
¹⁸ Part 1. Bonaire National Marine Park: Background information <http://www.redlist.org> or <http://www.cites.org/>

¹⁹ http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

²⁰ Bonaire marine park and Stinapa: <http://www.bmp.org>

However, one of the problems is wastewater pollution (nutrients, bacteria and organic matter). A recent study about nutrients in the waters of Bonaire²¹ included water sampling, reef cover analysis by video transects, chlorophyll a analysis, nitrogen isotope analysis from algae and fish stock counts (see sampling sites on map below). The preliminary results show reasons for concern. The reefs of Bonaire are at the thresholds of polluted values at 10 sites.²²

On Bonaire the Cargill Salt Company is likely an important nutrient (pollution) source. The salt company and the government together are willing to perform more research regarding the pollution.



Damage on corals (pressures)	Severity	Impacts
Tourism	●	Damage resulting directly from tourism includes mechanical breakage by scuba divers and snorkelers; ships' anchors; fishing tackle. Damage induced by increased water turbidity due to wastewater pollution
Erosion and Sedimentation	○	Overgrazing from goats and donkeys and poor surface water management practices result in death and sedimentation of the reefs.
Coastal zone development and activities	●	Debris, sand, cement, stones and other runoff of coastal development and erosion that are washed in the sea can cause serious damage or mortality to corals by smothering them and blocking their access to the sunlight.
Artificial beaches	●	Creating artificial beaches, has a negative effect on corals. Bonaire has a fringing reef largely devoid of natural sandy beaches. Artificial beach sand erodes away during storms and under normal weather conditions causing suffocation of the reefs. ²³
Pollution	○	Non treated sewage contains nutrients, organic matter and bacteria which result in, amongst other negative impacts, increased algal growth harmful to coral. Also the Salt Industry is a source of nutrients. A further source is surface water runoff during rain events containing various pollutants.
Several causes	●	Bleaching events and disease can result in a series of factors, from fluctuations in water temperature, poor water quality, to the sun skin-protectors used by sea users
Fishing/ mining	●	Over-fishing of reef fish, conch and rock lobster threaten the coral reefs
Damage on sea grass beds	●	In the shallow waters around Lac, sea grass has been damaged and is being continually eroded by trampling by swimmers, snorkelers, windsurfers and other users. ²⁴ In severe cases, the sea grass is removed or damaged beyond re-growth. Invasive sea grasses are reported in recent years.
	○	Coral reefs protect the sea-grass beds lying on their shoreward side, so their degradation can adversely affect the sea-grass.
Damage to other species	●	Damage to sea grass and mangroves means further destruction of fish spawning grounds. Internationally endangered species such as turtles also depend on the well-being of the sea grass for their survival.
○ Nil ○ Slight ● Moderate ● Heavy		

Grazing by free roaming goats and donkeys on Bonaire has had a major negative impact on the terrestrial vegetation cover, diminished recovery potential and caused a dominance of weed species (also in national parks). Large scale deforestation in the past and current poor forest (trees and shrubs) protection practices, have taken place.

21 October 2007: Impact of Increased Nutrient Input on Coral Reefs on Bonaire and Curacao by Mark W. Wieggers, BSc, University of Utrecht and Department of Environment of (former) Dutch Antilles.

22 Threshold values established by Brian E. Lapointe aslo.org/lo/toc/vol_42/issue_5_part_2/1119.pdf

23 IUCN study coral reefs 2011: <https://portals.iucn.org/library/node/9832>

24 Description of the marine park: <http://www.bmp.org/pdfs/BNMP-managementplan-part1.pdf>

Challenge 2 - Climate change - Severe

Bonaire is particularly vulnerable to the threat of global warming given the low altitude of most of its territory in relation to the sea. The island is extensively fringed by coral reefs, which are a crucial component in the delicate ecosystem found there, as a spawning ground for fish and as a natural buffer area protecting the islands from sea damage during storms. The coral reefs are very important as a tourist attraction and therefore to livelihoods on the island. The reefs are under severe pressure from temperature changes of the water and from storms.

Impact	Severity	Comments
Inundation of coastal land	●	A major part of Bonaire is low-lying and therefore particularly vulnerable to rising sea-level. The potential loss of beaches is a serious threat for the tourist industry.
Stressed fisheries	○	Commercial fishing not very important. Artisanal fishing is important to the Island. Sport fishing is only slightly important to the tourist industry.
Coral reefs threatened (bleaching, decreasing pH)	●	Islands ringed by coral reefs, deeper reefs presently still in good condition, but already subject to multiple threats (water temperature and quality).
Increased frequency of hurricanes	○	Hurricanes not often but is expected to increase.
Salinisation of groundwater	○	On the island, groundwater is no longer used for drinking water partly because of wastewater contamination.
Tourist industry	●	Tourist industry accounts for 80% of GDP. Reef tourism and beach tourism are important attractions.
○ Nil ○ Slight ● Moderate ● Heavy		

Challenge 3 - Solid waste management - Severe

All waste is now collected and put into open landfills. As the population has grown rapidly on Bonaire, and so has tourism, a plan for waste management was urgently needed. Selibon (the waste company) and the Bonaire government, with the help of a Dutch municipality (Breda) and the Dutch ministry of I&M, have prepared a Waste management plan for 2013-2020.²⁵ It was approved and will receive financial support from the Dutch Ministry of Infrastructure and Environment (I&M). It foresees that already in 5 years' time a large part of all waste will be collected separately and possibilities for recycling or sale for conversion to energy will be studied. Market volatility and high shipping costs pose a challenge to the expansion of recycling on the territory.

Since 1953, Bonaire has had a landfill which can't take any more waste (after sixty years). Research has shown the volume of waste should not expand any further, also for health reasons.²⁶ But Bonaire is too small to process this waste on its own. The companies outside Bonaire, which can digest Bonaire's waste, charge per kilo and it needs to be supplied already sorted. Selibon asks people and companies to reduce their waste and to bring it to the landfill²⁷. There is a particular problem with the old (car) tires left in uncovered in nature as they collect water in which mosquitoes breed and is a cause of the spread of the dengue. Selibon is placing closed containers for such garbage containing stagnant water.²⁸

²⁵ Het Afvalbeheer- en uitvoeringsplan Bonaire 2013 – 2022

²⁶ <http://ilovebonaire.com/bonaire/en/services/other/selibon-nv>

²⁷ Plasa Medio Ambiente.

²⁸ Selibon= serviso di di limpiesa Boneiru

<http://www.bonaire.nu/2013/09/19/selibon-plaatst-puinbakken/>

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

Bonaire is one of the three special municipalities of the Caribbean Netherlands (or BES for Bonaire, St Eustatius and Saba). No new nature legislation was introduced by Bonaire after October 10, 2010, as the old ordinance from 2008 was inherited unchanged.²⁹ However, a new nature conservation and management law for the 3 BES was adopted in 2011 in The Hague and it stipulates that each island has to make its own nature protection and management plan (and an environment plan) every 5 years.³⁰

The Nature Conservation Law BES delegates the primary responsibility for Nature on the islands of the Caribbean Netherlands to the islands themselves. Nature is a local island resource and should be managed by the island that directly benefits from this resource. However, it is the responsibility of the Dutch government to see to it that the islands adequately manage their nature and that assistance is given when they are unable to do so. Special nature areas or species that are of international concern, and are so designated by the Minister through the Nature Conservation Law BES, add to the responsibilities of the islands.

Outside of the jurisdiction of the islands, i.e., in the ocean beyond the territorial waters of the islands, the Dutch government is responsible for the management of nature. The Minister holds a responsibility for the management of the territorial waters based on the Maritime Management Law.³¹

Based on the Island Nature Ordinance, the Island Government is directly responsible for the management and conservation of the Marine Park, the further terrestrial areas and territorial waters of Bonaire. The management of the Marine Park and Terrestrial Park is mandated to non-governmental nature management organisations or Park Organisations.

As for environmental issues (water, waste, etc.), a new policy plan is now being prepared on Bonaire. There is also a special planning plan adopted by the Island Council in 2010.

4.2 REVIEW OF CURRENT INSTITUTIONS

The Public Entity Bonaire³² has an Island Council that decides on most issues concerning nature and environment, for instance it can decide on new nature parks. The directorate Space and Development (Ruimte en Ontwikkeling Bonaire- DROB) deals with all issues concerning nature and environment. There is also a directorate Enforcement and Control (Handhaving en toezicht). The management of the Marine Park is mandated by the local government to a local non-governmental, not for profit organisation, STINAPA Bonaire³³, which has a co-management structure with stakeholders, conservationists and local interest groups represented on the Board. The day to day management is carried out under the supervision of a Marine Park manager, a chief ranger and rangers which are all employed by STINAPA Bonaire.

The Dutch Ministry of Infrastructure and Environment (I&M) also has monitoring tasks. Selibon, the waste company, is responsible for good waste management.

29 In English: http://www.stinapa.org/pdfs/Island_Ordinance_Nature_Management_Bonaire.pdf

In Dutch: Eilandsverordening 1 september 2008,

<http://decentrale.regelgeving.overheid.nl/cvdr/XHTMLoutput/Actueel/Bonaire/7367.html> and

http://www.bonairegov.nl/sites/default/files/uploads/pdf/1044_Infoblad_Evnb.pdf

30 Wet Grondslagen Natuurbeheer en -bescherming BES, http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

31 Wet Maritiem Beheer BES, <http://dcnanature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>,

32 Openbaar Lichaam Bonaire= OLB

33 <https://portals.iucn.org/library/node/9832>

4.3 POLICY, STRATEGY, PLANS, PROGRAMMES

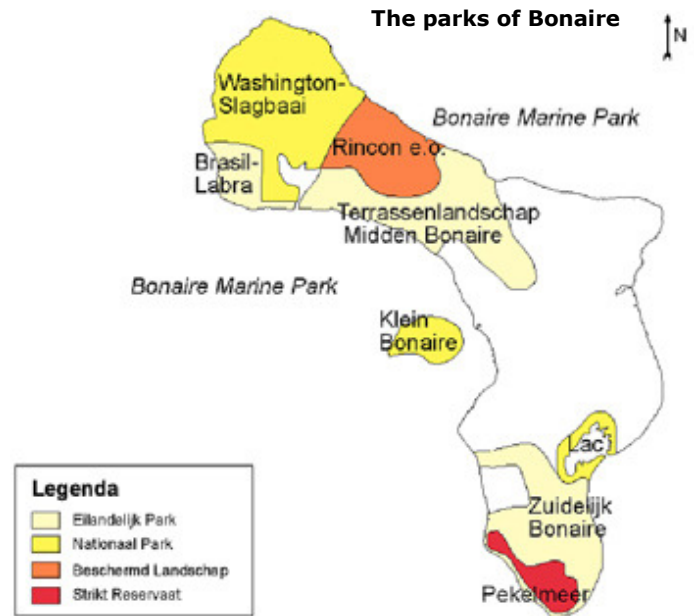
In this section we describe different types of policy plans: for the protection and management of nature, for the environment (mostly infrastructures for waste, wastewater, energy, etc.), for spatial and physical planning, and multiannual integrated master plans for sustainable development.

According to the laws adopted for the 3 BES islands (after October 10, 2010) and the multiannual policy plans for the BES, Bonaire has to make policy plans each 5 years, in all the areas mentioned above.

Nature

There is already a Nature Policy Plan for the 3 BES 2013-2017³⁴. This plan has not yet been 'translated' or implemented for Bonaire. But as concrete 'policies' we can mention the Bonaire Marine Park, and other protected areas like the 5 Ramsar Sites (Lac Bay, Klein Bonaire, Slagbaai, Gotomeer and Pekelmeer) But only the Marine Park and Klein Bonaire are legally protected areas; the Washington Slagbaai Park and the flamingos reserve in Pekelmeer are not yet. Lac Bay is part of the Marine Park.³⁵

The Bonaire National Marine Park (BNMP) was created in 1979, and has had consistent management since 1991. It includes all the waters surrounding Bonaire and Klein Bonaire (since 2001), from the high-tide mark to 60 meters of depth. There is a marine park management plan.³⁶ The park comprises 2,700 ha of coral reef, sea grass and mangrove ecosystems and provides habitat for a diverse range of marine species including about 65 species of stony coral and more than 450 species of reef fish. It hosts approximately 60,000 visitors a year of which 38,000 are scuba divers.



Environment

For the environment, the law for the BES (see section 4.4 on Legislation) states that an Environment Policy Plan should be made in each 'special municipality' like Bonaire. There is an Environment Policy Plan for Bonaire 2013 – 2017 and a draft (new) plan for Bonaire is being prepared for the period 2014-2018. Themes in this plan are: wastewater, waste, water and soil, businesses, external security and dangerous substances, physical plans and EIAs.

Wastewater

In 2013 all houses and businesses on the coast between Hato and Punt Vierkant were connected to the sewer and the wastewater treatment plant should start testing its installation in 2014. A new law is being prepared for water charges and use of water for irrigation.

Waste

A waste management plan has been drawn up by Selibon (the waste company) and the island's government (May 2013) with the support of the Dutch ministry of I&M.³⁷ Its goal is to have separate

³⁴ <http://www.government.nl/documents-and-publications/publications/2014/02/03/nature-policy-plan-the-caribbean-netherlands.html>

³⁵ <http://www.bonairegov.an/nl/omgeving/natuur-en-milieu/natuurgebieden>

³⁶ See: <http://www.bmp.org/pdfs/BNMP-managementplan-part1.pdf> and part 2: <http://www.bmp.org/pdfs/BNMP-managementplan-part2.pdf>

³⁷ Afvalbeheer- Naar een duurzaam afvalbeheer en uitvoeringsplan Bonaire, the plan was given to us by the Bonairian services.

waste collection in 5 years and that only a small part of total waste will be put into the landfill. The Netherlands have promised to help implement this plan. It is composed of 20 projects around:

1. better management, among others communication, prevention and implementation (against illegal dumping);
2. separate collection of waste for recycling: glass, metals, car tires, plastic, wood and garden refuse, refrigerators, and dangerous waste, etc.;
3. better final processing.

Priorities are: how to treat (bio)medical waste, dead animals and offal; a plan for dangerous substances like asbestos, pesticides, PCB's and fireworks; a new waste deposit in Rincon; better communication and education about separating glass from waste; research about rest waste; and new rules for harbours. This multiannual waste plan would cost € 13.6 million.

Water and soil

A draft policy plan is in preparation, for a vital and sustainable soil and water system.

Spatial and physical planning

The Physical Policy plan adopted in 2010 (ROB) details regions and describes activities that are allowed or not in these areas.³⁸ It may be revised/ adapted regularly. It details the vision for the old centre of Bonaire, construction permits, conditions for large projects and EIA.

Multiannual integrated masterplan

Besides the masterplan Strategic Development Bonaire 2010-2025³⁹ a concrete plan for strategic investments was presented to the Dutch Government in September 2013⁴⁰. The integrated development plan proposes a so called blue economy, based on the ideas of the Belgian Gunter Pauli and his visit to Bonaire in July 2013.⁴¹

This multi-year programme includes an investment plan (MJP) based on three basic principles:

- promote social identity and cohesion with a detailed plan for three neighbourhoods⁴²;
- sustainable and solid economic growth (blue economy);
- infrastructures at the same quality level as is mainstream in mainland Netherlands⁴³.

It brings together social development (a large part of the population lives in poverty), economy development (as Bonaire depends on tourism, it must protect its natural resources) and further protection of the natural environment (with physical planning actions). The part in the plan on the blue economy proposes: reforestation, control of erosion by free roaming goats, stimulating the growth of coral reefs and steering towards renewable energy. Costs involved are estimated to be € 15.4 million (studies: 0.4 million, goats: 10 years x 1 million, coral reefs: 10 years 0.5 million).

The plan foresees that a big effort needs to be made in terms of communication and civil society and business participation, to obtain a transformation of the economy. An earlier master plan for 2010-2015 was possibly even more ambitious concerning nature protection.⁴⁴ Now, with the post 2008 economic crisis making itself felt, the focus is more on social welfare.

38 Ruimtelijk Ontwikkelingsplan Bonaire (ROB). Text:

http://www.bonairegov.an/sites/default/files/uploads/Ruimtelijk_Ontwikkelingsplan_Bonaire_vastgesteld.pdf Areas:

<http://www.bonairegov.an/nl/omgeving/ruimtelijke-ontwikkeling/ruimtelijk-ontwikkelingsplan-bonaire-rob>

39 <http://www.banboneirubek.com/sites/default/files/Masterplan%20definitief%20zonder%20voorwoord%2015122009.pdf>

40 Text was given to us for consultation by the Dutch Ministry of I&M.

41 I'Institut ZERI (Zero Emissions Research Initiative), <http://www.cleantechrepublic.com/2011/01/25/gunter-pauli-fondements-economie-bleue/>

42 More or less € 100 million for 10 years, including poverty reduction, housing (11 million), roads (4 years x 12 million)

43 Harbour and airport: € 70 million

44 <http://www.banboneirubek.com/sites/default/files/Masterplan%20definitief%20zonder%20voorwoord%2015122009.pdf>

4.4 LEGAL FRAMEWORK AND ENFORCEMENT

Five pieces of legislation have been adopted by the Dutch Parliament for the 3 BES islands (i.e. also for Bonaire) concerning nature⁴⁵, environmental well-being (water, waste, energy)⁴⁶, physical planning⁴⁷, marine management⁴⁸ and fisheries⁴⁹.

The first one, the Nature protection and management law for the BES islands lays down many policy measures and law enforcement for Bonaire (and Sint Eustatius and Saba), including SPAW, CITES, the Bonn and Sea Turtle conventions and Ramsar and the Convention on Biological Diversity conditions are recalled. It states that the islands have to make a nature policy plan every 5 years, containing a list of actions for the plan period. This has not yet been done on Bonaire. There is however the old 2008 regulation for nature protection and management (unchanged from the Netherlands Antilles time with a list of protected species⁵⁰) and two Decisions: on nature management (2010) and for the underwater park (2010).

The environmental legislation for the BES islands has partly been in effect since July 2012. There is regulation for wastewater (2012), waste (1994) and two regulations are being prepared: wastewater charges and use of water for irrigation. The old pollution law for businesses of 1995 will be revoked by the new regulation for industries and activities (foreseen for 2015).

Concerning the physical planning, there is a Territorial Regulation (1994) (and the Policy plan (2010) mentioned earlier on).

The international agreements in force on Bonaire are:⁵¹ Ramsar, including a regional initiative, CITES, Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention), Bonn Convention, Sea turtles convention, Convention on Biological Diversity.

4.5 ENVIRONMENTAL AWARENESS

A lot of information is given on the island's government website⁵².

An information campaign was held on wastewater, for civilian and companies with a budget of US\$ 150,000. A project of information on environment and nature for primary schools: US\$ 60,000.

STINAPA Bonaire, commissioned by the island government to manage the two protected areas of Bonaire: the Bonaire National Marine Park (BNMP) and the Washington Slagbaai National Park (WSNP)⁵³, produces and disseminates a lot of information. Other active NGOs are:

- Sea Turtle Conservation Bonaire
- Echo (Parrots of Bonaire)
- DCNA is dedicated to nature conservation on the six islands/ countries of the Dutch Caribbean⁵⁴

Periodical beach and marine litter clean-ups are organised by NGOs and the diving industry. One could say that the role of the private sector concerning the environment is moderate.⁵⁵

45 Wet grondslagen natuurbeheer- en bescherming BES, http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

46 Wet volkshuisvesting, ruimtelijke ordening en milieubeheer BES <http://dcnanature.org/wp-content/uploads/2012/09/Wet-VR0M-BES.pdf>

47 Wet grondslagen ruimtelijke ontwikkelingsplanning BES, <http://dcnanature.org/wp-content/uploads/2012/09/Wet-grondslagen-ruimtelijke-ontwikkelingsplanning-BES.pdf>

48 Wet maritiem beheer BES, <http://dcnanature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>

49 Visserijwet BES, <http://dcnanature.org/wp-content/uploads/2012/09/Visserijwet-BES.pdf>

50 <http://www.bonairegov.an/nl/omgeving/natuur-en-milieu/beschermde-soorten>

51 <http://www.bonairegov.an/nl/omgeving/natuur-en-milieu/verdragen>

52 <http://www.bonairegov.an/>

53 STINAPA is an acronym for Stichting Nationale Parken, the National Parks Foundation. <http://www.stinapa.org>

54 Dutch Caribbean Nature Alliance www.dcna.nl

55 Info from DROB.

4.6 FINANCE FOR THE ENVIRONMENT

The Dutch Ministry of EZ (economic affairs and nature conservation) has an annual budget of € 1.1 million for the three BES Island of which 0.5 million is used for research, monitoring and reporting. The Dutch Ministry of I&M (Infrastructure and Environment) has financed many projects including a part of the wastewater treatment works.

Bonaire's government contributes 4% of the annual management costs of the protected areas, a further 85% is generated through user fees. User fees are: US\$ 25 for divers, US\$ 10 for other users (i.e. snorkelling, swimming etc. – only tourists) and cruise tourists pay US\$ 2 per person at arrival.

The Foundation that helps manage nature in the 6 Dutch OCTs (DCNA) receives € 250,000 per year from the Dutch Ministry of Internal Affairs. DCNA is building up a nature fund for the future. Annually € 750,000 is donated by the Dutch Ministry of Internal Affairs for this fund.

5 COOPERATION

For the Biodiversity Monitoring Programme, a budget of 0.5 million € was made available by the Ministry of EZ. For the Wastewater treatment project, € 20 million came through the EDF and 10 million from the Ministry of I&M.

6 CONCLUSIONS AND RECOMMENDATIONS

Bonaire has the healthiest coral reefs of the Caribbean and IUCN says that despite the many threats, "the successful management of the Bonaire National Marine Park (BNMP- protected since 1979), means that Bonaire's coral reefs remain among the healthiest in the Caribbean."⁵⁶

Bonaire has undertaken a large wastewater collection and treatment project these last years, with both EDF and Dutch aid, and it has now adopted an ambitious waste policy plan that foresees in separate waste collection to be reality in 5 years.

⁵⁶ <https://portals.iucn.org/library/node/9832> IUCN 2011 study on coral reefs on Bonaire.

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Protect coasts from development and artificial beaches	Regulate						
	Activities						
	All coastal construction on Bonaire should be strictly regulated and follow the construction guidelines. The guidelines should become law in order to be enforced appropriately.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Protect nature from invasive species	Combat and eradicate invasive free roaming species	Goats, donkeys and pigs have caused major damage to the natural environment					
	Activities						
	Reforestation where needed (i.e. the dry forests) Protect reefs from run off (of land erosion) and sedimentation. Animals should be kept behind enclosures or eradicated.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Protect nature	Better management plans and practices						
	Activities						
	In particular for dry forests, mangroves, wetlands and Salinas. Management plans, reforestation and enforcement should be implemented.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Wastewater	Investments	Leaching from septic tanks					
	Activities						
	Invest in appropriate sewage treatment facilities to improve water quality and increase the resilience of its valuable coral reefs. Set up a water quality monitoring program and sustain it.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Sustainable fishing	Regulate/ Control fishing	Increasing damselfish populations					
	Activities						
	Regulate and control the fishing of predatory fish species (i.e. Barracuda) on Bonaire's coral reefs. Reach a sustainable level to prevent population explosions of prey fish capable of modifying the reef habitat.						

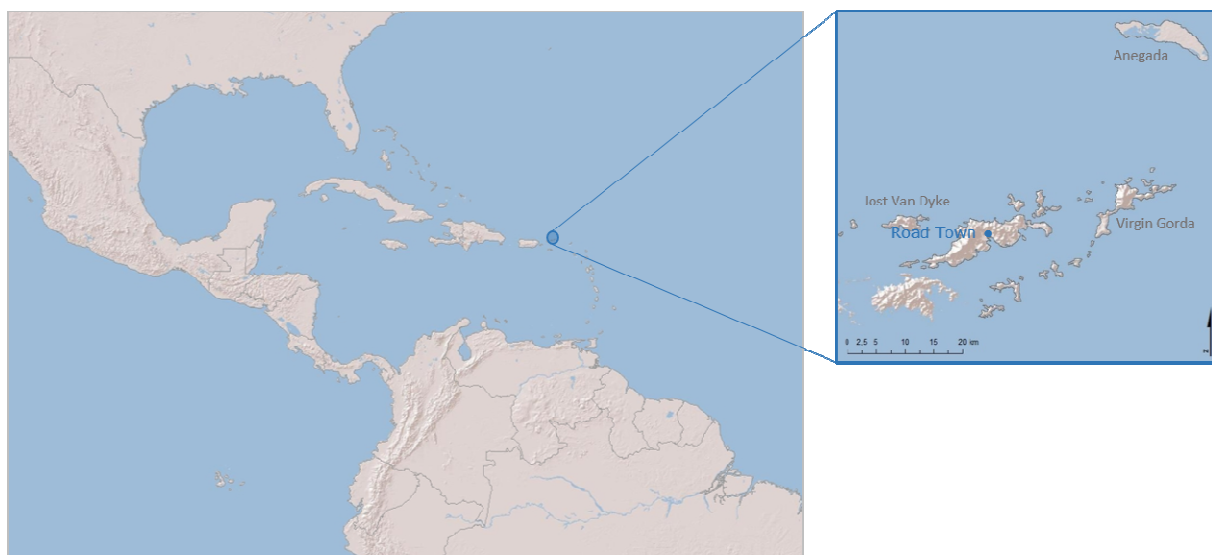
Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Protect coral reefs	Monitor populations of <i>Trididemnum</i> and <i>Lobophora</i>	Coral-overgrowing organisms					
	Activities						
	Study, monitor and eliminate where needed the populations of <i>Trididemnum</i> and <i>Lobophora</i> .						

ANNEX D :

THE BRITISH VIRGIN ISLANDS

ENVIRONMENTAL PROFILE

THE BRITISH VIRGIN ISLANDS



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SUMMARY

The British Virgin Islands is seeking to strike a balance between using the beauty and richness of its natural resources as a tourist attraction while limiting the environmental pressures and degradation which tourism can entail. The physical features and ecosystems, so attractive to tourists, are fragile and are under multiple, mutually reinforcing threats from rapid development, climate change and natural hazards, particularly hurricanes. The continued prosperity and well-being of the islands will depend, amongst other factors, on the careful nurture and protection of their vital ecosystems, particularly coral reefs and mangrove wetlands and the adoption of measures to enhance their resilience and adaptation to the consequences of climate change and severe meteorological events.

1 BACKGROUND INFORMATION

Name of Territory	British Virgin Islands
Region	Caribbean
Land area	153 km ²
Exclusive economic zone	80,117 km ²
Population¹	28, 280 (2012)
GDP/capita	\$ 29,236 (2012)
Literacy rate	97.8%
Unemployment rate	3% (1995)

The British Virgin Islands comprise over 60 islands, islets and cays located in the north-east Caribbean at approximately 18°N and 64°W. The territory has a total land area of only 153 km² scattered over some 3,445 km² of sea. The islands are surrounded by coral reefs. The waters around the archipelago average depths of 10 to 30m on an extension of over 2,000 km², the Puerto Rican Bank.

With the exception of the limestone island of Anegada, the islands are volcanic in origin and are mostly steep-sided with rugged topographic features and little flat land. The highest point in the British Virgin Islands is Mount Sage, 521m. Anegada rests on the north-eastern edge of this bank. It is made of limestone, and is estimated to be less than one million years old. Sediment produced by molluscs and corals were swept into sandbanks and compressed to form limestone, a process which took thousands of years. The islands once formed a continuous landmass with the US Virgin Islands and Puerto Rico, and were isolated only in relatively recent geologic time. The climate is subtropical and humid, with temperatures moderated by the Northeast Trade Winds.

The British Virgin Islands are subject to hurricanes and tropical storms, the most devastating of which were Hugo (1989) and Luis and Marilyn (1995) and more recently Omar (October, 2008) and Irene (August, 2011). Tortola lies near an earthquake fault, and minor earthquakes are common. A seismic monitoring system was installed in 2012. An earthquake of Richter 4.4 was experienced as recently as September 2013. In addition the British Virgin Islands have experienced tsunamis (there were 2 major tsunamis in 1867 following an earthquake, with waves up to 12m high).

Sixteen of the islands are inhabited, the four largest being Tortola (56 km²), Anegada (39 km²), Virgin Gorda (22 km²) and Jost van Dyke (8 km²). The capital, Road Town, is located on the island of Tortola and in 2011 had a population of about 10,000.

The population increased by 82.2% between 1990 and 2010. During these two decades, 80% of

¹ Since the official Database (<http://www.dpu.gov.vg/>) is not operational, the data provided in the table is from:
http://www.indexmundi.com/british_virgin_islands/demographics_profile.html
<http://data.un.org/CountryProfile.aspx?crName=British+Virgin+Islands>

population growth was due to immigration, with natural growth accounting only for 20%². The population is currently about 28,280 and the estimated growth rate in 2013 was 2.4%, with immigration accounting for half of the growth. About 82% is of Afro-Caribbean ethnicity, the remainder being Asian, Indian and mixed (11.2%), and white (6.8%). In 2010 approximately 37% of the population were immigrants from St Kitts and Nevis, the Dominican Republic, St Vincent and other Caribbean islands. Several thousand native Virgin Islanders live outside the territory, mostly in the US Virgin Islands and the United States.

The British Virgin Islands are classified as a middle income country (MIC), based on levels of per capita income. The economy of the territory is based upon the so-called "twin pillars" of financial services and tourism. Financial services are the main direct contributor to GDP (tourism direct contribution ranges 27% of GDP). Hence, income is distributed unevenly across the society and its middle income status masks the development challenges faced by the territory. Some of these challenges stem from the inherent economic, ecological and social vulnerabilities of being a small island developing state (SIDS). Other challenges are particular, but not unique, to the British Virgin Islands. These include changing demographics due to the steady influx of foreign workers to satisfy labour market needs; the vulnerability to exploitation and discrimination that certain categories of foreign workers face in the territory; a comparatively small but growing level of crime; antisocial behaviour among youth; and the weakening of traditional social structures.

The economy is closely tied to the larger and more populous US Virgin Islands to the west; the US dollar is the legal currency. The economy, one of the most prosperous in the Caribbean, is highly dependent on tourism. The British Virgin Islands is rated as one of the world's most tourism dependent economies³, with Travel & Tourism contributing in total US\$780.8mn (76.9% of GDP) in 2013⁴, the 4th in 184 countries in terms of relative contribution to GDP, and employing directly 33% of total employment. More than 934,000 tourists, mainly from the US, visited the islands in 2008. This number has however significantly decreased: following the economic crisis and in 2010 the islands receive about 842,000 tourists. Total tourist expenditure decreased from \$ 447 million in 2008 to an estimate of \$ 375 million in 2011. Yacht charter and recreational boating services, cruise ships, and diving tourism are particular attractions.

Livestock rearing is the most important agricultural activity. Overall, services account for about 87.3% of GDP and industry for about 11.6% (est. 2012)⁵.

2 BIOGEOGRAPHY, ENDEMISM AND IMPORTANCE FOR GLOBAL BIODIVERSITY

The islands are rich in different types of habitat: mangroves, moist and Caribbean dry forests on the upper slopes of the larger islands of Tortola and Virgin Gorda, coral reefs, seagrass beds, sandy flats, trenches and sea mounts. Within these habitats live hundreds of different species of fish (283 species of reef fish have been observed), invertebrates and plants. There are also a number of marine mammals such as dolphins, pilot whales and humpback whales that migrate seasonally to the British Virgin Islands. The islands are a significant foraging site for juvenile green and hawksbill turtles. There are small nesting populations of leatherback, hawksbill, loggerhead and green turtles. The number of resident turtle births has been on an increase in recent years. Retention of animals for any reason including by-catch is less than 80 animals annually.

2 Virgin Islands Health in the Americas (2012) - Pan American Health Organisation

http://www.paho.org/saludenlasamericas/index.php?gid=119&option=com_docman&task=doc_view

3 <http://listdose.com/top-10-countries-that-are-dependent-on-tourism/>

4 Travel & Tourism Economic Impact 2014, British Virgin Islands, World Travel and Tourism Council,

http://www.wttc.org/site_media/uploads/downloads/british_virgin_islands2014.pdf

5 CIA Factbook, Exxun, etc

British Virgin Islands supports approximately 45 plant species endemic to the Puerto Rican bank⁶. This includes single-island endemics such as the threatened *Acacia anegadensis* and *Metastelma anegadense* (in Anegada) and *Calyptanthus kiaerskovii* (in Virgin Gorda). Other red listed species include the *Cordia rupicola* and *Leptocereus quadricostatus* (in Anegada). The *Senna polyphylla* var. *neglecta* occurring in Anegada is also globally significant.

A quarter of the 24 reptiles and amphibians identified are endemic⁷. Among them are the British Virgin Islands tree boa *Epicrates granti* which is endemic to British Virgin Islands and the Anegada rock iguana *Cyclura pinguis* is only found on the Island of Anegada. Other endemics include the Carrot Rock Anole (*Anolis ernestwilliamsii*), the British Virgin Islands coqui frog (*Eleutherodactylus schwartzi*), the Anegada ground snake, the Virgin Gorda gecko (*Sphaerodactylus parthenopion*) and the Virgin Gorda and Anegada worm snakes. Other globally threatened reptiles within the British Virgin Islands include the *Anolis roosevelti* (CR) and *Epicrates monensis granti* (EN).

In 2012 a total of 48 threatened species had been identified. Eighteen roseate flamingos were reintroduced to Anegada in 1992 where a colony now flourishes, and by 2012 about 70 flamingos were born.

Vegetation is predominantly made up of cacti, thickets and dry forests. It comprises salt-tolerant plants - sea purslane, seagrape and manchineel - in the littoral zone, coastal scrub including thorny shrubs, cacti and frangipani in the coastal hinterland and, as the elevation increases, dry woodland including the turpentine tree and mampoo or loblolly tree and shrublands. Moist forest is found on higher slopes of the larger islands, for example Sage Mountain and Gorda Peak, both of which have been designated National Parks. These areas possess the best diversity of tree species in the British Virgin Islands. Most of these trees are evergreen. Evergreens such as the bullet wood and the white cedar grow to significant heights.

There are some 580 ha of mangroves in the British Virgin Islands (75% on Anegada). They act as hurricane shelters for boats, for example at Paraquita Bay where over 200 boats sought shelter from Hurricane Hugo in 1989. In 1990 the Conservation and Fisheries Department (CFD) with technical assistance from the OECS - Natural Resources Management Unit prepared an inventory and maps of all the major mangrove systems in the British Virgin Islands. Seventeen critically important mangrove sites were identified.



Source: CFD, Govt. of the British Virgin Islands. View of Anegada

Most of the shelf around the British Virgin Islands consists of sand and numerous rock outcrops covered by coral reefs. The British Virgin Islands has 380 km² of coral reefs that range in size from small fragments of a few square metres to the Anegada reef. The Anegada Horseshoe reef, with 77 km² of coral is the third largest barrier reef in the Caribbean. The overall reef condition remains relatively good, but with localised deterioration.

Seagrass beds, mainly turtle grass and manatee grass, are also found around almost every island in the British Virgin Islands. Some of the densest areas include Anegada's northern and south-western shore; Fat Hog's Bay, Tortola and Manchineel Bay, Cooper Island.

A system of marine and terrestrial protected areas has been established. Managed by various governmental organisations, the protected areas within this system include unique geological sites, coastal landscapes, historical sites, sea bird populations, marine habitats, forestry areas and recreational

6 Sanders S. 2006. Important bird areas in the United Kingdom Overseas Territories. Priority sites for Conservation. Sandy, UK: RSPB.

7 Petit, J. and Prudent, G. (eds). Climate Change and Biodiversity in the European Union Overseas Entities. Gland, Switzerland and Brussels, Belgium: IUCN. Reprint, Gland, Switzerland and Brussels, Belgium: IUCN, 2010. 192 pp.

sites. These areas extend throughout the 60 islands and cays in the British Virgin Islands, representing a total land area of 153.67 km², and total marine area of 82,759 km². There are approximately 51 designated protected areas in the current protected areas system. This includes 19 national parks (terrestrial), 1 marine park, 14 fisheries protected areas, 20 bird sanctuaries (5 of which are also national parks), 1 forestry reserve (Sage Mountain National Park), and 6 water areas. Only 5 of these sites have management plans. Currently, the National Parks Trust manages 20 land-based national parks (5 of which are bird sanctuaries) and one marine park. The Conservation and Fisheries Department manages 14 fisheries protected areas and the Agriculture Department manages 6 wetlands protected areas and 1 forestry protected area.

3 STATE OF THE ENVIRONMENT

3.1 OVERVIEW

A quarter of the land area is made of forest. The British Virgin Islands is particularly rich in coastal habitats: salt ponds, mangrove forests, coral reefs, and seagrass beds. However, these habitats are under multiple threats and have undergone major losses as a result of development associated with an increasing population and the expansion of tourism. This degradation does not yet appear to have been reversed or halted, despite measures taken.

The islands have limited natural fresh water resources except for a few seasonal streams and springs on Tortola. All households have access to potable water, which is mainly supplied through rainwater collected in household cisterns. Piped water is supplied by the Water and Sewerage Department within the Ministry of Communications and Works, and is obtained from several groundwater sources and from a desalination plant. The entire water supply on Tortola and Jost Van Dyke is desalinated water, as is 95% of Virgin Gorda's public water supply. The common methods of sewage disposal in the British Virgin Islands include the use of septic tanks, ocean outfalls and soakaway beds.

Regarding waste there is an incinerator on Tortola, and a second incinerator with the capacity to burn 100 tons per day was erected in Pockwood Pond in February 2009 and became operational in 2012. This besides waste dumps on other islands. The main concerns on waste management relate to motor oil, old batteries, and household and commercial chemicals.

Land and sea pollution continue to be a problem. Untreated sewage is discharged into the sea by some yachts, marinas, seafront hotels, businesses, and residences. Malfunctioning soakaways resulting from permeability continue to pose serious problems, particularly in communities where large apartment buildings have been constructed. The increasing number of cruise ships poses an additional water contamination threats and added demand for solid waste services.

Since 1989 Conservation and Fisheries Department, with the support of UNESCO, has been monitoring beach profiles. The data series reveals that the beaches have narrowed by an average of one meter throughout the territory, with up to three meters of beach being lost on the Island of Jost Van Dyke. The 2005 heat wave, which affected the whole of the Caribbean, led to the bleaching of close to 90% of the coral reefs of the British Virgin Islands. The subsequent loss of coral has been estimated at some 40%⁸.

⁸ Eakin, C.M., et al., Caribbean Corals in Crisis: Record Thermal Stress, Bleaching, and Mortality in 2005, November 15, 2010 DOI: 10.1371/journal.pone.0013969

3.2 MAIN CHALLENGES

In 2005, the Environmental Vulnerability Index⁹ indicated the British Virgin Islands as *Extremely Vulnerable*, despite significant information gaps as only 44% of topics were covered.

The most pressing issues identified were: the percentage of land lower than 50 m above sea level; distance to the closest continent; number of known species that migrate outside the territorial area at any time during their life spans (including land and all aquatic species) / area of land; number of endangered and vulnerable species per 1,000 km² land area (IUCN definitions); and number of environmental treaties in force in the country. Also significant are the reduced land area in a fragmented country.

The main environmental challenges faced by the British Virgin Islands were also identified in the 2006-07 Environmental Profiles and their seriousness is summarised in the table below.

Issues	Situation in 2006-07	Current Situation
Halting environmental and habitat degradation due to development	Severe	Severe
Climate change	Severe	Severe
Endangered species	Moderate	Moderate

New Emerging issues are:

Issues	Current situation
Coastal zone	Given the topography of the islands, most of the population is concentrated on the coastal zone. This means that most of the environmental pressures and conflicts such as environmental and habitat degradation due to development or pollution problems due to wastewater and solid waste also occur within the coastal zone.
Inland and watershed degradation	Watershed areas have been degraded through the removal of vegetation to facilitate construction of inland retreats, roads, and other supporting infrastructure for tourists. The impact of these actions is often exacerbated by erosion which results in excessive siltation of watercourses, beaches, and coral reefs.
Sewage disposal	There is lack of appropriate facilities for sewage disposal. In Tortola a new wastewater treatment plant will be built.
Invasive species	The British Virgin Islands has a considerable amount of invasive species within its small domain, which threaten the growth and survival of native organisms. Terrestrially the Cuban tree frog, mongoose, goats, rats and feral cats are becoming a great nuisance to the environment. In the marine environment, the newly introduced lionfish has led to decline of fish populations affecting the fisheries industry and also the reef system.

Development remains a major pressure on vulnerable coastal mangrove and wetland habitats. Conflicts in the coastal zone include dredging, mangrove reclamation, erosion and sedimentation due to land based activities, poor controls and development pressure. Sand mining law enforcement is limited. Locals are typically outnumbered by visitors and the infrastructure is not designed to support the increased amount; most of the development is at the coast as there is little interior land and most of it is mountainous and thus exponentially expensive to sustainable development.

The construction boom over the last 10-20 years, and sand mining for construction, is causing coastal/beach destruction. There is eutrophication of near shore waters due to on-shore development run-off and sedimentation, which disturb near-shore marine habitats. In the past few years there has been an increasing trend in large coastal developments (e.g. mega yacht marina and hotel).

Inland there is deforestation and other losses of vegetation, as a result of clearing for agriculture and development, and agro-chemical use. This leads to soil degradation, siltation and continuing degradation

⁹ http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

of important watershed resources. Goats are allowed by common law to roam freely and are causing problems of overgrazing and habitat destruction.

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

The head of state of the British Virgin Islands is the UK monarch, who is represented by a governor appointed by HM the Queen. The governor controls defence, foreign affairs, the civil service, the judiciary and certain financial matters. There is a unicameral Legislative Council with a four-year term comprising 13 seats (1 elected by direct popular vote by each of the nine electoral districts, 4 elected by a territory-wide vote). The Constitution provides for a ministerial system of government headed by the Governor, who presides over a Cabinet which includes the Premier and four other Ministers. The leader of the majority party/coalition is usually appointed Premier by the Governor. In December 2001, inhabitants were given UK citizenship, including the right of abode.

The British Virgin Islands enjoys a large measure of internal self-government. The Cabinet is responsible for all matters, except those on the realm of the Governor as external affairs, defence and internal security (including the police), the public service and the administration of the courts. The law of the British Virgin Islands is the common law of England, supplemented by locally enacted legislation. The past national elections took place on 7 November 2011 with a total of 13,352 registered voters.

4.2 INSTITUTIONAL FRAMEWORK

Environmental management in the British Virgin Islands is scattered amongst several ministries and departments.

The CFD falls under the Ministry of Natural Resources and Labour (MNR&L), and has overall responsibility for environmental protection, nature conservation and fisheries. The CFD includes the following divisions: *Planning and Policy* (responsible for the maintenance of the coastline, surveillance and protection of beaches); *Coastal Zone Management* (responsible for monitoring the natural, terrestrial and marine issues and natural and man-made changes and activities); *Environmental Information Division* which comprises two sections - Geographic Information Systems (GIS) and Environmental Education and Public Awareness; and *Fisheries Management* (responsible for data collection and research, fisheries extension services and surveillance and enforcement support). These Divisions carry out a range of functions including:

- routine and *ad hoc* environmental assessment and monitoring programmes;
- water quality measurement and monitoring;
- public awareness raising;
- advice on environmental policy and legislation;
- maintenance of a database as a tool for environmental decision-makers;
- development, in consultation with fishermen, of sustainable fishery management strategies.

The CFD has a total staff of 50 full-time employees and an annual budget of about \$ 2 million (2013).

Also within the MNR&L falls the *Department of Agriculture* which designates protected areas to protect watersheds, prevent deforestation, and protect water sources.

The National Parks Trust¹⁰ (NPT) is a non-profit, statutory body, established in 1961 by the British Virgin

¹⁰ <http://www.bvnationalparkstrust.org/>

Islands government to preserve the natural beauty and historic features of the territory. The NPT is legally responsible for the management of the protected areas system. It currently manages 21 national parks including 20 terrestrial parks and the Rhone Marine Park and designated marine and terrestrial protected areas. The work includes preservation of all flora and fauna within the parks, maintenance, upgrading of trails and picnic sites and scientific research. Each park will have a Management Plan outlining how it is to be developed, as required by the National Parks Act 2006, and currently (2014) about one quarter of the administered parks have management plans. The NPT receives an annual subvention from the government, has a staff of 32, and manages a total area (land and sea) of 765 ha (1,889.6 acres). It also operates programmes for biodiversity conservation (plant assessment, iguana rehabilitation, flamingo reintroduction), marine conservation (mooring buoy programme, coral monitoring, ecological assessment and environmental education), historical preservation (historical sites assessment and stabilisation) and terrestrial parks management (provision of trails, visitor facilities, interpretation and scientific research).

The *Solid Waste Department* falls under the Ministry of Health & Social Development and its responsibilities include collection and disposal of waste and promotion of recycling. Within the same Ministry, the *Environmental Health Department* is in charge of managing all environmental related issues with the potential of having a negative impact on health.

The *Water and Sewerage Department* under the *Ministry of Communication and Works* has for mission to ensure the provision of a continuous supply of safe potable water and an environmentally sound sewage disposal. It also provides water quality testing for \$20 fee.

There is a *Department of Disaster Management* (DDM) within the Deputy Governor's Office which is responsible for and administers the territory's disaster management programme. This includes community preparedness, mitigation measures and recovery coordination. The British Virgin Islands Government created a National Disaster Plan in 1997 and in 2009 adopted the Comprehensive Disaster Management Policy (2009-2013)¹¹. The DDM emergency response team includes medical staff, the police, fire and rescue officers, British Virgin Islands Search and Rescue (VISAR) and the Department of Disaster Management (DDM). Community shelters were created throughout the British Virgin Islands to provide a safe alternative for residents living in disaster prone areas. DDM has a staff of 12 persons.

The *Planning Authority* grants permission for all developments and is responsible for economic and social planning, providing information and analysis to policy makers to guide the planning. The Unit also coordinates project planning through the preparation and monitoring of the Public Sector Investment Programme. Development applications are also reviewed and discussed by the Planning Authority, a committee of 11 persons from the private and public sectors, which reviews all major developments applications, and the Technical Review Committee which reviews all marine development applications under the Ministry of Natural Resources and Labour.

Physical planning functions are carried out by the Town & Country Planning Department (TCPD), office of the Premier charged with the mission for ensuring the proper use and spatial development of the territory through integrated land use planning and management, and public education. It is guided by the Physical Planning Act (2004) and the Land Development Control Guidelines (1972).

Tourism is the responsibility of the Premier's Office. The *Tourist Board* works with the NPT and CFD to ensure that tourism-related activities within protected areas do not impact negatively on those areas.

The *National Climate Change Committee* (CCC) approved by Cabinet on December 2008 is a standing committee to monitor and advise Government on the impacts of Climate Change, to develop adaptation policies and strategies, and to support efforts to mainstream policies and strategies into national development planning. The CCC is also responsible for monitoring and implementation of the Climate Change Policy. The Committee is currently comprised of representatives from the CFD, NPT, TCPD, DDM,

¹¹ <http://bviddm.com/document-center/VI%20CDM%20Policy%20Final.pdf>

DPU, Water and Sewerage Department, British Virgin Islands Tourist Board, Agriculture Department, Environmental Health Unit, BVIEC, MC&W and the Public Works Department. The Committee is chaired by the Permanent Secretary of the Ministry of Natural Resources and Labour and co-chaired by the Office of the Premier.

4.3 POLICY FRAMEWORK

In July 2001, the British Virgin Islands signed with the UK the regional St. George's Declaration of Principles for Environmental Sustainability, which includes environmental targets and indicators. In September 2001 the Environment Charter was signed by the UK government and the British Virgin Islands government, comprising a number of guiding principles for action including the commitment of the latter to ensure *inter alia*: the protection and restoration of key habitats, species and landscape features through legislation and appropriate management structures and mechanisms, including a protected area policy, and attempt the control and eradication of invasive species; the integration of environmental considerations within social and economic planning processes; the promotion of sustainable patterns of production and consumption.

The National Integrated Development Plan (NIDP) 1999 – 2003 was the territory's first formal attempt at national planning. It is 10 years outdated and it is not known if it will be updated. Since 2004 an EIA is required for large-scale development projects/applications, and includes full public consultation. There is no land-use zoning, so government has little influence over the distribution or type of development occurring. The capital of Road Town has received the most attention in land use planning, with the Road Town Physical Development Plan 2005-2020¹². The Plan provides *inter alia* for the orderly and sustainable development of the town, the social, environmental and health welfare of the community and the promotion of mitigation measures.

The British Virgin Islands Millennium Development Goals (MDGs): A Plan of Action for Localising and Achieving the MDGs¹³, from February 2008, concluded that the territory had not articulated a specific MDG agenda, nor have the goals and targets been explicitly integrated into national or sectoral planning frameworks.

A National Environmental Action Plan (NEAP) was developed in 2004 by CFD¹⁴. The Plan provides the framework within which the territory's natural resources should be managed. It identifies the legal and institutional framework and challenges for improved environmental management which impact on biodiversity.

The territory has for many years had a policy to establish a network of protected nature conservation areas, particularly in the marine environment. The British Virgin Islands Protected Areas System Plan (2007-2017)¹⁵ was approved in January 2008. The British Virgin Islands do not have a National Biodiversity Action Plan.

The Anegada Biodiversity Action Plan (2006)¹⁶ identified the fragmentation and loss of habitat and habitat modification as the major threats for which the following specific actions were proposed: long-term habitat protection especially key sites for endemics; good land use planning to minimise habitat fragmentation and control of invasive species.

The British Virgin Islands Climate Change Policy (CCP) was endorsed by the CCC and approved in May 2013. It sets out the territory's plan of action to mitigate and adapt to the impacts of climate change and is intended to guide the work of all governmental, statutory, private sector, non-governmental and civic entities, supporting the transition to climate-resilient, low-carbon development. Positive outcomes from

12 <http://www.tcp.gov.vg/prodfiles/Rationale.pdf>

13 http://www.eclac.cl/portofspain/noticias/paginas/6/37516/British_Virgin_Islands_MDG_Plan_of_Action_2008.pdf

14 http://www.bvidef.org/main/%20media/NEAP_Draft.pdf

15 <http://ess-caribbean.com/wp-content/uploads/2011/08/British-Virgin-Islands-Protected-Areas-System-Plan-2007-2017.pdf>

16 <http://www.seaturtle.org/mtrg/projects/anegada/Anegada%20BAP.pdf>

the policy include the hosting of the Caribbean Challenge Initiative (Phase II) and the setting up of priorities which include the establishment of a funding mechanism (the Climate Change Trust Fund), the formation and management of an extensive protected areas network (protected some 33% of critical habitats) and the establishment of a sustainable yachting initiative. Other factors such as the acceleration to renewable energy from 100% fossil fuel dependence and the protection of sharks and rays in the territory should also be noted. The policy also called for the revision of several legislations associated with development and the environment, the enactment of which is expected by the end of 2014. The CCC oversees implementation of the policy. The Committee's first report was generated at the end of 2013.

The Comprehensive Disaster Management (CDM) Policy (2009-2013)¹⁷ aims at ensuring the full integration of disaster management plans in the development and management cycle of projects within an efficient government structure and grounded in community support with a view to making the British Virgin Islands a regional model and centre of excellence for CDM.

The National Oil Spill Contingency Plan¹⁸ was developed in 2006 with the objective of minimising the threat to seabirds, marine life, fisheries, ecologically sensitive areas, tourist-related beaches and water desalination plant intakes from oil spills.

4.4 LEGAL FRAMEWORK

The British Virgin Islands are a signatory to the following multilateral environmental agreements (MEAs):

MEAs	Remarks
Convention on Biological Diversity (CBD)	Ratification was extended to British Virgin Islands in June 1994. A biodiversity action plan has not yet been developed. Such a plan was developed for Anegada (2003-2006) as part of a Darwin Initiative project but has not been formally approved.
Ramsar Convention on Wetlands	Extended to British Virgin Islands in 1991. To date one Ramsar site has been designated: Western Salt Ponds of Anegada. Other sites have been proposed: Anegada Eastern Ponds and The Horseshoe Reef; Fat Hogs and Bar Bays.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Became effective in October 1976 and is being implemented by means of the Endangered Animals and Plants Ordinance (1976)
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Ratification was extended to British Virgin Islands in July 1985. There is some confusion as to whether or not the UK is satisfying its obligations under this Convention with respect to the legal harvests of marine turtles in British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands. These legal harvests involve commercial trade of marine turtles that may or may not qualify as accommodating 'the needs of traditional subsistence users' (undefined in the Convention).
Convention on Dumping of Wastes at Sea (London Convention)	Became effective in December 1975.
United Nations Convention on the Law of the Sea (UNCLOS) and Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks	Extended to British Virgin Islands in July 1997 and December 2001 respectively
World Heritage Convention Concerning the Protection of the World Cultural and	Adopted by UNESCO in 1972. The Caribbean Action Plan in World Heritage (2004-2014) was signed by British Virgin

¹⁷ <http://bviddm.com/document-center/VI%20CDM%20Policy%20Final.pdf>

¹⁸ http://www.bviddm.com/document-center/National%20Oil%20Spill%20Plan_working_2006.pdf

Natural Heritage	Islands.
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The British Virgin Islands have adopted the FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas and the FAO Code of Conduct for Responsible Fisheries.

The British Virgin Islands are a signatory to the following Regional Environmental Agreement:

Regional agreement	Remarks
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)	Ratification was extended to British Virgin Islands in October 1987, including the Protocol concerning Co-operation in Combating Oils Spills in the Wider Caribbean Region (Oil Spills Protocol). British Virgin Islands has also ratified the Specially Protected Areas and Wildlife (SPAW) Protocol, which entered into force in 2000, and the Protocol Concerning Pollution from Land-based Sources and Activities (LBS), which entered into force on August 2010.

The legislation most relevant to environmental protection in the British Virgin Islands is indicated in the table below.

Legal Instrument	Remarks
Physical Planning Act (2004) Regulations currently being drafted ¹⁹	Sets out a development assessment regime, including restricting development, designating protection areas, controlling activities and access, and requiring EIA for development activities listed on Schedule 3 Section 26 (there are no SEA requirements). The Act provides for public participation and consultation on development and has mechanisms for enforcement and non-compliance, but it does not provide a comprehensive regime. Areas that need to be improved in accordance with CFD include: mobilization of the community and tailoring the format to provide more useful feedback from the public for decision making. In addition, there is no National Physical Development Plan in place.
National Parks Act (2007) and Regulations (2008)	It allows the designation of nature reserves, wildernesses areas, national parks based on science criteria. It makes it possible to restrict activities and access to terrestrial and marine areas. It also makes provision for voluntary conservation agreements with landowners. The preparation of a protected area system plan is mandated by Section 13. It repeals: <i>the National Parks Ordinance No. 29 (1961)</i> as amended in 1978) which established the <i>National Parks Trust</i> , and provides for the creation of protected areas in the form of national parks to be managed by the Trust; the <i>Marine Parks and Protected Areas Ordinance No. 8 (1979)</i> which provides for the creation of a range of categories of protected area, including multiple-use management area or marine park and protected area.
Beach Protection Act (1985)	The Act requires a permit for dumping on and removal of material from the foreshore and removing any natural barriers against the sea. It is outdated and does not provide a beach management policy framework or regulations.
Coastal Conservation and Management Act (1991)	
Protection of Trees and Conservation of Soil Ordinance (1954/1965)	Provides for the declaration of protected areas for the prevention of deforestation, soil erosion and for the protection of watersheds, and prohibits grazing livestock or earthmoving in such areas, including private lands, without a license. Seven protected areas have been established under this Ordinance.
Protected Areas and Wildlife Act (1987)	
Protection of Endangered Animals, Plants, and Articles	This law was enacted to prohibit removal of listed corals without a license; it does not address protection of coral reefs <i>in-situ</i> .

¹⁹ Environmental Profile of Anegada, 2013, Island Resources Foundation.

(Removal and possession) Ordinance (1981)	
Wild Birds Protection Ordinance Cap. 98 (1959 as amended 1980)	Authorises the Governor to declare protected areas specifically as bird sanctuaries. The provisions of this Ordinance also apply to birds in any marine park or protected area designated under the Marine Parks and Protected Areas Ordinance No 8. It provides for the protection for approximately 31 species of rare or endangered wild birds, their eggs, nests, and young, at any time and under any conditions. Bird Sanctuaries Orders in 1959 and 1997 designated 20 bird sanctuaries, which provide full protection for all species of wild birds.
Fisheries Act (1997)	Provides for the establishment of marine reserves and regulates fisheries activities throughout the islands. Implemented through the Fisheries Management Plan for British Virgin Islands, 1998 regulates (together with the regulations listed below) the British Virgin Islands turtle fishery. Capture of leatherback and loggerhead turtles is prohibited. Nests, eggs and nesting turtles of all species are protected. It is only permissible to take green turtles of more than 24 inches (61 cm) carapace or shell length and hawksbill turtles of more than 15 inches (38.1 cm) carapace or shell length. The open season is for the months of December to March inclusive.
Fisheries Regulations (2004)	Provision for protection of marine habitat. For example makes provision for persons to pay penalty for contaminating the marine environment with oil.
The Taking of Marine Products Order (1991)	Prohibits the taking of any marine product using scuba gear and also prohibits spear-fishing on the Horseshoe Reef.
Public Health Ordinance (1967)	Authorises regulations to prevent, abate, and control environmental pollution. Environmental pollution is not defined, and regulations providing environmental standards have not been enacted.
Merchant Shipping (Oil Pollution) Order (1997)	Focusses mainly on prevention of pollution and liability for oil pollution.
Derelict Motor Vehicle Act, 2000	Makes provision for automobile owners to pay a fee for the eventual disposal of their vehicles at end-of-life.
Litter Abatement Act (2009)	Authorises appointment of litter wardens to issue warnings and tickets to violators of the litter law. Provides legislative authority for disaster management in the territory

The process of drafting the Environmental Management and Conservation of Biodiversity Bill was concluded in 2010 by a committee including a cross section of stakeholders. The draft bill is currently in review.

The Government is also in the process of revising:

- The Beach Protection Act and introducing a Beach Policy to better manage the territory's beaches;
- The Physical Planning in order to address many of the existent gaps and address the environmental issues in a more integrated manner.

In spite of some of the legislation in force providing sanctions scheme in case of violation, full enforcement of legislation is hindered by the lack of adequate facilities and manpower.

Marine Police and Customs Officers have been designated by law as authorised officers capable to enforce the Fisheries Act, 1997, and routinely do so.

4.5 ENVIRONMENTAL MONITORING

The CFD has developed a Coastal Resource Information System (CRIS) based on GIS, as a decision-making tool. CRIS includes data on the status of coral reefs, mangrove and seagrass stands, sedimentation, marine water quality, beach profiles, biodiversity (sightings of whales, turtles, or sea birds nesting), solid and liquid waste, fish stocks and catch distribution, coastal resources mapping, oil spills and

a surveillance network.

Environmental Sensitivity Index (ESI) maps are an integral component of hazardous event and hazardous material response planning. One of the primary uses of these maps are to help in the assessment of an oil spill and its possible impact on the coastal environment. Additionally the maps can help identify the critical areas for shoreline clean-up activities.

Water quality is regularly monitored at a number of locations around the British Virgin Islands coasts. The parameters measured include: coliforms, dissolved oxygen, nitrate, nitrite, nutrients (phosphorous) and algae, particulate matter, pH, temperature. These are compared with standards set by the US EPA. A number of turtle monitoring projects have been carried out by CFD, many in association with international agencies, involving monitoring at nesting sites, tagging and tracking and sightings data. The CFD monitors seagrass twice a year at seven sites around the British Virgin Islands. At each site, densities of each type of grass are recorded along with algal densities and overall health. Deterioration has been recorded at several sites since monitoring commenced, due to run-off, sewage dredging, land reclamation and the overload of nutrients from land-based sources. Beach wardens or coastal maintenance unit are responsible for collection of litter at 20 accessible beaches in the British Virgin Islands and outlining coastlines, monitor the conditions of beaches, amount of litter collected, numbers of users and illegal activities. The state of the territory's forests are monitored by the CFD and the NPT.

The Government is committed to implement environmental monitoring programmes in order to establish baseline data required to inform decision making regarding closed seasons, development projects and fisheries development and increase surveillance activities to reduce non-compliance with fisheries legislation.

Progress has reported to have been made regarding the continue monitoring of sea turtle populations through a tagging programme.

4.6 ENVIRONMENTAL AWARENESS

The public often regard mangrove areas as useless swamp land with little useful function. The CFD and NPT have been working on changing this perception through a public education programme in the schools and community. Reclamation is the major threat facing mangroves in the British Virgin Islands.

The Department of Disaster Management produces every 2 years the Disaster Digest, and due to advertisers and sponsors it is provided to its readers free of cost. It is considered to be the Caribbean journal on disaster management practices. The latest issue published in December 2013 contains 28 articles on issues such as repositioning disaster resilience in the development agenda; building a cleaner, greener British Virgin Islands; investing in your eco-system; the hazard landscape; and energy and water conservation among others.

Prior to 2012, the legal framework in the British Virgin Islands supporting the nonprofit sector was very weak. Under the Non-profit Organisations Act, 2012, all NPOs operating in the territory must be registered or face substantial fines and/or imprisonment. Registration requires that substantial documentation, including financial statements, be provided by NPOs. Leaders of the British Virgin Islands nonprofit community have stated that these requirements will unnecessarily burden NPOs, especially smaller community-based, public service groups that are generally operated by volunteers.

There are a number of environmental NGO's in the British Virgin Islands including the Jost Van Dyke Preservation Society (JVDPS); the British Virgin Islands Environmental Council (VIEC); the Caribbean Youth Environmental Network Virgin Islands Chapter (CYEN- Virgin Islands Chapter), the Green VI and the US-based Island Resources Foundation.

The Green Pledge Initiative spear-headed by CFD sought to encourage community action in environmental stewardship. Groups and businesses are assessed and "rated" by the department based on pledges made at the programme launch. This includes both public and private groups. One example of

a success story from this programme would be the almost total ban of use of plastic bags by the largest and most widespread supermarket chain in the territory, the increase of local products and decrease of importation to decrease their carbon footprint, and in the case of one establishment the update of its physical infrastructure to become more climate resilient.

Several awareness campaigns have been launched to protect British Virgin Islands' natural resources. In a recent one launched in 2012 by the tourist board to keep it clean, three questions were asked to the public: Do You Dive for Litter? Do You Truck It? Do You Really Even Care?

The British Virgin Islands Environmental CD Atlas and Teaching Resource²⁰ constitutes another example by providing factual and current information about the environments of the different islands in a format that encourages learning and increases overall awareness of the Virgin Island's environments within the classroom of every school.

4.7 FINANCE FOR THE ENVIRONMENT

The Government's Budget estimates for 2013 with the aim of continually preserving and protecting the natural environment, proposes the introduction of an environmental levy which will be used to implement programmes designed to offset the carbon footprint left by both residents and visitors.

The status of the territory as a UKOT (making it not eligible for international funding), combined with its high GDP makes the mobilisation of funding extremely difficult. The few eligible available options require competition with other entities (many of which have several options for funding). These options also typically limit project life to shorter periods meaning that larger scaled (and arguably more meaningful) projects cannot be implemented.

The Government approved the British Virgin Islands Climate Change Trust Fund in 2013²¹ to financially support implementation of the CCP. The Fund will become operational by the end of 2014 though the potential funding logistics are still being refined. It is anticipated that it will help mobilise funding from prominent donors (such as GEF) to community groups which is currently not possible.

5 INTERNATIONAL COOPERATION

British Virgin Islands assumes the chairmanship of the Overseas Countries and Territories Association (OCTA) in 2014.

The British Virgin Islands are a regional member of the Caribbean Development Bank and an associate member of UNEP, of the Caribbean Community and Common Market (CARICOM) and the Organisation of Eastern Caribbean States (OECS), where they participate only in the areas of functional cooperation and not in the common markets or foreign affairs committees. The British Virgin Islands are also associated with Economic Commission for Latin American and Caribbean States (ECLAC) which has developed a Programme of Action for the Sustainable Development of Small Island Developing States (SIDS POA) in the Caribbean Subregion 1994-2003/4, covering British Virgin Islands, and affiliated with Latin American and Caribbean Planning Institute (ILPES) and Commonwealth Fund for technical co-operation (CFTC). In the area of health, the British Virgin Islands are a member of Pan American Health Organization (PAHO) and with regard to tourism it is a member of the Caribbean Alliance for Sustainable Tourism (CAST). British Virgin Islands is also a member of the Caribbean Catastrophic Risk Insurance Facility (CCRIF).

²⁰ <http://www.ukotcf.org/infoDB/infoSourcesDetail2.cfm?module=projects&refID=169>

²¹ http://issuu.com/bvibeacon/docs/virgin_islands_climate_change_trust

Following an oil spill near Tortola in March 2004 affecting over 1.6 km of coastline, the British Virgin Islands signed a memorandum of understanding with the US in August 2004 to respond efficiently in the event of a major discharge of oil or other hazardous substance near the islands. The agreement applies in the waters of the British Virgin Islands and the US Virgin Islands.

In the field of fisheries, the British Virgin Islands are a member of the International Commission for the Conservation of Atlantic Tuna (since 2001) and the Caribbean Regional Fishery Mechanism (full membership pending). In March 2014 British Virgin Islands joined the Global Partnership for Oceans which aims at tackling documented problems of overfishing, pollution, and habitat loss.

European Union

The British Virgin Islands are not eligible for territorial allocations since the 9th EDF due to their high per capita GNP (which exceeds the Community average). However, it can participate in regional initiatives. The Deputy Regional Authorising Officer in British Virgin Islands is the contracting authority for the Strengthening the Development of Small and Medium Enterprises of the OCTs in the Caribbean Region Programme – funded by the 10th EDF at € 15 million.

UK

In April 2012 the British Virgin Islands Government signed protocols for Effective Financial Management with the UK Government. At the same time the British Virgin Islands Government undertook to strengthen its public financial management legislation and return the public finances to a sustainable footing in the medium term. The UK welcomes the commitment this represents to accountable, transparent and prudent financial management.

Environmental projects funded include:

- Enhancing the Capacity to Combat the Imminent Invasion of Lionfish in the British Virgin Islands: The Lionfish (*Pterois volitans*) eradication project funded by JNCC was initiated in 2009. This project provides a framework to coordinate activities among government and non-governmental agencies and local businesses and organisations to prevent the lionfish from negatively impacting the British Virgin Islands fisheries, marine ecosystems and endangering public safety;
- Biodiversity research on Anegada, gathering data on birds, marine turtles and plants;
- British Virgin Islands Environmental CD Atlas: environmental data are being compiled for use with the British Virgin Islands GIS system by schools to support the geography curriculum;
- Caribbean Waterbird Census (CWC) and a CANARI spear-headed DEFRA-funded project that has created a network among Caribbean UKOT National Trusts and conservation organisations.

Others

Under the auspices of CBD, the Caribbean Challenge Initiative (CCI) is an effort to protect at least 20% of the marine and coastal environment of the Caribbean by 2020. The British Virgin Islands hosted the Summit of Caribbean Political and Business Leaders to launch the second phase. UNEP has launched a Review Progress of the Regional Networks of Marine Protected Areas in 2008.

The OECS is working with the CFD on the digital mapping of Virgin Island coastal resources: seagrass, mangroves and coral.

The British Virgin Islands are rich in different types of habitat: mangroves, rain forests on the upper slopes of the larger islands of Tortola and Virgin Gorda, coral reefs, seagrass beds, sandy flats, trenches and sea mounts. Within these habitats live hundreds of different species of fish, invertebrates and plants. There are also a number of marine mammals such as dolphins, pilot whales and humpback whales that migrate seasonally to the British Virgin Islands.

British Virgin Islands is one of the most tourism dependent economies of the world. As in other Caribbean countries tourism grew quite fast. Locals are typically outnumbered by visitors and the infrastructure is not designed to support the increased amount. Besides, in the case of British Virgin Islands most of the pressures are coastal as there is little interior land and most of it is mountainous and thus exponentially expensive to sustainably develop.

Increasing trend of coastal development and the introduction of the invasive lionfish has led to a decline and transition of fish populations (which has ultimately affected the reef system). However, British Virgin Islands has been implementing a series of governing instruments that will allow a larger equilibrium between development and the conservation of the natural wealth – which is crucial for tourism, as well as for the preservation of the livelihood of its population. The update and strengthen of legislation and enforcement practices, the increase in public awareness and programmes (such as CFD's Green pledge initiative) to foster better environmental stewardship had a positive effect on the territory. The climate change policy (CCP) if implemented is very promising.

The implementation of the CCP is an example of best practices. Positive outcomes from the policy include the hosting of the Caribbean Challenge Initiative (Phase II) and the establishment of a funding mechanism (the Climate Change Trust Fund), the establishment and management of an extensive protected areas network (protected some 33% of critical habitats) and the establishment of a sustainable yachting initiative. It has also called for the revision of several pieces of legislation associated with development and the environment, some of which are expected to be adopted by the end of 2014. The British Virgin Islands have now formally protected sharks and rays in the territory. The process of introduction of renewable energy is also ongoing.

Another best practice is The Green Pledge Initiative. Coordinated by the Conservation and Fisheries Department of the Ministry of Natural Resources and Labour, the initiative sought to encourage community action in environmental stewardship. Public and private groups and businesses are assessed and "rated" by the department based on pledges made at the programme launch. One example of a success story from this programme is the almost elimination of use of plastic bags by the largest and most widespread supermarket chain in the territory.

Currently British Virgin Islands is trying to mobilise "seeder" funding to the Climate Change Trust Fund with the aim to achieve self-sufficient sustainability within five years of establishment.

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible sources	€
Improve habitat conservation	Strengthen the terrestrial and marine protected areas network	The British Virgin Islands count with several environmental management tools elaborated through the years. There is a need to further integrate and articulate these tools and strengthen implementation	5 years	BVI Government, MNRL		Political will and capacity to mobilize funding	EU, UK, private sector, banks (business and biodiversity)	
	Activities							
	<p>Enlarge the protected areas network under the Protected Area System Plan for the British Virgin Islands 2007 – 2017. On land: elaborate maps for the territory through vegetation classification modelling and gap analysis and propose terrestrial sites for inclusion into protected areas network. Include a Marine Protected Areas network. Create marine sanctuaries for sharks and rays. Strengthen involvement in the Caribbean Challenge Initiative and set example by conserving 33 % (CCI target is about 20 %) of the near shore coastal and marine environment. Establish a sustainable finance mechanism to manage these protected areas.</p> <p>Continue research and implement a response strategy on lionfish.</p> <p>Improve fish stock assessment data; Review existing fisheries regulations.</p> <p>Approve and implement the British Virgin Islands Wetlands Management Policy providing guidelines on the management of wetland areas with specific reference to streams, salt ponds, beaches and mangroves.</p> <p>Establish erosion control measures.</p> <p>Update environmental legislation as needed for the implementation of the above – in particular update a physical planning act and plan.</p>							

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible sources	€
Promote Green Growth ¹	Greening the tourism industry and mainstream renewable energy	The British Virgin Islands are one of the world's most tourism dependent economies. Starting by greening this sector will influence the development path of the territory. BVI has set the Green Pledge Initiative that enables further action and constitutes an example for the region.	7 years	BVI government, private sector, regional organizations			EU, WB and Regional Development Banks, Private sector	
	Activities							
	<p>Continue and expand the Green Pledge Initiative, tackling specific sectors.</p> <p>Promote sustainable tourism - Greening the yachting and hotel industry.</p> <p>Find new alternative sources of construction material and/or enforce mitigation measures and restoration to avoid erosion due to the excavation in hill sides for house or property development.</p>							

¹ According to OECD Green growth means promoting economic growth while reducing pollution and greenhouse gas emissions, minimising waste and inefficient use of natural resources, and maintaining biodiversity (<http://www.oecd.org/environment/green.htm>)

	<p>Establish and implement a sustainable boating and yachting initiative that will help to reduce marine pollution - Control and treatment of marine discharge of sewerage throughout the proposed MPA network and territorial dive sites.</p> <p>Development of tourism products (artcrafts).</p> <p>Assess renewable energy resource and establish the energy mix.</p> <p>Promote renewable energy – eliminate barriers in terms of legislation, financial incentives (tax incentives, waiving of certain import duties, access to funding), support the establishing of markets (studies, installation, parts, maintenance), training and capacity building</p> <p>Mobilise “seeder” funding to the Climate Change Trust Fund to allow it to achieve self-sufficient sustainability within five years of establishment -</p> <p>The climate change policy is very broad and includes also a socio-economic approach, and it contains a list of priority actions to be implemented which require funds for implementation.</p>
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Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible sources	€
	Improve waste and wastewater management	Reduction of land-based sources of pollution, improved collection and treatment of wastewater, and adequate solid waste management through reduction, reuse and recycling would significantly benefit the coastal water quality of BVI.	7 years	BVI government, private sector, regional organizations		Interest of the private sector. Political will within the region to establish regional projects	EU, UK Regional Development Banks Private sector	
Improve utilities	Activities <p>Refurbishment and extension of sewage systems – In Tortola a loan from Barclays bank with the guarantee of the UK will allow to increase available water as well as wastewater treatment. Further investments will be required for other islands. It is important to improve management, including universal access to services and cost recovery.</p> <p>Improve solid waste management – Develop a Waste Management Plan for the British Virgin Islands—based on reduce-reuse-recycle strategies. Include a rigorous hazardous waste management strategy. Study which waste streams can be managed and valued locally and establish agreements for out of territory disposal of some waste streams – promote regional cooperation in this regard. Update legislation and standards. Establish a tax on import of items that generate waste – plastic, tires, batteries, etc. – with incentives to returning to origin. Map needs and priorities in the different islands. Increase the protection of landfills and elimination of waste dumps. Set the business environment for the involvement of the private sector on waste management.</p> <p>Home composting educational initiatives should be carried out as a precursor to commercial composting.</p>							

ANNEX E :
CAYMAN ISLANDS

ENVIRONMENTAL PROFILE

CAYMAN ISLANDS



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SUMMARY

The Cayman Islands are considered to be part of the geographic Western Caribbean Zone as well as the Greater Antilles. The territory is a major world offshore financial centre and worldwide known tourism destination. The natural environment of the Cayman Islands is under considerable pressure from rapid and poorly planned physical development and accompanying population and tourist growth. The features of outstanding natural beauty not only contribute to the quality of life of these islands' residents but are also vital for tourism. Continued prosperity and well-being of the islands will depend amongst other factors on the careful nurture and protection of their vital ecosystems, particularly coral reefs and mangrove wetlands and the adoption of measures to enhance their resilience and adaptation to the consequences of climate change and severe meteorological events.

1 BACKGROUND INFORMATION

Name of territory	Cayman Islands
Region	Caribbean
Land area	262 km ²
Exclusive Economic Zone	119,137 km ²
Population	55,036 (growing at 3.1%/year ¹), with 56.8% Caymanian. At 31st March 2013 non-permanent foreign workers stands at 20,441 mainly from Jamaica.
GDP/capita	€38,609 (2012) ²
Literacy rate	(defined here as >15 years old, ever been to school) 99.7%; 27.8% attend College/University
Unemployment rate	6.2% (2011)
% below poverty line	1.9% of the population were deemed to be poor, an additional 1.8% fell below the vulnerability line of CI\$ 4,979 (2006-2007 estimate) ³

The Cayman Islands are located on the boundary between the North American and Caribbean tectonic plates and are geologically and tectonically active, and composed of three islands. Grand Cayman, Cayman Brac and Little Cayman are emergent along a submarine ridge south of Cuba, west of Jamaica. The Cayman Trench is more than 6 km deep and is located 6 km to the south of Grand Cayman. Each island is formed by a central core of older bluff limestone from the Oligocene-Miocene period and a surrounding coastal limestone terrace formed of consolidated coral, mollusc shells and unconsolidated (marl) from the Pleistocene period. Natural fresh water resources are limited due to the high porosity of the bedrock.

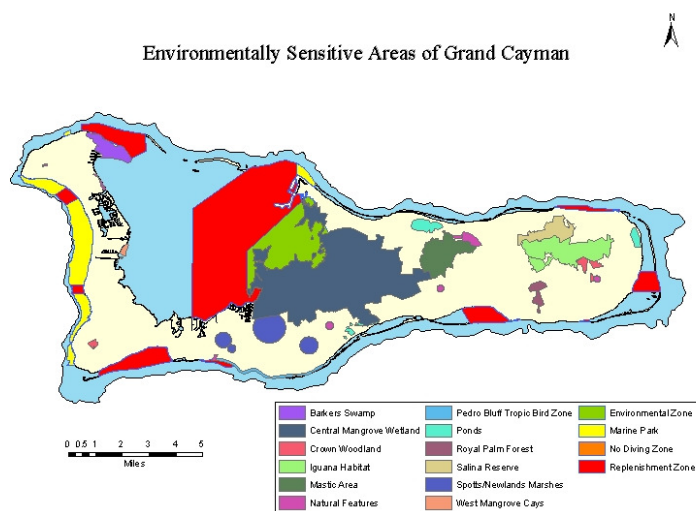
The Cayman Islands have a coastline of 160 km. Grand Cayman is approximately 75 miles (121 km) southwest of Little Cayman and 90 miles (145 km) southwest of Cayman Brac. Grand Cayman is the largest of the three islands, with an area of 197 km² and hosts most of the population (93.8%). The island's narrow insular shelves support prolific coral reef communities, and Grand Cayman and Little Cayman are almost completely surrounded by fringing coral reefs.

The terrain is generally low-lying, with the exception of a massive limestone bluff on Cayman Brac, rising 43 m above sea-level. The highest point on Grand Cayman is the municipal 'landfill' which now rises to a height of 30 m. Many developed areas lie at little more than 1 m above sea-level.

1 As of last census 2011 - http://www.eso.ky/indicators_page.html#1

2 <http://www.caymannewresident.com/cayman-islands-facts-figures>, and 1 KYD = 0.883169 EUR

3 The Cayman Islands National Assessment of Living Conditions in 2006/2007, Caribbean Development Bank (2008)



Grand Cayman has a unique geomorphology, with a large central swamp, measuring 50 km² (see map). The North Sound is an 85 km², semi-enclosed, shallow lagoon, fringed by coastal development on the west, mangroves to the south and east, and an exposed fringing coral reef to the north. Approximately 60% of the North Sound is covered by well-developed beds of turtle grass.

The climate is tropical marine, with warm, rainy summers and cool, relatively dry winters. The Cayman territory is brushed or hit by a hurricane or tropical storm on average every 2.2 years, and suffers a

direct hurricane hit every 9.6 years⁴. Most recent large events were Hurricane Ivan in 2004 affecting mostly Grand Cayman and Hurricane Paloma in 2008 affecting mostly Cayman Brac and Little Cayman⁵. Earthquakes are common in the Cayman Islands⁶, examples are a 6.8 on Richter scale in 2004 and 5.9 on Richter scale in 2010, resulting in casualty drills.

The main biogeographic characteristics of the Cayman Islands are lowland mangrove swamps, dry sub-tropical forests and coral reefs. The most significant forest areas are within the Mastic region of Grand Cayman and the Bluff forest on Cayman Brac. In the island of Grand Cayman the only well-preserved mangrove patch is the Central Mangrove Wetland (CMW), which stretches over an area of 3,400 hectares. The island of Little Cayman still has 40% wetland coverage on publicly-owned land. Fringing coral reefs, sea grass beds and mangroves provide many ecological and economic services to the islands; they all provide a habitat and breeding grounds for many types of marine life. Coral reefs and mangroves protect the islands from storms and erosion. Reefs also have a role in the sand budget and beach maintenance. Sea-grass encourages settlement of sediment, thereby protecting the reefs and provides a nursery for many fish species. Wetlands store and filter stormwater providing the clear clean water necessary for the establishment and growth of reef habitat.

The population has grown very rapidly in recent decades, from 17,000 in 1979 to over 55,000 today. High net immigration has contributed to this and as a consequence the proportion of Caymanians of the total population is 57% today.

The Cayman Islands enjoy a high standard of living. The Cayman Islands Government has never depended on the British Government for its recurrent budget, and all aid for capital projects ceased over 18 years ago. After a period of economic buoyancy in the 1990s, growth has been slower, with a recent fall in GDP in 2009 and 2010 due to decreased public and private internal consumption. However, the economy has started to recover since 2011 stimulated by the recovery of stay-over tourism and financial and insurance services.

The main sources of government revenue are import duties, company, bank and trust licence fees and stamp duties. There is no direct taxation, estate or excise duty. About 90% of the islands' food and consumer goods are imported. Only 4% of the land is arable. Although overall imports outstrip exports by about 100:1, the visible trade gap is more than offset by earnings from tourism and financial services.

The islands are a thriving offshore financial centre. In 2012 about 10,800 mutual funds were registered in the Cayman Islands, and about 768 insurance licences and 226 Bank and Trust licenses were granted. There were about 93,600 companies registered in 2012, 80% of which are exempt companies.

⁴ <http://www.hurricanecity.com>

⁵ <http://www.hurricanecity.com/city/caymanislands.htm>

⁶ <http://earthquaketrack.com>

The islands are renowned worldwide as a diving and snorkelling destination. In recent years the tourist industry has been attracting about 1.5 million cruise arrivals per year, a decrease from the 1.8 million in 2005. The number of stay-over visitors has declined from a maximum of 354,000 in 2000 to 260,000 pre-hurricane Ivan, and in 2012 it had recovered to 321,700. About 80% of stay-over visitors are from the USA. One of the greatest attractions on Grand Cayman is the world-renowned Seven Mile Beach, which hosts many hotels.

2 BIOGEOGRAPHY, ENDEMISM AND IMPORTANCE FOR GLOBAL BIODIVERSITY

According to the Cayman Islands Natural History and Biogeography (1994), the following endemic species and subspecies can be found: 21 plants, 16 birds, 21 reptiles, 1 bat, 1 marine fish, 2 freshwater fish, 30 land snails, nearly 50 insects, 1 centipede, 2 scorpions, 2 copepods, and 1 isopod.

The Cayman Islands are home to the rare blue iguanas and critically endangered ghost orchids. It has the last large tracts of old-growth forest left in any of the UK OCTs, and the largest contiguous mangrove wetland remaining in the Caribbean (the Central Mangrove Wetland).

There are 415 plant taxa (species and varieties) thought to be native to the Cayman Islands. A Red List published in 2008 has identified 46% of the native flora to be threatened with extinction mostly as a result of habitat loss. Large mahogany trees were once common in the dry forests, however, exploitation has removed all the large trees. Native forests are threatened by land clearance and invasive species including logwood, casuarinas, wild tamarind and scaevola.

About 75% of the reptiles found in Grand Cayman are native, including the endemic blue iguana (*Cyclura lewisi*), the blind snake (*Typhlops sp.*) and the land boa (*Tropidophis caymanensis*).

Remnants of the once large green turtle population (for which the islands were once named Las Tortugas) are still found in the surrounding seas. Traditional licensed turtle fishermen are allowed, under the Marine Conservation Law, to take 6 per year in season, for local consumption only. The government-owned Cayman Turtle Farm breeds the green turtle and markets turtle meat locally.

Bats are the only surviving native mammals on Cayman. However, mice, rats, cats, dogs, and agoutis are naturalized/invasive on the islands.

There are 226 species of birds in the Cayman Islands, of which 50 species are nesting birds and 170 migratory birds (Cayman Compass). The wetlands of Little Cayman are an important stop-over for many migratory species. Common species include the Antillean grackle, the smooth-billed ani, many species of heron and the snowy egret, ground doves, bananaquits and Cayman parrots, Cayman's national bird. Grand Cayman houses seven sanctuaries for protected birds, including the Queen Elizabeth II Botanical Gardens, Colliers Pond, Salina Reserve, as well as the Mastic Reserve. Cayman Brac is home to a parrot reserve of more than 70 hectares. Following the passage of hurricane Ivan in 2004, several native birds disappeared from the west of Grand Cayman and the bird population was seriously reduced throughout the islands (Cayman Compass).

The territory has witnessed many extinctions, among others, the local disappearance of three bird species, two species of mammal and the freshwater Cuban spotted crocodile *Crocodylus rhombifer*. Additionally invasive alien species settle and develop rapidly, thereby threatening the survival of indigenous species, primarily in disturbed areas. A report by the Joint Nature Conservation Committee recorded more than 100 exotic alien species of flora and fauna in the Cayman Islands (JNCC 2007).

The Cayman Islands have experienced several large-scale coral bleaching episodes in 1987, 1995, 1998, 2005 and 2009. This resilience of Cayman's coral reefs in the face of extreme events is not common among the reefs of the Caribbean. The observed bleaching in 2005 reached more than 95% in some places, but the subsequent mortality rate among the corals was relatively limited (estimated at 10%

around Grand Cayman), while the corals of Little Cayman have practically all regenerated (Reef check)⁷.

The Cayman Islands Department of Environment has established a well-structured network of marine protected areas, more than 27 years ago. Many reefs are protected in the form of Marine Parks, and associated Replenishment Zones, in which in-water activities are restricted. However, reefs are suffering from land based pollution and sediment. The Department of Environment is currently examining the effectiveness of the Marine Parks in the Cayman Islands, with a support of Darwin fund. It is anticipated that this study will produce practical recommendations for the enhancement and best management of these protected areas.

Only in February 2014 the National Conservation Law was published enabling establishment of a parallel system of Terrestrial National Protected Areas. Land-based protected areas are limited to Animal Sanctuaries (designated under the Animals Law 1976), and National Trust property. In the past, Animal Sanctuaries have been degazetted in the interests of facilitating development, (e.g. Westerly Ponds, Cayman Brac). Saltwater Pond Animal Sanctuary (Cayman Brac) is currently subject to a proposal for development into a marina. Despite its "inalienable" status National Trust Property is currently subject to gazetted roads corridors, which includes transgression of the "Central Mangrove Wetland", the "Mastic Reserve" and the "Salina Reserve" National Trust properties.

Shrubland is underrepresented in the protected areas of the island. In Grand Cayman ca. 624 acres of shrubland are protected within the National Trust Salina Reserve, and a further 190 acres was recently secured on a 99-year peppercorn lease from Cayman Islands Government. Both areas are currently under threat from a proposed road corridor. Both areas are of particular importance for reptiles, particularly the Grand Cayman blue iguana, which is utilized locally as a charismatic flagship species for shrubland preservation.

3 STATE OF THE ENVIRONMENT

3.1 OVERVIEW

The Cayman Islands are home to remarkable wildlife, from rare blue iguanas to critically endangered ghost orchids. It has the last large tracts of old-growth forest left in any of the UK OCTs, and the largest contiguous mangrove wetland remaining in the Caribbean (the Central Mangrove Wetland). However, almost 85% of the Central Mangrove Wetland remains without any protection at all. This besides the degazetting of protected areas referred on the previous section. On Cayman Brac and Little Cayman, there are no formal development plans and limited planning legislation. This allows ongoing subdivision into small lots and marketing of undeveloped forest land. The National Conservation Bill, stalled in political process since 2007, was finally passed into law in December 2013. It is anticipated that this important legislation, once fully implemented, will remedy many of the most significant gaps in Cayman's environmental governance, including formally recognizing the Cayman Islands Department of Environment as a legal entity.

Fresh groundwater is scarce on Cayman Islands. The traditional water mobilization in the territory were wells and cisterns for roof catchment. These are still prevalent, but water is now being desalinated on a large scale and distributed by pipeline and truck delivery. Since 2008 the entire island of Grand Cayman gained access to piped water supply. In Cayman Brac the piped water supply system serves approximately 100 customers. Water delivery to the Brac customers not served through pipeline is provided using Water Authority tanker trucks. There are no viable fresh groundwater resources in Little

⁷ Wilkinson, C., Souter, D. (2008). Status of Caribbean coral reefs after bleaching and hurricanes in 2005. Global Coral Reef Monitoring Network, and Reef and Rainforest Research Centre, Townsville, 152 p

Cayman, and a number of small desalination plants serves individual properties and developments. Centralized wastewater services are limited to 20% of the population as public sewerage services cover only the Seven Mile Beach area and several residential communities on the West Bay peninsula. Adequate toilet facilities are available to 99.5% of the population. Domestic wastewater is collected through the sewers and pumped to the wastewater treatment site in George Town. Areas not served by the public sewerage system use onsite treatment systems (septic tanks) with larger developments utilising aerobic treatment units. With few exceptions, effluent disposal is via injection well. Typically, installed onsite treatment systems are not designed to treat and reduce nutrients in wastewater. Given the porosity of the bedrock, and findings from extensive studies carried out in the similar environment of the Florida Keys in the United States, effluent discharge causes nutrients to be discharged into the sea by groundwater.

The islands generate 68,000 tonnes of solid waste per year⁸, this relatively high (per capita) figure being partly due to the size of the tourist industry. The government-managed unlined landfills on each of the three islands constitute the only legal disposal sites, however, the territory has inadequate solid waste facilities, and the landfill site on Grand Cayman is full. On Grand Cayman solid waste is collected at least three days per week. The Department of Environmental Health has been working with businesses and civic groups on recycling programmes, and has succeeded in reducing the total waste stream by 21%. Cost is a critical factor as some materials would need to be shipped off Island. However, with proper planning and vision there is room to improve cost-effectiveness as well as profitability of the system. Involvement of private sector has increased since 2010, and some private companies are continuing to expand the recycling programme on Grand Cayman. Some revenues are gained from higher-value materials like aluminium, scrap metal, used motor and cooking oil and batteries. Aluminium recycling program has expanded significantly and all recyclables are shipped off island for recycling. Other potentially valuable/recyclable/reusable materials as plastic and glass are being shipped out of islands with financial cost. New initiatives to recycling plastic and glass have been introduced at a limited scale in 2011 and 2013 by the private sector.

Hazardous wastes other than contaminated used oils are stored at the landfill sites in a controlled area and shipment of these materials are on-going to reduce the stock. Bio-medical and infectious waste is incinerated in a double burn chamber equipment, but there is no on-going monitoring of the emissions from the stack. Grand Cayman accumulates a significant volume of scrap metals and derelict vehicles; around 16,000 tons of scrap metal have been shipped off Islands since 2011 and it is expected that the majority of stored scrap metals to be shipped off island by 2015. The George Town landfill has a lined area that encapsulates the toxic (arsenic) ash that resulted from the burning of debris due to hurricane.

Regarding renewable energies, there are on-going initiatives both at larger scale and at consumers/small producer's scale. The Caribbean Utilities Company, Ltd (CUC), the electrical utility on Grand Cayman aims at accepting up to 13 MW in aggregate of grid-connected renewable energy generators on Grand Cayman. In August 2011, CUC issued a request for expressions of interest and preliminary proposals for the financing, construction, ownership and operation of renewable energy generation facilities and negotiations are ongoing with two successful bidders to execute power purchase agreements and interconnection agreements. On the small scale, the Electricity Regulatory Authority (ERA), effective August 30, 2012, has approved revisions to the existing feed-in-tariffs (FITs) programme for consumers on Grand Cayman. The CUC consumer-owned renewable energy (CORE) programme provides incentives to consumers on Grand Cayman to generate electricity with small scale generation utilizing renewable or alternative sources and be compensated through stable, long-term rates.

⁸ Department of Environment communication.

3.2 MAIN CHALLENGES

In 2005, the Environmental Vulnerability Index⁹ listed the Cayman Islands as *Highly Vulnerable*, despite significant information gaps as only 60% of topics were covered.

The most pressing issues identified were the percentage of land lower than 50 m above sea level; number of known species that migrate outside the territorial area at any time during their life spans (including land and all aquatic species) / area of land; number of endangered and vulnerable species per 1000 km² land area (IUCN definitions); number of species known to have become extinct since 1900 per 1000 km² land area (IUCN definitions); and number of environmental treaties in force in the country.

Also significant are the reduced land area in a fragmented country with some population density, increasing the vulnerability to anthropogenic activities impacts and reduced refuges for wildlife; the exposure to high winds, and a decrease in precipitation in the last 5 years as compared with 30 years average; and intensive farming (annual tonnage of intensively farmed animal products (includes aquaculture, pigs, poultry).

The main environmental challenges faced by the Cayman Islands were also identified in the 2006-07 Environmental Profiles and their estimated degree of gravity is provided in the table below. Since then, several issues have been addressed with some results that changed its gravity.

Issues	Situation in 2006-07	Current Situation
Pressures on habitats and biodiversity	Severe	Severe
Invasive species	Severe	Severe
Waste management	Moderate	Severe
Climate Change / Sea Level Rise	Severe	Local long range implications of climate change remain largely unknown. There has been increased frequency of coral bleaching episodes due to elevated sea temperatures. Major storms have also resulted in substantial impacts to the shallow and fringing reef environments. The low lying characteristics make the islands vulnerable to sea level rise.
Natural and Environmental Disasters	Severe	

A new emerging issue is overfishing (moderate).

Challenge 1 - Pressures on the Cayman Islands' habitats and biodiversity - Severe

The three most typical marine habitats around Cayman, the coral reefs, sea-grass beds and mangrove wetlands, are all coming under pressure.

Damage to coral reefs (pressures)	Severity	Impacts
Tourism	●	Damage resulting directly by tourism includes mechanical breakage by scuba divers and snorkelers; ships' anchors; boat groundings; fishing tackle.
Coastal zone development and activities	●	Damage induced by decreased water quality and increased turbidity due to upland and shoreline construction and modification, offshore dredging, clearance of fringing coastal mangroves and wetlands, sand removal from beaches.

⁹ http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

Pollution	○	Treated sewage injected into the groundwater contains nutrients which result in increased algal growth harmful to coral; canal and other coastal developments lead to deterioration in water quality through land based sources of pollution. Septic tank system used on islands is contributing to introducing more pollutants to ground water around islands.
Several causes	●	Bleaching events and disease can derive from a series of factors, from elevated water temperatures to the sun skin-protectors used by sea users.
Fishing pressure	○	Increased fishing pressure removes important trophic groups, particularly herbivorous fish that have significant impacts to reef health and coral resilience.
Damage to seagrass beds	Severity	Comments
Degradation of Coral reefs	○	Coral reefs protect the sea-grass beds lying on their shoreward side, so their degradation can adversely affect the sea-grass.
Anthropogenic activities	○	Suffered as a result of physical removal, construction impacts, siltation and turbidity. Alteration to water quality and movement leading to epiphytic fouling from increased nutrients.
Damage to mangroves and terrestrial habitats	Severity	Comments
Construction and Development	●	Mangroves and coastal wetlands continue to be cleared and drained for construction and development due to inadequate planning and conservation legislation. Terrestrial habitats are also undergoing loss and fragmentation as a result of expansion of residential / commercial areas and infrastructure.
Non-native species	●	Non-native species are establishing rapidly and impeding the recovery of native species in disturbed areas, especially in coastal areas.
○ Nil ○ Slight ○ Moderate ● Heavy		

Damage to seagrass and mangroves means further destruction of fish spawning grounds and a further loss of protection from the sea.

The road corridor remains an actively gazetted corridor and the government has recently entered into a memorandum of understanding to develop a public private partnership agreement to fund a 10 mile section from Hirst Road to Frank Sound Road (through the southern Central Mangrove Wetland and Mastic Trail).

Challenge 2 - Solid waste management - Severe

See also section 3.1.

Several independent studies have indicated the need for evaluating the current and future landfill sites and needs on the Islands. The 72 acres landfill site in George Town, Grand Cayman, is now full after more than 30 years of use, and it constitutes the highest point on Grand Cayman. The landfill site was reorganized in 2009 and 2010 where the operations were relocated in a more organized manner and relocated away from main municipal solid waste disposal area. Any expansion of the George Town landfill and the one in Brac, which is also nearing capacity, require serious consideration. Previously, a 100 acre site was purchased in Cayman Brac for waste management facilities; however, the site is being used for other agencies and no waste management facilities have been developed to date. The EIA for a new sanitary landfill in Grand Cayman commenced in 2013 but has not been finalized.

The Department of Environmental Health has been monitoring the ground water quality around the current landfill in George Town for many years, testing to EPA standards and all results have been within their acceptable limits.

The Cayman Islands Government considered exploring the option of waste to energy on Grand Cayman and also the possibility of mining the existing George Town landfill site. Subsequently, a request for proposals was prepared in 2010 and several companies applied. The tender was awarded to a reputable and established United States company to undertake a comprehensive evaluation and execution of a waste to energy project; however, this pathway stalled and the government made a new arrangement with a private partner. The selected new waste management site was identified to be developed in the District of Bodden Town and the existing George Town landfill would have been closed-out and capped. These plans were later cancelled by the new government following the May 2013 elections and the landfill remains in George Town.

The Grand Cayman accumulates a significant volume of scrap metals and derelict vehicles; around 16,000 tons of scrap metal have been shipped off Islands since 2011 and it is expected that the majority of stored scrap metals to be shipped off island by 2015. The landfill also receives between 300 to 350 tons of derelict vehicles every year from the public. Although many of the identified locations have been cleaned, there may be some areas that have not yet been identified or new locations where derelict vehicles were recently abandoned. The revised Traffic Bill creates a new job called a "vehicle removal agent"; a person that will be licensed under regulations drawn up by the government to assist police in instances where vehicles need to be removed. In such a case, fees for the removal would be paid to the vehicle-removal agent and not the commissioner of police, as the law currently prescribes.

Challenge 3 - Invasive species - Severe

Global invasive species database¹⁰ lists 79 invasive species in the Cayman Islands. JNCC reported in 2006 110 invasive / naturalised flora and fauna known in the Cayman Islands¹¹. Since completion of this report, pink hibiscus mealy bug has been recognised in Grand Cayman. Probably the highest priority invasive species requiring management action are *Casuarina equisetifolia*, *Scaevola sericea*, pink hibiscus mealy bug *Maconellicoccus hirsutus*, mahogany shoot-borer *Hypsipyla grandella* and *Iguana iguana*. In the marine environment, the lionfish invasion, which has become a regional problem within the Caribbean, is a significant and increasing threat to local marine resources.

¹⁰ <http://www.issg.org/database/species/search.asp?st=sss&sn=&rn=Cayman%20Islands&ri=19159&hci=-1&ei=-1&lang=EN>

¹¹ Varnham, K, 2006, Non-native species in UK Overseas Territories: a review - JNCC Report 372

4 ENVIRONMENTAL GOVERNANCE

Cayman Islands is mentioned as one of the OCTs with a weakest environmental and physical development management. However, situation is likely to be improving. During her acceptance speech in the Legislative Assembly in September 2013, the new governor has added her voice to calls for responsible management of the local environment, expressing her commitment to the management of the islands' natural resources. The National Conservation Law, which was drafted since 2007, has finally been published in February 2014. Regulations for its implementation are, however, missing.

4.1 CONSTITUTION

The Cayman Islands were administered from Jamaica after 1863. In 1959, the islands became a territory within the Federation of the West Indies, but on its dissolution in 1962, the Cayman Islands chose to remain a British dependency. The law is based on English common law and locally enacted statutes.

Currently the head of state is the Queen, who is represented by a governor appointed by the monarch. The executive body is the Cabinet. Following legislative elections, the governor appoints the leader of the majority party or coalition as premier. The Cabinet is composed of two official members (the deputy governor and the attorney general, appointed by the governor) and seven elected members, called ministers; one of whom is designated premier.

With the new Constitution (6 November 2009), the unicameral Legislative Assembly increased from 15 to 18 elected members and currently comprises 21 seats. These 3 members appointed by the Governor - Chief Secretary, the Attorney-General and the Financial Secretary - do not vote. The seven ministers are voted into office by the 18 elected members of the Legislative Assembly.

4.2 INSTITUTIONAL FRAMEWORK

Currently there are the 7 ministries: i) Ministry of Financial Services, Commerce & Environment (includes the Directorate of Environment, DoE), ii) Ministry of Planning, Lands, Agriculture, Housing & Infrastructure (includes the Directorate of Territorial Planning, the Lands & Survey, the Directorate of Agriculture and the Petroleum Inspectorate); iii) Ministry of Health, Sports, Youth & Culture (includes the Environmental Health directorate and the Mosquito Research & Control Unit); iv) Ministry of Home & Community Affairs (includes the Fire Service); v) the Ministry of Finance & Economic Development; vi) Ministry of District Administration, Tourism & Transport; and vii) Ministry of Education, Employment & Gender Affairs.

Almost 80 departments, sections and units carry out the business of government, joined by a number of statutory boards and authorities set up for specific purposes. Examples of which include the Water Authority, the National Trust for the Cayman Islands, Cayman Islands Economic and Statistics Office (ESO), the Port Authority, the University College Board of Governors, etc.

The following table the responsibilities and tasks of each institution:

Topics	Policy-making	Implementation of projects	Law-enforcement	Monitoring	Statistics
Environment	Ministry of Financial Services, Commerce and Environment.	Department of Environment.	DoE Conservation Officers Royal Cayman Islands Police.	DoE	1. ESO 2. Department of Environment.
Water	Ministry of Planning, Lands, Agriculture, Housing and Infrastructure.	Water Authority-Cayman	Water Authority -Cayman	Water Authority - Cayman	1. ESO 2. Water Authority - Cayman.

Waste	Ministry of Health, Youth, Sports and Culture.	The Department of Environmental Health	Public Health Law	Department of Environmental Health	1. ESO. 2. Department of Environmental Health
Biodiversity	Ministry of Financial Services, Commerce and Environment	DoE; National Trust for the Cayman Islands (NT)			
Territorial Planning	Ministry of Planning, Lands, Agriculture, Housing and Infrastructure.	Central Planning Authority, Development Control Board, Planning Department	Planning Department	Planning Department	1. ESO. 2. Planning Department.
Civil Protection ¹²	Ministry of Home and Community Affairs.	Hazard Management Cayman Islands.	Hazard Management Cayman Islands.	Hazard Management Cayman Islands.	1. ESO 2. Hazard Management Cayman Islands.

The following monitoring is undertaken:

Topics	Monitoring
Water	DoE: monitoring of water quality in George Town harbour and North Sound in conjunction with the Water Authority-Cayman; DEH: Laboratory analysis of water samples.
Biodiversity	DOE: monitoring of mangrove, seagrass and coral reef systems (CARICOM) long-term monitoring of coral reef resources on the three islands; incidence of coral and diseases monitoring; beach and in-water marine turtle monitoring status of population of Cayman parrot.
Integrated coastal zone management	DoE: beach profile monitoring.
Fisheries	DoE: studies of reproductive migrations and spatial ecology of Nassau grouper on Little Cayman spawning aggregation the status of shallow water populations of queen conch in and out of the marine protected areas.

The DoE is subdivided into: Research and Assessment (11 staff), responsible for planning and implementing research and monitoring programs on the environment and natural resources, assessing the environmental impacts of activities around the islands and recommending the appropriate action. It is also active in educational outreach and public information; Operations (7 staff) responsible for the maintenance of marine parks markers, signs, regulatory buoys and moorings for recreational vessels; Enforcement (9 staff) responsible for compliance with the Marine Conservation Law around the islands. It also provides information to the public on the regulations on marine parks and other natural resources.

The Department of Environmental Health (DEH) with 135 staff is responsible for solid and hazardous wastes including waste collection, recycling and disposal; district sanitation and rodent control; management of food hygiene and safety; laboratory services; engineering and developmental control; and public education and promotion programmes. DEH has an office in Cayman Brac which caters to the needs of Cayman Brac and Little Cayman. The majority of services offered in Grand Cayman is also offered in Cayman Brac and Little Cayman.

A Solid Waste Management Strategic Committee, comprised of elected officials and civil servants was established in 2007 and other committees were established in 2011 and 2014 to develop an overall long-range comprehensive solution and strategy for solid waste management including hazardous waste management, waste-to-energy, reduction, reusing and recycling. Additionally, these committees have been discussing technologies other than traditional landfill methods. Based on studies and previous and current strategic planning, the Department of Environmental Health explored the option of introducing

¹² Response to disasters, emergencies, coordination of contingency planning, responsible for management of early warning systems

waste to energy technology to the Cayman Islands as an ultimate solution to reduce waste disposal in landfills by almost 90%. However, other options were placed on the table for further consideration and the Department is currently working on an overall strategic plan to select the best options for waste management on the islands via steering committee formed in 2014.

The Water Authority, 127 staff, is Government owned and supplies piped water to George Town, Bodden Town, East End and North Side in Grand Cayman and also in Cayman Brac, covering a total population of approximately 25,000 permanent residents – less than half of the population. The Cayman Water Company, a privately owned water utility, provides piped water to the Seven Mile Beach area and West Bay.

The National Trust for the Cayman Islands is a statutory body. It owns approximately 800 hectares of land which is protected in perpetuity for the people of the Cayman Islands under the Trust Law. Trust nature reserves include the Booby Pond nature reserve on Little Cayman, a Ramsar site of international importance, home to 20,000 red-footed boobies, the Brac Parrot reserve, the Salina reserve, and some parcels in the targeted Mastic and Central Mangrove Wetland reserves on Grand Cayman. The National Trust also maintains a herbarium. The trust runs a programme of captive breeding and restocking of protected habitat of the blue iguana. The National Trust undertakes biodiversity surveys based on satellite images and fieldwork.

4.3 POLICY FRAMEWORK

The Environment Charter (see section 3.3), signed by the UK government and the government of the Cayman Islands in September 2001, includes a commitment of the Cayman Islands government to ensure that environmental considerations are integrated within social and economic planning processes, and promote Charter commitments. This has not yet been formalised in terms of an implementation plan.

The territory has for many years had a policy to establish a network of protected nature conservation areas, however, only a system of marine parks has come to fruition leaving terrestrial environmental resources unprotected.

The main existing policy documents are listed in the table below.

Topic	Remark
Vision 2008 (1999)	This is the current national strategic development plan for the Cayman Islands. It was completed in 1999 after extensive stakeholder consultation. Two strategies are intended to ensure nature conservation is integrated into development projects. Strategy 10 states "We will develop and implement a growth management plan to achieve and maintain a balance between the natural and built environment" and Strategy 11 states "We will protect our natural environment, particularly the Central Mangrove and other wetlands, the North Sound and coral reefs, from further development".
National Environment Policy Framework (2002)	The National Environment Policy, approved by the Cabinet, was developed to address commitments made in the Charter and MEAs in which the Cayman Islands participates. This outlines five broad goals and eight key strategies, with two of the agreed priorities being: the enactment of the National Conservation Legislation; and The establishment of a National System of Protected Areas, starting with the creation of Barkers National Park. Both of these priority actions are still outstanding, and in fact the latter depends heavily on the former which has been published a few months ago.

Development Plan for Grand Cayman (1997)	This is a planning statement document that outlines physical development within zones and includes reference to environmental and ecological considerations. Policy is translated into statute via the Development and Planning Law and Regulations, which include limited provisions for mangrove protection within the Mangrove Buffer Zone, but do not contain EIA provisions. The draft 2003 Development Plan for Grand Cayman has not been implemented and omitted the majority of recommendations made by the Environment and Coastal Zone Management Special Issue Committee ¹³ , e.g. a workable EIA framework, open Central Planning Authority meetings, standard conditions for approval in areas of primary vegetation. Currently no physical development plan exist for the sister islands.
National Tourism Management Policy (2002)	The overall goal for tourism to be a thriving and sustainable sector of the economy. It aims to accomplish this through nine key policy objectives, three of which are environment-focused: adopt a sustainable approach to tourism development; protect and enhance the marine resources of the islands; and develop eco-tourism on the Sister Islands. Sustainable tourism practices are encouraged through the endorsement of a proposed local initiative, Cayman Islands Environmental Project for the Tourism Sector (CEPTS), which is mirrored after the US AID-funded Environmental Audits for Sustainable Tourism (EAST) project in Jamaica that establishes environmental management systems in tourist accommodations leading to eventual Green Globe 21 certification. However, many of the mechanisms needed in order to meet the policy objectives have not been implemented.
Aggregate Policy (2004)	The purpose of this document is to reduce natural resource loss from quarry operations whilst ensuring the continuing availability of building materials.

A draft climate change policy exists since 2011, prepared with support from DFID. It aims at achieving a low carbon climate-resilient economy. Priorities are: marine and coastal resources; terrestrial resources; energy security; water resources and hydrology; food security; critical infrastructure; tourism sector; insurance and financial services. Despite three years of public consultation, the government still has not formally considered the policy and it remains in draft form.

There is also a draft National Energy Policy. It has recently been reviewed and assessed by external consultants, namely to evaluate its economic implications

4.4 LEGAL FRAMEWORK

If the Cayman Islands want to be part of a Multilateral Environmental Agreement (MEA) a formal request needs to be issued to the UK in that regard. Usually in order to be part of a convention Cayman needs to enact legislation and prepare some processes. The following table includes MEAs extended to Cayman Islands.

Convention	Remarks
Biological Diversity	Extended to Cayman Islands in June 1994. In 2005 the territory submitted its Third National Report to the CBD (within the UK report). Pending enactment of National Conservation Law has been preventing full implementation. Cayman Islands has not yet developed a biodiversity action plan, although this is the subject of an ongoing for Darwin Initiative project.
RAMSAR	One site (Booby Pond & Rookery) formally approved to date, but Ramsar Information Sheets have been submitted for another four sites (Barker's Wetland, Central Mangrove Wetland, Little Sound, Ponds and associated Marine Zones, Little Cayman Crown Wetlands and Marine Parks, Salina Reserve).
CITES	Became effective in May 1979 and extended to Cayman Islands in February 1986. The Convention is implemented in the Endangered Species Trade and Transport Law. There has been some controversy about the small quantities of turtle products or live turtles bred in captivity and exported by the Cayman Turtle Farm and whether this is a breach of the Convention by the Cayman Islands or the importing country.

¹³ The Environment and Coastal Zone Management SIC is a sub-committee of the Development Plan Review Committee established to administer the consultative review of the Development Plan, which is required by Law to be reviewed every 5 years.

Migratory Species	There is some confusion as to whether or not the UK is satisfying its obligations under this Convention with respect to the legal harvests of marine turtles in British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands. These legal harvests involve commercial trade of marine turtles that may or may not qualify as accommodating 'the needs of traditional subsistence users' (undefined in the Convention).
Climate Change	Request for these commitments to be extended to the Cayman Islands was made in September 2005.
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter	Became effective in December 1975.
Regional	Remarks
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)	Extended to Cayman Islands in February 1986, including the Oil Spills Protocol. The Specially Protected Areas and Wildlife (SPAW) Protocol entered into force in 2000. UK ratification is awaiting the enactment by the CI of the National Conservation Law.

The main national legislation is as follows:

Theme	Existing legislation
National Conservation Legislation (2013)	It will serve to (i) establish the National Conservation Council, set out its roles and responsibilities and those of the Department of Environment, (ii) outline mechanisms for the designation and management of protected areas, (iii) set out procedures for the nomination, designation and conservation of protected species, (iv) regulate the introduction of non-indigenous or genetically altered species of flora and fauna, (v) establish statutory requirements for environmental impact assessments, (vi) establish a conservation fund, and (vii) set out detailed enforcement procedures and penalties for contravention of the provisions of the law. Now that it has been approved development of regulations is required.
Biodiversity	Animals Law which protects wild birds including Cayman Islands parrots, traditionally kept as pets; Marine Conservation (Turtle Protection) Regulations limit take of marine turtles by local fishermen; Marine Conservation legislation covering various culturally significant species: whelks, lobster, conch, etc.
Water and wastewater	Water Authority Law of 2011 (originally enacted in 1982); Water Authority Regulations (2007 revision - original version came into force in 1985); Wastewater Collection and Treatment Law 2011; Water Production and Supply Law 2011 (originally enacted in 1979)
Waste	Public Health Law (2002) and Regulations (revised) broadly deals with solid waste management. It also incorporates requirements on hazardous substances (chemicals) and on noise.

The National Conservation Legislation introduce mandatory EIA for large projects, but has not yet been enacted by the legislative assembly. However, despite the absence of a legislated EIA framework, an environmental report confined to the marine impacts associated with the construction of a proposed cruise ship facility in George Town Harbour is currently being prepared.

There is a draft Solid Waste Management Bill, 2012. This bill will regulate all aspects of the waste industry including waste to energy and waste haulers.

The Cayman Islands has been successful not only in protecting its marine environment on paper but also in implementation and enforcement. There is an active enforcement section within the DoE that patrols the islands daily, monitoring coastal and inland projects and fisheries conservation activities. In 1995 the Marine Conservation Law was amended to increase fines for marine offences from US\$6,000 to US\$ 600,000.

4.5 ENVIRONMENTAL AWARENESS

The DoE is currently raising awareness of the issues of specific invasive species through the Darwin Initiative. The National Trust for the Cayman Islands is currently promoting general appreciation of native species through its media campaign "Know Your Islands".

DoE is establishing a native plant nursery, to offer native trees and local *Scaevola plumieri* to the public, to encourage local landscaping.

DoE is currently assisting in several research initiatives on invasive species:

- investigate origin / hybridization of local freshwater turtles Hickatees *Trachemys decussate* with Red-eared Sliders *Trachemys scripta*;
- investigate the ecology and impact of *Iguana iguana* on local flora and fauna;
- investigate the ecology and impact of monk parakeet *Myiopsitta monachus*; and
- support the National Trust's blue iguana.

A Private Members Motion, recently approved in the Legislative Assembly, has committed the Government to considering the establishment of a bounty of \$5 per lionfish with the Environmental Protection Fund (EPF) being used to finance this initiative. The Department of Environment is very concerned as it believes that this is not an appropriate approach for addressing the problem of lionfish and will simply result in the rapid depletion of the EPF, with no tangible result.

4.6 FINANCE FOR THE ENVIRONMENT

In 1997 an Environmental Protection Fund was established by law in the Cayman Islands. The fund's revenue is raised by means of a tax on departing tourists. It was originally intended that the Fund should assist with the acquisition of land in environmentally sensitive areas, but it has been quite ineffective in this regard. However, the Fund which amounts to over \$43 million is not readily accessible for its intended purposes, as it forms a large proportion of the overall Government cash reserve required under local financial management legislation. The Department of environment urges the decoupling of the Environmental Fund from the General Reserves.

In December 2008, the Cabinet approved a policy for import duty waivers for renewable/alternative energy equipment.

The DoE, is a participating institution in:

Name and aim of Organisation	Other OCT members	Other non-OCT members	Benefits
Caribbean Community (CARICOM)	OCTs are associated members Anguilla; Bermuda; British Virgin Islands; Cayman Islands; Turks and Caicos Islands	Most former British colonies in Caribbean plus, recently, Surinam and Haiti	Created in 1973 as a free trade area (incl. Monserrat). Other British OCTs joined between 1991 and 2002. Goal of CARICOM Task Force on climate change and development: facilitate and coordinate technical work, advice on policy directions, support CARICOM Member States in their preparations for key regional, hemispheric and other global forums and in their negotiations with international development partners.

The Cayman authorities express that an area of concern remains the underrepresentation of the Cayman Islands/Territory views with respect to the UK's position in negotiations on international treaties. This is due to the bloc voting approach of the UK within the European Union.

The Cayman Islands is also not eligible for several of the international environmental and sustainable development funding mechanisms. Available funding tend to focus at regional level (or Caribbean OCTs level) and are not country specific. Cayman's relatively isolated geography presents some fairly unique challenges that would benefit from country specific approaches.

In the case of the EU, the Cayman Islands are not eligible for territorial allocations under the 9th and following EDF due to their high GNP per capita (which exceeds the Community average). The Cayman Islands can however access other funds and be involved in regional initiatives. Cayman has submitted a request to the Commission for aid from the 9th EDF for the reconstruction and rehabilitation of houses that were destroyed by hurricane Ivan. For this purpose, a project of € 7 M has been accepted. This project finished in 2009. A project of € 4.5 million, also financed from the 9th EDF, is underway for a digital early warning system in the Cayman Islands which will fill in a gap in the regional radar system.

For all the above, continued access to UK expertise, technical support and resources is crucial, and although with small projects the Darwin Plus Initiative is seen very positively. According to the Department of Environment the environment is a low political priority which means that it is either not considered or is assigned a much lower weight than other factors in the decision making process, and local action and political commitment is ultimately what is required in order to achieve a more sustainable development for the Cayman Islands – the high level relation with external entities contribute to this goal. Traditionally, technical cooperation with the UK in the area of environment has been in biodiversity/conservation management and planning. For example, collaborative projects between DOE and UK academic/conservation institutions with associated funding mechanisms (e.g. Darwin, OTEP, RBG Kew, JNCC and UKOTCF). The Department values the introduction of the Overseas Territories and Crown Dependencies Steering Group meetings (facilitated by the JNCC) as a coordinating mechanism for biodiversity issues.

Main environmental projects implemented in Cayman recently:

Area / topic	Name	Budget	Source(s) of funding	Type of funding (loan, grant, co-financing)
Biodiversity	Create habitat maps for the marine and terrestrial environments using a combination of remote sensing and biological survey techniques	€ 250,000	Darwin Project – UK initiative	Grant
Biodiversity / fisheries	CARICOMP (Caribbean Coastal Marine Productivity Centre)		UNESCO	

The Cayman Islands territory is a major world offshore financial centre and worldwide known tourism destination due to its outstanding natural beauty. This has led to rapid population and economic growth with rapid increase of tourism.

However, economic planning and development decisions are largely reactive. The absence of a long term planning strategy, and the lack of formal project appraisal/evaluation process (cost benefit analysis, strategic environmental assessment and environmental impact assessment) associated with weak conservation legislation has caused conflict between technical advice and political decision-making. This, coupled with absence of strategic assessment of the infrastructure requirements associated with rapid population growth and high volume of cruise tourists that visit Grand Cayman (1.5 million visitors per annum) has resulted in development which is undertaken in an *ad hoc* manner with little and piecemeal implementation of the National Tourism Management Plan.

One example is the fact that as there are no development plans and there is limited planning legislation in the Sister Islands, a significant number of large tracts of undeveloped land is being subdivided into small lots, marketed and sold by a UK based investment company. This with no regard to the immediate environmental impacts associated with potential development of the land (including the speculative clearing of these sites), or the future infrastructure requirements to support such development. Another example is the fact that five sites were designated as animal sanctuaries by the Cayman Government in 2003, but two have since had their protection revoked, setting a worrying precedent.

Collection, analysis and use of reliable and relevant data and statistics to assist sound economic planning is very limited. There have been efforts to develop some crucial policies such as climate change, energy and coastal works (seabed) however, policies remain in draft form and therefore have practically no influence on the development process. Reportedly, where policies exist, they tend to operate in isolation with little or no integration at a national or inter-disciplinary level.

The environment continues to be a low political priority which means that it is either not considered or is assigned a much lower weight than other factors in the decision making process. This has led to lack of integration of environmental and climate change concerns in economic development. The maintenance of this situation affects livelihood of the population, and in time will affect the tourism assets (nice beaches and natural beauty) and further disrupt the economy. A first sign of change is, however, the National Conservation Law, 2013, published¹⁴ as Supplement No.1 to the Extraordinary Gazette No 9 dated February 5, 2014, after at least 4 years of waiting and discussion. To allow the implementation of the Law there is a need to enact regulations. Of particular interest is the Environmental Impact Assessment process that needs to be regulated. Much of the protection for species in the National Conservation Law will come through publically consulted Species Conservation Plans (NCL Section 17). The Department of Environment has prepared biodiversity action plans for several species that will form the basis on how these species should be managed under the National Conservation Law.

Large projects involving both offshore (Cabinet's jurisdiction) and land-based components (Central Planning Authority's jurisdiction) are not reviewed, assessed and determined collaboratively and comprehensively. Separate decisions are issued independently by the two bodies. This creates the potential for applicants to achieve permission for one element (i.e. offshore or onshore) and not the other, resulting in an untenable situation for both the applicant and the decision-making bodies. Consequently, poor decision making from an environmental perspective is greatly increased as it is often impossible to take full account of ecological linkages between the terrestrial and marine environment.

14 http://www.gazettes.gov.ky/sites/default/files/extraordinary-gazettes-supplements/Es052014_web.pdf

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Improve physical and natural resources planning	Develop and implement National Physical Development Plan, watershed plans and forests plans, elaborate coastal zone management plans.	There is a lack of policies, strategies, and legislation to delineate technical and political decisions, and lack of direction, coordination, and technical oversight of major economic investment and development plans ¹ . Decisions are often based on poor quality information and analysis and the environmental costs and benefits of projects are not properly identified and accounted for.	5 years	Cayman Island Government. Different ministries	National mobilization	Political will and capacity to mobilize efforts, adherence of the private sector	Cayman government, private sector, UK, EU
	Activities Involve and coordinate the various actors (environment, land, fishing, police, defence, ports, tourism, rural development, local authorities) Characterize the different areas of the territory and their possible uses Develop a study on the economic potential and environmental risks in the different areas of the territory, including climate change scenarios. Engage on the development of an integrated National Physical Development Plan that is co-developed with a National Strategic Environmental Assessment and identify the country's development priorities taking into consideration the economic development and the conservation of ecological assets, as well as the prospective scenarii and climate change. Promote workshops and discussion to identify main issues and solutions and set goals. Set up a realistic programme of measures to achieve green growth. Mobilize funds for implementation. Assess status and uses of watersheds, through a participatory process. Identify uses and pressures and main concerning issues and establish programme of measures for the preservation of good ecological and chemical status. The measures should take into account different uses, the need for conservation, and the promotion of sustainable use – even if some practices have to change. EU Water Framework Directive can function as guide. Establish monitoring programmes. Make a territorial forest inventory (including the different types of forests), identifying areas for protection and areas that can be used. Establish forest reserves. Identify areas that can be used by most vulnerable population, and set up community projects on sustainable use of forest. Establish forest management plans, including commercial forest management. Establish forest monitoring programmes. Engage into an integrated coastal zone management process. The plan should take into account the components referred above, together with climate change scenarios. The plan should take into account the importance of tourism, boating and yachting. Assess missing legislation to implement the plans and develop/update the legal framework. Enact also directives and regulations to allow proper law implementation and enforcement. Promote co-management, eco-tourism, renewable energies, wherever possible. Coordinate regionally for whatever harmonization and collaboration possible.						

¹ For example port developments, ForCayman Investment Alliance, Enterprise City, Health City Cayman.

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Increase invasive and feral species control	Specifically control <i>Casuarina equisetifolia</i> , <i>Scaevola sericea</i> , green iguana, lion fish, rats, and feral cats and dogs.	Invasive fauna and flora species are proliferating in the Cayman Islands, despite ongoing efforts. Feral animals also pose much pressure on native species.		Coordination: DoE Support: Agriculture		Availability of funding Environmental Protection Fund	Environmental Protection Fund, law violation sanctions, UK, private sector sponsored projects
	Activities Assess projects implemented in the past, to control the specific invasive species in the Caribbean region, and the reasons for their success / failure. Undertake site assessments to know the current situation. Promote general awareness raising of the ecological impact of key invasive species, and of the unique and endangered nature of many of Cayman's native flora and fauna Implement a coastal conservation programme targeting removal of <i>Casuarina equisetifolia</i> and <i>Scaevola sericea</i> , combined with habitat restoration through planting of head-started native plants and trees. Increase effective public relations work and awareness-building towards local stakeholder alignment regarding preservation of Little Cayman rock iguana <i>Cyclura nubila caymanensis</i> and Grand Cayman blue iguana <i>Cyclura lewisi</i> . Establish a protected area dedicated to supporting a self-sustaining population of the endemic iguana species. Develop a lion fish response plan, inspired on possible existing best practices in other Caribbean countries and territories addressing the same problem, or even from examples from the Pacific. Implement control and eradication methods for rat/cat eradication on Little Cayman and cat/dog control on Grand Cayman Expansion of capacity of spay and neuter programme for cats and dogs. Perform long-term monitoring / management.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible sources €
Promote Green Growth ²	Enact and implement climate change policy, energy policy and solid waste management plan	A Draft Climate Change Policy was produced ³ and has undertaken three years of public consultation but remains in draft form. A draft National Energy Policy is currently being reviewed and assessed namely regarding its economic implications. There lacks an integrated approach to solid waste management and legislative framework which is creating significant environmental impacts such as migration of landfill leachate directly into the marine environment. There are ongoing initiatives on energy and waste, but coordination and direction is required to seize the efforts.	7 years Start two years after the beginning of implementation of first recommendation	Cayman Islands government and particularly Ministry of Environment and Home Affairs.			EU WB and Regional Development Banks Private sector
	Activities Once governance issues start to be tackled (see first recommendation): Enact climate change policy and energy policy. Study the business environment and study ways of engaging private sector. Massive awareness-raising. Establish awards and certifications regarding sound environmental behaviour. Work on finding a good renewable energy mix for the Cayman – assess renewable energy potential and the status of the grid. Proceed with legal reform to increase renewable energy penetration and improve energy efficiency. Articulate regionally to assess possible regional solutions. Promote energy efficiency. Develop a waste management plan taking into account possible waste valuation. Find solutions for the waste streams that cannot be dealt in the territory. Organise proper disposal landfills for the waste that cannot be valued. Assess the different possibilities to solve the environmental problem of the existing landfill (waste to energy, coverage and greening). On water and waste management develop economic instruments (cost recovery, incentives to recycling, taxes on imported items that became waste) and valuation of waste. Organise networking between the different stakeholders dealing with a particular issue. Promote debate and information sharing; establish dedicated websites for sharing of possible national solutions, and sharing of know-how and experience between regions. Organize trainings on technical issues. Organize training on fund mobilization (internal and external), training and assistance on proposal writing. Support the implementation of the sustainable tourism certification schemes. Define indicators, or guidelines, for sustainable tourism.						

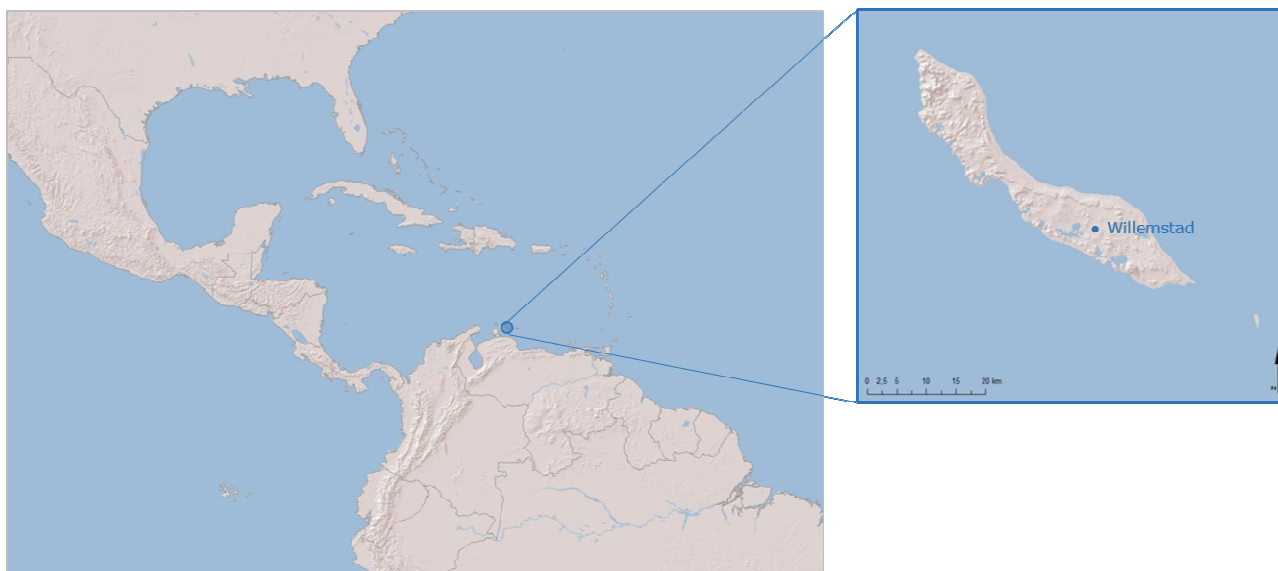
² According to OECD Green growth means promoting economic growth while reducing pollution and greenhouse gas emissions, minimising waste and inefficient use of natural resources, and maintaining biodiversity (<http://www.oecd.org/environment/green.htm>)

³ The draft climate change policy was developed under the Enhancing the Capacity for Adaptation to Climate Change Project funded by UK-DFID.

ANNEX F : CURAÇÃO

ENVIRONMENTAL PROFILE

CURAÇAO



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SUMMARY

Curaçao, previously part of the Netherlands Antilles, became an independent country within the Kingdom of the Netherlands on October 10, 2010, when the Netherlands Antilles were dissolved. Aruba, Curaçao and Sint Maarten now have the same status and are independent countries in the Kingdom. The other three former Netherlands Antilles have become special municipalities of the Netherlands (Bonaire, Sint Eustatius, and Saba). Data gaps, related in part to the dissolution of the Netherlands Antilles and lack of institutional capacity, impede a complete diagnosis for this Curaçao profile¹.

Curaçao is a hotspot centre for biodiversity within its wider ecoregion.² It is estimated that Curaçao's reefs bring in at least \$ 1.6 million per km per year through revenue from tourism, fishing and coastal protection during storms³ Damage to the reefs (from climate change and rapid and poorly planned physical development caused by population and tourism growth) will thus have severe economic consequences.

There are many studies concerning the future of the country, including for the oil refinery. The recent Government Programme for 2013 – 2016 ('Hope and Confidence') states that 'The environment, the nature, the quality of our living environment and pollution are important points of action. The elimination of pollution and identifying natural areas are priority issues⁴.

Continued prosperity and well-being of the island will depend amongst other factors on the careful nurture and protection of vital ecosystems, particularly coral reefs and mangrove wetlands and the adoption of measures to enhance their resilience and adaptation to the consequences of climate change and severe meteorological events.

1 BACKGROUND INFORMATION

Key facts and statistics

Name of territory	Curaçao, capital: Willemstad
Region	Caribbean, 55 km off the coast Venezuela
Land area	444 km ²
Exclusive economic zone	68,783 km ² Exclusive fishing zone: 12 nm
Population	150,563 (2011) ⁵
GDP/capita	€ 24,560 per capita (CIA: based on 2008 data growing at 3,5 % year)
Literacy rate	n.a.
Unemployment rate	10,3 % (CIA: 2012) 10,1% (IMF: 2009)
% below poverty line	> 15 % (UNDP: 2012)

1 IMF report 2011, <https://www.imf.org/external/pubs/ft/scr/2011/cr11342.pdf>

2 CARMABI/ Univ of Amsterdam: The current state of Curaçao's Coral Reefs by dr Mark J. A. Vermeij, A.J. 2012.

[http://www.researchstationcarmabi.org/images/stories/file/Mark%20PDFs/Vermeij%20MJA%20\(2012\)%20Curaçao%20State%20of%20the%20reef%202012%20Carmabi%20\(c\)2012.pdf](http://www.researchstationcarmabi.org/images/stories/file/Mark%20PDFs/Vermeij%20MJA%20(2012)%20Curaçao%20State%20of%20the%20reef%202012%20Carmabi%20(c)2012.pdf)

3 http://www.reefcare.org/index.asp?page=http://www.reefcare.org/page.asp?pag_id=410

4 [http://www.gobiernu.cw/web/site.nsf/resources/A380A9A1AC44287904257C8C00566641/\\$FILE/RESUMEN%20ENG%2020.pdf](http://www.gobiernu.cw/web/site.nsf/resources/A380A9A1AC44287904257C8C00566641/$FILE/RESUMEN%20ENG%2020.pdf)

5 CBS: Centraal Bureau Bureau voor de Statistiek. <http://qracao.com/index.php/ouder/1074-cbs-publiceert-cijfers-volkstelling>

Physical geography

Curaçao is part of the southern group of Caribbean Islands, off the coast from Venezuela. It is flat with extensive sand dunes, scrubland, an estimated 55 ha of mangroves, salinas (salt ponds), fjord-like bays that cut deep into the land and fringing coral reefs (with a total surface of 7.85 km² situated at a distance from the coast ranging from 20 m to 250 m.⁶ Most of the territory is less than 1 m above sea level. One central hill (Mt Christoffel) is 372m.

Its climate is semi-arid, with little rain in 3 out of 5 years, and a wet year one in every 5 years. Vegetation consists of drought-resistant cacti and thorn scrub.⁷ Curaçao lies in the path of persistent trade winds but hurricanes are rare. Earthquakes are common in the region, the last ones occurred in January and June 2013. Nearly all areas in the Caribbean have experienced a tsunami at some time in history, and during the last hundred years some 33 possible tsunamis have been reported, of which 17 are well documented and verified.

Geologically Curaçao has four different types of stone formations.⁸ It has a volcanic origin but sedimentary rocks were deposited in certain areas and it also has lime stone terraces. During the Quaternary, ice-age controlled coral reef development dominated. Several inner bays were formed as a result of a sea level rise after the last glacial period 16,000 years ago.⁹

Demography, socio-economy

Curaçao has 150.5 thousand inhabitants. About 76% of the population was born on Curaçao, 6% in the Netherlands. 7% were born in Colombia and Dominican Republic. 78% speak Papiamentu (a local language) at home. The vast majority is catholic.¹⁰

Average living standard is relatively high in comparison with the region but economic growth has been slow, unemployment remains high, and population aging pressures are becoming significant.¹¹ Services (including oil refinery, financial services and tourism) account for 84% of GDP.

Before oil refining became a major source of wealth (around 1920), there was an important production of salt. The irregular coastline has allowed for the development of excellent natural harbours, including for cruise ships and for large oil tankers. Shell established an oil refinery in 1915 when oil was found in the Maracaibo lake in Venezuela. Presently Venezuela's state oil company, Petróleos de Venezuela (PDVSA) operates the Isla refinery, which has a 320,000 barrel per day capacity.

Poor soils and inadequate water supplies hamper the development of agriculture. Arable land is only 10% of the land surface and a large percentage of the food in Curaçao is imported,

Like in many other Caribbean countries, off shore finance is also important.¹² Tourism is important, around 350,000 tourists visited the island in 2010, mostly from the Netherlands.¹³

6 CARMABI/ Univ of Amsterdam: The current state of Curaçao's Coral Reefs by dr Mark J. A. Vermeij, A.J. 2012.

<http://www.dcbd.nl/?q=document/current-state-cua%C3%A7aos-coral-reefs>

7 L. Pors and I. A. agelkerken (CARMABI) for Unesco/ CSI paper <http://www.unesco.org/csi/pub/papers/pors.htm>

8 CARMABI, <http://www.carmabi-educatie.org/images/stories/file/de%20geologie%20van%20curacao.pdf>

9 Unesco paper

10 [http://qraao.com/attachments/article/1074/20120731_Publicatie_Eerste_resultaten_Census_2011%20\(1\).pdf](http://qraao.com/attachments/article/1074/20120731_Publicatie_Eerste_resultaten_Census_2011%20(1).pdf)

11 IMF

12 CIA: <https://www.cia.gov/library/publications/the-world-factbook/geos/cc.html>

13 IMF 201 and <https://www.imf.org/external/pubs/ft/scr/2011/cr11342.pdf>

2 BIOGEOGRAPHY, ENDEMISM, IMPORTANCE FOR GLOBAL BIODIVERSITY

Curaçao has relatively well preserved fringing reefs (compared to other Caribbean countries) as the island is less battered by hurricanes. The total number of coral species found in various marine environments of Curaçao is 68, representing more than 70% of all Caribbean species.¹⁴

In a recent compilation of scientific literature on the state of Caribbean reefs by the Global Coral Reef Monitoring Network (GCRMN), some of Curaçao's reefs, especially those along the eastside of the island, rank among the best remaining in the Caribbean region.¹⁵ Curaçao's reefs currently range in quality from degraded to almost pristine (see further on, in the section State of the environment).

The area occupied by mangroves is equivalent to 0.12% of the island's land surface. Together with the sea grass beds mangroves function as nursery areas for many Curaçaoan reef fish as well as nesting habitats for a wide variety of local birds. The number of known fish species for Curaçao is currently 358, which is, like the number of coral species, relatively high for an island the size of Curaçao.¹⁶

There are 245 bird species, none endemic.¹⁷ Hypersaline lakes on the southwestern coast are feeding habitats for the West Indian flamingo and migratory shore birds.

Curaçao has six distinct terrestrial habitat types.¹⁸ For instance the west side of the Knip mountain is of hard rock, rich in silica and is dominated by evergreen woodland in which also most of the rarer species of vegetation are found. In the mid-section of Curaçao (the soil is a mix of sand and clay) there are deciduous forests and the vegetation harbours a large variety of smaller herbs, considered the most important foraging area for most of Curaçao's fauna.

3 STATE OF THE ENVIRONMENT



According to CARMABI (Caribbean Research and Management of Biodiversity), the fragmentation of natural areas is a major issue, even though 32% of the islands area has some protection status.¹⁹

Several recent studies²⁰ point to a decrease in the cover and health of coral reefs on Curaçao. There has been a 20% decrease in the abundance of corals on the island in the last 25 years due to coastal development, pollution (untreated sewage, nutrients and chemicals) and overfishing. However, as said above, in some areas of Curaçao, the coral cover is good, compared to other Caribbean countries:

14 CARMABI/ Univ of Amsterdam: The current state of Curaçao's Coral Reefs by dr Mark J. A. Vermeij, A.J. 2012.

<http://www.dcbd.nl/?q=document/current-state-cua%C3%A7aos-coral-reefs>

15 http://www.icriforum.org/sites/default/files/ICRIGM27-OR-GCRMN_presentation.pdf

16 CARMABI reef research 2012

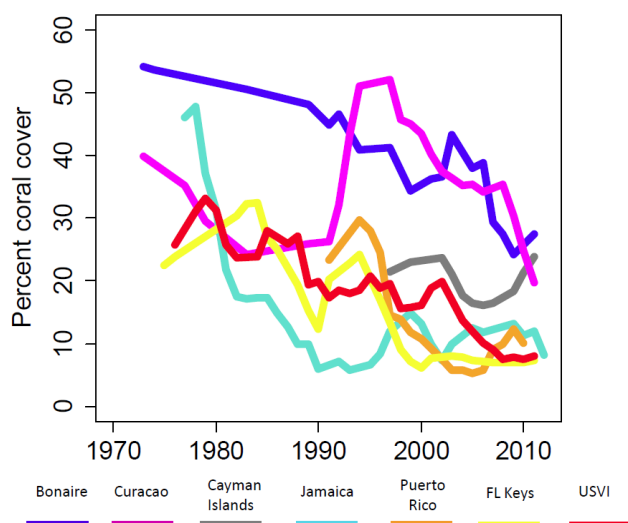
17 <http://www.birdlife.org/datazone/country/Curaçao>

18 <http://www.researchstationcarmabi.org/ecosystems/terrestrial-ecosystems>

19 <http://www.carmabi-educatie.org/images/stories/file/infoblad%20natuur%20in%20gevaar%20voor%20internet.pdf>

20 Nacri (Netherlands Antilles Coral Reef Initiative) on nutrients pollution: <http://www.nacri.org/nutmon.html>; Reef Base:

<http://www.reefbase.org/main.aspx>, CARMABI 2012: <http://www.dcbd.nl/?q=document/current-state-cua%C3%A7aos-coral-reefs>, ECLAC review 2004: <http://www.eclac.org/publicaciones/xml/9/13229/lcarg749-10-Chapter07.pdf>, ICRI: <http://icriforum.org/GCRMN>, WRI: <http://www.wri.org/publication/reefs-at-risk-revisited>. GCRMN 2012: http://gcrmn.org/wp-content/uploads/2012/11/Tropical_Americas_Coral_Reef_Resilience_Final_Workshop_ReportC.pdf and http://www.icriforum.org/sites/default/files/ICRIGM27-OR-GCRMN_presentation.pdf



Tourism has stimulated artificial beaches which is destructive for coral reefs.

Fish communities have been impacted similarly through uncontrolled fishing practices and Curaçao presently holds an intermediate rank among Caribbean nations in terms of fish abundance.²¹

A recent monitoring programme including water sampling, reef cover analysis by video transects, chlorophyll a analysis, nitrogen isotope analysis from algae and fish stock counts, concluded there is reason for concern. The sites at the Mega Pier and Piscadera Bay are polluted at a higher degree than the pollution thresholds.²²

The oil refinery has witnessed some accidents and is responsible for air, soil, ground and surface water pollution. A technical study by a Dutch engineers firm, shows that there is too much SO₂ and fine dust in the air near Schottegat refinery, and the quality of the surface water there is bad.²³ Besides, the soil and ground pollution at the refinery, the quality of groundwater and water wells should also be monitored. Another study, from 2012, about possible futures for the refinery, indicates that mitigating measures can already be taken to minimize the pollution of the adjacent aquatic sediment, which would require investments of approximately \$ 50 million and annual operating costs approximately \$ 1.5 million.²⁴

There is a lack of fresh water.²⁵ Water used for drinking is obtained through desalination. The island used to have good water aquifers but urbanisation has reduced infiltration. A series of dams, built by the Dutch around 1920, stopped the rain water from rushing downhill.²⁶ Water seeps into the ground and keep groundwater levels as high as possible. Artificial fresh water lakes were formed, that can still be seen behind for instance at Muizenberg and Malpais, now important bird areas.²⁷

21 According to the CARMABI Foundation and the University of Amsterdam 20102 study

22 Mark Wiegers, University of Utrecht, 2007: <http://www.nacri.org/greyllit/wiegers2007impactnutrientscoralreef.pdf>

23 <http://www.luchtmetingenCuraçao.org/pool/5/documents/2007-U-R0801B%20ter%20Meer%20-%20Milieudienst%20Curaçao6.pdf>

24 <http://www.stichtingsmoc.nl/uploads/EcoRYS2012Sustainable-future-for-Curaçao.pdf>

25 ECLAC: <http://www.eclac.org/publicaciones/xml/8/39188/LCARL.250.pdf>

26 <http://www.caribbeanfootprint.com/2012/01/03/rain-brings-life-rain-and-people-on-Curaçao/>

27 http://www.ramsar.org/cda/en/ramsar-news-archives-2013-Curaçao-4/main/ramsar/1-26-45-590%5E26081_4000_0_

3.1 THREATS / CHALLENGES / VULNERABILITY

Challenge 1 - Climate change - Severe

Curaçao is vulnerable to sea level rise and storm surges as it is less than 1 m above sea level and 40% of the workforce occupies the coastal region. The oldest part of the capital Willemstad is a World Heritage site. The city is an important asset for tourism on the island, besides its value as a commercial and government centre. A limited sea level rise will greatly increase chances that during a storm the whole inner city will be inundated or even destroyed. The potential loss of beaches is a serious threat for the tourist industry.

Impacts	Severity	Comments
Inundation of coastal land	●	Curaçao is low-lying. The potential loss of beaches is a serious threat for the tourism and construction industries, and turtle nesting populations.
Damage to mangroves	●	Extensive mangroves occur on the islands, important for fish breeding
Submergence, silting of sea grass beds	●	Extensive beds of grass in shallow lagoons around the islands
Coral reefs threatened (bleaching, decreasing pH)	●	Islands ringed by coral reefs, sensitive for water temperature increase and CO ₂ dissolving in water.
Consequences	Severity	Comments
Stressed fisheries	○	Commercial fishing and sport fishing is important to tourist industry
Tourist industry	●	Tourist industry accounts for 80% of GDP. Reef tourism and angling are important attractions.
Increased damage from natural hazards	●	Natural hazards and climate change are related
○ Nil ○ Slight ○ Moderate ● Heavy		

Corals bleaching occurred in 2005 and in 2010 due to higher than normal water temperature. A regional average of thermal stress during the 2010 event exceeded any observed from the Caribbean in the prior 20 years of satellite records and 150 years of reanalysed temperatures, including the record-setting 2005 bleaching event.²⁸

The toppling of many of the larger colonies on Curaçao's reefs and severe damage to all west facing coral communities on the island that was caused by hurricane Lenny in 1999, was repeated in 2008 by hurricane Omar.²⁹

Challenge 2 - Pressures on the Curaçao's habitats and biodiversity - Severe

At the beginning of the early 1980's reef building corals covered approximately 40% of the reef. In 2010, that number had decreased to 23.2%, indicating that coral cover has decreased by 42% in only three decades.³⁰

²⁸ CARMABI coral reefs report 2012: <http://www.dcbd.nl/?q=document/current-state-cua%C3%A7aos-coral-reefs>

²⁹ Idem CARMABI coral reefs 2012

³⁰ Idem CARMABI 2012 coral reefs 2012

Pressure	Severity	Impacts
Tourism	●	Damage to coral reefs resulting directly by tourism includes mechanical breakage by scuba divers and snorkelers; ships' anchors; fishing tackle. Pumping up sand from sea grass beds for artificial beaches ³¹ reduces fish breeding and extra sand deposition on various beaches ³² .
Coastal zones development and activities	●	Construction on internal waterways and salinas ³³ with a negative effect on birds, mangroves, sea grass beds. Mangroves continue to be cleared and drained for construction and development due to inadequate planning and conservation legislation. ³⁴ Terrestrial habitats are also undergoing loss and fragmentation as a result of expansion of residential / commercial areas and infrastructure. Increased coastal development has resulted in pollution of near shore waters through the release of (untreated) sewage, nutrients and chemicals, resulting in algae growth and death of coral reefs. Also: pumping up sand from sea grass beds for artificial beaches ³⁵ and extra sand deposition on various beaches ³⁶ .
Pollution	○	Non treated wastewater caused a decrease in the abundance of corals on the island in the last 25 years. ³⁷ Also wastewater and pollution of waters and more waste due to an increase in the population and tourists (effect on mangroves, reefs, sea grass beds).
Degradation of coral reefs	○	Coral reefs protect the sea-grass beds lying on their shoreward side, so their degradation can adversely affect the sea grass.
Other causes	●	Bleaching events and disease can derive from a series of factors, from difference in water temperature to the sun skin-protectors used by sea users.
Anthropogenic activities	●	Coral reefs suffer as a result of physical removal, siltation and turbidity. Use of water for gardens and golf courses.
Industry	●	Pollution by industrial activities by Isla oil refinery and Aqualectra.
Overfishing	○	Lobster, whelk (kiwa) and conch (karko) are seriously threatened in their existence.
Insecticides	○	Malathion used against dengue pollutes water
○ Nil ○ Slight ● Moderate ● Heavy		

Excessive levels of nutrients like nitrogen and phosphorus in shallow coastal waters encourages blooms of phytoplankton in the water, which block light from reaching the corals, or they can cause vigorous growth of algae and seaweeds on the sea bed that out-compete or overgrow corals. In severe cases (which have occurred on Curaçao in 2009 and 2011), eutrophication can lead to hypoxia, where decomposition of algae and other organisms consumes all of the oxygen in the water, leading to "dead zones", fish kills and eventually complete near shore ecosystem collapse.³⁸

All unprotected reefs of Curaçao suffer from over-fishing. The Curaçao 2008 fisheries law plans to establish fish reserves but no reserves have been designated yet. Curaçao presently holds an intermediate rank among Caribbean nations in terms of fish abundance.³⁹ The presence of groupers and other larger predators, an indicator for fish abundance, has become extremely rare, but there are no

31 at Princess Beach hotel, Sea Aquarium, het Sonesta Hotel-Marriott

32 on Banda'bou and coastal development at Jan Thiel)

33 at Jan Thiel, on Spaanse Water and St. Joris bay

34 Bouchon et al: 'Status of Coral Reef Resources of the Lesser Antilles', Chapter in: Wilkinson, C. (ed.). Status of Coral Reefs of the World: 2008. GCRMN = Global Coral Reef Monitoring Network and Reef and Rainforest Research Center, Townsville, Australia.

http://www.reefbase.org/resource_center/publication/statusreport.aspx?refid=27173

35 at Princess Beach hotel, Sea Aquarium, het Sonesta Hotel-Marriott

36 on Banda'bou and coastal development at Jan Thiel)

37 <http://www.nacri.org/greylit/wiegers2007impactnutrientscoralreef.pdf>

38 CARMABI Coral reefs 2012: <http://www.dcbd.nl/?q=document/current-state-cua%C3%A7aos-coral-reefs>

39 Idem

quantitative data.⁴⁰ Damage to sea grass and mangroves means further destruction of fish spawning grounds and a further loss of protection from the sea.

Challenge 3 - Invasive Species - Severe

Invasive alien species is a real issue for Curaçao. The necessary laws have to be drafted and the body in charge of enforcing the law and implement the other strategies and activities with regard to this issue has to be strengthened and is in need of technical support. The existing nature conservation programmes have to be inventoried, strengthened and made better known to stakeholders.⁴¹

The following invasive alien species pose a wide threat to Curaçao's nature: lionfish (*Pterois volitans*), *Rhynchophorus ferrugineus* (red palm weevil), *Scyphophorus acupunctatus* (agave snout weevil) and *Azadirachta Indica* (neem).⁴² Free roaming goats are also a problem.⁴³

Pressures/ actions	Severity	Comments
Goats and extensive grazing	○	Free grazing goats cause erosion of soil and damage to native vegetation
Public awareness and knowledge	○	Between 2010 and 2013, there were many awareness raising campaigns regarding lion fish and red palm weevil.
Spreading of specific species	○	Lionfish
○ Nil ○ Slight ● Moderate ● Heavy		

Challenge 4 - Water and air pollution - Severe

Several recent studies have been made about air and water pollution caused by the oil refinery located in the Schottegat bay, near the capital of Curaçao and about possible future strategies for the refinery.⁴⁴ The main problems are high emissions of sulphur dioxide and particulates, and a 'tar lake' (a legacy from the past when proper provision was not made for the environmentally sound disposal of refining residues). The impacts on the surrounding population include respiratory complaints and eye irritation, green substance deposition (probably a vanadium compound), odour nuisance, noise from the flare, etc. Schools in the area close down on some days because of the bad smell.

According to SMOC⁴⁵, a local NGO, soot and ill smelling particulates pollute the air of 20,000 inhabitants. A recent fire (Feb. 2014) caused such high levels of emissions that questions were asked in the Dutch parliament.⁴⁶ There have also been problems related to oil discharges and spills into the sea from leaking tanks on the refinery or from tank cleaning activities. In 2012 there was an oil spill near Jan Kock Salinas. The detergents used in the clean-up are also bad for the environment.⁴⁷

Curaçao has a long history of air and soil pollution related to the oil refinery on the island. Shell built the refinery in 1915 and by 1952, the plant employed 22,000 and oil refining represented 50% of Curaçao's GDP. Shell left in 1985, as refining became less profitable. It 'sold' the refinery for \$ 1 to the government on the condition that no environmental claims would be made in the future, in particular relating to the oil spills/tar lake on the refinery's property. The government then leased the refinery to the Venezuelan company PDVSA, Petroleros de Venezuela SA.

40 Bouchon study

41 Information obtained from the ministry of nature and environment.

42 <http://www.cabi.org/isc/?compid=5&dsid=108401&loadmodule=datasheet&page=481&site=144>

43 CARMABI brochure [http://www.carmabi-](http://www.carmabi-educatie.org/images/stories/file/infoblad%20natuur%20in%20gevaar%20voor%20internet.pdf)

[educatie.org/images/stories/file/infoblad%20natuur%20in%20gevaar%20voor%20internet.pdf](http://www.carmabi-educatie.org/images/stories/file/infoblad%20natuur%20in%20gevaar%20voor%20internet.pdf)

44 CARMABI, Wieggers/ Nacri, TNO, Ecorys, mentioned earlier.

45 Stichting Schoon Milieu op Curaçao <http://www.stichtingsmoc.nl/>

46 <http://www.nieuws360.com/lokaal/brand-oorzaak-uitstoot-zwaveloxide/> and <http://www.stichtingsmoc.nl/2014/03/plasterk-geeft-niet-thuis-2/>

47 <http://www.stichtingsmoc.nl/2012/09/rnw-oplossing-voor-olieramp-gevaarlijker-dan-gedacht/>

In the past SMOG started legal procedures asking the government to enforce environmental standards. The government replied that the company would then have to close which would mean a loss of jobs. It has been estimated that € 880 million would need to be invested in order to be able to comply with environmental standards. In June 2009 Curaçao court decreed that PDVSA would have to pay ANG 75 million (approx. € 30.4 million) for violations in the yearly concentration of sulphur dioxide norm, i.e. 80 µg/m³.⁴⁸ A government service shows regular measurement of two locations.⁴⁹

The future of Curaçao's oil refinery is increasingly in doubt because of its high polluting nature, its lack of capacity to produce low sulphur fuels and the International Financial Services (IFS) sector has been in trend decline over the past decade.⁵⁰

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

Curaçao is an autonomous country within the Kingdom of the Netherlands since October 10, 2010. The Dutch government is responsible for defence, foreign affairs and the Supreme Court. Curaçao has an elected parliament which appoints the cabinet of (9) ministers and the prime minister⁵¹. A Governor General is appointed by and represents the Dutch King.

Since October 10, 2010, Curaçao's governing body is primarily responsible for nature and environmental policies and their implementation.

The Netherlands is responsible for the management of the exclusive economic zone (EEZ) linking the four countries (Netherlands, Aruba, Curaçao and St Maarten). In order to coordinate the sustainable management of this extensive marine area, a management plan was put in place, parts of which have already been implemented by the Netherlands and by the three Caribbean municipalities (Bonaire, St Eustatius and Saba). The parties now strive to have the Curaçao, Aruba and St Maarten to join in.⁵²

4.2 REVIEW OF CURRENT INSTITUTIONS

The Ministry of Public Health, Environment and Nature in Curaçao is responsible for the environment and nature management. The Minister formulates environmental policy, proposes new laws and is responsible for their implementation. Within this Ministry there is an Environment and Nature Department⁵³, which implements and enforces environmental regulations, alongside the police, who are the general enforcement authority. The Inspectorate consists of 22 employees. There is also a policy department which formulates and implements environmental policies, with 7 policy advisors. The Nature Department executes coastal zone management and maintains public gardens, parks and public beaches. This ministry gives out nuisance permits and measures/ monitors air quality⁵⁴ and recreational waters quality (2x 4 staff members).

48 Verdict January 12, 2010

49 <http://www.luchtmetingenCuraçao.org/>

50 IMF

51 <http://www.gobiernu.cw/web/site.nsf/web/58CD2BA91443930204257847006B22CF?opendocument&language=nederlands>

52 http://www.dcnanature.org/wp-content/uploads/2013/10/EZ_BO_NaturePolicyPlan%20Car.NL_ENG_2.pdf

53 This department replaces Vomil and Milieudienst from before 10-10-10.

54 www.luchtmetingenCuraçao.org

Other ministries also have departments involved in environmental tasks:

- The Public Works Department in the Ministry of Traffic, Transport and Urban Planning operates the sewage treatment plant.
- A Disaster Prevention Department, in the Ministry of General Affairs (linked to the Prime Minister) coordinates the response to disasters, which have to be reported to this department.
- The Marine Authority of Curaçao coordinates the response to oil spills.
- The Dept. of Fishery and Husbandry (10 staff members) is responsible for sustainable fishery management and establishing non fishing zones.
- The Curaçao's Port Authority, a private company, with Curaçao as the main shareholder, owns infrastructure and most of the superstructure of the ports, while the facilities are leased out to private operators. The CPA provides services; managing its property, equipment and marketing; and upgrading its facilities. The CPA also collects port tariffs, including harbour dues, wharfage, pilotage and cruise passenger fees.⁵⁵

There are several companies and associations with environmental tasks. The publicly-owned company SELIKOR collects, transports and disposes of all solid waste including bulky household waste and car wrecks. SELIKOR reports to the environmental minister. Aqualectra is the water and power company and has 700 workers.⁵⁶

Other relevant institutions

- The Environmental Advisory Board ⁵⁷ advises the Government on environmental issues.
- CARMABI Foundation ⁵⁸ Caribbean Research and Management of Biodiversity was founded in 1955. It manages nine protected areas on the island and organises activities and projects in these parks to support sustainable development. The CARMABI foundation further implements an environmental education programme reaching 1,200 school children per year. It is the largest field station for ecological research in the Southern Caribbean. It provides facilities and logistical support to some 70 visiting researchers and graduate students per year.

4.3 POLICY, STRATEGY, PLANS, PROGRAMMES

The Dutch government prepared a nature policy plan for the three special municipalities of the Caribbean Netherlands (Saba, Bonaire and Sint Eustatius) and hopes that the three other countries in the Kingdom (Curaçao, Sint Maarten and Aruba) will want to join in common efforts. The plan's goals are:⁵⁹

- stimulate cooperation with Aruba, Curaçao and St Maarten in promoting nature conservation policy, for instance by the implementation of cooperation agreements;
- promote international cooperation and agreements for common management policies with countries and territories bordering the exclusive economic zone;
- integrate the support for nature conservation in the policy and action plans of the Kingdom's Coast Guard in the Caribbean.

A review of the existing environmental and nature policies is announced by Curaçao in the Government Programme: 2013 – 2016.⁶⁰ In the meantime the old policies and laws of the time Curaçao was part of the Netherlands Antilles are still valid: the Nature and Environmental Policy Plan 2004 -2007, the Waste

⁵⁵ <http://www.curports.com/>

⁵⁶ <http://www.aqualectra.com/en/>

⁵⁷ Milieuraad

⁵⁸ <http://www.carmabi.org/>

⁵⁹ http://www.dcnanature.org/wp-content/uploads/2013/10/EZ_BO_NaturePolicyPlan%20Car.NL_ENG_2.pdf

⁶⁰ The full version, in Dutch, page 40:

[http://www.gobiernu.cw/web/site.nsf/resources/6F1BDFBC2506F11304257C8C0055E030/\\$FILE/REGEERPROGRAMMA_DEF.pdf](http://www.gobiernu.cw/web/site.nsf/resources/6F1BDFBC2506F11304257C8C0055E030/$FILE/REGEERPROGRAMMA_DEF.pdf) in English:

[http://www.gobiernu.cw/web/site.nsf/resources/A380A9A1AC44287904257C8C00566641/\\$FILE/RESUMEN%20ENG%2020.pdf](http://www.gobiernu.cw/web/site.nsf/resources/A380A9A1AC44287904257C8C00566641/$FILE/RESUMEN%20ENG%2020.pdf)

management Policy Plan of 1995 and the Draft Waste Management Policy Plan 2009. It is foreseen that the National Nature and Environmental Policy Plan 2004-2007 will be revised and updated.

The Government Programme 2013 – 2016 focuses on: Good education, Public health, A healthy living environment, Security and Social support. More strategic objectives are:

- 1. 'Nation Building',
- 2. Lasting Economic Recovery and Investments,
- 3. Improve quality of life,
- 4. Promote Good Governance,
- 5. Responsible and cautious Budgetary Management.

The programme states that "The elimination of pollution and identifying natural areas are priority issues'.

Another policy document is "Vision 2025", on which the UNDP National Building support is based. The Vision has 4 priorities:⁶¹

- develop a high quality of life;
- develop a high standard of living;
- strengthen social cohesion; and
- increase adherence to democratic governing processes.

The central aspect in the UNDP programme Nation Building, is sustainable development and education.

There is also a policy document describing longer term strategic economic of April 2013.⁶² In this plan, the Ministry of Economic Development integrates environmental and nature issues into the sustainable economic strategy.

Energy

Curaçao had the first commercially operated wind farm in the region with a 3 MW wind farm at Tera Kora followed by the 9MW wind farm at Playa Kanoa, commissioned respectively in 1993 and in 2000.⁶³ In 2012 Curaçao expanded its renewable energy sources with 10 new windmills at Playa Kanoa and Tera Kora.⁶⁴ These new windmills produce 130 MWh/day. NGOs complained that no environmental impact assessment on Playa Kanoa had been done.⁶⁵ Tera Kora was further expanded in September 2013.⁶⁶ Aqualectra continues their long-term commitment to clean energy as the Caribbean's leader in wind energy with wind-sourced goals of 30% by the year 2020 and 40% of generation capacity by the year 2030 (now 10-15 %).⁶⁷

As for marine protection, Curaçao Marine Park encompasses 20 km of coastline from Oostpunt to Willemstad. Despite being established by the island government in 1983 it still is a 'paper' park with limited legal basis. Only the collection of coral and spear-fishing are banned. Management of the Marine Park has been delegated by the government to the CARMABI Foundation who asked for the establishment of an underwater park in the area in which the park now exists.⁶⁸ A new marine protection law is in the making at this moment, which will once and for all indicate an official Marine Park for Curaçao with the same model as the Bonaire Marine Park. Since 1997 a volunteer NGO, Reef Care Curaçao has run regular reef check monitoring.

61 <http://www.undp.org.tt/NA/Signed%20Capacity%20Development%20for%20Nation%20Building%20of%20Curaçao%20project%20document.pdf>

62 Strategies for sustainable long Term economic development in Curaçao: http://www.stichtingsmoc.nl/uploads/2013.04.10_Curaçao-Report-ook-Isla.pdf

63 http://www.ecpamericas.org/data/files/Initiatives/lccc_caribbean/LCCC_Report_Final_May2012.pdf

64 <http://www.nucapitalsvcs.com/index.php/playa-kanoa-tera-kora-Curaçao>

65 <http://www.versgeperst.com/nieuws/164543/wettelijke-procedures-windmolenpark-genegeerd.html>

66 <http://www.kkCuraçao.com/?p=36015>

67 Green energy policy (no document yet)

68 <http://www.carmabi.org/nature-management/Curaçao-marine-park>

The Ministry of Public Health, Environment and Nature has recently made a proposal to establish no fishing zones. Other policy actions are related to UNESCO Man and Biosphere, SIDS Programme, Ramsar, Biodiversity Programme (see International cooperation section).

Territorial planning

There are EROC and EOP plans, respectively for physical planning and for the Island's development.⁶⁹

Natural Risks

A risk assessment study was prepared for tsunamis in Curaçao⁷⁰, and a tsunami detector was placed at the Mega Pier in 2011 by the Curaçao Ports Authority (CPA). It measures water level at the entrance of the Saint Anna bay. The system is subsidised by the Intergovernmental Oceanographic Commission (IOC). The Meteorological Service is responsible for the maintenance, the collected data and the 24-hour control of the system.⁷¹

Tourism

Curaçao has upgraded its tourism development strategies.⁷²

4.4 LEGAL FRAMEWORK

The legal basis for all the laws valid on Curaçao (and those related to the environment and to nature protection) are the Government programmes (Regeerakkoord), Annual Plans and the Instellingsbesluit.

Curaçao is party to the following multilateral environmental agreements: Ramsar, Cites, Migratory species, Cartagena, Convention on Biological Diversity, Basel (on waste), Marpol, Conventions on Tuna, Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.

Besides, the following laws are active: Nuisance Ordinance of 1994⁷³, Nature Protection Ordinance. A draft Environmental Protection Ordinance is being prepared. The Solid and Chemical Waste Ordinance⁷⁴ is not actively implemented.

There are also fisheries laws managed by the Department of Fishery and Husbandry is responsible for the implementation of the fishing laws, i.e. proposing and establishing non fishing zones. There is a Police Ordinance.⁷⁵

4.5 MONITORING AND ENFORCEMENT

The Ministry of Public Health, Environment and Nature is responsible for Law Enforcement of the Nuisance Ordinance, Nature Protection Ordinance, and Execution of Environmental International Treaties.

The department of policy for Agriculture, Environment and Nature measures air quality around Beth Chaim and Kas Chikitu⁷⁶ and the quality of recreational water. Water quality monitoring started around Curaçao in 2008 to assess nutrient enrichment from coastal development.⁷⁷

⁶⁹ Eilandsverordening Ruimtelijke Ontwikkelingsplanning Curacao and Eilandelijk Ontwikkelings Plan, not received from the services.

⁷⁰ By the Meteorological services and Aqualactra: http://www.meteo.an/include/Pub/documents/RA_final.pdf

⁷¹ <http://testing.amigoe.com/english/72686-tsunami-detection-station-on-Curaçao-> and http://www.meteo.an/include/Pub/documents/RA_final.pdf

⁷² According to the IMF. Document not found.

⁷³ www.luchtmetingenCuraçao.org

⁷⁴ Vaste en Chemische Afvalstoffenverordening

⁷⁵ Politieverordening

⁷⁶ www.luchtmetingenCuraçao.org

⁷⁷ Reef Base study 2008

CARMABI (Caribbean Marine Biological Institute or Caribbean Research and Management of Biodiversity)⁷⁸ is a member of the Association of Marine Laboratories of the Caribbean and was founded in 1955. It has an active role in monitoring and managing several protected areas:

- the Christoffel Park (2,300 ha) with wild orchids, the palabrúa (rare native barn owl) the Curaçao white tailed deer (of which there are only about 250 left);
- the Shete Boka Park, known for its nesting turtles;
- the Curaçao Marine (or underwater) Park, established in 1983 that covers 20 km of south-coast reefs starting at the eastern tip and extending to the west. Some of the best developed reefs are located within the park.⁷⁹

The recently built new research station can now house up to 30 persons and offers modernised dive-facilities (nitrox) and acquired new boats.

A monitoring system of coral reefs is put into place by Reef Care, run by volunteers.⁸⁰

4.6 ENVIRONMENTAL AWARENESS

The Ministry of Public Health, Environment and Nature has as tasks environmental field research and public awareness raising. The Policy Department will be working with a Geographical Information System (GIS) soon, where geographical and statistical data will be included and this information will be available to the public and other departments. A lot of data is available but not yet accessible for the public.

The policy department is also preparing Awareness programmes for children from ages 8 -12. The department also wishes to develop a curriculum for schools consisting of environmental and nature aspects. There are also courses given on noise nuisance for environmental inspectors. Air pollution courses are given by the Health department of Amsterdam.⁸¹

Several NGOs are active in awareness raising.

4.7 FINANCE FOR THE ENVIRONMENT

In Curaçao there is a tax on vehicles that is used to pay for the processing of old cars. Legal dues (Leges) amount to 200 € per permit per year (according to the nuisance legislation).

5 COOPERATION

5.1 INTERNATIONAL AND REGIONAL

CARICOM has a Forum with Task Forces (CARIFORUM) for stimulating regional cooperation and integration of all islands of the Caribbean, on aids, trade and investment, calamity management, communication/ energy/ transport policies.

The UNDP supports “Nation building” in a capacity building programme.⁸²

⁷⁸ The institute is currently visited by approx. 200 scientists a year for research purposes and by various universities for courses related to coral reef ecology. Is member of the Member of Association of Marine Laboratories of the Caribbean <http://www.amlc-carib.org/>

⁷⁹ Pors, UNESCO paper: <http://www.unesco.org/csi/pub/papers/pors.htm>

⁸⁰ IUCN, 2008, Changement climatique et biodiversité dans l’Outre-mer européen, Jérôme Petit & Guillaume Prudent. chapter 2.4

⁸¹ GGD.

⁸² <http://www.undp.org.tt/NA/Signed%20Capacity%20Development%20for%20Nation%20Building%20of%20Curaçao%20project%20document.pdf>

With the Netherlands

In 2011, at the request of Curaçao, the Netherlands placed West-Curaçao's former plantation area as a potential site on its provisional list of 11 sites to be nominated to the World Heritage Committee (WHC) for inclusion as world heritage site. Comparative analysis will be carried out between 2011 and 2014 for all the sites on the provisional list.

The Dutch government wrote off the bulk of the debt the Netherlands Antilles had, but Curaçao still is left with a debt.⁸³ This debt burden is one of the reasons why the Netherlands insisted on having close oversight over how the country runs. In October 2013 the Dutch minister for Home and Kingdom Affairs visited Curaçao for issues related to the budget and pollution (of the oil refinery).⁸⁴

5.2 COOPERATION WITH THE EU

The 9th EDF included improvement of roads, drainage, sewerage streetlights and foot paths in the Netherlands Antilles. For Curaçao, this took place in two specific neighbourhoods (Parerawijk-Cocowijk and Nieuw Nederland). In the 10th EDF, Curaçao proposed to continue this strategy and improve infrastructures in socially deprived areas: Kortijn, Tera Kora, Sapate block H, Fortuna Ariba Phase 2 and Nieuw Nederland.⁸⁵ An amount of € 11.250 million has been reserved for the 10th EDF programme.

Curaçao is also involved in a number of European funded Regional programmes for the Dutch and British OCTs:

- Regional risk reduction initiative R3i⁸⁶
- For stimulating territorial innovation strategies.
- In favour of Small and Medium sized enterprises. (10th EDF)
- Response to HIV/AIDS. (9th EDF)

6 CONCLUSIONS AND RECOMMENDATIONS

Curaçao is building a new nation since October 10, 2010 and has a long term vision and strategic social and economic development goals. One of them is the wish to increase renewable energy production radically. In the other areas of nature and environment, the old policies and laws of the time of the Netherlands Antilles are valid but need to be revised/ updated. Air pollution caused by the refinery remains an unsolved problem, despite many studies and reform scenarios.

83 a billion dollars in the red according to http://www.bbc.co.uk/caribbean/news/story/2010/10/101008_Curaçao101010.shtml

84 <http://www.nieuws360.com/laatste-nieuws/plasterk-levert-verslag-werkbezoek-Curaçao-bonaire-tweede-kamer/>

85 DOCUP for Curaçao: http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/signed-spd-06-2012.pdf

86 http://www.bb.undp.org/content/barbados/en/home/operations/projects/crisis_prevention_and_recovery/R3i/

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Regulate environmental components for sustainable use of resources and protection of the environment	Elaborate the Environmental Protection Ordinance						
	Activities						
	Mobilize technical assistance from legal and technical experts, both local and international. Develop the ordinance components on waste, water and wastewater management, air pollution, management of hazardous substances, Environmental Impact assessment, Noise Nuisance, and Land Based Sources of pollution.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Strengthen spatial legal framework	Develop territorial planning and develop legislation						
	Activities						
	Produce and enforce legislation on land-use and physical planning. Produce and enforce legislation on the designation and management of protected areas						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Strengthen environmental enforcement							
	Activities						
	Further regulate and elaborate guidelines the EIA process including post-EIA monitoring in accordance with modern standards of good practice. Introduce environmental and health and safety audit systems, namely for the most polluting activities.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Support to full implementation of MEAs				The Netherlands Government			
	Activities						
	Assisting the islands to make and implement their own adequate laws. As capacity improves, increasing responsibilities at territorial level.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Improve bathing water, also as a way to provide added value to tourism							
	Activities						
	Mobilize support to set up a EU blue flag system on beaches Set up a data base of bathing water quality						

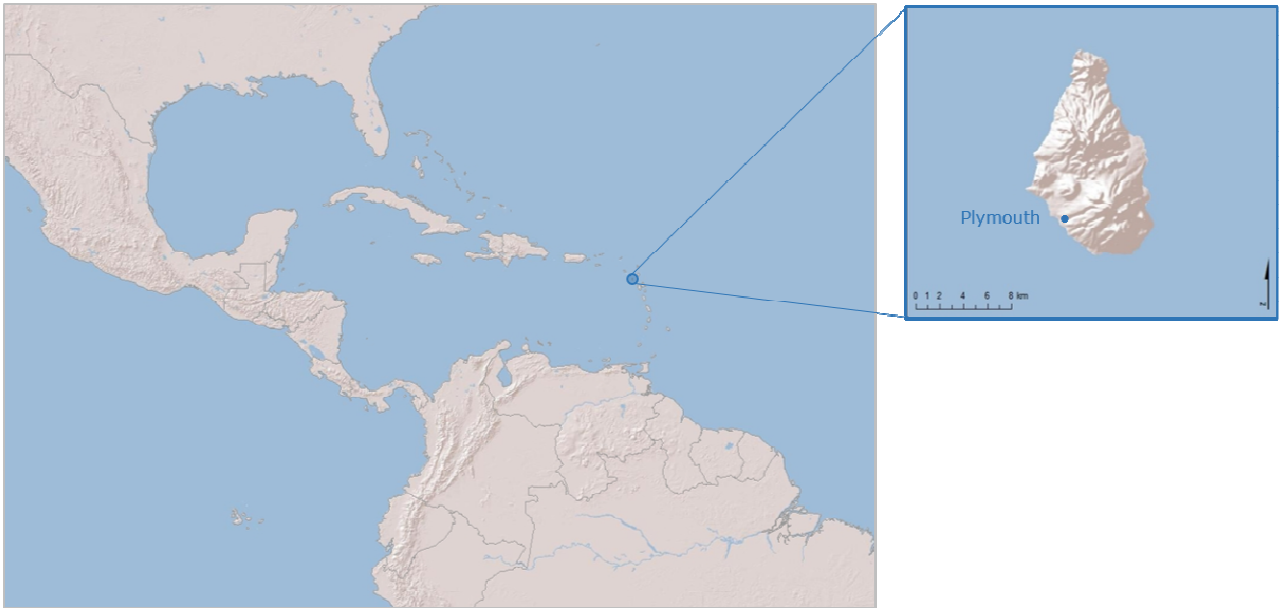
Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Strengthen monitoring systems							
	Activities						
	Undertake a noise pollution overview of different kind of areas of Curaçao. Install noise monitoring devices in selected areas. Establish an air pollution monitoring system. Create a GIS system for this information and also for the water quality						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Improve waste and wastewater management	Develop management tools and rehabilitate polluted sites						
	Activities						
	Develop governing tools (policies, strategies, action plans) for wastewater and waste Management. Assess the severity of the polluted sites and develop a rehabilitation programme Mobilise funds for action.						

ANNEX G : MONTSERRAT

ENVIRONMENTAL PROFILE

MONTserrat



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SUMMARY

Montserrat is a pear-shaped island known as the “Emerald Isle of the Caribbean” and is one of the richest of all the UK Overseas Territories in terms of its biodiversity. The island¹ is covered in lush, green rainforest trimmed by streams that descend to a rugged coast intermittently interspersed by exotic black and silver grey sand beaches. Due to volcanic eruptions, which began in 1995, tourist arrivals on Montserrat dropped significantly. Although enormous progress has been made in recovering from past volcanic activity and in learning to live with its ongoing activity, the volcano continues to be a dominant factor in relation to Montserrat’s environment. The volcano caused extensive damage to biodiversity and associated ecosystems (including the island’s first proposed Ramsar sites, coral reefs, terrestrial protected areas and some species of flora and fauna); intensified the threats faced by endemic and restricted-range species of global conservation value and had a major negative impact on the tourist, agriculture and fishing industries. Recruitment and training of staff for environmental management has been difficult due to a lack of adequate financial resources. Other environmental challenges are related to pressures on endemic species imposed by invasive alien species such as rats, feral pigs, goats, sheep and cattle. There is also need to create new utilities and in particular to develop a sound waste management system and infrastructure. One of the benefits resulting from volcanic eruptions is the significant accretion of most beaches due to the deposition of volcanic sand; this serves as a barrier to sea level rise.

1 BACKGROUND INFORMATION

Name of territory	Montserrat
Region	Caribbean
Land area	102.6 km ² , habitable 44 km ²
Exclusive economic zone	7,582 km ²
Population	4,922 (census 2011 ²) <i>A July 2013 estimate is 4,959</i> Before the first volcanic eruption in 1995, Montserrat had 10,400 inhabitants; 62.5% of the population has since emigrated.
GNP/capita	€9,271.45, 2012 est.
Literacy rate	96% (defined as >10, can both read and write a short, simple statement)
Unemployment rate	6.5% (census 2011)
Poverty	36% of the population is poor ³ and 20% are vulnerable.

Montserrat is a volcanic island 17.7 km long and 11.3 km wide, lying 43 km south-west of Antigua and 92 km north-west of Guadeloupe. The island is mountainous, with three main areas of highland reaching altitudes greater than 740m, with streams and waterfalls amongst dense tropical vegetation. The coastline is rugged, and offers no all-weather harbour, although there are several anchorages sheltered from the prevailing trade winds.

In July 1995, the Soufriere Hills volcano in the south of the island became active for the first time in 350 years. By April 1996, increased pyroclastic activity had forced the evacuation of the capital Plymouth and most of the south of the island. The island was divided into 2 zones: a Safe Zone in the north covering one-third of the island and accommodating all human settlements and associated activities and an Exclusion Zone in the south covering the remaining two-thirds of the island and a Marine Exclusion Zone

1 See more at: <http://www.travel2thecaribbean.com/montserratislandvacation.html#sthash.1f9kDZVK.dpuf>

2 <http://www.gov.ms/wp-content/uploads/2011/02/Montserrat@AGlance.pdf>

3 Government of Montserrat and the Caribbean Development Bank, Final Report, Country Poverty Assessment, Volume 2. Supplementary Material, July 2012

including the capital Plymouth (which was abandoned in 1997). The exclusion zone has been evacuated, 65% percent of the housing stock and 90% of commercial buildings were destroyed. Volcanic activity has continued since, with the last eruption occurring in February 2010.

The volcanic eruption severely affected economic activity and access to the island due to the destruction of the airport in 1997 and restricted access to the port of Plymouth; there was massive disruption of agriculture and tourism with a 21% fall on GDP in 1997. It also affected the social situation, disrupted families and communities and weakened the social fabric of the island.

Major commercial activity and Government Offices are now centred in the north-west of Montserrat in the areas of Brades, Sweeney's, Carr's Bay and Little Bay. Brades is the *de facto* capital. A new port is proposed for Carr's Bay and an airport was constructed further inland at Gerald's.

The majority of the population⁴ (88.4%) is of African descent; the remainder being mixed 3.7%, Hispanic/Spanish 3%, Caucasian/White 2.7%, East Indian/Indian 1.5% and other 0.7%. In 1995 the population of Montserrat was nearly 10,400, but two-thirds of the inhabitants fled the island as a result of the volcanic activity. In 2006, Montserrat's population was 5,028, and in 2007, the population fell to just over 4,800. Currently Montserrat has a population of about 5,000 persons, including migrants (about 27% of the population) primarily from the English-speaking CARICOM countries and the Dominican Republic.

The 1990s were dramatic for Montserrat's economy. By 1981, Montserrat no longer needed budgetary support from the UK, but Hurricane Hugo in 1989 damaged around 90 per cent of all property on the island. Around £16 million in UK aid was required to rebuild the infrastructure. By 1995 Montserrat was on the road to recovery from Hugo and was in budgetary surplus. The ongoing volcanic crisis which started in 1995 not only increased government spending requirements for relief and reconstruction, but also dramatically reduced the tax base. The island received £324m between 1997-98 and 2011-12. DFID expects to provide more than £34m each year from 2012-13 to 2014-15 to help Montserrat achieve self-sufficiency. Even with the support, there continues to be severe human resource constraints, coupled with increased unemployment, increased vulnerability and dependency, and higher levels of poverty.

The construction sector has benefited from external aid for instance the development of the safe zone, and the new airport (which became operational in July 2005) funded jointly by DFID and the European Union. The economy grew between 2006 and 2008, but declined in 2009 and 2010 due to the global economic crisis. Inflation remained under 5% over 2006–2010. In 2013 the largest contributor to Gross Domestic Product was Government Public Administration, Defence and Compulsory Social Security (33.5%).

Montserrat had a thriving *tourism* industry prior to 1995, accounting for a third of the island's GDP. The volcanic activity decimated the industry. In 1993 about 32,000 tourists visited Montserrat, 21,000 were stay-overs, and visitor expenditure was estimated at €54m. From 1996-98 however, arrivals decreased to less than 10,000. By 2007 the number of tourists was about 10,000 and reduced to 7,000 in 2011. In 2012 Montserrat received a total of 9,905 visitors. Tourism revenues continue to drop from £5.9m in 2000 to £3.3m in 2011. The development of nature tourism is seen as an important component of the island's redevelopment; this potentially provides opportunities to combine biodiversity conservation with economic growth. This includes bird-watching, hiking, and various water adventures. Tourism's contribution to GDP in 2012 is estimated at 2.75%

Agricultural production was also greatly affected by the onset of volcanic activity. Between 1995 and 1997 all the major agricultural producing areas were either destroyed or deemed unsafe. The majority of the fertile agricultural lands, pasture and fishing areas are in the Exclusion Zone with restricted or no access. As a result, the contribution of agriculture and fishing to GDP fell from 5.4% in 1994 to approximately 1.6% in 2012. The Government has embarked on a number of programmes in an effort to attain self-sufficiency in some agricultural products.

⁴ Montserrat Census 2011.

Shallow-shelf and reef fish and coastal pelagic have been moderately to heavily exploited and are unlikely to support increased exploitation. The concentration of people in the safe area toward the northern part of the island has led to particularly intensive fishing there, and decreased catches. But there is potential for increased exploitation of deep slope and bank fish. The contribution of the fisheries sector to GDP in 2013 was 0.35%

The island has a large resource of volcanic sand located inland of the coast as a result of the continuing eruptions. The mining and export of this sand has steadily increased over the past 15 years. Originally, the sand mining was predominantly along the eastern, less populated side of the island, near the village of Trants. An eruption in 2010 covered this region with fresh pyroclastic material, destroying equipment and roads, and forcing the sand mining companies to look for another location. Sand mining was moved to the Belham Valley on the western side of the island. Materials are targeted at local and regional markets. Environmental management and health and safety protocols are being developed for the industry.

2 BIODIVERSITY, ENDEMISM AND IMPORTANCE FOR GLOBAL BIODIVERSITY

Eleven distinct vegetation types have been described for Montserrat, namely: mangrove, littoral woodland, thorny woodland, deciduous seasonal forest, semi-evergreen seasonal forest, tree fern break, fumaroles vegetation, rain forest, palm break, lower montane rain forest and cloud forest or elfin woodland.

Nearly all of Montserrat's original forest cover was cleared by early European colonists for agriculture or timber exploitation. More recently, Montserrat lost approximately 45% of its forest to volcanic activity; this loss was exacerbated by the presence of feral livestock whose numbers have increased significantly following the emigration of a significant proportion of the island's population. Presently the area of forest is 5,656 ha broken down as follows: wet forest 439 ha; mesic forest 3,027 ha; littoral forest 484 ha; dry forest 1,696 ha; and elfin woodland 9.3 ha.

In common with other Lesser Antillean islands, Montserrat has a rich biota, and high endemism. The Montserrat plant checklist records 795 known native species; of these, 78 are of restricted range and therefore represent the highest priority plant species for conservation action. Three endemic plants have been listed for Montserrat. Two of these plants, Pribby (*Rondeletia buxifolia*) and the Montserrat Orchid (*Epidendrum montserratense*) have extremely restricted distributions, the vast majority of which are not protected. The third endemic plant, *Xylosma serratum*, has not been found recently and is believed to be extinct. The National Bird, the Montserrat oriole, is critically endangered and is an icon for environmental education and the only single island endemic bird found on Montserrat. The critically endangered 'mountain chicken' is one of the largest terrestrial frogs in the world and the top native predator on its home islands, Montserrat and Dominica. Several other species are restricted to Montserrat and some nearby islands. There are two endemic reptile species on Montserrat: the Montserrat galliwasps (*Diploglossus montiserrati*) and the Montserrat anole (*Anolis lividus*), and four endemic reptile subspecies – the Montserrat ameiva (*Ameiva pluvianotata pluvianotata*), southern leeward dwarf gecko (*Sphaerodactylus fantasticus ligniservulus*), Montserrat racer snake (*Alsophis antillensis manselli*) and the Montserrat blind worm snake (*Thyphlops monastus*). There are two subspecies of bats now confined to Guadeloupe and Montserrat: the Yellow shouldered bat (*Sturnira thomasi vulcanensis*) and the White-lined bat (*Chiroderma improvisum*). A further sub-species of bat, the common tree bat (*Ardops nichollsi montserratensis*) is confined to Montserrat.

Montserrat supports at least 132 tree species, 146 species of birds (including 34 breeding species, 90 regular migrants and 11 restricted range species), and 13 mammals. Three species of amphibian, 11 terrestrial reptile and 10 native bat species have been recorded on Montserrat in modern times.

Montserrat's marine habitats consist of small patch and fringing coral reefs scattered around the island, in many cases close to shore, along with pockets of sea grass, sand and sediment on the seabed. There are two major sources of impact on the marine resources of Montserrat: sediments (airborne volcanic ash, ash and debris runoff from the land and re-suspension of benthic sediments) and coastal currents.

Sea grasses occur in shallow, sheltered habitats associated with Montserrat's reef ecosystems and are important habitats for marine fish, conch and marine turtles. The presence of turtles is related to the quantity and quality of sea grass beds available, as these form their main feeding habitat. Loss of sea grass beds during the 1995 hurricane season has had a significant effect on the turtle population in the north of the island. Recent increased sightings of turtles may be an indication of the recovery of the sea grass beds. All of the island's western beaches are significant nesting sites for the green, hawksbill and leatherback turtles; heavy deposition of volcanic ash has prevented nesting on some beaches.

There are three terrestrial protected areas covering an area of 11% of the total land area and 30% of the volcano safe zone. The protected areas include: the Centre Hills Forest Reserve and protected forest; the Silver Hills Forest Reserve and Foxes Bay Bird Sanctuary which has been decimated by volcanic activity. Additionally most streams, ravines and steep land receive *de facto* protected areas status.

3 STATE OF THE ENVIRONMENT

3.1 OVERVIEW

The ongoing volcanic activity which began in 1995 has inflicted substantial damage to the environment of Montserrat. Huge plumes of sediment entered the sea at several locations, and the effects on the reefs on the south and east of the island were severe. Direct deposits of ash and waterborne sediment led to coral bleaching and an increase in coral diseases. The largest mangrove swamp - the Foxes Bay Bird Sanctuary - was destroyed by ash deposits and siltation.

The effects of the eruptions on the island's plants and animals are being studied where circumstances allow. Extensive monitoring of key avifauna species including the Montserrat oriole, as well as the mountain chicken and other important key indicator species is ongoing. The Galliwasp Species Action Plan (SAP)⁵ was produced in 2010. However, the SAP will be revised shortly followed by the execution of conservation measures.

With the relocation of a large part of the population to the Northern part of the island villages have expanded their borders but development seems to have been restricted to lands which were once occupied by farmers, as opposed to intrusion into forested areas. However, the endemic galliwasp is found on the fringes of a residential area and is therefore likely to be severely impacted if conservation measures are not put in place.

Refuse is collected by private contractors on Montserrat. Prior to the crisis, a 22 ha plot was procured for development of a sanitary landfill, but the site had to be abandoned because it was located in the exclusion zone. A temporary dump-site was established at Little Bay in the North, but has been replaced by a Government managed 12 ha site. Challenges faced regarding management of this site include insufficient access to equipment for the timely trenching, compacting and burial of refuse. The development and implementation of environmental health programmes, including integrated waste management systems, with associated standards and regulations that will reduce the impact of waste on ecosystems is identified as a priority under the Sustainable Development Plan (2008-2020) - see section 4.3 below. Solid waste management is still identified as a serious environmental concern and there is

5 http://www.durrell.org/library/Document/Galliwasp_SAP.pdf

need for the development and execution of a holistic solid waste management plan to include reducing, reusing and recycling of waste.

Most households receive piped water and sewage is disposed via onsite sanitation system (septic and soak away) and mechanical onsite sewage treatment facility or communal treatment systems.

3.2 MAIN CHALLENGES

In 2005, the Environmental Vulnerability Index⁶ indicated Montserrat as *Highly Vulnerable*, even with significant information gaps as only 48% of topics were covered.

The most pressing issues identified were the percentage of land lower than 50m above sea level; distance to the closest continent; vulnerability to tsunamis, Number of known species that migrate outside the territorial area at any time during their life spans (including land and all aquatic species) / area of land; Number of endangered and vulnerable species per 1000 km² land area (IUCN definitions); and Number of environmental treaties in force in the country.

The main environmental challenges faced by Montserrat were also identified in the 2006-07 Environmental Profiles and their gravity is provided in the table below. Since then, several issues have been addressed with some results that changed their significance.

Issues	Situation in 2006-07
Exposure to multiple natural hazards	Severe
Conserving Montserrat's unique natural environment	Moderate

New Emerging issues are:

Issues	Current situation
Biodiversity	Severe
Coastal and Marine Zone	Severe
Solid and Liquid Waste Management	Moderate
Invasive Alien Species	Moderate
Capacity constraints	Moderate

Issues	Current situation
Biodiversity	Despite its small size, the ecological/biological resources of Montserrat are of national, regional and global conservation importance, because they support <i>inter alia</i> , assemblages of single-island and regional endemic species of fauna and flora, as well as eight globally threatened vertebrate and plant species. These resources also provide environmental goods and services that are important to sustainable livelihoods and quality of life. The key challenges facing biodiversity are Climate Change, habitat loss/fragmentation due to the expansion of agricultural practices and the built environment, Invasive Alien Species and water harvesting.
Coastal and Marine zone	Climate Change is likely to severely impact the Coastal and Marine zone via sea level rise, warmer and more acidic waters, increased frequency and intensity of tropical storms. Some of the impacts include erosion of the coastline, loss of aesthetics and destruction of coral reefs and sea grass beds. The entire coastline is benefiting from millions of tonnes of volcanic sand that has been deposited along the shore, establishing a buffer against sea level rise and storm surge and creating additional recreational spaces. There is need for an integrated coastal zone management plan to include an inventory and mapping of the coastal and marine assets and to undertake monitoring of the coastal and marine environment.

⁶ http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

Solid and Liquid Waste	<p>Solid waste management has been identified as a serious environmental concern and there is need for the development and execution of a holistic solid waste management plan to include reducing, reusing and recycling of waste. Government should also develop a procurement policy that would limit or ban the use of non-biodegradable materials such as Styrofoam and plastics. The proposed management plan should be informed by a waste categorisation study.</p> <p>Prior to the onset of volcanic eruptions in 1995, liquid waste was disposed of via On-site Sanitation Systems: septic tank and soak away, attached to individual buildings. Following the evacuation of the southern two thirds of the island, high density communities were constructed in areas such as Davy Hill and Lookout. As a result, in addition to the septic tank and soak away systems, Communal Mechanical Sewage Treatment Systems: Extended Aeration Treatment Package Plants and Septic Tank plus Leach Field and soak away are being used.</p> <p>The soils in the north of the island is much shallower than those in the south, due mostly to parent material and accelerated soil erosion brought about by poor land use practices. As a result the capacity of these soils to accommodate significant increases of liquid waste has been compromised.</p> <p>There is need to make appropriate arrangements to accommodate the expected increase in liquid waste, that is likely to occur with the continuing development of the Little Bay Town Centre and the anticipated increase in the development and repopulation of the island. The development of a sewage master plan would be a step in the right direction.</p>
Invasive Alien Species	<p>A large number of Invasive Alien Species are adversely impacting the environment of Montserrat. These include ungulates (pigs, goats, sheep and cattle), the lion fish, the Chytrid Fungus (<i>Batrachochytrium dendrobatidis</i>) and a number of plant species.</p> <p>The ungulates are implicated with the destruction of springs and biodiversity, accelerated soil erosion and general forest deterioration.</p> <p>The Loin Fish prey on small fish, invertebrates and molluscs in large amounts, thereby reducing native populations.</p> <p>The Chytrid Fungus interferes with the amphibian's ability to breathe through their skin, which eventually leads to death. The Mountain Chicken (<i>Leptodactylus fallax</i>) has been severely impacted by the Chytrid Fungus which resulted in a population decline of 80%. Efforts are afoot to save the species from extinction.</p> <p>The invasive plants include the Purple Allamanda (<i>Cryptostegia grandiflora</i>), Casuarina (<i>Casuarina equisetifolia</i>), Black Berry (<i>Syzygium cumini</i>), and Mimosa (<i>Mimosa Sp.</i>).</p> <p>Montserrat should develop a comprehensive Invasive Species Strategy (ISS) including national biosecurity protocols. This can serve as a template/model for the other Caribbean UKOTs.</p>
Capacity (human and financial)	<p>Insufficient human and financial resources are significant hindrances to sound environmental management and by extension to sustainable development. A candid organizational review of the Department of Environment and other organizations involved in environmental management is required in order to adequately staff, fund and equip environmental management agencies.</p>

Other environmental problems

Climate change. The limited occurrence of low-lying settlements makes Montserrat less vulnerable to climate change (sea level rise and storm surge) than some other Caribbean and Pacific islands. Nonetheless the further erosion of beaches and more frequent and intense tropical storms will hardly be good for Montserrat's recovering but fragile tourist industry. Damage to coral reefs and sea grass beds will lead to loss of habitat for fish, turtles and conch. This will in turn lead to smaller fish catches and threaten fisheries and tourism-based livelihoods.

In addition, during strong winds the wind speed generally increases with height above the ground. Areas close to the edge of escarpments will therefore attract higher than normal wind speeds and buildings located in such areas will be more vulnerable to wind hazard; this is a concern for Montserrat given its mountainous topography and the increased frequency and intensity of tropical storms that are likely to occur as a result of climate change.

The possibility of the Leeward Island chain experiencing longer periods of drought may impact the hydrology of watersheds, which are not only significant in terms of service value but are ecologically rich.

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

The head of state of Montserrat is the UK monarch, represented by a Governor. The Governor is responsible for internal security (including the police), external affairs, defence, the public service and offshore finance. The island has a Cabinet and a unicameral Legislative Assembly (11 seats, 9 popularly elected plus the Attorney General and Financial Secretary sitting as *ex officio* members). The Premiere is usually the person who has the support of the majority of the elected representatives in the Assembly. Elections are held every five years on the basis of universal adult suffrage. The last elections were held on September 8, 2009.

The new constitutional order came into effect in September 2011, replacing the previous Constitution from 1989 (as amended). It was negotiated by the British Government with the Legislative Council of Montserrat over several years and subject to wide public consultation. The law of Montserrat is based on English common law supplemented by locally enacted legislation.

4.2 INSTITUTIONAL FRAMEWORK

Ministry of Agriculture, Lands, Housing and Environment (MALHE) is the lead Ministry for development of policy on environment and natural resources management. It has 6 major sections including – Administration, Environmental Management, Agriculture, Lands and Survey, Physical Planning and Housing. It is headed by a minister and a permanent secretary. The overall Ministry budget is about \$ 7.08 m EC (€1.88 million) one third of which is for the environment. The Ministry has a total staff complement of 87.

The Department of Environment (DOE) is responsible for, inter alia: direction and implementation of environmental policy; biodiversity conservation and research; management of protected areas (terrestrial and marine); Multilateral Environmental Agreements (MEAs); climate change; sustainable forestry and watershed management; public education and outreach and collection and management of environmental data.

The Montserrat Land Development Authority was established under the MALHE in 1971 to promote efficient and economic utilization of land.

The Physical Planning Unit (PPU) is responsible for the orderly and progressive development of land, for the acquisition, preservation and management of historic buildings and sites, for restricting the export of artefacts and for matters connected therewith. In the performance of its duties the PPU is guided by the Planning and Development Authority (PDA) which is an autonomous, multi-disciplinary and multi-sectorial body. The PPU is the implementing arm of the PDA.

The Department of Agriculture is responsible for food production, protection/management of coral reefs, sea grasses and supporting the regulation of sport fishing, dive establishments and water sports.

The Department of Environmental Health, within the Ministry of Education, Health and Community Services, is responsible for vector control, monitoring of water quality, promoting coastal water quality standards and management of solid and liquid waste.

The Disaster Management Coordinating Agency is responsible for disaster prevention and management including oil spill management. This Agency reports to the Governor's Office.

The Montserrat National Trust, founded in 1970, is the main conservation NGO. It has a mandate to manage and preserve natural resources and the cultural heritage of Montserrat. It is also involved in

education and awareness campaigns and trail development. The National Trust works with partners in the public and private sectors and NGOs.

The Montserrat Tourist Board was initially a department of the Government of Montserrat but was established as a statutory body in 1993 to develop and promote the tourism industry, including the regulation of sport fishing, dive establishments and water sports.

The Montserrat Volcano Observatory (MVO) monitors air quality and the activity of the volcano, raising alerts when necessary. There is also a Scientific Advisory Committee that advises on longer-term risks.

4.3 POLICY FRAMEWORK

Montserrat is a signatory to the St Georges Declaration of Principles for Environmental Sustainability in the Organisation of Eastern Caribbean states (SGD), which was signed in 2001. The SGD includes environmental targets and indicators. On September 26, 2001 the Montserrat Environment Charter was signed by the UK and Montserrat Governments. It includes guiding principles and a set of mutual commitments by the governments in respect of integrating environmental conservation into all sectors of policy, planning and implementation.

The Montserrat Sustainable Development Plan (SDP) 2008-2020⁷, has five strategic goals. Goal 3 Environmental Management and Disaster Mitigation: aims to conserve Montserrat's natural resources within a system of environmentally sustainable development and appropriate strategies for disaster mitigation. The Medium Term Strategic Objective (2013 – 2017) of Goal 3 is to integrate climate change adaptation measures across sectors; while the sub objective is responsible for increasing coping capacity to adapt to climate change. One of the priorities is the development of efficient and effective governance structures for environmental management and disaster mitigation, with the required legislation, policies and regulations developed and enforced. The following outcomes are expected to be achieved by 2020: i) sustainable use and management of the environment and natural resources; ii) long-term improvement in the state of environmental resources; iii) effective disaster mitigation, response and recovery at the national and community levels; and iv) adaptation to climate change.

In 2011 the Montserrat Climate Change Adaptation Policy: "Transforming to a Climate Resilient and Low Carbon Economy"⁸, was published by the MALHE. Although a considerable amount of work was put into the adaptation policy, it is felt that it could be more focused to allow it to address the most pertinent issues. As a result the Department of Environment is desirous of revising the policy to include an action plan and indicative budget; this would enable the Department to prioritise future actions.

Species Action Plans (SAPs) have been developed for 6 species covering the endemic and critically endangered Montserrat oriole (*Icterus oberi*), two endemic plant species: the Pribby (*Rondeletia buxifolia*) and the Montserrat orchid (*Epidendrum montserratense*), the critically endangered mountain chicken (*Leptodactylus fallax*), the galliwasp (*Diploglossus montisserrati*) and the yellow shouldered bat (*Sturnira thomasi vulcanensis*).

The Tourism Development Plan (2012-2020)⁹ sees *tourism as a major driver of economic activity and wealth creation for the benefit of all Montserratian citizens, achieved through the sustainable development of the island's touristic resources, while protecting and enhancing the island's natural and man-made environments and patrimony*. One of the guiding principles is to *respect the natural marine and terrestrial environments and support for their conservation and enhancement* in order to be able to offer a pristine environment. The Tourism Development Plan highlighted the following main environmental concerns:

7 <http://www.mnialive.com/externaldocs/mni-sustainable-plan.pdf>

8 <http://dms.caribbeanclimate.bz/php/gateway/eldis.php?id=4168>

9 <http://www.visitmontserrat.com/downloads/Draft%20Final%20Report%2019%20July%202nd%20Edition.pdf>

- Impact of uncontrolled grazing, roaming feral and loose livestock, and vegetation clearance for development and agriculture
- Effects of high tides and storm surge on low-lying areas, such as Carr's Bay and Little Bay;
- Impact of the removal of beach vegetation, litter and garbage (which attract rats) on key nesting beaches for turtle breeding; and
- Impact of sand mining activities in the Belham Valley, including the associated heavy-axle truck traffic, on the surrounding residential areas and on the environment.

The remaining key documents on the environment and future development of Montserrat are the National Environmental Management Strategy (NEMS), the Forestry Policy, the Biodiversity Research Protocol, the Public Participation Policy and Physical Development Plan (PDP) for North Montserrat 2012-2022.

4.4 LEGAL FRAMEWORK

Montserrat participates in the following MEAs:

MEA	Remarks
Convention Concerning the Protection of the World Cultural and Natural Heritage (UNESCO WHC)	Extended
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Ratified 02-Aug-1976
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)	Ratified 17-Nov-1975
Amendments to Articles I and II of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 29/12/1972	Extended 09-Mar-1979
Amendments to Articles XI, XIV (4)(A) and XV(1)(A) of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 29/12/1972	Extended 21-Mar-1980
1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972	Extended 15-Dec-1998
Convention on Wetlands of International Importance especially as Waterfowl Habitats (Ramsar) Areas earmarked for inclusion were Fox's Bay Bird Sanctuary and Piper's Pond at Carr's Bay. Both of these sites no longer exist. Additionally, two Ramsar sites were proposed: forested ghauts in the Centre Hills and marine shallows along the north west coast. It is hoped that these areas will be Ramsar-listed shortly.	Extended 05-Jan-1976
Protocol to amend the Convention on Wetlands of International Importance of 2/2/1971 especially as Waterfowl Habitats	Ratified 19-Apr-1984
Amendments to Articles VI and VII of the Convention on Wetlands of International Importance of 2/2/1971 especially as Waterfowl Habitats	Extended 27-Jun-1990
Vienna Convention for the Protection of the Ozone Layer, and	Ratified 15-May-1987
Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol)	Ratified 16-Dec-1988
Convention on the Conservation of Migratory Species of Wild Animals (CMS) or Bonn Convention	Ratified 23-Jul-1985
Protocol relating to intervention on high seas in cases of pollution by substances other than oil	Extended 1982
UK Overseas Territories Environment Charter (UKOTEC)	Extended
St. George's Declaration of Principles for Environmental Sustainability in the OECS	Extended 2001
Protocol on Environmental Protection to the Antarctic Treaty	Extended 25-Apr-1995
Protocol to Amend the International Convention on Civil Liability for Oil Pollution Damage of 29/11/1969	Extended 29-Sep-1994
Protocol to Amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage of 18/2/1971	Extended 29-Sep-1994

MEA	Remarks
United Nations Convention to combat desertification in those countries experiencing serious drought and/or desertification, particularly in Africa	Extended 24-Dec-1996
International Convention on the Regulation of Whaling	

The main elements of environmental legislation are as follows:

Legal instrument and responsible agency	Remarks
Disaster Preparedness and Response Act (1999) (Disaster Management Coordination Agency & Governor's Office)	For the effective management and control of disaster and related matters
Physical Planning Act (1996) (Physical Planning Unit & Montserrat National Trust)	For the orderly and progressive development of land, the acquisition, preservation and management of historical buildings and sites and for restricting the exports of artefacts. It provides for mandatory Environmental Impact Assessment (EIA) for developments in excess of 50 lots, land reclamation, airports, marinas, ports, power plants, petroleum installations and operations generating emissions or hazardous substances.
Forestry, Wildlife and National Parks and Protected Areas Act(1996) (Dept. of Environment)	Aims at the conservation and proper use of forests, the management of wildlife, and the establishment and management of national parks and protected areas it repeals the Wild Birds Protection Ordinance (1987). Makes provision for an Environmental Board to manage forests, wildlife, national parks and protected areas, for a national forestry plan and for an environmental fund to finance protected areas and wildlife protection. The fund is yet to be established. Currently a system of protected forest and forest reserve areas are being managed by the Department of Environment. This includes the management of watershed. A number of potential marine protection areas have been identified, but none have been designated.
Montserrat Land Development Authority (1999) (MALHE)	Establishment of a land development authority to promote efficient and economic utilization of land
Registered Land Act (1988) (Land and Surveys Dept.)	To provide for a comprehensive system of land registration and other matters in land based or cadastral survey
Crown Title Act (2000) (Land & Surveys Dept.)	To provide for the vesting of title of all unclaimed land in the Crown
Piers and wharves Act (1941) (Governor's Office)	To designate and delimit any wharf, pier or jetty as a public shipping place
Revised Port Authority Act (2003) (Montserrat Port Authority)	To establish a port authority to provide and administer a coordinated and integrated system of port facilities and services
Beach Protection Act (1980) (Ministry of Agriculture)	To regulate the removal of sand, stones, shingle or gravel from beaches and foreshore and to prohibit the fouling thereof
Montserrat National Trust Act (1970) (Montserrat National Trust)	Established the Montserrat National Trust
Convention on Migratory Species of Wild Animals Act (1985) (Dept. of Environment)	To provide for the implementation of the CMS.
Endangered Animals and Plants Act (1982) (Department of Environment)	Enabling legislation for CITES - restricts the importation, exportation and re-exportation of certain animals, plants and articles
Turtles Act (1952) (Department of Agriculture and The Royal Montserrat Police Service)	Regulates the hunting of sea or river turtles and the taking of their eggs - covers all marine turtle species. It provides for a closed season from 1 June to 30 September and specifies the minimum capture size as 9 kg.
Plant Protection Act (1941)	Prohibits or restricts the transportation, cultivation or harvesting of

(Dept. of Agriculture)	any diseased plant or anything likely to infect any plant with any pest or disease.
Fisheries Act (2000) (Dept. of Agriculture)	Aims at the promotion, management and conservation of fisheries resources
Agricultural Act (1958) (Dept. Of Agriculture)	To Manage and farm agricultural land so as to prevent erosion and ruination of the soil.
Revised Animals (Trespass and Pound Act (1999))(Dept. of Agriculture & Dept. of Environment)	To Make provisions for impounding and disposing of straying and trespassing livestock and poultry.
Wrecks Inquiries Act (1966) (Governor's Office)	To investigate loss, abandonment, damage or stranding of ships or other casualties on or near the coast of Montserrat
Caribbean Environmental Health Institute(1982) (Ministry of Health)	To provide technical and advisory services to Member States in all areas of environmental management
Public Health Act (1988) (Ministry of Health)	To promote and preserve the health of the inhabitants of Montserrat
Montserrat Utilities Act (2007)	To consolidate the operations of the Montserrat Water Authority and the Montserrat Electricity Services Ltd.
Water Authority Act (2003)	Establishes a water authority , to provide potable water supply and address the conservation of water resources
Underground Water Act (1967) (Ministry of Communications and Works)	To provide for the ownership, control and exploitation of underground water
Pesticides Control Act (1975) Dept. of Agriculture	For the control of importation, sale, storage and use of pesticides
Radioactive Minerals Act (1949) (Governor's Office)	Authorizes exploration and mining
Burial Grounds Act (1944) (Ministry of Health)	Stipulates conditions for the internment of cadavers
Tourist Board Act (1993) (Office of the Premiere)	To establish a tourist board to develop the tourism industry and promote its efficiency
Caribbean Meteorological Organization (1979) (J. A .Osborne Airport)	The promotion and coordination of regional activities in the field of meteorology and allied sciences

A comprehensive Conservation and Environmental Management Act (CEMA) was drafted and submitted to Cabinet in 2013 ¹⁰ establishing *inter alia*: the coordination of responsibilities for environmental management; the conservation and sustainable use of biological diversity, natural resources and the natural heritage; the designation and management of protected areas; the protection of human health through pollution prevention and control; the incorporation of international obligations with respect to the environment into national law; and the establishment of an environmental fund to support long-term financing of environmental management activities.

The CEMA establishes the National Conservation and Environmental Advisory Council in charge of advising on, reviewing and assisting in the formulation and development of policy, strategies, guidelines, standards, objectives and regulations for the protection and management of the environment. For environmental management it foresees the adoption of the National Environmental Information System (NEIS); the National Environmental Management Strategy (NEMS); and the Protected Areas Systems Plan (PAS). It is likely that the legislation will be passed by mid-year 2014. The instruments of the Endangered Animals and Plants Act (1982) will form a set of regulations under the CEMA and will give effect to CITES. These regulations have been drafted and reviewed and are currently with the Legal Department for final adjustments.

¹⁰ The process is long as there are three possible readings before being adopted.

In December 2011 an EIA was undertaken to address issues related to the mining of aggregate in the Belham Valley. The EIA was made available to the public. Near shore habitat protection was addressed by establishing operations further inland in the Belham Valley and enforcing a permitting system for regulating beach sand mining. The beach protects significant wetland ecosystems just landward of the sandy berm.

The Royal Montserrat Police Force (Marine Division) is responsible for enforcement of coastal laws and regulations and marine surveillance. It reports to the Governor's Office.

4.5 ENVIRONMENTAL AWARENESS

The SDP oversees the education of the general public on environmental and disaster mitigation legislation, policies and plans, and how they can effectively play their part in disaster mitigation and managing of natural resources. It also recommends strengthening the capacity of organisations with the responsibility for educating the general public and implementing and enforcing environmental management and disaster mitigation legislation, policies and plans.

The Montserrat Environmental Education Project funded by OTEP in 2007-Includes an education and outreach strategy. A series of radio programmes were developed to highlight various aspects of the environment and climate change. A number of posters, brochures and public service announcements were published. School visits, field trips and quizzes with attractive promotional items as prizes were also carried out. Pertinent information related to the environment was transmitted to Local media houses including the Government web portal and to external partner agencies that either included these items in their newsletters or posted them to their own websites.

Annual disaster preparedness exercises are held under the auspices of the Governor's Office and the Disaster Management Coordination Agency (DMCA). This is in an effort to assess the state of preparedness of public and private entities on island and review management plans.

Besides the Montserrat National Trust, the other major NGO's are the Montserrat Fishermen's Cooperative and the Montserrat Farmer's Association, which assume responsibility for environmental management on behalf of their stakeholders. Caribbean Marine Projects is involved in coastal and marine conservation projects.

Several UK-based NGOs (e.g. Royal Society for the Protection of Birds (RSPB), Durrell Wildlife Conservation Trust (DWCT) and Royal Botanic Gardens Kew) as well as the U.S. International Institute of Tropical Forestry have a long history of involvement in Montserrat's conservation, working in partnership with the Forestry Division of DOE and the National Trust.

The Darwin Initiative Mountain Chicken Project, implemented by DOE and Durrell Wildlife Conservation Trust, have been raising awareness of the critically endangered Mountain Chicken on Montserrat. A series of radio programmes, field trips and presentations to schools and public groups were organised. Posters have been distributed to schools and government institutions and displayed in frequently visited public areas. A website and Facebook page are also functional.

4.6 ENVIRONMENTAL MONITORING

The Environmental Health Department monitors discharges to surface waters and water quality. The Montserrat Utilities Ltd Water Division under the Ministry of Communications and Works is responsible for water monitoring. DOE monitors Forests, habitats, invasive alien species, surviving local mountain chickens and protected areas and undertakes annual bird monitoring exercises.

A biodiversity assessment on Centre Hills was concluded in 2008 by a number of international partners (RSPB, KEW and Durrell Wildlife Conservation Trust) in close collaboration with the MALHE and the

Montserrat National Trust. The assessment recommends continuous monitoring of the various populations of Fauna and Flora.

The MVO is continuously monitoring volcanic activity on the island. It also measures atmospheric concentrations of Carbon Dioxide (CO₂), Hydrogen Sulphide (H₂S) and breathable dust, and reports the results to the public. The air quality in the safe zone in the north of the island has been consistently within acceptable limits.

Substantial beach monitoring has been carried out in the past, particularly after the hurricanes of the late 1980s and 1990s, which caused extensive erosion.

4.7 FINANCE FOR THE ENVIRONMENT

In accordance with the Budget statement (2012-2013) the expenditure on environmental management in 2011/2012 was EC\$ 776,700.00 (€ 208 000) with an estimated increase to EC\$ 1,011,400.00 (€271 881) in 2013-2014. The key strategies are: conserve and sustainably utilize biodiversity; strengthen public awareness and outreach in environment and natural resources; and implement, coordinate and support an environmental management service of the highest quality and efficiency across the private, public and civil society sectors.

The CEMA provides for the creation of an Environmental Trust Fund. This would supplement regular Government subventions to agencies with responsibility for environmental management. The Fund would be governed by a Board of Trustees from inside and outside of Government, and would be audited annually. It is supplied by: funding organisations; user fees; revenues from taxes and other charges and investment earnings. Funds would be used for the implementation of environmental management activities in harmony with national environmental priorities.

Montserrat is the only Overseas Territory to be a full member of the Organization of Eastern Caribbean States (OECS). It is also a member of the Caribbean Community (CARICOM), but needs to be granted with the necessary legal instruments from the UK and put in place the necessary administrative framework to sign up to the CARICOM Single Market (CSM). Montserrat is a member of the Eastern Caribbean Central Bank (ECCB) and the Caribbean Development Bank (CDB). It is also an observer at the Caribbean Forum of African, Caribbean and Pacific States (CARIFORUM).

Montserrat participates in regional programmes for disaster preparedness and mitigation, cooperating in this area closely with the Caribbean Disaster Emergency Response Agency (CDERA), the organisation responsible for disaster mitigation and relief in the Caribbean

To date, most funding for conservation work is received from international donor agencies. In particular UK government funds such as the OTEP¹¹ and the Darwin Initiative¹², through the funding of collaborative projects which draw on UK biodiversity expertise).

Under the OTEP approximately \$30,000 were spent in 2010-2011. This amount was increased to a revised estimate of \$172,500 under in 2011-2012 and included the following projects: enhancing implementation of CITES and CEMA (2008-2009); revision of the Species Action Plan (2010-2014); enabling Montserrat to save the critically endangered mountain chicken (2010-2013).

The Darwin Initiative has produced in collaboration with the Department of Agriculture (MALHE), the Montserrat National Trust and Tourist Board a plant conservation checklist and vegetation map of Montserrat's Centre Hills (2006-2009).

The initial 9th EDF allocation amounted to € 11 M. Adding the transfers from previous EDFs, the indicative territorial allocation amounted to € 16.9 M, which is provided as budgetary support focused on trade in services, and in particular on tourism. Following the Mid-Term Review of the 9th EDF, the initial allocation has been increased with € 5.6 M, for an extension of the existing budget support programme and for the repayment of an outstanding EIB loan, which was granted for the reconstruction of the port that was devastated by the volcanic eruptions. Montserrat received an allocation of € 15.66 million under the 10th EDF over a 5 year period. In January 2013, the EU announced the disbursement of a € 4.5 million aid package to Montserrat in order to boost the country's economic recovery, with a specific focus on public finance management, public sector reform, and prudent economic management. The 11th EDF foresees € 18.4 million for Montserrat and the programming document is being prepared.

11 A joint initiative of the Foreign and Commonwealth Office and the DFID to support the implementation of the Environment Charters and environmental management

12 Promoted by DEFRA to assist countries that are rich in biodiversity but poor in financial resources to meet their objectives under one or more of the three major biodiversity Conventions - CBD, CITES, and CMS.

Montserrat is a pear-shaped island known as the “Emerald Isle of the Caribbean”. It is located in the Leeward Island chain of the Eastern Caribbean and is one of the richest of all the UK Overseas Territories in terms of its biodiversity. The island¹³ is covered in lush, green rainforest trimmed by streams and waterfalls. A rugged coast is interspersed with volcanic black and silver-grey sand beaches.

The increased volcanic activity which began in 1995–has had a major negative impact on the tourist, agriculture and fishing industries, with GDP falling more than 20 it lead to a massive emigration of about 63 percent of the population. Although enormous progress has been made in recovering from past volcanic activity on the island and in learning to live with its ongoing activity, Montserrat is still not self-sufficient and has a poverty rate of 36%.

The volcano caused extensive damage to biodiversity and associated ecosystems (including the island’s first proposed Ramsar sites, coral reefs, terrestrial protected areas and some species of flora and fauna); intensified the threats faced by endemic and restricted-range species of global conservation value. Massive emigration lead to increased numbers of feral pigs, cattle, sheep and goats.

Other environmental challenges are related to the need to develop new population centres and facilities such as a port. Reportedly the concentration of the population in the north of the island was done at the cost of previous farmland, and not so much on clearing forest. However, the coast is and will continue to develop. There is a need to create new utilities and in particular to develop sound a waste management system and infrastructure. Beach erosion due to sea level rise is also of concern. However, substantial accretion of beaches resulting from the deposition of volcanic deposits is expected to buffer the impacts of sea level rise.

Montserrat sees tourism *as a major driver of economic activity and wealth creation for the benefit of all Montserratian citizens, achieved through the sustainable development of the island’s touristic resources, while protecting and enhancing the island’s natural and man-made environments and patrimony*¹⁴. The policy and legal framework that is enhancing the tourism/environment relationship that Montserrat is about to embark upon can serve as an example to other OCTs, particularly those in the Caribbean. The Tourism Development Plan (2012-2020) clearly expresses the importance of being able to offer tourists a pristine environment. Besides, one of the main goals of Montserrat’s Sustainable Development Plan (SDP) 2008-2020 is adequate environmental management and disaster mitigation. A comprehensive Conservation and Environmental Management Act (CEMA) was drafted and submitted to Cabinet in 2013¹⁵ establishing *inter alia*: the coordination of responsibilities for environmental management; the conservation and sustainable use of biological diversity, natural resources and the natural heritage; the designation and management of protected areas; the protection of human health through pollution prevention and control; the incorporation of international obligations with respect to the environment into national law; and the establishment of an environmental fund to support long-term financing of environmental management activities.

Implementing the above tools will be challenging, more so as the population exodus has created capacity problems throughout the government service and recruitment and training of staff for environmental management has been difficult due to a lack of adequate financial resources.

¹³ See more at: <http://www.travel2thecaribbean.com/montserratislandvacation.html#sthash.1f9kDZVK.dpuf>

¹⁴ <http://www.visitmontserrat.com/downloads/Draft%20Final%20Report%2019%20July%202nd%20Edition.pdf>

¹⁵ The process is long as there are three possible readings before being adopted.

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible sources	€
Promote Green Growth ¹ and Blue Growth ²	Set high-end sustainable tourism, sustainable fisheries and renewable energies as drivers of development.	Montserrat is creating a policy and legal framework that enables sustainable development.	7 years	Montserrat government		Political will, availability of funds, availability of staff	EU, UK, Regional Development Banks Private sector	
	Activities							
	Development of ecotourism (Spas and wellness centres) using volcanic and geothermal resources. Support the implementation of a sustainable tourism certification scheme. Define indicators, or guidelines for sustainable tourism. Use the Geothermal resources and solar energy to reduce the dependence on fossil fuels. Develop a renewable energy and energy efficiency strategy, enact legislation, and promote the involvement of the private sector. Establish a market and create capacity building on maintenance. On blue economy promote the elaboration of marine strategies, sustainable fisheries strategies, transport and logistics, tourism activities. Develop studies on income generating activities in the coastal areas, with a view also to support activities at sea. Streamline the National Climate Change Adaptation Policy and include an action plan and indicative budget. Mobilize funds for its implementation. Organise networking between the different stakeholders dealing with a particular issue. Promote debate and information sharing; establish dedicated websites for sharing of possible national solutions, and sharing of know-how and experience between regions. Promote regional articulation. Promote technical visits to other OCTs and countries in the region on specific topics. Organize trainings. Organize training on fund mobilization (internal and external), training and assistance on proposal writing. Study the business environment and study ways of engaging private sector.							

¹ According to OECD Green growth means promoting economic growth while reducing pollution and greenhouse gas emissions, minimising waste and inefficient use of natural resources, and maintaining biodiversity (<http://www.oecd.org/environment/green.htm>)

² According to EU's DG Mare Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole. It recognises that seas and oceans are drivers for the European economy with great potential for innovation and growth. It is the Integrated Maritime Policy's contribution to achieving the goals of the Europe 2020 strategy for smart, sustainable and inclusive growth (http://ec.europa.eu/maritimeaffairs/policy/blue_growth/)

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Increase Invasive species and feral control	Specifically control chytrid, rats, feral pigs and goats, and lion fish	Invasive species incursion impacting native species - <i>Batrachochytrium dendrobatidis</i> (chytrid) impacting the “mountain chicken” frog. Free roaming animals; pigs, goats, etc. destroying habitat for the Montserrat Oriole. Invasive Lionfish- forcing out native fish species.		Ministry of Agriculture, Lands, Housing and Environment		Availability of funding Environmental Fund	Environmental Fund, law violation sanctions, UK, private sector sponsored projects
	Activities Assess projects implemented in the past, to control the specific invasive or feral species in the Caribbean region, and the reasons for their success / failure. Undertake site assessments to know the current situation. Promote general awareness raising of the ecological impact of key species, and of the unique and endangered nature of many of Cayman’s native flora and fauna. Increase effective public relations work and awareness-building towards local stakeholder alignment regarding preservation of endemic and limited range species of Montserrat. Develop a lion fish response plan, inspired on possible existing best practices in of other Caribbean countries and territories addressing the same problem, or even from examples from the Pacific. Implement control and eradication methods for Rat and feral species posing pressures. Perform long-term monitoring / management						

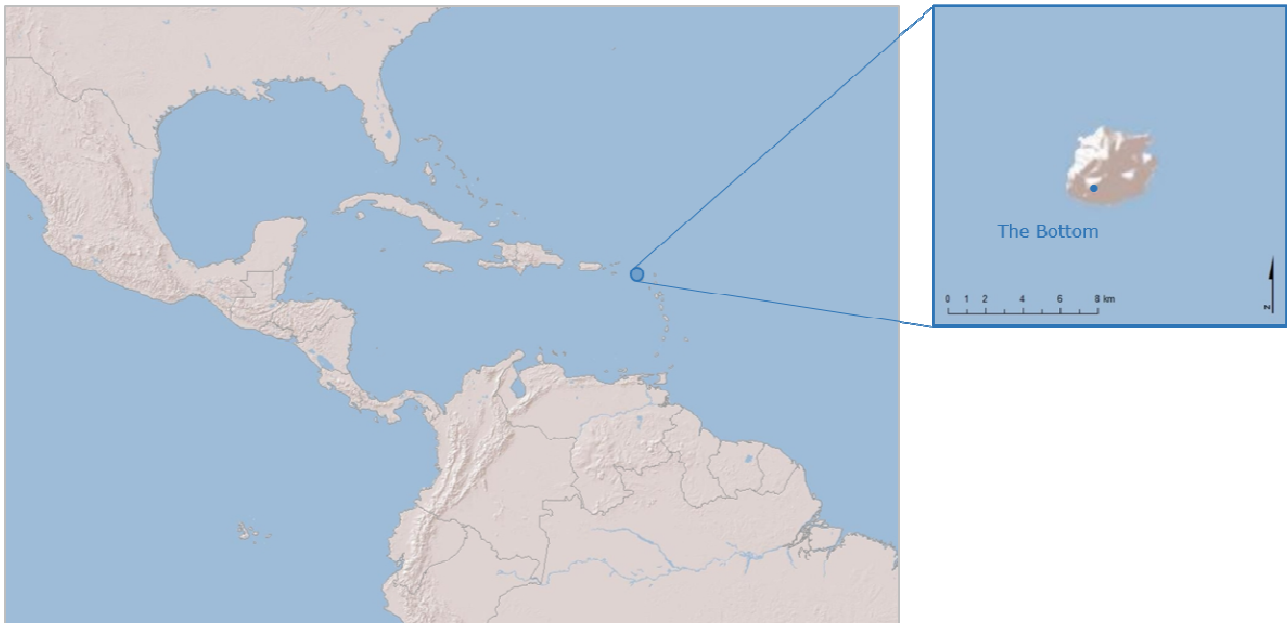
Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Improve utilities	Improve waste and wastewater management	Reduction of land-based sources of pollution, improved collection and treatment of wastewater, and adequate solid waste management through reduction, reuse and recycling.	7 years	Montserrat government, private sector, regional organizations		Interest of the private sector. Political will within the region to establish regional projects	EU, UK Regional Development Banks Private sector
	Activities Improve solid waste management – Develop a Waste Management Plan for Montserrat —based on reduce-reuse-recycle strategies. Include a rigorous hazardous waste management strategy. Study which waste streams can be managed and valued locally and establish agreements for out of territory disposal of some waste streams – promote regional cooperation on this regard. Update legislation and standards. Establish a tax on import of items that generate waste – plastic, tires, batteries, etc. – with incentives to returning to origin. Increase the protection of a central landfill and close any existing waste dumps. Set the business environment for the involvement of the private sector on waste management. Home composting educational initiatives should be carried out as a precursor to commercial composting. Refurbishment and extension of sewage systems						

ANNEX H :

SABA

ENVIRONMENTAL PROFILE

SABA



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SUMMARY

On October 10, 2010 the Netherlands Antilles were dissolved and the status of Saba changed: it became a Public Entity¹ or a 'Dutch municipality with special status' of the Netherlands, and one of three BES islands: Bonaire, Sint Eustatius, Saba.

Saba is very small: 13 km² with almost 2,000 inhabitants. The island has a dormant volcano and Mount Scenery is the highest point in the Kingdom of the Netherlands (877 m). Main income generating activities are tourism, the Saba University School of Medicine (a collaboration with US hospitals) and artisanal fishing.

As early as 1997 a biological inventory was made of Saba² and a Marine Park was legally established within the terms of the Saba Marine Environment Ordinance of 1987³. A nature policy plan was made in 1998 and updated in 2002, but not yet adopted, so there is currently no nature policy plan (nor spatial planning plan)⁴ other than a temporary rule that forbids construction above a certain height. However, there is a nature protection and management law for the 3 BES islands⁵.

Due to lack of staff, the island government has delegated management responsibility for the Marine Park to a NGO, the Saba Conservation Foundation. This NGO also manages the Saba Bank National Park, established in 2010, by patrolling the bank, monitoring the fisheries, and facilitating further research on the bank.

Tourism is actively marketed and is of great economic importance to the island. Saba offers a good example of how the relationship between nature and natural values on the one hand, and tourist development on the other hand, can be positively reinforcing. It is vital that the natural values of the island continue to be regarded as the island's economic capital in order to ensure sustainable growth management of tourism and other economic sectors.

As there is also poverty on the island, the challenge will be to stimulate tourism as an economic driver, but in such a way as to maintain its status of the Unspoiled Queen of the Caribbean.

1 BACKGROUND INFORMATION

Saba is situated in the Caribbean Sea and one of the northern or Leeward Islands, situated more or less between Sint Maarten en Sint Eustatius. Saba is a dormant volcano with steep slopes, its highest point is 877 m.

Name of territory	Saba
Region	Caribbean
Land area	13 km ²
Maritime claims	Territorial sea: 1,611 km ² . Excl. econ zone: 8,033 km ²
Population	1,990 (2013)
GDP/capita	n.a.
Literacy rate	95.8 % of population 14 and older
Unemployment rate	3.9% (CBS, 2013)
% below poverty line	n.a.

Due to the topography, farming and cattle breeding is only possible on a small part of the island. Most

1 Openbaar Lichaam (OL)

2 Anna Rojer, Carmabi Foundation, November 1997

3 <http://www.sabapark.org/> http://www.sabapark.org/marine_park/

4 The concept nature plan of 1998, revised in 2002 for the period of 2002-2007 has not yet been approved.

5 Wet Grondslagen Natuurbeheer en -bescherming BES, http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

revenues come from tourism, the School of Medicine and a stone crusher facility in the south. Fisheries revenues from the Saba Bank contribute around 8% to the economy. Many researchers stay on Saba for shorter or longer periods. Energy resources, food and manufactured goods are mostly imported.

According to a recent proposal for an integrated development plan, submitted by Saba's authorities to the Dutch ministries, a large percentage of the population lives below the poverty line and there is a lack of support for the elderly and for alcohol and drugs abusers.⁶

2 BIOGEOGRAPHY, ENDEMISM, IMPORTANCE FOR GLOBAL BIODIVERSITY

The island hosts a highly varied topography due to its volcanic origins and six distinctive vegetation zones including the very exceptional cloud forest and tropical rain forest at the highest elevations. The diversity of plants and plant communities is determined by the variation in climatic conditions at the different altitudes. Above 450 m, precipitation increases gradually until it reaches its maximum at the top of Mt. Scenery. At the very top of Mt Scenery is the elfin forest - a cloud forest that is unique in the region, with a number of species of mosses, liverworts, bromeliads, orchids and ferns. The forest collects large quantities of moisture from the air, which is filtered through the ground to the lower sections of the island.

The marine environment surrounding the island is the habitat of some of the most beautiful, pristine and relatively intact coral reef areas in the Caribbean.

Birds constitute the largest group of vertebrates and amphibians and reptiles constitute the second largest group and mammals the third - bats are the only endemic species of mammal.

The lizard *Anolis sabanus* is the only endemic species of vertebrates on the island. The scorpion found on Saba is believed to be endemic. Of the total 26 species of summer birds, 15 are species of West Indian origin of which five are endemic to the Lesser Antilles and the Virgin Islands and 4 subspecies are restricted to the Lesser Antilles.⁷

Saba Bank is a large submerged mountain rising 1,800 metres from the seabed, and its flat summit is about 30 m below the water surface. Saba Bank stretches over 2,200 km², making it the third largest atoll in the world and the largest in the Caribbean⁸. It has some of the richest diversity of marine life in the Caribbean Sea, containing large coral reef areas and unique algal communities. In 2010 it was designated as the "Saba Bank National Park", one of the National Parks of the Netherlands. In 2012 it was recognized as an area of regional importance by the SPAW Protocol (Specially Protected Areas and Wildlife Protocol under UNEP Regional Seas Program for the Caribbean and the CBD recognised it as an Ecologically or Biologically Significant Marine Area (EBSA). In 2013 the International Maritime Organisation (IMO) formally ratified it as a Particularly Sensitive Sea Area (PSSA), one of only thirteen such areas in the world.

⁶ From a recent proposal for an integrated development of Saba, by the Saban authorities: Masterplan nr 2908 of 2014, in collaboration with the Dutch Ministry of Infrastructure and Environment.

⁷ The above paragraphs from: Concept Nature Policy Plan 2002-2007.

⁸ IUCN and Onerc: Climate Change and Biodiversity in the European Union Overseas Entities - Jérôme Petit & Guillaume Prudent, 2008

There is no specific Environmental Vulnerability index for Saba, only for the former Netherlands Antilles, of which Saba was a part before October 10, 2010.⁹ The index shows that these islands are Highly Vulnerable due to factors such as 'exposure to natural disasters', 'climate change', etc.

Challenge 1 –Climate change - Moderate

Climate change is expected to have a whole raft of adverse effects in many countries, but these effects are likely to be particularly severe in small tropical islands. The table below applies this general analysis to the specific circumstances of Saba.

Impact	Severity	Comments
Inundation of coastal land	○	The four villages of Saba are not low lying, but its airport is.
Stressed fisheries	●	The Saba Bank fishery brings in some 5% of total revenues of the island.
Coral reefs threatened (bleaching, decreasing pH)	●	Fringing reefs are subject to multiple threats.
Tourist industry	●	Tourist industry accounts for large % of GDP. Reef tourism and fishing are important attractions.
More frequent and more intense storms	●	This poses a severe threat for the Windward Islands which are already affected frequently by hurricanes. Hurricane Hugo (1989) severely damaged the elfin forest and caused landslides. Hurricane/ tropical storm Earl 2010.
○ Nil ○ Slight ● Moderate ● Heavy		

Challenge 2 - Loss of natural habitats and biodiversity - Severe

Damages to coral reefs		
Causes	Severity	Impacts
Tourism	●	Damage resulting directly by tourism includes mechanical breakage by scuba divers and snorkelers; ships' anchors; fishing tackle. Damage induced by increased water turbidity due to waste water pollution
Building and development activities	○	Debris, sand, cement, stones and other runoff of coastal development and erosion that are washed in the sea can cause serious damage or mortality to corals by smothering them and blocking their access to the sunlight. This is limited to the vicinity of the harbour.
Pollution	○	Pollution of the ravines causes household garbage to end up in the sea.
Mining	●	The stone crusher near the harbour poses a threat to the Marine Park: debris and dust are deposited into the sea, which causes direct damage to the coral systems and beds of sea grass
Storms	○	As the island has steep slopes, tropical storms cause rain water to go down the hills too quickly, taking with it waste and causing landslides, which then pollute the coastal waters.
Fishing	●	Over-fishing threatens coral reefs around the island Over-harvesting of Caribbean top shells (whelk, <i>Cittarium pica</i>) in the tidal zone threatens the local population of these shellfish
Ship traffic	○	Pollution by intensive ship traffic and the damage to coral by dragging anchors potentially threaten the Saba Bank. The PSSA status now safeguards the Bank from Anchoring and ship traffic.
Several other causes	●	Bleaching events and disease can derive from a series of factors, from difference in water temperature, the sun skin-protectors used by sea users, etc.
○ Nil ○ Slight ● Moderate ● Heavy		

⁹ http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

Pressures on biodiversity and natural habitats		
Pressure	Severity	Impacts
Hunting	●	Two types of animals are endangered by hunting: the mountain crab and the green iguana
Construction	●	The construction of houses, hotels and new trails results in the loss of valuable nature and scenic areas as well as deteriorates flora and fauna.
Invasive species	●	Introduced predators, such as cats, dogs and rats. Rats are especially detrimental to the bird population, and they can also attack snakes. ¹⁰
	●	Free roaming wild goats causes degradation of the vegetation, prevents regeneration and leads to erosion.
○ Nil ○ Slight ● Moderate ● Heavy		

In the last biological inventory made for Saba, the following other threats were identified:¹¹

- 1- Disrupting of water drainage systems by uncontrolled construction of houses and roads in the ravines,
- 2- Introduced invertebrates that cause disease among indigenous species, such as the moth *Psychonocta spec.* which attacks several tree species, in particular the white cedar, another moth that has eradicated almost all *Opuntia* cacti (report ABC-Advies, 1994), and possibly the snail *Zadryse auricoma*, which is in the process of spreading from a garden on The Level.

The lionfish (*Pterois volitans/miles*), introduced from the Pacific and spreading over the entire Caribbean over the past decade, is also present around Saba and on the Saba Bank. Densities around Saba appear to be still relatively low, possibly due to the presence of large predatory fish such as groupers around the island because fishing does not take place around the island but only on the Saba Bank. Recently, fishing has started in the waters around the island and this will quickly cause such predators to disappear and will provide a chance for the lionfish to multiply quickly, which could be disastrous for the marine ecosystem around the island.

On the Saba Bank large numbers of lionfish are now coming up in traps set for red snapper around the edges of the Bank. Testing for Ciguatera fish poisoning (CFP), an illness humans can acquire by eating reef fish containing the naturally occurring toxins, should establish whether lionfish consumption can be promoted as a measure to keep them under control

According to the draft nature policy plan of 2002, other endangered species are:

- Queen conch: a relatively small population of the queen conch is present on Saba (with the largest density just east of Fort Bay) but numbers have decreased as a result of the habitat disturbance and reduction through the activities of the stone crusher. The conch population on the Saba Bank is assumed to be considerable although its trade must be strictly controlled. (N plan)
- Lizards: although the endemic *Anolis sabanus* is very common on Saba, this species deserves protection as an endemic species, which is often targeted for commercial trade. There are some indications that foreign collectors annually export an unknown number of specimens of this species.
- The green iguana (*Iguana iguana*) of Saba is now considered an endemic, melanistic subspecies. It is potentially in danger from hybridisation if green iguana were to be imported from elsewhere, and from hunting.

¹⁰ See Debrot et al, 2013, Predation threats to the Red-billed Tropicbird breeding colonies of Saba: focus on cats. DCNA: <http://www.dcnanature.org/invasive-predator-research-on-saba/>

¹¹ Anna Rojer, Carmabi Foundation, November 1997:

<http://www.dcbd.nl/sites/www.dcbd.nl/files/documents/Rojer%201997%20Biological%20Inventory%20Saba.PDF>

- The land crab has been poached in recent years for commercial export purposes in large numbers. The growth in tourism especially in St Maarten, where land crab is consumed, threatens to deplete the numbers of land crabs in Saba. Accurate data on catch and population is needed in order to establish an export quota and regulations.

Challenge 3 - Lack of drinking water and some issues for waste disposal - Severe ¹²

Saba does not have a water distribution system and the topography would make such a system costly. Rain water is collected by households and hotels in private cisterns. There are two desalinisation plants for water to be used in the hospital, old age home and can be sold for private consumption. A few public cisterns collect water that runs down the roads, for use by the fire brigade, agriculture, etc. At times there is a lack of water while at other times heavy tropical rains cause erosion and loss of water/ run off to the sea.

Waste is collected but not sorted and burnt in an airburner oven. After this, 10% is left over, containing a lot of glass which is buried. Larger waste items (cars, tires, steel, batteries, etc.) are sorted and kept in deposit. On the west side of the harbour, a lot of building material has been dumped in the sea.

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

Saba is one of the three special municipalities of the so called Caribbean Netherlands (or BES for Bonaire, St Eustatius and Saba) and the Dutch ministries dealing with nature conservation and environment are helping the islands. However, the nature conservation legislation, policies and obligations for the islands were transposed (unchanged) from the Netherlands Antilles period before October 10, 2010. The environmental legislation is new but was already being developed by the Netherlands Antilles government. For instance the Nature Conservation Law BES¹³ delegates the primary responsibility for nature on the islands of the Caribbean Netherlands to the islands themselves. The islands have an obligation to develop their own island nature plans as well as an island nature legislation that implements the international agreements that the Kingdom is party to. This includes the management of those species or areas that have been identified internationally as needing special protection.

However, it is the responsibility of the Dutch government to see to it that the islands adequately manage their nature and that assistance is given when they are unable to do so. Special areas or species that are of international concern, and are so designated by the Minister through the Nature Conservation Law BES, add to the responsibilities of the islands.

Outside of the jurisdiction of the islands, i.e., in the ocean beyond the territorial waters of the islands, the Minister is directly responsible for the management of nature. The Minister also holds a responsibility for the management of the territorial waters based on the Maritime Management Law.¹⁴

4.2 REVIEW OF CURRENT INSTITUTIONS

Saba is a small island but the administrative responsibilities of the island government are vast. To be able to execute and co-ordinate the entire field of government functions, the government has delegated a number of tasks to non-governmental organisations.

¹² From The Master Plan for an integrated development of Saba, nr 2908.

¹³ Wet Grondslagen Natuurbeheer en -bescherming BES, http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

¹⁴ Wet Maritiem Beheer BES, <http://dcnannature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>,

With regards to nature management, the Saba Conservation Foundation (SCF), a non-governmental nature management organisation plays an important advisory, preparatory and executing role in cooperation with the Island Government. The SCF is the responsible organisation for the management of the Saba National Marine Park and maintains the nature trail network in a clean and safe state.

The responsibility of environmental improvement (such as waste removal, building regulations, etc.) lies with the Planning Bureau and the Public Works Department.¹⁵

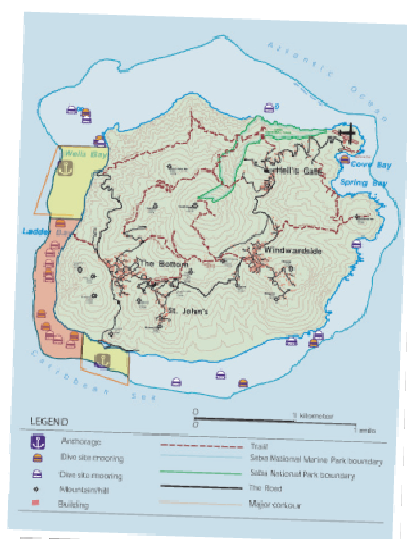
4.3 POLICY, STRATEGY, PLANS, PROGRAMMES

As said earlier on, there is no current nature policy plan for Saba (latest draft is from 2002), but there are two marine parks, established by law: the Saba National Marine Park¹⁶ and the Saba Bank National Park¹⁷. There is however an overarching nature policy plan for the 3 BES islands¹⁸.

This 2013 Nature Policy Plan Caribbean Netherlands for the period 2013-2017, was prepared jointly by the islands and the Dutch ministry responsible for nature. It was approved by the Dutch Parliament.¹⁹ It focuses on mainstreaming/ integrating nature conservation and sustainable use into all policy sectors and sound nature management of protected areas and species. This Nature Policy Plan should be used to set priorities for nature conservation and to ensure the wise allocation of resources.

One of the actions mentioned in this plan is Saba's request that the Netherlands place the island as a whole on the provisional list of sites to be nominated to the World Heritage Committee (WHC) for inclusion as world heritage site.

Marine Park and Saba Bank



The Saba National Marine Park is situated around the entire island, with permanent mooring buoys (facilitating diving and preventing damage to corals), regulations of use and maintenance. A zoning plan divides the park for different recreational and commercial uses. The park raises revenue through visitor fees, souvenir sales and donations.

The Saba Bank National Park (established in 2010) was recognized by the Netherlands in September 2012, for protecting the biodiversity on the bank, including sea turtles, migratory humpback whales, more than 200 species of fish and thousands of seabirds. The Saba Bank, which is located less than five kilometres off the coast of the island of Saba, constitutes the largest actively growing underwater atoll in the Caribbean and possibly the third largest in the world.

In October 2012, it was formally accepted by the International Maritime Organisation (IMO) as a Particularly Sensitive Sea Area (PSSA), with the designation coming into force in June 2013. This designation marked the end of a long battle for government officials and conservationists who were trying to demonstrate that while the Saba Bank has some of the most pristine and richest diversity of marine life in the Caribbean Sea, this may not be the case for long without special protection from threats such as heavy marine traffic. With the entry into force of the PSSA status in 2013 the Saba Bank became the world's 13th PSSA. The PSSA status for the Saba Bank includes two associated

¹⁵ The above paragraphs from: Concept Nature Policy Plan 2002-2007.

¹⁶ <http://www.sabapark.org/>

¹⁷ http://www.sabapark.org/marine_park/

¹⁸ <http://www.government.nl/documents-and-publications/publications/2014/02/03/nature-policy-plan-the-caribbean-netherlands.html> or: <http://www.dcnanature.org/nature-policy-plan-for-bonaire-saba-and-st-eustatius/>

¹⁹ http://www.dcnanature.org/wp-content/uploads/2013/10/EZ_BO_NaturePolicyPlan%20Car.NL_ENG_2.pdf. See also: <http://www.dcnanature.org/nature-policy-plan-for-bonaire-saba-and-st-eustatius/>

protective measures, it is a no-anchoring zone and an Area To Be Avoided (ATBA) for ships greater than 300 Gross Tonnage (GT). The prohibition on anchoring had already been established through local legislation in 2010 with establishment of the Bank as a nature park because anchors destroy the bottom and threaten the coral reefs and other unique sea life, but with the IMO no-anchoring status this is reinforced internationally. The ATBA measure was necessary because ships passing over the Bank often destroy the marker buoys of lobster and fish traps, causing ecological damage because the lost traps continue fishing as so-called “ghost traps” as well as great economic damage for the fishermen.

The Dutch Navy will soon be completing a new, more detailed bathymetric map of the waters surrounding Saba whereby the whole island is once again surveyed.²⁰

Tourism

Saba attracts tourists who come for nature, the scenery and the tranquillity of the island. The island offers diving and hiking opportunities without having to alter the fundamental character of the island. The tourism strategy of Saba has been to avoid mass tourism and focus instead on low key nature-oriented or eco-tourism. Tourism is of great economic importance to the island. A recent (2011) Tourism Master Plan clearly formulates the importance of sustainable tourism development as a basis for the future economic development of the island.²¹

The objective of tourist development is to aim for an ecologically responsible use of natural resources via nature friendly and nature-oriented forms of land and sea activities.

However, a new proposal for an integrated development of the island, proposed by Saban authorities, focuses more on developing higher end facilities for tourists. It sees greater economic activity as essential for increasing the welfare of the islanders. To that end, the plan proposes to build more hotels, restaurants, improve the harbour and the airport, and invest in drinking water facilities and internet connectivity. The plan also foresees in tourism marketing and improvement rehabilitation of hiking trails.

Invasive species

Saban authorities have had a rat control programme in place for more than 15 years now, but rats still remain a widespread and unrelenting problem. This suggests that the rats may well have become partly resistant to the main rodenticide used and that a switch to a different rodenticide is the next logical step. Alternating use of rodenticides is the most effective and internationally recommended practice for rat control. This is already being practiced on nearby St Eustatius where rat problems are much less acute than on Saba, as evidenced by camera trap data.²²

Free roaming goats are a continuing problem on the island. They damage and overgraze the vegetation, especially on the dryer lower lying slopes, they also contribute heavily to soil erosion by breaking the bottom and causing rock falls and by removing vegetation cover which opens up the soil to erosion even more.

Recently the Institute for Marine Resources and Ecosystem Studies (IMARES)²³ produced a report for the Ministry of EZ (Economic Affairs and Nature) entitled “Key elements towards a joint invasive alien species strategy for the Dutch Caribbean”. This report includes both recommendations for the island as well as for the Caribbean Netherlands as a whole. For Saba the report notes the recent establishment and spread of guinea pigs and rabbits on The Level. It recommends the establishment of legislation to prevent potential invasive species from entering the island, enhanced capacity to deal with this issue, and establishment of a network of experts and volunteers that can be mobilised when necessary.

20 The above paragraphs are from: <http://www.dcnanature.org/saba-banks-pssa-status-fully-implemented/>

21 Tourism Strategic Plan for Saba 2011 – 2014 <http://sabatourism.com/pdf/Tplan2011.pdf>

22 Debrot et al, 2013, Predation threats to the Red-billed Tropicbird breeding colonies of Saba: focus on cats. DCNA:

<http://www.dcnanature.org/invasive-predator-research-on-saba/>

23 Of the Wageningen UR

The Saba National Marine Park adopted a Lionfish Response Plan to address the invasive lionfish.²⁴ Diveshops are requested to report lionfish sightings so park rangers can go out to capture them.

EEZ

Following the declaration of an Exclusive Economic Zone (EEZ) in June 2010, which includes the entire Saba Bank, a management plan has been drafted for the EEZ of the entire Dutch Caribbean. This management plan ensures that the Saba Bank's fisheries and rich biodiversity are well protected and sustainably managed.

4.4 LEGAL FRAMEWORK, MONITORING AND ENFORCEMENT

Five pieces of legislation have been adopted by the Dutch Parliament for the 3 BES islands (Saba, St Eustatius, Bonaire), concerning nature, environmental wellbeing (water, waste, energy), physical planning, marine management and fisheries.²⁵

In particular the Nature protection and management law for the BES islands, adopted in December 2011²⁶ lays down many policy measures and law enforcement for Saba (and the other two special municipalities': Bonaire and Statia). In particular SPAW, Cites, the Bonn and Sea Turtle conventions are mentioned and Ramsar and Convention on Biological Diversity are recalled. It states that the islands have to make a nature policy plan every 5 years, containing a list of actions for the planned period.

Nature protection and management laws	
Regulates	Implements
Protection of flora and fauna	<ul style="list-style-type: none"> - Annex 1, 2 and 3 of the SPAW protocol - Annex I of the IAC (Inter-American Convention for the Protection and conservation of Sea-Turtles) - Addendum I and 2 of Bonn Convention on Migratory Species
Conservation of biodiversity	Convention on Biological Diversity
Management and conservation of habitats and ecosystems	<ul style="list-style-type: none"> - Ramsar Convention on Wetlands of International Importance - The SPAW-protocol (Specially Protected Areas and Wildlife Protocol) of the Cartagena Convention - Annex II of the IAC (Inter-American Sea Turtle Convention)
Trade in endangered species	Addendum I and II of the CITES or Washington Convention

MEA	Remarks
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)	Legal instrument of the Caribbean Environment Program (CEP), the UNEP Regional Seas Program for the Caribbean. It includes the Oil Spill Protocol the SPAW Protocol and the Land Based Sources of Marine Pollution (LBS) Protocol. The Oil Spills and SPAW Protocols have been ratified and are implemented in BES law. The LBS Protocol has not yet been ratified, although it is implemented by the Environmental Act BES (for the three special municipalities, including Saba. (Wet VROM BES)
Convention on Biological Diversity (CBD)	Enabling law is available for BES but for full implementation island legislation is required. Only Bonaire has done so adequately.
Ramsar Convention	There are no Ramsar sites on Saba.
CITES	In Nature Conservation Law BES and (not yet) fully implemented.
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Enabling law is available for BES but island legislation is required. Only Bonaire has done so adequately.

²⁴ <http://www.sabapark.org/downloads/SCF%20Lionfish%20Response%20Plan%202010.pdf>

²⁵ Wet volkshuisvesting, ruimtelijke ordening en milieubeheer BES <http://dcanature.org/wp-content/uploads/2012/09/Wet-VROM-BES.pdf>, Wet maritiem beheer BES, <http://dcanature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>, Wet grondslagen ruimtelijke ontwikkelingsplanning BES, <http://dcanature.org/wp-content/uploads/2012/09/Wet-grondslagen-ruimtelijke-ontwikkelingsplanning-BES.pdf>, Wet grondslagen natuurbeheer- en bescherming BES. <http://www.dcanature.org/wp-content/uploads/2012/09/Wet-grondslagen-natuurbeheer-BES.pdf>, Visserijwet BES, <http://dcanature.org/wp-content/uploads/2012/09/Visserijwet-BES.pdf>

²⁶ Wet grondslagen natuurbeheer- en bescherming BES, http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

Monitoring

The mandate of the NGO Saba Conservation Foundation (SCF), who manages the marine park, is laid down in regulations and management agreements. Apart from being responsible for the development and implementation of the management plans, the organisation also has enforcement authority.

4.5 ENVIRONMENTAL AWARENESS

During the entire month of October, the annual 'Sea & Learn' event takes place on Saba. People travel from all over the world to the island to see experts present their findings and learn about nature. Fieldtrips are organised and presentations are given by leading scientists on their field of expertise. From orchids to birds and spiders and from seaweed to corals and fish; every topic was touched on at least one day in the 2013 event. During one of the fieldtrips, two new species of spider were discovered on Saba by an arachnid expert.²⁷

DCNA, the Dutch Caribbean Nature Alliance, is a well-established Foundation that informs about nature and the environment in the six Dutch OCTs.²⁸

The Dutch Caribbean Biodiversity Database (DCBD) - a project of the Dutch Ministry of Economic Affairs in cooperation with DCNA helps awareness raising²⁹.

4.6 FINANCE FOR THE ENVIRONMENT

The Nature Policy Plan Caribbean Netherlands, 2013-2017 goal is to help BES islands³⁰ to set priorities for nature conservation, ensuring the allocation of resources including the € 7.5 million earmarked by the Dutch Parliament for nature conservation in the three BES islands over the coming four years, with \$ 2,095,360 designated to Saba.

The plan says that most of the funding available for nature management in the Caribbean Netherlands is generated by user fees. On Saba, the national marine park generates 53% of the total budget for nature management, by means of user fees. Part of the exploitation costs of the designated protected areas is covered by subsidies from the islands' governing bodies (Saba 17%). The Government in The Hague, in partnership with the 3 BES islands' governing bodies and local stakeholders, will carry out an exploratory study and put forward recommendations to ensure a sustainable financial future for the national parks.

Access to the Saba National Marine Park is free for all residents but visitors pay US\$ 3 per dive.

In 2007 the Dutch government decided to give € 1 million per year (during 10 years) to a Trust Fund for the DCNA (Dutch Caribbean Nature Alliance). Other charities are now also putting money into this fund like the National Lottery and IUCN and WWF support projects. Such a construction avoids complicated project selection and disbursement procedures by civil servants. The Trust Fund is managed by an independent board of financial experts within DCNA. The nature park management organisations united in DCNA agreed not to use the interest earned by the fund at least until 2016, in order to build up the capital further. The goal is to build up the fund to a principal sum large enough to earn sufficient interest to cover the minimum management requirements for all six islands (Saba, Sint Eustatius, Bonaire, Aruba, Curaçao and Sint Maarten).

From the 2012 report of the Public Entity, revenues generated on the island cover only 6% of the expenditures.

²⁷ <http://www.dcnanature.org/new-spiders-for-saba/>

²⁸ www.dcnanature.org or www.dcnanature.org

²⁹ www.dcbd.nl

³⁰ <http://www.government.nl/documents-and-publications/publications/2014/02/03/nature-policy-plan-the-caribbean-netherlands.html>

5 COOPERATION

As part of the Netherlands Antilles until 2010, Saba receives funds from the EU. Three million € was approved in the 10th EDF for infrastructural works related to social housing (phase 2 for Under the Hill project).³¹ In Phase 1 (€ 2.5 million) roads, water cisterns, septic tanks/ cess pits were built and an enlargement of the water catchment area for The Bottom area.

The Saba Conservation Foundation (SCF) is a member of the Caribbean Marine Protected Area Managers (CaMPAM) network of the SPAW Protocol and received support from SPAW to participate in capacity building for marine protected areas (train the trainer workshops) and to participate in regional meetings of marine parks and workshops on combatting the invasive lionfish. With the Saba Bank National Park now recognized by the SPAW Protocol as a protected area of regional importance (one of eighteen so far, including also the Quill/Boven National Park on St Eustatius and the Bonaire National Marine Park), it is eligible for a small grant fund of the SPAW Protocol established in 2013 and earmarked to promote and develop cooperation between such areas.

The SCF participates in yearly joint surveys of marine mammals funded by the French 'Agoa' marine mammal sanctuary. These surveys also include the Saba Bank and are part of the cooperation of the Ministry of EZ with Agoa in preparation for declaration of a Dutch marine mammal sanctuary in the EEZ waters surrounding Saba and St Eustatius.

Through the DCNA foundation (Dutch Caribbean Nature Alliance, Saba receives support in cooperative programmes aimed at capacity building. This includes joint training workshops with the other Dutch islands, exchange of staff with St Maarten, St Eustatius, and Bonaire, and administrative support from the DCNA secretariat.³²

As a member of DCNA, SCF is also eligible for emergency funding from DCNA, in case of an acute emergency situation due to a hurricane for instance.

6 CONCLUSIONS AND RECOMMENDATIONS

Saba is small and is called the Unspoiled Queen but has few own non-natural resources. The two mainstays of the economy are tourism and the Medicine school. There is neither a nature nor an environmental policy plan nor physical planning. However, Saba has two marine parks and there is basic Nature protection legislation for the Saba and the other two 'special municipalities' (VROM –BES- Law) which requires that 5 year plans be made and nature legislation to be updated.

31 10th EDF for the Netherlands Antilles (including Saba): http://ec.europa.eu/europeaid/where/octs_and_greenland/documents/signed-sp-06-2012.pdf

32 www.dcnanature.org

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Protect nature from invasive species	Introduce legislation and management measures	Saba's iconic red-billed tropicbird menaced by feral cats and rats. Large numbers of lionfish are coming up in traps set for red snapper around the edges of the Saba Bank					
	Activities Legislation for impoundment, exclusion, confiscation, quarantine and destruction of potentially invasive species. Additional human resources and capacity building is also needed. Establish a network of experts and volunteers to mobilise when necessary. <u>Cats:</u> Rid the landfill of the exceptionally high feral cat (<i>Felis catus</i>) densities: build a concrete overnight pen for un-incinerated garbage that is varmint-proof, Stop releasing spayed/neutered cats back into the wild Judiciously using euthanasia, in particularly sensitive areas (such as the mapped seabird colonies). ¹ <u>Lion fish:</u> Monitor and eradicate where possible. Make an analysis of ciguatera contents of lionfish, to ascertain whether the local lionfish does or does not pose a risk of ciguatera fish poisoning.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Promote sustainable tourism	Prepare the necessary conditions	New tourism plan (2011) wants to promote nature-oriented tourism					
	Activities Make and implement physical planning s to safeguard valuable nature areas: the take-up or new development of land should be limited. Focus on existing small-scale stay-over tourist accommodations to enable tourists to experience nature through well managed diving facilities, hiking trails, information brochures and information panels, etc. Make and implement nature protection plan. Invest in a better and storm safe harbour, airport, eco lodges, restaurants, improved water catchment, etc.						

¹ Debrot et al, 2013, Predation threats to the Red-billed Tropicbird breeding colonies of Saba: focus on cats. DCNA: <http://www.dcnanature.org/invasive-predator-research-on-saba/>

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Make own policy plans	Apply the guidelines of the (mandatory) Nature Policy Plan for the BES islands ²						
	Activities						
	Evaluate the (old) nature legislation to identify gaps in implementation of the international requirements and to identify the necessary measures to realize the goals of the Nature Policy Plan Caribbean Netherlands and the island nature plan.--Conduct a thorough baseline mapping (physical and biological) of the Saba Bank for monitoring and reporting purposes. Implement the EEZ management plan with a focus on the Saba Bank Ensure the active management and protection of the Saba Bank as Particularly Sensitive Sea Area (PSSA) and national park within the Exclusive Economic Zone.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Protect endemic/ endangered species		Endemic green iguana (<i>Iguana iguana</i>) in potential danger from hunting. Queen conch suffers from activities of the stone crusher. Poaching of land crab, for tourists and export. Lizards targeted for commercial trade.					
	Activities						
	Protect the green iguana, prohibit hunting on iguana. Control trade in conchs, including Queen conch. Study situation at stone crusher. Produce accurate data on catch and population of land crab in order to establish an export quota and regulations. Protect the endemic lizard (<i>Anolis sabanus</i>). Monitor export.						

² <http://www.government.nl/documents-and-publications/publications/2014/02/03/nature-policy-plan-the-caribbean-netherlands.html>

ANNEX I : SAINT-BARTHÉLEMY

ENVIRONMENTAL PROFILE

SAINT-BARTHÉLEMY



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SUMMARY

Saint-Barthélemy is one of the smallest OCTs (Overseas Countries and Territories) of the European Union with 25 km² and 9,171 inhabitants. The island obtained its status as an Overseas Collectivity (COM) in 2007. Subsequently in 2012, its status changed from a European OR (Outermost Region) to an OCT.

Generally speaking, since the 1960s, Saint-Barthélemy has been able to implement a development model for creating wealth, based on a high-end tourism development strategy. Without any of its own energy resources, little fresh water and no agricultural production, the island depends heavily on imports. Its standard of living is quite high due to the difficulty of accessing the island.

The collectivity sets the environmental regulations applicable in its territory by analogy with French national regulations. Its environmental code was adopted in 2009 and since that time it has been governed by a public body, the Territorial Environment Agency.

In 1996, a natural marine reserve was created on the island. In 1998, it was the first island in the Caribbean to establish separate sorting of household waste; there is a daily collection of household waste¹, recycling and the thermal energy from the incinerated materials fuels a desalinisation plant to produce drinking water.

1 BACKGROUND INFORMATION

Name of territory	Saint-Barthélemy
Region	Caribbean
Land area	21 km ² /25 km ² (including smaller islands)
Maritime claims	EEZ: 4,000 km ² Territorial waters: From 8 to 12 nautical miles around the island
Population	9,171 (as of 1 January 2014), 436 inhab/km ²
GDP/inhabitant	€26,000 (1999) ²
Literacy rate	100%
Unemployment rate	3.2% (2012)
% under poverty line	1 to 3% maximum.

Saint-Barthélemy is located in the Caribbean Sea in between the Greater and Lesser Antilles, 230 km north of Guadeloupe and 21 km south-east of Saint Martin. Saint-Barthélemy comprises an archipelago of several small islands but only the main island is inhabited: the islands of Chevreau, Coco, Fourchue, Frégate, Tortuga, Le Boulanger, des Grenadins, Pain-de-Sucre, Pelé, Petit-Jean and Toc Vers.

Geography

Saint-Barthélemy (capital: Gustavia) has a land area of 21 km² and 25 km² when smaller islands are included. It is a mountainous island of volcanic origin; Morne du Vitet is the highest peak at 286 m. The vegetation on the dry hills is primarily thorny. Although this image has changed (becoming greener) due to the supply of drinking water (watering and drip irrigation) and to the importation of topsoil and other species of plants, particularly into urbanised areas.

The island features bays of fine sand carved out of the jagged coastline.

The island of Saint-Barthélemy has a tropical marine climate. There are two separate seasons: a dry season from December to May and a rainy season from July to October. It is very sunny all year round,

¹ 6 days a week.

² INSEE, under evaluation.

although in the rainy season cloud banks can develop and form tropical depressions, storms or even hurricanes.³

Economy and population

High-end tourism is the main economic activity of Saint-Barthélemy. In 2012, 321,000 visitors came to the island, which represents an increase following a fall between 2008 and 2010 when approximately 70,000 visitors come each year.⁴ The figures on the number of visitors coming by cruise ships each year vary between 46,000 and 13,000.⁵

Traffic at the maritime terminal and the commercial port is growing each year. Its free port status and taxation system tailored towards local businesses have allowed and encouraged the development of an interesting and economically viable commercial business.

The runway at the Carl Gustav airport is 650 m long, making it one of the smallest in the world. It plays an important role in the island's economy.

Along with tourism, the construction and public works sector forms a key economic activity on Saint-Barthélemy. It has gone through some tough times over the last few years, but public contracts have played a vital role in maintaining this business sector during the international crisis.

The population is made up of different ethnic groups. The last census recorded nearly 40 different nationalities. Employment opportunities attract a significant foreign workforce. The arrival of this external workforce creates certain problems: accommodation, waste management, their children's education and road traffic.

2 INSTITUTIONAL AND POLITICAL STRUCTURE

Saint-Barthélemy has been an Overseas Collectivity (COM) since 2007. Its nationals are French citizens.⁶ Between 1947 and 2007, Saint-Barthélemy was attached administratively to Guadeloupe, serving as a municipality of this Department. On 7 December 2003, the electorate of Saint-Barthélemy voted overwhelmingly in favour of the status as an Overseas Collectivity.

On 1 January 2012, Saint-Barthélemy changed its status from an OR (Outermost Region) to an OCT (Overseas Countries and Territories). In addition to a derogation from European standards, OCT status allows the collectivity to benefit from having customs jurisdiction.

The President of the Territorial Council is the executive member of the Overseas Collectivity, whose role is to represent the collectivity towards third parties, to prepare and implement resolutions from the Territorial Council and the Executive Council, and to chair the Executive Council.⁷

The Territorial Council has entrusted a Territorial Environment Agency (ATE) to manage the environment.

3 http://www.iedom.fr/IMG/pdf/ra_2012_saint-barthelemy.pdf

4 The range of tourist accommodation is covered by about 65% villas and 35% hotels, ranging from luxury (5 stars) to small guest houses.

5 Respectively from small units and the CIA: <https://www.cia.gov/library/publications/the-world-factbook/geos/tb.html>

6 <http://www.outre-mer.gouv.fr/?presentation-saint-barthelemy.html>

7 <http://www.octassociation.org/spip.php?article48>

3 BIOGEOGRAPHY, ENDEMISM AND IMPORTANCE FOR GLOBAL BIODIVERSITY

Despite its small size, Saint-Barthélemy has a diverse flora. Since 1996, it has been home to a 1,200 hectare marine reserve. According to BirdLife International, there are 3 IBAs (Important Bird Areas) covering a total of 1,055 ha.⁸

Its flora has changed significantly since 1995 (the year of hurricane Luis) due to the introduction of plants and topsoil in connection with the development of tourist activities (gardens in luxury villas and hotels). This importing has also encouraged the arrival of certain alien and invasive species of plants and animals. The most cited example in the animal kingdom is a species of iguana, *Iguana delicatissima*, classified as endangered by the IUCN, which is crossbreeding with *Iguana* that has recently been introduced to the island from Saint Martin.

According to the recent Overseas Biodiversity publication by the IUCN and the database of the Saint-Barthélemy Territorial Agency, the following terrestrial and marine species have been recorded, as presented in the tables below.⁹

Terrestrial biodiversity				
Flora	Invertebrates			
348 plants recorded, including 13 endemic to the Lesser Antilles + 150 species introduced or with extensive tropical distribution	Myriapoda	Molluscs	Insects	Arachnids
	17	13	377	61
Vertebrates				
Amphibians	Reptiles	Birds	Mammals	
3 species of frog introduced	16 species of terrestrial reptiles. 7 endemic to the Lesser Antilles. 7 alien and 1 endemic species to the island.	20 nesting species, including 5 endemic to the Lesser Antilles.	6 native species of bat, including 1 endemic to the Lesser Antilles; several species introduced	

Marine and coastal biodiversity					
Flora	Invertebrates				
Phanerogams	Sponges	Cnidaria	Echinoderms	Molluscs	Crustaceans
6	60	96	24	243	46
Vertebrates					
Fish	Reptiles	Birds	Mammals		
400	3 species of turtles laying eggs here	15 nesting species	23		

4 STATE OF THE ENVIRONMENT

4.1 OVERVIEW

Without any of its own energy resources, little fresh water and no agricultural production, the island depends heavily on imports. Saint-Barthélemy has been able to take measures to protect its environment. A great effort has been made to improve waste management and refuse processing (see 5.2. Policies). The island uses separate sorting, recycling and incineration for energy production, which is

⁸ <http://www.birdlife.org/datazone/country/st-barthelemy>

⁹ Overseas Biodiversity, IUCN French Committee, Roger Le Guen Editions, 2013.

then used in the desalinisation plant to produce drinking water.

In March 2013, a treatment and sanitation network for Waste water was put into service with a capacity of 3,500 population equivalent. The plant already treats all the sewage from municipal and public buildings (schools, the college and the hospital), as well as the sewage from the town of Gustavia through a system of pipes which is gradually being put in place. The sludge should be used in the composting process.

The island of Saint-Barthélemy is dependent on the outside for its electrical energy, which is almost exclusively produced from fossil fuels and is both expensive and polluting. Electricity production reached its highest level in 2012, generating 99,231 MWh. A policy to support renewable energies has been implemented. Energy production is gradually beginning to replace all the systems with units that are smaller, less fuel-intensive, more efficient and much more compliant with environmental standards.

4.2 MAJOR CHALLENGES

Challenge 1 - Degradation of biodiversity - Severe

Land clearance and deforestation operations are now controlled by the collectivity. Livestock farming, particularly of goats, has been drastically reduced and no longer represents a real risk to vegetation or soil.¹⁰ Nevertheless, previous land clearance has led to soil erosion and has had an impact on biodiversity.^{11,12}

The spraying of insecticides just to combat mosquitoes, which carry dengue fever or the chikungunya virus, has devastating effects on other insects that are the primary agents of pollination. Over time, these poorly controlled and poorly targeted actions risk causing great harm to the island's ecological balance and could even lead to a loss of biological diversity, a depletion of vegetation and a destabilisation of soil (from an increase in erosion).

The soil erosion caused by weather events (hurricanes) between 1995 and 2000 has slowed down significantly with the return of wild vegetation that binds the soil.

Challenge 2 - Degradation of coral reefs - Severe

According to the IUCN, the increased number of leisure boats around the lagoon and small islands is damaging the coral reefs. The spread of certain diseases that affect reefs and sea urchins throughout the entire Antilles has also had an impact on Saint-Barthélemy.¹³

It is also harmful when terrigenous sediment and runoff rainwater enter the marine environment during torrential downpours along the coastlines and around the small islands.

Extremely promising results are being achieved from the programmes for preservation, prevention and control implemented by the marine reserve and by the Territorial Environment Agency that was created in 2013.

Challenge 3 - Overexploitation of the marine environment - Severe

Fishing has become more prevalent over the entire continental shelf. The arrival of fishermen from other Caribbean islands (Guadeloupe, Martinique, etc.) has contributed to increasing the phenomenon of

¹⁰ Strictly speaking, there are no forests, but certain small islands are/were forested.

¹¹ Overseas Biodiversity, IUCN French Committee, Roger Le Guen Editions, 2013

¹² <http://stbarthessentiel.fr/wp-content/uploads/2012/07/StBarthEssentiel-Mission-Report-2009-2012.pdf>

¹³ Overseas Biodiversity, IUCN French Committee, Roger Le Guen Editions, 2013

overexploitation. It has become a matter of urgency to lay down local regulations and establish a stable regional regulatory framework.

Challenge 4 - Climate change - Severe

Like everywhere else in the world, rising sea levels represent a threat to the low-lying coastal areas. The areas most under threat are the port area and the beaches. Over time, the rising water temperatures also risk bleaching and even killing the coral.

The Caribbean is expected to see an increase in the frequency of thunderstorms and tropical storms.¹⁴ Every year, Saint-Barthélemy already experiences a hurricane season (with some very strong swells) and is located in a seismic zone with a real risk of tsunamis. Studies are underway to ensure, in particular, that the harbour and the town of Gustavia are protected. Other low-lying parts of the island along the coastline are also directly concerned.

Challenge 5 - Control over the future

The territory is small (21 km²), the population is increasing (9,171 inhabitants, 436 inhabitants per km²), the needs and pressures linked to urbanisation are increasing and consequently all these factors risk changing the ecological balance.

5 ENVIRONMENTAL GOVERNANCE

As an Overseas Collectivity, Saint-Barthélemy is the competent authority for the environment (including the protection of woodland areas), as well as for energy, tourism, town planning and for establishing and organising the public services and institutions of the collectivity.¹⁵

The French State remains the competent authority for criminal proceedings and law, commercial law and monetary, banking and financial law. A delegated Prefect is appointed to represent the State and the government within the COM of the islands of Saint Martin and Saint-Barthélemy.

5.1 INSTITUTIONS

The Territorial Council exercises powers that are currently devolved to the municipality, the department and the region. It lays down the regulations applicable to the issues listed above.

Saint-Barthélemy has had an environmental code since 2009. Through its Territorial Environment Agency (ATE), the collectivity lays down the regulations and defines its policy on environmental protection and sustainable development.

The former Regional Environment Directorate (a service of the French State), now known as DEAL¹⁶ in Guadeloupe, is no longer the competent authority in Saint-Barthélemy. However, an agreement has been signed between the DEAL and the ATE for control of ICPE facilities. National legislation remain in force

¹⁴ Climate Change 2014: Impacts, Adaptation, and Vulnerability, summary for policy makers. http://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf

¹⁵ Furthermore, it handles: taxation (levies, duties and taxes), land registry, construction, accommodation, housing, road traffic and road transport, maritime services of territorial interest, vessel registration, the construction, management and use of maritime ports, the road services department (excluding the labour system which is the responsibility of the State), state law and property of the collectivity, and foreigners' access to employment.

¹⁶ Ministry of the Environment, Housing and Planning in Guadeloupe, 300 persons. <http://www.guadeloupe.developpement-durable.gouv.fr/IMG/pdf/DEAL-ENG.pdf>

until the new legal texts proposed by the collectivity to the State are ratified.

The Prefect is responsible for matters of national interest, compliance with law and French international commitments, public order and administrative control. He gives orders on declarations of public utility and classified facilities. He takes any measures necessary to maintain health and safety, and public peace. He supervises the work of the gendarmerie services, who are responsible for border control at the Saint Jean airport and at the port of Gustavia.

In 2008, the collectivity reorganised its board of tourism to create a Territorial Tourism Committee, the CTTSB. The hotel rankings fall under local jurisdiction and an agreement has been made so they are directly linked with the ATOUT FRANCE organisation.

The Territorial Council has created a local public institution with special status, the Multiprofessional Economic Chamber (CEM), which deals with the local authorities, serving as the representative body in matters of commerce, industry, services, jobs and the liberal professions.

The Regional Directorate for Industry, Research and the Environment (DRIRE) still has an agreement with the collectivity to carry out devolved tasks for the inspection of classified facilities and for the appraisal and approval of work projects to generate and transport electrical energy, including issuing certificates that grant the buy-back of electricity and also issuing energy efficiency certificates. Furthermore, the DRIRE controls the atmospheric emissions from the household waste processing plant.

The collectivity of Saint-Barthélemy manages the island's sanitation system through a public on-site sanitation service (SPANC), which has been operational since 2005. It encourages the broadest implementation possible of collective solutions for the management of Waste water on different levels, by area and by district.

Since 1984, the UCDEM (Caribbean Union for Seawater Desalination), a branch of the SIDEM (International Seawater Association), has ensured the production of drinking water for distribution around the collectivity.

The daily collections of household waste, initially carried out by the collectivity, have been handed over to small private family-owned businesses. Waste management is carried out by public service delegation (DSP). The metals (iron, aluminium, copper and lead) waste collection, sorting and valorisation (recycling) are ensured by a special service run by the collectivity "Le Service Propreté"

5.2 POLICIES, STRATEGIES, PLANS AND PROGRAMMES

The collectivity has policy documents on all sectors of its development, including issues that are directly or indirectly linked to the environment. An updated comprehensive document should be released in the next few years.

Waste

As explained above, after sorting household waste, Saint-Barthélemy incinerates the residual waste (waste that cannot be valorised) in a combustion oven pursuant to European standards; the heat produced is then recovered to contribute towards the seawater desalination process, a unique and modern technique for the Antilles. The atmospheric emissions are "clean". The smoke is filtered through a mixture of activated carbon and quicklime. The hazardous waste resulting from the incineration process (the REFIOMS) are stored in "big-bags" that are sent in containers to Europe for treatment in a special centre. The bottom ash is reused on-site, in particular for building and construction, while any surplus is sent to landfills. Several recovery procedures are being used, see annex 1.

There is also a plan for port waste. It has been subject to legal compliance audit and is strictly enforced.

Water

All houses on the island are fitted with a tank (averaging between 10 and 100 cubic metres) to collect rainwater. The collectivity produces its own drinking water for distribution. This water is produced in seawater desalination plants. It is then channelled towards reservoirs located at altitude around several sites on the island. It is stored at these sites and redistributed around the whole island by gravity. All districts on the island are supplied with water. The drinking water produced is regularly subjected to analysis at Pasteur Institute.

Energy

Saint-Barthélemy is increasingly shifting towards renewable energies. A policy to control energy consumption has been implemented for a number of years.

- There is widespread use of photovoltaic panels for outdoor lighting and for heating water and swimming pools. During the same period, the collectivity refitted an old water tank in Saint-Jean, using solar panels, which was then connected to the network in April 2012. This facility generates 25 MWh per year. Energy-saving bulbs and LEDs are increasingly being used for household lighting.
- The air conditioning in buildings only runs on energy efficient systems (inverters).
- EDF is installing new systems that are smaller, less fuel-intensive, more efficient and cleaner. By 2020, the production of electricity from renewable energies (essentially from the production of photovoltaic energy) could reach 12 GWh, which accounts for 10% of the energy balance.

Waste water

Generally speaking, sanitation in Saint-Barthélemy is run on an individual unit basis. Each dwelling must treat its own wastewater. Moreover, most hotels on the island are fitted with mini wastewater treatment plants (WWTP) so they can reuse wastewater to irrigate green areas. Specialised companies deal with the maintenance of individual systems. The sludge from septic tanks and from the mini WWTP are reprocessed at the community purification plant in Gustavia. The Petits Galets public purification plant in Gustavia started operation in March 2013. At the same time, the collectivity continued with the installation of a network in Gustavia and buildings could gradually be connected to this network. Started in 2011, the main collection point for Gustavia's wastewater is now being completed. It will receive all the sewage before it is transferred to the public purification plant.

Climate change (adaptation and mitigation strategies)

In 2014, the collectivity is looking into a project to protect the harbour of Gustavia (the port and the town) against the effects of swells, storm surges and a potential rise in sea level. On the beaches, dune stabilization (in Gouverneur) and beach rehabilitation (in Saint Jean) measures have been carried out successfully. Pilot measures of coral reef rehabilitation through propagation by cuttings have started and follow their normal course. A natural hazards prevention plan has been authorised and should be finalised in the next few years.

Nature/habitats

The collectivity is continuing to work towards the final adoption of a zoning and strict town planning regulations, covering the natural green areas that need protection. Any land clearance or deforestation is subject to prior authorisation. Goats have been permanently removed from the small islands. Their numbers have declined significantly on the main island.

One-off experiments have been conducted along the coastline:

- beach nourishment following certain weather events (strong swells or hurricanes);
- reconstruction and stabilisation of dunes (in Gouverneur);
- experiments in coral propagation by cutting to reconstruct a barrier reef (in Saint Jean).

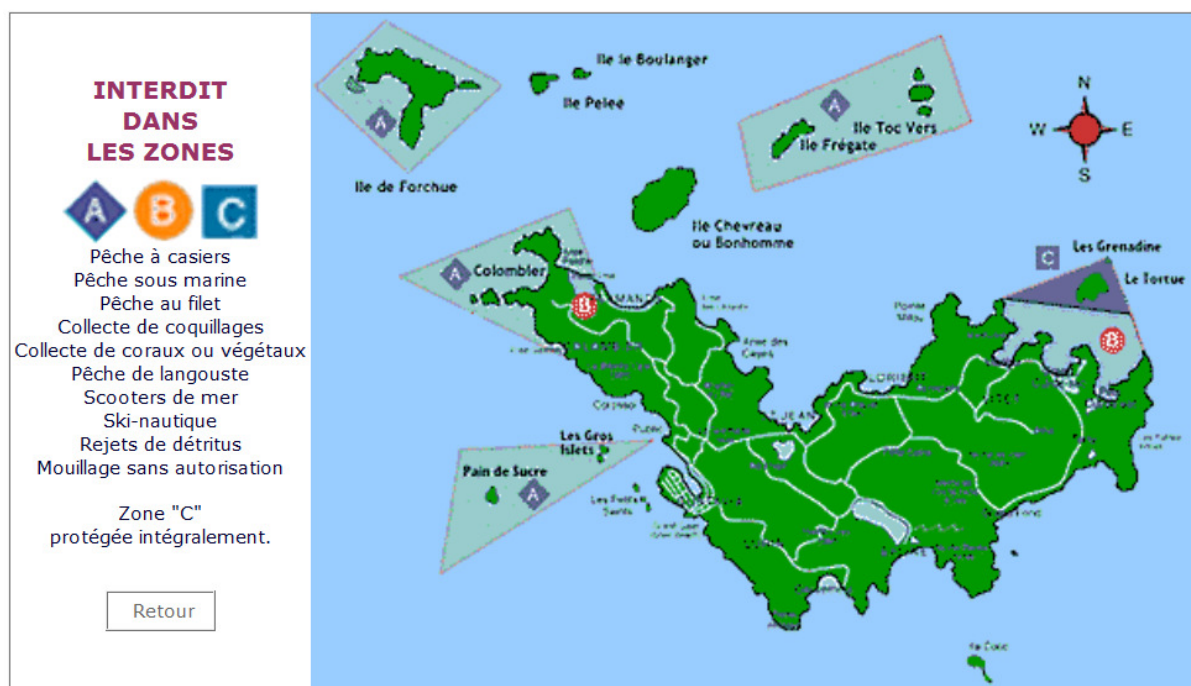
Biodiversity

Fauna and flora inventories are being compiled and exhaustive lists of endemic and/or threatened species to be protected will be produced, they have already partly been adopted. They are annexed to the environmental code. The regulations will be set accordingly.

The fishing regulations are currently being redrafted. The collectivity is lobbying for harmonised regulations throughout the entire Caribbean. Only the EU could establish this stable framework.

Marine reserve

The marine reserve was founded in 1996 and has enabled the establishment of protected marine areas all around the islands. The marine reserve has its own management plan and helps to protect marine biodiversity, while ensuring that populations of species are preserved. It is prohibited to fish, gather and collect any living or dead organisms along the shore or on the seabed anywhere in the reserve. Commercial fishing is strictly regulated here and is subject to authorisation. Two special protection areas have been established to preserve breeding and development sites (Petite Anse and between Marigot and Petit Cul-de-Sac), where it is strictly prohibited to fish, drop anchor or scuba dive. See the map below.¹⁷



¹⁷ http://www.st-barths.com/marine-reserve/marine_map.html

5.3 LEGAL FRAMEWORK AND LAW ENFORCEMENT

At the request of the collectivity, on 15 July 2007, the responsibility for the environment was handed over to Saint-Barthélemy by the French State. In June 2009, the provisions of the national environmental code, which by then fell under the jurisdiction of the collectivity, were repealed by the Territorial Council which subsequently voted to adopt the local environmental code.¹⁸ The code is currently in force in its entirety. The French Republic laws are applicable within the territory of the overseas collectivity of Saint-Barthélemy, with the exception of those concerning devolved power to the collectivity. Local sanctions may not exceed national sanctions for the same offence. Criminal proceedings lie solely within the competence of the State.

The Code covers the following issues:

- General principles: A management and sustainable development plan for Saint-Barthélemy; environmental assessment and information for citizens (conditions for conducting environmental impact studies); institutions which help to protect the environment (ADEME, IFREMER, IFRECOR, etc.)
- Natural areas
- Prevention of noise pollution
- Prevention of air pollution
- Waste
- Facilities at risk
- Chemicals and biocides
- Major natural hazards
- Protection of fauna and flora
- Advertising, signs and advanced warnings
- Renewable energies

A building permit is required before any use of land. This permit is issued by the Executive Council following the recommendation of a special commission.

Any international conventions and protocols ratified by the State before 2007 shall remain applicable in Saint-Barthélemy, since they were in force prior to its status change and have not been amended. It must be clarified whether any new commitments by the State are applicable in Saint-Barthélemy.

Similarly to the other islands, Saint-Barthélemy has chosen to participate at regional level in certain programmes, such as for the protection of marine mammals, threatened species, etc.

5.4 ENVIRONMENTAL AWARENESS

Since the 1970s, school and college students have been taught about issues relating to environmental management and the protection of their island. Organisations such as the APNSB or SUBPROTECT have led major activities and campaigns. It has become compulsory to teach students about the environment and sustainable development. Since 1995 when the municipal environmental plan was adopted, these organisations and the municipality (which later became the collectivity) have been organising information and education campaigns every year in schools and at the college, as well as communication and information campaigns for the general population.

The Territorial Environment Agency and other organisations on the island have picked up the baton and are leading awareness campaigns for the public and in schools. In 2013, the annual event focused on “sustainable fishing for the islands of the North Caribbean”.

¹⁸ This code was approved by Deliberation No 2009-050 TC of 12 June 2009 that was submitted to the representative of the State on 25 June 2009; the code became enforceable on 11 July 2009. www.comstbarth.fr

Three NGOs (Saint Barth Environment and Sustainable Development¹⁹, St-Barth Essentiel²⁰ and APO - the Association for the Protection of Birds) have launched various petitions, such as "*Save the last natural areas of Saint-Barthélemy*" in 2009-2010. This campaign helped to raise awareness among the population and the elected members of the Territorial Council (the sole authority that can reject building projects) in the Salines district.

The collectivity participates in the NGOs' work by awarding them annual operating grants, by helping to fund certain one-off operations and by providing them with any means possible.

Since its creation, the marine reserve has also developed its own education programme for children at schools and at the college.²¹

Together with the University of the French West Indies and Guiana, an associate member of the Natural History Museum and other associate partners, an inventory and an annual programme of research and conservation have been created.

5.5 FINANCE FOR THE ENVIRONMENTAL

In 2012, from a budget of €13.2 million allocated to infrastructure and network investment, the collectivity dedicated €8.1 million to financing work in the water and sanitation sector. The collectivity has proceed with drinking water supply aiming at increasing the potential connection of the population.

The State's special investment fund (FEI) provided €500,000 out of the total investment of €4.6 million needed to finance the construction of the community purification plant (large wastewater treatment plant). An embankment to protect the plant against hurricanes was also built at a total cost of €3,500,000.

The collectivity has put an aid mechanism in place for solar water heaters and photovoltaic panels: on 30 December 2011, the sum of €10,000 was approved by the Territorial Council as part of the island's budget for the 2012 fiscal year.

All applicable taxes in Saint-Barthélemy are set forth in the taxation code, which is available online at the collectivity's website. These include: taxes on the disposal and processing of household waste (€105 for private persons and professionals); taxes on the disposal of bulky items; taxes on fuel consumption; and a tax on the disposal of port waste.

¹⁹ <http://saintbarthenvironnement.over-blog.com/>

²⁰ <http://stbarthessentiel.fr/>

²¹ <http://reservenaturellestbarth.com/>

6 COOPERATION

6.1 COOPERATION WITH FRANCE

The collectivity of Saint-Barthélemy, an OCT, shall remain a collectivity of the French Republic and apply its laws and regulations, unless jurisdiction has been transferred to the collectivity to lay down such legislation. The island is not independent. It just has autonomous status in certain sectors clearly defined by law.

The services of the State and the collectivity shall continue to collaborate in many areas. The collectivity shall adhere to French national policies on: the protection of coral reefs, protected marine areas, the protection of marine mammals, the protection of birds, coastal conservation and recommendations on the French coasts of the Americas, collaboration with the ADEME (the French Environment and Energy Management Agency), etc. The fauna and flora inventory and the list of threatened and protected species have been entrusted in part to the island's organisations in collaboration with the Territorial Environment Agency.

6.2 OTHER INTERNATIONAL COOPERATION AND MULTILATERAL ENVIRONMENTAL AGREEMENTS (MEAs)

The collectivity of Saint-Barthélemy shall respect all the commitments signed by France in this area, as in others. This is a legal obligation.

6.3 OTHER FUNDS ALLOCATED BY THE INTERNATIONAL COMMUNITY FOR ENVIRONMENTAL PROJECTS

When the collectivity was a municipality of Guadeloupe, it could benefit from aid as an OR within the framework of the POI²² (for example, EDF funds). Since its transition to an OCT, Saint-Barthélemy is not eligible for European aid, with the exception of aid within the framework of regional cooperation projects.

7 CONCLUSIONS AND RECOMMENDATIONS

The collectivity of Saint-Barthélemy has developed its economy by promoting high-quality tourism. Its free port status and tailored taxation system have allowed and encouraged the development of an economically viable commercial business.

Significant investments have been made in the area of the environment: wastewater treatment, waste management and energy saving. The marine reserve was created in 1996.

Without any of its own energy resources, little fresh water and no agricultural production, the island depends heavily on smart investments. The collectivity wishes to find the means to ensure balanced and controlled economic and social development, while meeting the needs of a growing demography and guaranteeing the standards set by the EU and France, without damaging ecological balances or the environment in general.

²² Interregional operational programme

Goal	Action	Current situation	Priority and time frame	Responsible entities	€ and HR needs	Risks and assumptions	Possible sources of funding
Waste management	Take the next steps for waste control.	Small territory with a growing population.					
	Activities						
	<ul style="list-style-type: none"> - Set up the composting sector (studies are currently being finalised). - Establish permanent final destinations for sorted waste to be recycled (recovered). - ISO 14001 standards for incineration plants in all sectors. - Local communication (on-going information, education and improvement of human behaviour). 						

Goal	Action	Current situation	Priority and time frame	Responsible entities	€ and HR needs	Risks and assumptions	Possible sources of funding
Climate change	Protect the island without causing too much damage to the environment.	Climate change, when combined with the island's geology, poses particular problems.		Territorial Council EDF			
	Activities						
	<ul style="list-style-type: none"> - Examine the project to protect the harbour of Gustavia (the port and the town) against the effects of swells, storm surges and a potential rise in sea levels. - Study the ecological effect of operations to stabilise dunes, to reconstruct beaches and to reconstruct coral reefs through propagation by cutting. - Continue to measure, assess and model the impact of climate change and the frequency of extreme weather events (on the coastline). - Finalise the natural risk prevention plan. - Explore how to finance this protection work (major investments). 						

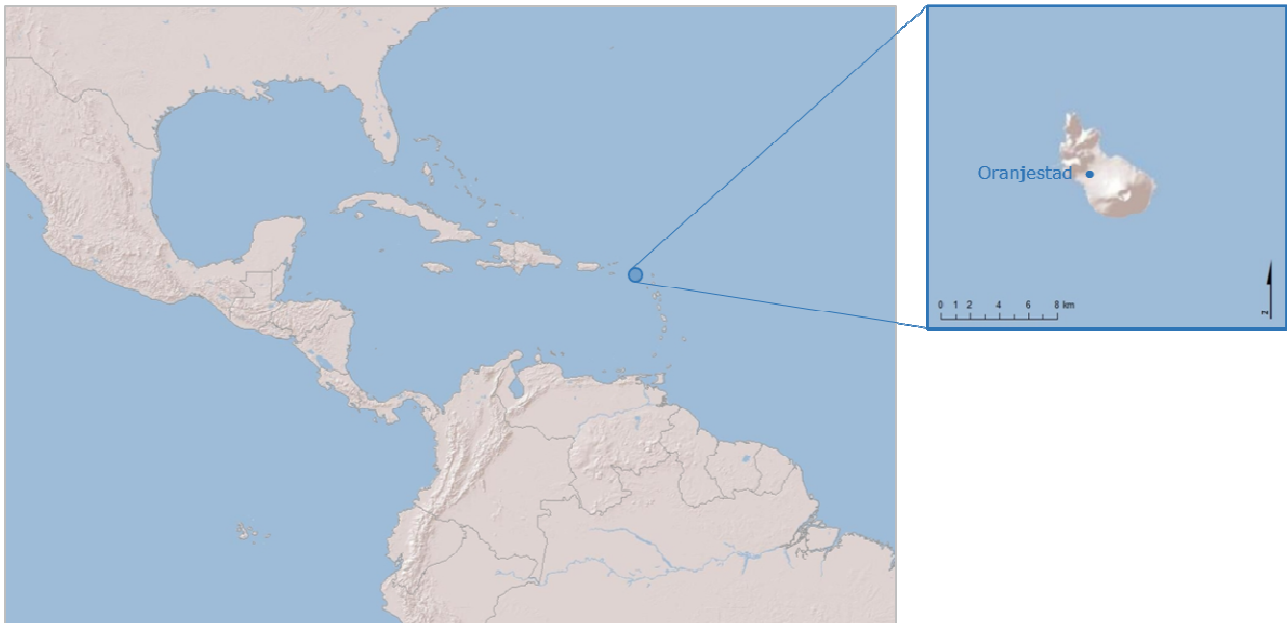
Goal	Action	Current situation	Priority and time frame	Responsible entities	€ and HR needs	Risks and assumptions	Possible sources of funding
Energy saving and promotion of renewable energies	Improve energy efficiency. Promotion of renewable energies.	The use of photovoltaic panels is becoming more widespread around the island.		Territorial Council EDF			
	Activities						
	<ul style="list-style-type: none"> - Continue to support the purchase of more efficient boilers. - Information campaigns to reduce electricity demand. - Improvement of the energy efficiency of buildings. 						

ANNEX J :

SINT EUSTATIUS

ENVIRONMENTAL PROFILE

SINT EUSTATIUS



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SUMMARY

On October 10, 2010, the Dutch Antilles were dissolved and the status of Sint Eustatius (or Statia) changed as it became a Public Entity¹, i.e. a Dutch municipality 'with special status' of the Netherlands. Three of the former Netherlands Antilles (Caribbean Netherlands), consisting of Bonaire, Sint Eustatius and Saba² now have the same status.

St Eustatius is a small island situated in the Caribbean Sea, one of the northern or Leeward Islands, 50 km from Sint Maarten. Together with St Kitts and Nevis it lies on a shallow submarine bank, the St Kitts bank. It has a range of dormant volcanos on the north side (Boven, 200-300 m) and a younger dormant volcano on its south side (The Quill, 600 m).

St Eustatius is in a transition phase in relationship to The Netherlands. Many Dutch ministries are intervening on the island: renovation of school buildings, considering new infrastructural works and repairing existing ones. The island is proposing a Master Plan for its integrated development, in which access to nature areas has been included, improvement of airport and harbour and work on waste problems. A lot of upkeep work is also needed.

As for nature protection, as early as 1997 a biological inventory was made of Sint Eustatius³ and there are two national parks: the St Eustatius National Marine Park created in 1996 and the SPAW listed St Eustatius Quill / Boven National Park, created in 1997. The Miriam Schmidt Botanical Garden adjacent to the latter was started in 1999. The three areas are mandated by the island government to be managed by an NGO: the St Eustatius National Parks Foundation (STENAPA).⁴

1 BACKGROUND INFORMATION

St Eustatius is a small Caribbean island of 21 km² and 3,900 inhabitants. The submarine bank on which it is linked to St Kitts and Nevis is relatively shallow (max 180 m).

Name of Territory	Sint Eustatius
Region	Caribbean
Land area	21 km ²
Maritime claims	Territorial sea: 1,174 km ² . EEZ: 1,107 km ²
Population	3,900 (2013 ⁵)
GDP/capita	n.a. ⁶
Literacy rate	n.a.
Unemployment rate	3.2 % (2013 ⁷)
% below poverty line	n.a.

1 Openbaar Lichaam (OL)

2 Sometimes called the BES islands

3 Anna Rojer, Biological Inventory of Sint Eustatius, Carmabi Foundation, 1997, <http://www.bio-diversity-nevis.org/Documents/Biodiversity%20of%20Statia.pdf>

4 St Eustatius National Parks Foundation (Stenapa), <http://www.statiapark.org/>

5 CBS, Statistical Office

6 According to the Woonvisie, a Cooperative for social housing, average household income was 900- 1,000 € per month (2012-2015) but a large part of the population earns 4.20 per hour, = 600-700 per month.

7 CBS

It has historic, Dutch style buildings, from when it had an important agricultural production and was a regional trading centre, called the Golden Rock. It is now known as the Caribbean's Hidden Treasure. The capital is Oranjestad.

From an economic point of view, the majority of the people work for the government and the oil terminal (Nustar) but tourism is also important although data are missing for its share of GDP. Approximately 11,000 tourists visit the island on a yearly basis.⁸ Of these, 80% engage in marine ecosystem related activities.⁹ In 2009 a total of 6,050 dives were registered in the Marine Park and 713 visitors paid National Parks entrance fees.¹⁰

The climate is partly savannah and partly monsoon-type. The Quill volcano, in the south, clinging the clouds, causes more rainfall on the top than on the plains and on the northern hills. These climatological differences lead to a great variety of plants and plant communities.

2 BIOGEOGRAPHY, ENDEMISM, IMPORTANCE FOR GLOBAL BIODIVERSITY

The Northern Hills (including the Boven National Park) consist of 5 hills that contain numerous layers of volcanic deposits and are red colored due to oxidation of the iron-magnesium mineral. Arid conditions are the cause of much more sparse vegetation than that of the Quill volcano in the south. Besides the weather conditions, the vegetation of the Northern Hills has been seriously disturbed in the past by agriculture and roaming livestock. At present agriculture is greatly reduced, but the roaming livestock (mainly goats) continues to reduce the vegetation and threaten native species.

These Hills provide a habitat to a number of endangered species, most of which are protected by local laws and some by international treaties. These species include:¹¹

- The Lesser Antillean iguana¹², a rare and threatened species (different from the Green iguana, its Central American relative). The native iguanas are hard to find but are seen in parts of the Boven Park. St Eustatius is one of the few remaining islands where this endangered species is still found. A recent study showed that the population on the island is in decline and critically endangered.¹³
- The endemic ground lizard¹⁴ is one of the most common animals of St Eustatius and is recognizable due to light yellowish lines along their flanks and red heads. They live in holes and are seen along the trail in the Boven Park.
- The leatherback turtle, green sea turtle and hawksbill sea turtle¹⁵ nest on Zeelandia Beach, the main nesting beach of these endangered sea turtles in the Caribbean Netherlands.
- 18 species of orchid are found around St Eustatius, often in big trees, at the top of the Boven and in and around the large cracks of the rocks.
- The endemic Statia Morning Glory 16 is a creeper found throughout the Northern Hills.
- The cliffs on the south side area are a nesting site for the red-billed tropicbird.¹⁷
- The Red-tailed Hawk is frequently seen hunting in the Northern Hills.¹⁸

The Quill (National Park) contains the only "evergreen seasonal forest" of the Dutch Caribbean islands with other rare mountain vegetation like "montane thicket" and "elfin woodland".¹⁹ Towards the top of

8 <http://knoema.com/WTODB2014Jan/world-tourism-organization-database-january-2014>

9 Tadzio Bervoets: St Eustatius National Marine Park- Report on the Economic Valuation of St Eustatius' Coral Reef Resources, Stenapa, March 2010.

10 Sint Eustatius National Parks Annual report 2009.

11 <http://www.statiapark.org/parks/boven/index.html>

12 *Iguana delicatissima*

13 Debrot, A.O. and Erik Boman. The Lesser Antillean Iguana on St Eustatius: 2012 status update and review of limiting factors. IMARES Report number C166/12.

14 *Ameiva erythrocephala*

15 *Dermochelys coriacea*, *Chelonia mydas*, *Eretmochelys imbricate*

16 *Ipomoea sphenophylla*

17 *Phaethon aethereus*

18 *Buteo jamaicensis*

the crater a lush vegetation shows a rich variety of mosses, ferns, arum, bromeliads and orchids. The Quill is the only habitat on St Eustatius of the bridled quail dove, the brown trembler and the scaly-naped pigeon.²⁰ Recently a new plant species unknown to science was found on St Eustatius. It is a vine in the milkweed family²¹ and was found on the inner crater walls of the Quill. The extent of the population is not yet known.²²

The exclusive economic zone around Saba, Sint Eustatius and Sint Maarten encompasses the entire Saba Bank, which is the largest submerged coral atoll in the Atlantic Ocean and has some of the richest marine biodiversity in the Caribbean Sea. New species of fish, coral and algae that have never been described before are discovered here on a regular basis. The deep reef and deep-sea environment around the islands are as of yet essentially unexplored, but appear to be rich in species as compared to other deep sea areas.²³ Species found in Statia's waters:

Sea turtles	Confirmed sightings of leatherback, green and hawksbill sea turtles, and an unconfirmed sighting of loggerhead sea turtle ²⁴ .
Cetaceans - whales	Regular visitors both to the reefs and the waters around Statia: baleen, pilot, dwarf sperm, humpback, Gervais' beaked, killer, melon-headed, sperm and Cuvier's beaked whales ²⁵
Cetaceans - dolphins	Pantropical spotted, striped, spinner and bottlenose dolphins ²⁶
Rays	Manta and eagle Rays ²⁷ visit the Marine Park from deeper waters.
Commercially and recreationally valued marine animals	Queen conch, spiny lobsters and two shark species, Caribbean reef and nurse sharks. ²⁸

Plate corals	<i>Agaricia sp.</i>
Soft corals	Sea fans and wire corals (<i>Ellisella sp.</i>).
Hard corals on shallower reefs	Mustard hill coral (<i>Porites astreoides</i>), brain coral (<i>Diploria sp.</i>), various forms of star coral (<i>Montastrea sp.</i>), flower coral (<i>Eusmilia fastigata</i>), maze coral (<i>Meandrina meandrites</i>), pillar coral (<i>Dendrogyra cylindrica</i>) and the blade form of fire coral (<i>Millepora complanata</i>).
Other coral species	Sea plumes, gorgonians and black coral (<i>Antipathes sp.</i>) at depths in excess of 20 m, particularly at the drop off.

In the three Parks, numerous endangered or critically endangered species are protected through active management, research and monitoring programmes, including four species of sea turtles, the Lesser Antillean iguana, red bellied racer snake, orchids, cacti and the endemic vine Statia Morning Glory.²⁹ St Eustatius records 26 nesting species of birds with an additional 28 migratory species.³⁰

19 Nature Policy Plan 1998-2003 by F.J. van Zadelhoff, 1997.

20 Respectively: *Geotrygon mystacea*, *Cinlocerthia ruficauda* and *Columba squamosa*.

21 *Gonolobus aloiensis*.

22 A. Krings and F. Axelrod: '*Gonolobus aloiensis* (Apocynaceae, Asclepiadoideae), a New Species from St Eustatius', Systematic Botany, Volume 38, Number 4, 2013.

23 Nature Policy for the Caribbean Netherlands 2013-2017, Dutch Ministry of Economic Affairs and Nature, April 2013.

24 Respectively: *Dermochelys Coriacea*, *Chelonia Mydas*, *Eretmochelys Imbricate*, *Caretta caretta*.

25 Respectively: *Balaenoptera sp.*, *Globicephala macrorhynchus*, *Kogia simus*, *Megaptera novaeangliae*, *Orcinus orca*, *Peponocephala electra*, *Physeter macrocephalus*, *Ziphius cavirostris*.

26 Respectively: *Stenella attenuate*, *Stenella coerulescens*, *Stenella longirostris*, *Tursiops truncatus*.

27 *Manta birostris* and *Aetobatus narinari*.

28 *Strombus gigas*, *Panulirus argus*, *Carcharhinus perezi*, *Ginglymostoma cirratum*.

29 <http://www.statiapark.org/>

30 Stenapa Bird monitoring program, see <http://www.statiapark.org/parks/boven/index.html>

3 STATE OF THE ENVIRONMENT / THREATS / VULNERABILITIES

3.1 OVERVIEW OF THE STATE OF ST EUSTATIUS' ENVIRONMENT

There is no recent study of the state of the environment in St Eustatius but STENAPA has a number of programmes to protect and monitor sea turtles, queen conch, spiny lobster, Lesser Antillean iguana, red-billed tropicbirds³¹, butterflies, spiders, the Statia Morning Glory. The Quill and Boven National park was declared an Important Bird Areas (IBAs) in 2008. The results of bird monitoring showed that 20 different species of birds were observed, totalling 679 individuals. Seven of nine species listed as key species for Sint Eustatius by Bird Life International were observed during the 2009 survey.³²

The Ministry of Economic Affairs and the Island Government have commissioned IMARES (Institute for Marine Resources and Ecosystem Studies, Wageningen UR) to carry out research on a variety of issues, like invasive species, marine habitats, conch, spiny lobster and fish populations.

All waste is currently brought to one place and there is no sorting. The current landfill is located directly next to Zeelandia beach, the turtle nesting area. Waste, mostly plastic, ends up on the beach and other surrounding areas. However, the Dutch State Secretary committed to a technical and financial assistance for the Waste Management project (October 2013). This technical assistance consists of a waste expert for the three BES islands and finances for the purchase of an incinerator and supplementary material. The waste expert is stationed on Bonaire since November 2013 and visits St Eustatius on a regular basis. In cooperation with this waste expert, an action plan is made for St Eustatius aiming at (partly) separated collection of waste, facilities for further separation and processing of the waste and the installation of an incinerator. There are also plans to close the existing landfill.

3.2 VULNERABILITIES AND MAIN CHALLENGES

Challenge 1 - Climate change - Severe

Climate change is expected to have a whole raft of adverse effects in many countries, but these effects are likely to be particularly severe in small tropical islands. The table below applies this general analysis to the specific circumstances of Sint Eustatius.

Impact	Severity	Comments
Inundation of coastal land	●	The capital, Oranjestad, has a lower and an upper town. The airport and some containers of the oil terminal are also low-lying.
Stressed fisheries	○	The fishing industry is not of great economic importance in the Territory
Coral reefs	●	Islands ringed by coral reefs are subject to multiple threats (bleaching, decreasing pH)
Tourist industry	●	Tourist industry accounts for a large number of jobs (and income ³³). Reef tourism (diving and snorkelling) and hiking are important attractions.
More frequent and more intense storms	●	This poses a severe threat for the Leeward Islands which are already affected frequently by hurricanes. Hurricane Omar in 2008. ³⁴

31 Hatching success of Red-billed Tropicbirds at five study sites in St Eustatius, November 2012 – June 2013.

<http://www.statiapark.org/downloads/>

32 See publications on <http://www.statiapark.org/downloads/index.html> and 2009 report:

<http://www.statiapark.org/downloads/downloads/St%20Eustatius%20National%20Parks%20Annual%20Report%202009.pdf>

33 Exact data n.a.

34 <http://www.youtube.com/watch?v=jqBibbZrHsQ>

Impact	Severity	Comments
"Cooked" turtle eggs	●	Since 2009 the STENAPA Sea Turtle Conservation programme has been documenting the occurrence of infected and (partially) cooked eggs due to excessively high sand temperatures. ³⁵ With the predicted increase in temperatures the programme will be in a position to best determine from combined years data what mitigating measures can be taken to address the problem.
○ Nil ○ Slight ● Moderate ● Heavy		

Challenge 2 - Loss of natural habitats and biodiversity - Severe

Damages to coral reefs		
Cause	Severity	Impacts
Tourism	●	Erosion and disturbance by increasing coastal development and inefficient waste removal systems.
	○	Damage to reefs resulting directly from tourism includes mechanical breakage by scuba divers and snorkelers; to accommodate scuba divers the Marine Park offers 30 buoyed dive sites for boats up to 50 feet and five designated for boats up to 100 feet. ³⁶
Building and development activities	●	Debris, sand, cement, stones and other runoff of coastal development and erosion that are washed in the sea can cause serious damage or mortality to corals by smothering them and blocking their access to the sunlight they need for energy. This runoff is increased by land clearing techniques which remove plants that hold the soil in place.
Fishing	○	Over-fishing threatens coral reefs, though fishing pressure on St Eustatius is low.
To sea grass beds	○	Coral reefs protect the sea grass beds lying on their shoreward side, so their degradation can adversely affect the sea-grass. Vice versa sea grass beds also protect smothering of coral reefs.
Other causes	●	Corals can bleach with temperature increases and disease can derive from a series of factors.
○ Nil ○ Slight ● Moderate ● Heavy		

Pressures on biodiversity and natural habitats		
Pressure	Severity	Impacts
Pollution	○	The lack of proper waste disposal causes pollution of soil, the coast and the sea (but is being worked on). The Oil Terminal has caused several incidents of leakages into the soil and into the marine environment.
Oil Terminal Nustar	●	Anchoring of vessels in the Marine Park damages coral reefs. Pollution from ships including ballast waters. An expansion of the terminal to another location was not allowed recently.
Storms	○	St Eustatius has repeatedly been hit by hurricanes in the past. Trees in the craters might fall during a hurricane or tropical storm.
Ship traffic	○	In 2002, tanker Paulina dumped its ballast water containing oil that polluted the length of the island, the marine park, harbour and shoreline. 12 years later, the St Eustatius National Parks Foundation (STENAPA) has yet to receive restitution for cleanup of this incident; sources say it will likely end up in court. ³⁷ Improper anchoring causes mechanical damage to the coral reef and ships travelling out of the shipping lanes cause damage to fishing gear and moorings.

³⁵ <http://www.statiapark.org/downloads/downloads/2012%20Sea%20Turtle%20Conservation%20Program.pdf>

³⁶ <http://www.statiatourism.com/ecotourism.html>

³⁷ <http://www.ecology.com/2012/01/02/oil-terminal-risks-st-eustatius/>

Pressures on biodiversity and natural habitats		
Pressure	Severity	Impacts
Hunting and trade	○	Danger of hunting mainly for Lesser Antillean Iguana. Some plant species, e.g. orchid and ferns can be potential trade objects. ³⁸
Construction and industry	●	Valuable nature areas are sacrificed to industrial or tourism development. Tumble Down Dick Bay (the Oil Terminal) was lost as nesting area for regionally endangered and vulnerable sea birds. The impact goes beyond just the immediate area concerned because of e.g. the visual disturbance of the landscape.
Invasive species	●	The Mexican creeper (<i>Antigonon leptopus</i>) has invaded large areas of nature, suffocating all other vegetation. ³⁹ The lionfish arrived in 2011 and is now established, though still in relatively low numbers. The African giant snail and a new invasive species of sea grass (<i>Halophila stipulacea</i>) arrived in 2013.
Free roaming cattle	●	Particularly goats, sheep, cattle, pigs and chickens cause a lot of degradation of the vegetation, which causes erosion. The latter is a serious problem because the soil of the Kultuurvlakte is extremely prone to erosion. Donkeys are now fenced in.
Introduced (predator) species	○	Cats and rats pose a threat to herpetofauna and avifauna (breeding seabird red-billed tropicbird). There is also a danger of accidental introduction of the Mongoose, monkey and Green Iguana from other islands.
○ Nil ○ Slight ● Moderate ● Heavy		

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

St Eustatius is one of the three special municipalities of the so called Caribbean Netherlands (or BES). A set of new laws (the BES laws) have been laid down by the Netherlands for the 3 Caribbean municipalities (Sint Eustatius, Saba, and Bonaire), dealing with nature protection, environment, physical planning, marine management and fisheries.⁴⁰ These will be introduced in stages and so often the 'old' laws from before 10 October 210 (Netherlands Antilles) are still in force.

For instance the BES Nature Conservation Law⁴¹ delegates the primary responsibility for Nature on the islands of the Caribbean Netherlands to the islands themselves. Nature is a local island resource and should be managed by the island that directly benefits from this resource. This includes the management of species or areas that have been identified internationally as needing special protection.

However, it is the responsibility of the Minister in The Hague to see to it that the islands adequately manage their nature and that assistance is given when they are unable to do so. Special areas or species that are of international concern, and are so designated by the Minister through the Nature Conservation Law BES, add to the responsibilities of the islands.

Outside of the jurisdiction of the islands, i.e., in the ocean beyond the territorial waters of the islands, the Dutch Minister is directly responsible for the management of nature. The Minister also holds a responsibility for the management of the territorial waters based on the Maritime Management Law.⁴²

38 Biological inventory by Rojer. <http://www.statiapark.org/downloads/downloads/RojerKNAP96-33BioInv-statia%5Beng%5D.PDF>

39 <http://www.statiapark.org/downloads/downloads/Corallita%20pilot%20project-results%20recommendations-jan07.pdf>

40 These BES laws can be found on: <http://www.dcnanature.org/resources/policy-law-enforcement/>

41 Wet Grondslagen Natuurbeheer en -bescherming BES, http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

42 Wet Maritiem Beheer BES, <http://dcnanature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>,

4.2 REVIEW OF CURRENT INSTITUTIONS

Institutions and Responsibilities⁴³					
Directorate E&I (Economy and Infrastructure)= Dir E&I Unit for Implementation & Control (Inspectie & Uitvoering) = unit I&C Department of Area Planning and Public Works = DROB STENAPA= St Eustatius National Parks Foundation					
Topics	Policy-making	Implementation of projects	Law-enforcement	Monitoring	Statistics
Environment	Island Govern't: Dir. E&I and Kingdom	Island Govern't Dir. E&I, unit I&C STENAPA	Police, Island Govern't: Dir. E&I, unit I&C STENAPA	Island Govern't: Dir. E&I, unit I&C STENAPA IMARES	Island Govern't: Dir. E&I, unit I&C STENAPA IMARES
Drinking water and waste water	Island Govern't: Dir. E&I and Kingdom	Sint Eustatius Utility Company STUCO			
Waste	Island Govern't: Dir. E&I	Island Government Dir. E&I Units DROB & Management	Police		
Biodiversity	Island Govern't: Dir. E&I and Kingdom	Island Govern't: Dir. E&I, unit I&C STENAPA	Police, Island Govern't: Dir. E&I unit I&C STENAPA	Island Govern't: Dir. E&I unit I&C STENAPA IMARES	Island Govern't: Dir. E&I unit I&C STENAPA IMARES
Territorial Planning	Island Govern't: Dir. E&I	Island Govern't: Dir. E&I, unit management	Police		
Civil Protection (see end note) ⁴⁴	Kingdom & Island Government	Island Government (and STENAPA)	Police and Island Government (and STENAPA)	Island Govern't, STENAPA and IMARES	
Integrated Coastal Zone Management	Island Govern't: Dir. E&I and Kingdom	Island Govern't and STENAPA	Police, Island Government: Dir. E&I unit I&C STENAPA	Island Govern't, STENAPA and IMARES	
Fisheries	Island Govern't: dir. E&I	Island Govern't: Dir. E&I, unit I&C and STENAPA	Police, Island Govern't Dir. E&I, unit I&C and STENAPA	Island Govern't, STENAPA and IMARES	Dir. E&I, unit I&C
Farming and livestock	Island Govern't: Dir. E&I	Island Govern't: Dir. E&I unit I&C	Police and Island Government	Island Govern't: Dir. E&I unit I&C	
Renewable energy and energy efficiency	Island Govern't: Dir. E&I	Island Govern't: Dir. E&I			
Industry	Island Government (dir. E&I)	NOTE: very few industries on the island			
Tourism	St Eustatius Tourism Development Foundation	St Eustatius Tourism Development Foundation		St Eustatius Tourism Development Foundation	St Eustatius Tourism Development Foundation
Private Sector			Police		

Nature Conservation on the islands is delegated to STENAPA (St Eustatius National Parks), a non-governmental nature conservation organisation. Its mandate is anchored in regulations and management agreements. Apart from being responsible for the development and implementation of the management

⁴³ <http://www.statiagovernment.com/directory.html>

⁴⁴ Response to disasters, emergencies, coordination of contingency planning, responsible for management of early warning systems

plans, this organisation also has enforcement authority.⁴⁵ In 2013 STENAPA had eight qualified and experienced members of staff with over 35 years of practical experience with the Foundation.⁴⁶ The Marine Park has a manager and a ranger and successfully recruits volunteers to supplement the workforce.⁴⁷ The Marine Park staff work closely with two local dive centres to ensure that diving practices minimize impact on the reef.

Staff members of STENAPA were trained in bird identification and monitoring by Bird Life International, within the framework of a monitoring programme for bird populations funded in 2008 by the NGOs DCNA⁴⁸ and Vogelbescherming (Bird Protection) Netherlands.

Concerning the Management Plan for the natural resources of the EEZ of the Dutch Caribbean, which excludes the Marine Park of Statia, tasks are delegated as follows: implementation will be led by a dedicated committee for marine biodiversity and fisheries, the EEZ committee. The National Government will:

- coordinate the implementation of the EEZ management plan for natural resources in the EEZ for the Dutch Caribbean;
- guarantee active management of the EEZ for the Dutch Caribbean by developing mutually agreed common policy approach;
- ensure continuous involvement of interested parties in the development
- Implementation of the management plan;
- develop an integrated research and monitoring plan, in cooperation with the partners of the EEZ committee, based on national and international commitments, the different competences of signatories and other parties, and on the possibility of using local capacity.

Another stakeholder with responsibility for nature or the environment is the utilities company GEBE⁴⁹ who was, until 1 January 2014, producing and distributing electricity on Sint Maarten, Saba and Sint Eustatius and distributing water on Sint Maarten and St Eustatius and also for waste water management. But Sint Maarten is now the full owner of GEBE since Dec 2013. The new utility companies on Saba and St Eustatius are: Statia Utility Company STUCO and Saba Electrical Company (SEC). A six-month grace period is now in effect, allowing Sint Maarten to render any technical service that may be required by Saba and Statia. All operations and employees will be transferred by January 1, 2014.⁵⁰

4.3 POLICY, STRATEGY, PLANS, PROGRAMMES

There is no Nature Policy Plan for Statia yet, as required in the more general Nature Policy plan 2014-2017 made by the Dutch Ministry for the three BES islands.⁵¹ There is however a Spatial Planning plan.

But as said earlier, there are two National Parks, the Quill / Boven National Park and the St Eustatius National Marine Park, managed by STENAPA. The Quill / Boven National Park has also been recognized by the Specially Protected Areas and Wildlife (SPAW) protocol as a protected area of regional importance. The criteria and procedure for this recognition were only recently established by the parties.

45 BES nature policy 2013- 2017

46 www.statiapark.org

47 Hoetjes et al, 2002, chapter 17 (Status of Coral Reefs in the Eastern Caribbean: The OECS, Trinidad and Tobago, Barbados, and the Netherlands Antilles in Wilkinson (ed.): Status of coral reefs of the world: 2002. GCRMN Report.

48 <http://www.dcnanature.org/> Dutch Caribbean Nature Alliance

49 Gemeenschappelijk Elektriciteitsbedrijf Bovenwindse Eilanden

50 <http://www.dutchcaribbeanlegalportal.com/news/business-financial/3685-gebe-fully-owned-by-st-maarten-lake-lauds-all-who-made-it-possible>

51 <http://www.government.nl/documents-and-publications/publications/2014/02/03/nature-policy-plan-the-caribbean-netherlands.html>



The St. Eustatius Marine Park Management Plan was published in 2007 and the Quill / Boven National Park and Botanical Garden Management Plan was finalized in 2009. STENAPA distributed CDs of the management plan to island stakeholders involved with development and implementation of the plan, including the Island Council, Tourist Office and Legal Office. The management plans were presented to the public via media including the newspaper and STENAPA newsletter, and made available on their website.⁵²

Following the declaration of the Quill and Boven as Important Bird Areas (IBAs) in 2008⁵³ two NGOs funded the establishment of a monitoring framework for bird populations (see above).

In 2010 an EEZ management plan was developed in consultation with the 6 OCTs within the Kingdom of the Netherlands: the Management Plan for the natural resources of the EEZ of the Dutch Caribbean.⁵⁴ A Memorandum of Agreement was drawn up for the implementation of the Management Plan, not only including these waters, but also the territorial waters outside the borders of the marine parks around the islands.⁵⁵

In 2013 a Master plan Infrastructure St. Eustatius was made.⁵⁶ According to this Master plan the authorities on St. Eustatius main goals are: upgrading many important infrastructures: the airport (€ 5-8 million), prison (€ 6 Million), houses and roads (€ 5-8 million, including the road to the Botanical Garden and if including dirt roads: € 8-11 million), prevention against storms (bringing all cables underground (€ 11-14 million)).

As said earlier on, ambitious new policy initiatives are taking place since October 2013 in the area of waste management, with Dutch technical assistance for extra expert manpower and funds for new installations.

For energy, a feasibility study was done to place windmills near Corre Corre bay. Due to the isolated location of the windmills and the possible threat of damage in the case of a storm or hurricane, it is believed that this project is not profitable. The government is now looking into solar energy.

Also concerning the free roaming animals, donkeys are already fenced in and there is a project to fence in or destroy the roaming cows.

Actions by STENAPA

Beach cleanups are regularly conducted on Zeelandia Beach and other beaches. Within the Marine Park there are two actively managed Reserves in which no fishing or anchoring is permitted to conserve marine biodiversity, protect fish stocks and promote sustainable tourism. Regular mooring maintenance (dive, snorkel and yacht sites), patrols and research are also done by STENAPA.

⁵² STENAPA annual report 2009:

<http://www.statiapark.org/downloads/downloads/St%20Eustatius%20National%20Parks%20Annual%20Report%202009.pdf>

⁵³ STENAPA report 2009

⁵⁴ IMARES, 2010.

⁵⁵ This plan has been signed so far by all parties except Aruba and St. Maarten.

⁵⁶ Ontwikkelplan Openbaar Lichaam Sint Eustatius, document provided by authorities in The Hague.

4.4 LEGAL FRAMEWORK, MONITORING AND ENFORCEMENT

Five pieces of legislation have been adopted by the Dutch Parliament for the 3 BES islands i.e. including Sint Eustatius, concerning nature, environmental wellbeing (water, waste, energy), physical planning, marine management and fisheries.⁵⁷

In particular the Nature protection and management law for the BES islands, adopted (unchanged from the Netherlands Antilles) in December 2011⁵⁸ lays down many policy measures and law enforcement for Sint Eustatius (and Bonaire and Saba). In particular SPAW, Cites, the Bonn and Sea Turtle conventions and obligations are cited and Ramsar and CBD conditions are recalled. It states that the islands have to make a nature policy plan every 5 years, containing a list of actions for the plan period.

The Island Ordinance for Protection of Fauna and Flora (1997) and the Marine Environment Ordinance (1996) are still in force. However, these ordinances do not fully implement the international requirements with regard to sea turtles, or the annexes of the Bonn Convention or SPAW protocol. The Dutch Ministry can provide support to the island to review and update these ordinances for full compliance. A proposal for this was recently sent to the executive council.

Regulates	Implementation status
Protection of flora and fauna	<ul style="list-style-type: none"> - Addendums I and II of the Sea Turtle Treaty (Inter-American Convention for the Protection and conservation of Sea-Turtles) - Addendum I of Bonn Convention on Migratory Species - The islands' decree in force does not include sea turtles, the explanatory memorandum mentions them
Conservation of biodiversity	Convention on Biological Diversity: insufficient implementation
Management and conservation of habitats and ecosystems	<ul style="list-style-type: none"> - Ramsar Convention on Wetlands of International Importance (St Eustatius does not have significant wetlands) - Addendums I and II of the SPAW-protocol (Specially Protected Areas and Wildlife Protocol) of the Cartagena Convention - Not Implemented
Trade in endangered species	Addendum I of the CITES or Washington Convention- Not implemented, but customs enforces CITES permit requirements

Multilateral Environment Agreement	Remarks
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)	Convention, together with the Oil Spills and SPAW Protocols are in BES law
Convention on Biological Diversity (CBD)	Enabling law is available for BES but for full implementation island legislation is required. Not yet done
CITES	Mentioned in BES. Implemented by national legislation but not yet at island level. Customs enforces CITES permit requirements
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Enabling law is available for BES but island legislation is required. But not yet done

Monitoring

Monitoring of tankers increased in 2009 and a number of violation reports completed. Since 2010 the shipping inspectorate under the Ministry of I&M is strictly enforcing the maritime act for BES including environmental requirements. Patrols of marine reserves are ongoing.⁵⁹

⁵⁷ Wet volkshuisvesting, ruimtelijke ordening en milieubeheer BES <http://dcnanature.org/wp-content/uploads/2012/09/Wet-VROM-BES.pdf>, Wet maritiem beheer BES, <http://dcnanature.org/wp-content/uploads/2012/09/Wet-maritiem-beheer-BES.pdf>, Wet grondslagen ruimtelijke ontwikkelingsplanning BES, <http://dcnanature.org/wp-content/uploads/2012/09/Wet-grondslagen-ruimtelijke-ontwikkelingsplanning-BES.pdf>, Wet grondslagen natuurbeheer- en bescherming BES, <http://www.dcnanature.org/wp-content/uploads/2012/09/Wet-grondslagen-natuurbeheer-BES.pdf>, Visserijwet BES, <http://dcnanature.org/wp-content/uploads/2012/09/Visserijwet-BES.pdf>

⁵⁸ Wet grondslagen natuurbeheer- en bescherming BES, http://wetten.overheid.nl/BWBR0028434/geldigheidsdatum_13-12-2011

⁵⁹ Stenapa report 2009

4.5 ENVIRONMENTAL AWARENESS

Activities by STENAPA mentioned in their last report (2009):

Public information was further expanded with the in-house completion of three guide books for the National Parks: Diver guide to the Statia National Marine Park (200 pages), Hiker guide to the Quill / Boven National Park (40 pages) and Guide to the Miriam C Schmidt Botanical Garden (40 pages).

Quarterly newsletters and press releases for all significant events and visits are made and quarterly informative public forums are held.

Outreach activities include presentations, guided hikes, tours, trails, talks and other activities:

- public meeting and presentation of information on lionfish;
- seabird research presentation;
- presentation to visiting parliamentarians;
- guided hikes for the general public, tourists, travel agents, press;
- tours in the Botanical Garden (daily, full moon and school tours);
- tour for the visiting representatives of the Dutch ministry;
- meetings, advice and report review for consultants from Holland on various issues;
- a fishermen workshop took place in 2009 about use of environmentally friendly fish traps, use of pop up devices, and use of GPS units. A presentation about shark protection was also given;
- four types of after-school clubs are held during the school year: Snorkel Club, Advanced Snorkel Club, Junior Rangers 1 and Junior Rangers 2.

Furthermore, a new event was held in October 2012: "People and the Parks".⁶⁰ Staff from each department gave informative presentations about their respective areas of work to the public, who were given the opportunity to ask questions at the end of each session. STENAPA is working on a project to produce a set of television programmes so that the message can be made available to the wider public.

STENAPA staff took part in the Sustainable Conference in Statia in 2012 and 2013.

Role of civil society	
Non-Governmental Organisations (NGOs) related to environment and type of activities	STENAPA- www.statiapark.org is the only organization on the island mandated to manage the Protected Areas of St Eustatius. DCNA (Dutch Caribbean Nature Alliance) www.dcnanature.org , is a regional network of protected areas set up to help and assist the park management and conservation organisations on the islands of Aruba, Bonaire, Curaçao, Saba, St Eustatius and Sint Maarten to better safeguard their unique natural world. SEAD (St Eustatius Awareness and Development) has protested against the extension of the oil terminal to "the Farm", an abandoned farming area. WWF Netherlands provides some funding for nature conservation on the islands
Role of the private sector concerning the environment	There are two dive centres on the island. They raise awareness for the marine environment.

The Dutch Caribbean Biodiversity Database (DCBD) is a data base funded by Dutch Ministries, which helps raise awareness. www.dcbd.nl

⁶⁰ <http://www.statiapark.org/downloads/downloads/newsletter/newsletter-dec2012.pdf>

4.6 FINANCE FOR THE ENVIRONMENT

The BES Nature Policy Plan 2013-2017 goal is to help BES islands, including Sint Eustatius, to set priorities for nature conservation, ensuring the allocation of resources including the € 7.5 million earmarked by the Dutch Parliament for nature conservation in the three BES islands over the coming four years. For St Eustatius, \$ 2,488,240 is available (approx. € 1.8 million).

Amongst the four project plans proposed by St Eustatius, three have been approved:

- Concerning Roaming Animals (related to sustainable animal husbandry);
- Strengthening Nature Management;
- Anti-Erosion Measures.

The fourth plan, on beach restoration, needs to be revised or replaced.

The BES Nature Policy Plan states that most of the funding available for nature management in the Caribbean Netherlands is generated by user fees. On Sint Eustatius National Parks generate only 14% of their total budget for nature management by means of user fees.⁶¹ Divers in the Marine Park have to purchase a dive tag for the upkeep and maintenance of the park facilities. Year passes are sold for US\$30 and single dive passes are sold for US\$ 6.⁶² Part of the exploitation costs of the designated protected areas is covered by subsidies from the islands' governing bodies (for Sint Eustatius 48%, Saba 17%). The Government in The Hague, in partnership with the 3 BES islands' governing bodies and local stakeholders, will carry out an exploratory study and put forward recommendations to ensure a sustainable financial future for the national parks.

In 2007 the Dutch government decided to give € 1 million per year (during 10 years) to a Trust Fund for the DCNA (Dutch Caribbean Nature Alliance). Other charities are now also putting money into this fund (National Lottery). Such a construction avoids complicated project selection and disbursement procedures by civil servants. The Trust Fund is managed by an independent board and disburses only the interest earned by the fund.

The recent St Eustatius Authorities' Master Plan asks for investments in roads (see under policies, above), airport and to improve the safety of the harbour, extending the wave breaker (€ 10 million), investments needed to separate commercial and tourism harbour and build new commercial harbour (in the longer term) are estimated at € 20-25 million.

EU subsidies available for upgrading the container terminal from the 10th EDF amounted to € 2 million (Finance Agreement signed).

Energy

Research into the possibility of using geothermal energy on the island was planned. The company that was supposed to execute this would arrange for funding, which unfortunately did not happen. The island is looking into solar energy at this moment. The Netherlands also financed research into best location for 2-3 windmills and a feasibility study was done for the Corre Corre bay.

⁶¹ On Saba it is 53%, due to a larger number of visitors.

⁶² <http://www.statiatourism.com/ecotourism.html>

There is regional interactive action on nature issues, by STENAPA:

The STENAPA 'Lionfish Action Plan' developed a list of invasive species in the Dutch Caribbean and STENAPA staff attended a workshop about invasive species management in Guadeloupe (Report 2009).

STENAPA participated in a workshop to prepare a plan for invasive species on the French Antilles. Contacts were made with other groups working on Corallita.

The Turtle programme: The beach monitoring programme was started in 2002 in affiliation with the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). In 2003 however, regular night patrols were conducted following the introduction of the Working Abroad Programme, which brings groups of international volunteers to assist with projects in the National and Marine Parks. By 2004 the programme had expanded to include morning track surveys on the islands nesting on Zeelandia beach, with a dedicated vehicle and a part time project coordinator, during the nesting season.⁶³

STENAPA is a member of the Caribbean Marine Protected Area Managers (CaMPAM) network of the SPAW Protocol and received support from SPAW to participate in capacity building for marine protected areas (train the trainer workshops) and to participate in regional meetings of marine parks and workshops on combating the invasive lionfish. With the St Eustatius National Marine Park now recognized by the SPAW Protocol as a protected area of regional importance (one of eighteen so far, including also the Saba Bank National Park and the Bonaire National Marine Park), it is eligible for a small grant fund of the SPAW Protocol established in 2013 and earmarked to promote and develop cooperation between such areas.

STENAPA participates in yearly joint surveys of marine mammals funded by the French 'Agoa' marine mammal sanctuary. These surveys also include the Saba Bank and are part of the cooperation of the Ministry of EZ with Agoa in preparation for declaration of a Dutch marine mammal sanctuary in the EEZ waters surrounding Saba and St Eustatius.

Through DCNA, STENAPA receives support in cooperative programmes aimed at capacity building. This includes joint training workshops with the other Dutch islands and exchange of staff with Sint Maarten, Saba, and Bonaire.

As a member of DCNA, STENAPA is also eligible for emergency funding from DCNA, in case of an acute emergency situation due to a hurricane for instance.

⁶³ <http://www.statiapark.org/downloads/downloads/2012%20Sea%20Turtle%20Conservation%20Program.pdf>

6 CONCLUSIONS AND RECOMMENDATIONS

Besides the Boven/Quill national park and the marine park, the species protection legislation existing since 1997, the research and monitoring done by the NGO STENAPA, we note that there is a Nature Policy Plan 2013-2017 for the 3 BES, but that a Nature Policy Plan has not been developed for St Eustatius. The Spatial planning Plan can however help protect important species and habitats.

The main priorities identified in the territory are:

Issues	Current situation	Responses
Pressures on Statia's habitats and biodiversity	Roaming cattle, illegal sand mining on Zeelandia beach	Implement the "Roaming Animals for Sustainable Animal Husbandry" plan.
Invasive species	Lionfish, corallita, African giant snail, <i>Halophila stipulacea</i> , etc.	Monitoring and eradication of lionfish.
Climate change / sea level rise		Sites for wind mills were prospected, now also considering greater use of solar energy
Waste management	No separation of waste, everything dumped on landfill.	New ambitious waste policy and infrastructures are being prepared with Dutch aid.

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Help make transition to new constitutional regime	Support making new nature policy and law, according to the Nature Plan Caribbean Netherlands and BES laws	The 'old' nature policy and laws still in force					
	Activities Provide support to the island's administration and Nature Park management to evaluate its nature policy and legislation. Idem to identify gaps in implementation of the new Nature Plan Caribbean Netherlands and new BES Nature law (plus international requirements). Idem to identify the necessary measures to realize new BES Plan and BES law. Consider the possibility of making St Eustatius an UNESCO Man and Biosphere reserve (example St Kitts?) Make own nature plan and nature law.						

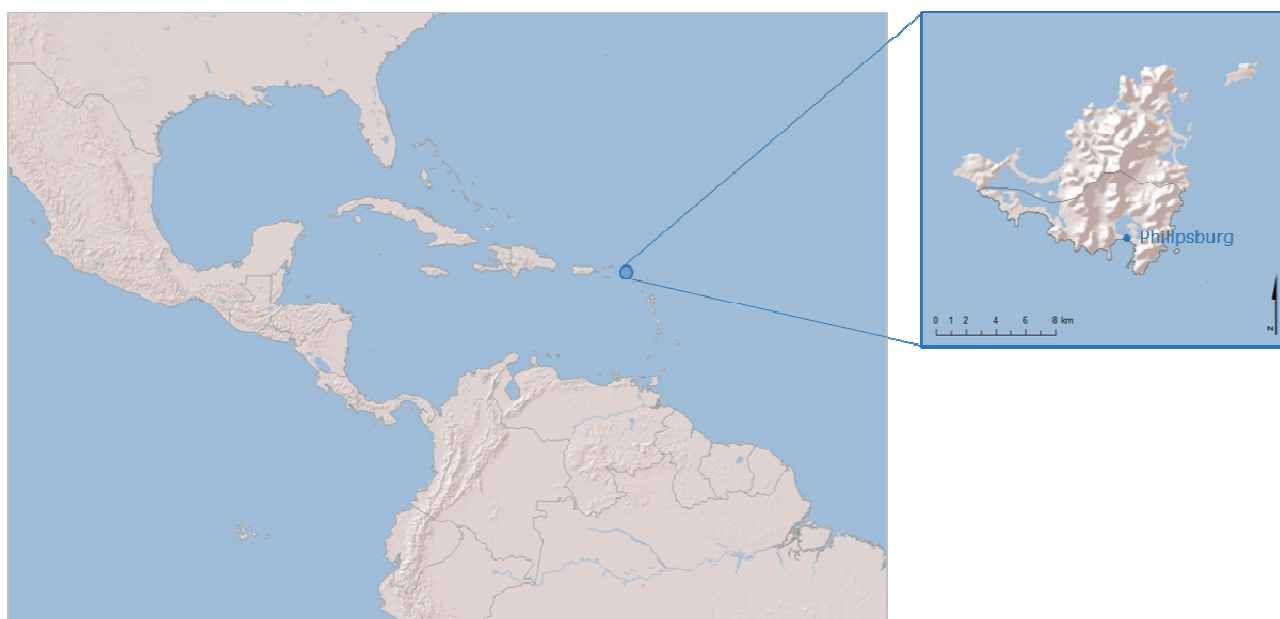
Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Combat invasive species	Support monitoring/ policy/legislation/implementation	Lionfish appeared in 2011 and has established itself. Invasive plants are dominant on large tracts on the island.					
	Activities Continue monitoring Lionfish and eradicated where possible Analysis of the ciguatera contents of lionfish and of risk of ciguatera fish poisoning. Monitor (and eradicate) other invasive species like the African Giant Snail and the invasive sea grass (<i>Halophila stipulacea</i>). On land: the Corral vine (Corallita) is especially prevalent. Neem trees, the spiny and succulent vine are also very invasive. Support additional capacity and the establishment of a network of experts and volunteers to mobilize when necessary. Legislation is needed to provide authority for impoundment, exclusion, confiscation, quarantine and destruction of potentially invasive species.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Introduce 'polluter pays principle'	Increase knowledge and use (in policies) of the economic value of nature	A recent study of the value of nature on St Eustatius gives recommendations on how to incorporate results in other policies					
	Activities Include economic impacts in assessing fines for damages to reefs from activities such as anchoring in the reserves, oil spills etc., Enforce strict usage of anchorage areas, Evaluate distributional effects ("winners" and "losers") of proposed coastal development projects, Incorporate economic valuation into EIAs, Enforce land-use and development regulations (in particular in coastal areas where there are new developments) Weigh revenues from a growing tourism industry against possible long-term economic losses from environmental impacts, Invest in Scientific Research. Recently the Caribbean Netherlands Science Institute was installed on St Eustatius. Increase support from the private and public sector in the Marine Park Management Authority (STENAPA)						

ANNEX K : SINT MAARTEN

ENVIRONMENTAL PROFILE

SINT MAARTEN



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SUMMARY

Sint Maarten, previously part of the Dutch Antilles, became an independent country within the Kingdom of the Netherlands on October 10, 2010. At the same date the Dutch Antilles were dissolved. Aruba, Curaçao and Sint Maarten now have the same status as an independent country while the other three former Dutch Antilles have become Dutch municipalities with special status (Bonaire, Sint Eustatius, and Saba). Sint Maarten has full autonomy for internal affairs, the Dutch government being responsible for defence, foreign affairs and some maritime surveillance tasks.

Sint Maarten is highly dependent on tourism and therefore maintaining and protecting the natural environment is essential to socio-economic wellbeing. The country is actively analysing possibilities concerning renewable energy and improved waste management (the latter together with Saint Martin).

In economic terms Sint Maarten (and Curaçao) face substantial challenges: low growth, high unemployment, aging population and the current account deficit has risen to worrisome levels. Major data gaps significantly complicate the diagnosis.¹

1 BACKGROUND INFORMATION

Situated in the Caribbean Sea, on one of the northern or Leeward Islands, nearly 1,000 km north of the three southern islands Aruba, Bonaire and Curaçao. Sint Maarten shares the same island with the French territory Saint Martin. Together, these two entities make up the smallest landmass in the world shared by a self-governing state (Sint Maarten) and an overseas collectivity (of France, Saint Martin).²

Sint Maarten has an elected parliament, the leader of the party winning the elections usually becomes Prime Minister and head of government. A Governor General is appointed by and represents the Dutch King. The Council of Ministers includes a representative in the Netherlands (Minister Plenipotentiary). The territorial Parliament has legislative powers.

Name of Territory	Sint Maarten
Region	Caribbean
Land area	34 km ² (including the French side: 87 km ²)
Maritime claims	Exclusive fishing zone: 12 nm, EEZ : 12,860 km ²
Population	39,000 (est. 2013, estimate CIA); density 1,147 inhab/km ²
GDP/capita	15,259 €
Literacy rate	95.8 % of population 14 and older
Unemployment rate	12% (est. 2010 IMF)
% below poverty line	30 % of male working population (45% for female workers) earn less than ANG 2,000 per month while minimum wages amount to ANG 1482,59 – 1799,11 per month

Sint Maarten is hilly with more than 30 bays and partly covered with salt lakes and lagoons. Highest point is Mount Flagstaff (386 m), an extinct volcano. Its climate is tropical but moderate as it has northeast trade winds and has hurricanes season (from July to November). The average rainfall is 1,500 mm/year.

¹ IMF Country Report No. 11/342, Dec 2011, <https://www.imf.org/external/pubs/ft/scr/2011/cr11342.pdf>

² CIA: <https://www.cia.gov/library/publications/the-world-factbook/geos/sk.html>

Physically, the west end is an atoll of low land surrounding a lagoon, while the east end is a range of conical hills. The island has white sandy beaches and numerous bays. A lagoon and three brackish ponds are home to all four species of mangrove.³

Demography, socio-economy

A population density of over 1,147 /km² is high compared with other OCTs. Only 20% was born on the island. Most immigrants are from Haiti and Dominican Republic. The aging population is seen as a problem. English is the main language, Dutch is the official language.

The country has a high mean income compared with many other Caribbean countries. The most important sectors is tourism (including tourism related activities) that accounts for 80% of GDP. In 2013 there were almost 2 million cruise ship visitors and almost 500 thousand stay-over tourists.⁴ Sint Maarten saw a booming expansion of hotel capacity since the 1970's, but the development of new resorts has slowed down. It also has an oil terminal at Coles Bay.

With no significant agriculture and limited local fishing, almost all food is imported. Energy resources and manufactured goods are also imported.⁵

2 BIOGEOGRAPHY, ENDEMISM, IMPORTANCE FOR GLOBAL BIODIVERSITY

There is no on-land nature park but the hills of Sint Maarten show hibiscus, orange sage, flamboyant, mahogany and cactus. In coastal areas there are palm trees, sea grapes and aloe. Tropical birds (including the nation bird, the Brown pelican) and lizards abound. Sint Maarten has patch reefs⁶ and barrier reefs⁷ and some mangrove stands.

The Man of War Shoal Marine Park was established in 2010. It is located off the southern shore of the island and is home to varied reef fish, sea turtles, lobsters and the rare queen conch. It also is a stopover point for many marine mammals. It includes the island's most valuable ecological and economic marine habitat. It provides a safe haven for whales, sharks, sea turtles and hundreds of species of fish. It includes not only a range of habitats from coral reefs to sea grass beds and open water, but also the Proselyte Reef⁸.

The Man of War Shoal Marine Park is a home and migratory stopover or breeding site for 3 IUCN red list species, 10 CITES Appendix I species and 89 Appendix II species. It is an area with a relatively healthy population of marine mammals including migratory whales and dolphins, numerous species of shark, sea turtles and numerous fish species.

Establishing the Man of War Shoal Marine Park was in accordance with the Specially Protected Areas of Wildlife (SPAW) Protocol and with the Federal Decree on Maritime Management.

³ DCNA, Dutch Caribbean Nature Alliance, <http://www.dcnanature.org/ecosystems-tag-archive/?ecosystems=St.%20Maarten>

⁴ Idem CIA .

⁵ Idem CIA

⁶ Patch reef: an isolated, often circular reef, usually within a lagoon or embayment.

⁷ Barrier reef: reefs that are separated from land by a lagoon or open water.

⁸ Where lays the Proselyte's wreck, a Dutch frigate

3 STATE OF THE ENVIRONMENT AND MAIN ENVIRONMENTAL CHALLENGES

Coral reefs are at risk due to damage from hurricanes, bleaching due to water temperature rise, pollution (waste water and seepage from cesspits), tourism (diving, trampling of sea grasses, breakage by anchors) and oil spills.⁹ Mangroves, crucial as spawning grounds for coral reef fish, have also been reduced near populated areas as a result of development.

Large land areas have been eroded by extensive grazing and agriculture in the past.¹⁰

Challenge 1 - Climate change and natural disasters - Severe

Climate change is expected to have a whole raft of adverse effects in many countries, but these effects are likely to be particularly severe in small tropical islands. Increase in water temperature bleaches coral reefs and CO₂ in the air dissolves in water and makes it more acidic, which is also bad for coral reefs. Low lying land is vulnerable to sea level rise and climate change means more frequent and more intense storms.

Sint Maarten is particularly vulnerable to the threat of global warming given its dependence on the tourist industry and the low altitude of part of its territory. The island is fringed by coral reefs, which are a crucial component in the delicate ecosystem found there. The reefs are very important as a tourist attraction and therefore to livelihoods on the island, as a spawning ground for fish and as a natural buffer area protecting the islands from sea damage during storms. Climate change also poses a threat to beaches a major concern given the reliance of the economy on tourism.

The Netherlands Antilles Coral Reefs Initiative (NACRI) reported substantial loss of coral reefs in Sint Maarten after a water temperature rise to 30°C in 2005.¹¹

The table below applies this general analysis to the specific circumstances of countries like Sint Maarten:

Impact	Severity	Comments
Inundation of coastal land	●	Sint Maarten has low-lying areas (e.g. Philipsburg and Simpson Bay) and is vulnerable to rising sea-level. The potential loss of beaches is also a serious threat (for the tourist industry).
Coral reefs threatened (bleaching, pH)	●	Major bleaching occurred in 2005 due to water temperature rise.
Salinisation of groundwater	○	On Sint Maarten groundwater is no longer used for drinking water, partly because of contamination, but it is used by local laundries.
Tourist industry	●	Tourist industry accounts for 80% of GDP. Diving and fishing are important attractions.
Sea grass	○	Much of the sea grass beds that were present 20 years ago, have been lost due to pollution, hurricanes, and development. Sea grass beds are breeding grounds for marine life and act as "anchor points for sand" ¹²
More frequent and more intense storms	○	This poses a threat for the Leeward Islands which are already frequently affected by hurricanes.
○ Nil ○ Slight ● Moderate ● Heavy		

⁹ <http://www.reefbase.org/>

¹⁰ IUCN / ONERC: Changement climatique et biodiversité dans l'outre-mer européen, Jérôme Petit & Guillaume Prudent, 2008.

¹¹ Report on observations of coral bleaching in St Eustatius Marine Park, Saba Marine Park, Sint Maarten Marine Park by Nicole Esteban & David Kooistra (Ocean Care Sint Maarten): <http://www.nacri.org/BleachingreportSSSislandsNov05.pdf>

¹² Global and local sea grasses threatened, Andy Caballero, Nature Foundation Sint Maarten, 2000.
<http://www.thescubashop.net/OldWebsite/seagrass.htm>

Challenge 2 - Loss of natural habitats and biodiversity - Severe

Sint Maarten's coral reefs are threatened¹³ not only by climate change. They are also exposed to multiple other threats like physical damage (breaking, stifling, invasive species) and pollution (coral reefs intolerant of pollution, particularly sewage and other nutrient-rich pollution and turbidity). Mangroves are being quickly eradicated by uncontrolled tourism development¹⁴ and the situation with sea grass beds is similar¹⁵. If these beds are not there, sand will begin to shift and can be lost, or even worse, can be moved to areas where too much sand will stifle any marine life. Without sea grass beds, a large hurricane can move the unprotected sand to other places, either filling a beach with too much sand, or leaving it bare.

Most of these threats are the result of ongoing development, building activity, habitat destruction and environmental degradation due to increased population density in low-income areas and mass tourism. In particular tourism, which results in demand for development land for hotels and other facilities, increased production of sewage and solid waste, increased disturbance and physical damage is responsible for many pressures. As noted earlier on, in 2013 there were almost 2 million cruise ship visitors, and almost 500 thousand stay-over tourists. Infrastructures and a qualified workforce are necessary. The main reason why tourists come to Sint Maarten is the climate, the sea, the beaches and the Caribbean heritage and culture.

Studies conducted by the Sint Maarten Nature Foundation have shown that biodiversity in the marine area, particularly coral reef coverage, is high and the economic goods and services, which the ecosystem provides are in excess of \$ 50 million annually.¹⁶

Related issues

- Lack of sewage and waste water treatment in many areas is polluting the groundwater and the sea,
- Poor waste management; landfills are reaching maximum capacity, increasing risks of groundwater contamination
- Some appropriate national and island environmental regulations exist, but enforcement is limited by institutional capacity;
- Saba, St Eustatius and Sint Maarten are located within the hurricane belt. Almost every year at least one tropical cyclone occurs within a range of 100 miles and on average once every 4-5 years hurricane conditions are experienced.

Challenge 3 - Energy dependence - Severe

Sint Maarten is fully dependant on petroleum products. The only power producer and distributor is the government owned company N.V. GEBE. It uses diesel and HFO (heavy fuel oil).¹⁷ Studies are being executed to reduce the HFO share by converting some of the power generators to LNG (liquid natural gas) or LPG or installing Dual Fuel Engines. There are plans by an independent power producer (IPP) to build a 9.32 MW waste-to-energy power plant, to be in operation in the beginning of 2016. There are also studies (on Saba) to explore geothermal potential. The Saba geothermal project could interconnect Sint Maarten via a 60 km submarine cable.

The minister of Public Housing, Spatial Planning, Environment and Infrastructure (VROMI) has established an energy committee in the summer of 2013 and the committee (consisting of

13 http://www.naturefoundationsxm.org/education/coral_reefs/threats_to_coral_reefs.htm

14 Bouchon et al, Status of Coral Reef Resources of the Lesser Antilles: The French West Indies, The Netherlands Antilles, Anguilla, Antigua, Grenada, Trinidad and Tobago, In: Wilkinson, C. (ed.). Status of Coral Reefs of the World: 2008. Global Coral Reef Monitoring Network and Reef and Rainforest Research Center, Townsville, Australia. p265-280

15 Global and local sea grasses threatened, Andy Caballero, Nature Foundation Sint Maarten, 2000.

16 <http://www.dcnanature.org/man-of-war-shoal-national-marine-park/>

17 From EU OCTs energy study.

representatives of the ministries of VROMI and TEZVT, and N.V. GEBE) has drafted a (green) energy policy and a regulatory framework on (among others) allowing renewable energy sources to the net to be approved by the Council of Ministers.

However, in the Energy Concession agreement between N.V.GEBE and the government,¹⁸ there is a clause that limits the power capacity of other (new) companies or residents (to max 500 kVa/ 450kW). An IPP cannot sell electricity to the utility, and an IPP is not allowed to distribute power to its own clients. The energy committee is currently working on changing this clause.¹⁹

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

Since October, 10, 2010, when Sint Maarten became an independent country within the Kingdom of the Netherlands, Sint Maarten's governing body is primarily responsible for nature and environmental policies and their implementation. Many non-governmental bodies are also active in nature management on Sint Maarten.

The Dutch government prepared a Nature Policy Plan for the three 'special municipalities' of the Caribbean Netherlands (Saba, Bonaire and Sint Eustatius)²⁰ and hopes that the three other countries of the Kingdom (Curaçao, Sint Maarten and Aruba) will want to join in common efforts. For instance the Netherlands are responsible for the management of the exclusive economic zone (EEZ) linking the four countries of the Kingdom (i.e. the Netherlands and three other Caribbean countries of the Kingdom). In order to coordinate the sustainable management of this extensive marine area, a management plan was put in place, parts of which have already been implemented by the Netherlands and the Caribbean Netherlands. The parties now strive to have the Aruba, Sint Maarten and Curaçao to join in.

The Kingdom of the Netherlands is signatory and party to various multilateral environmental agreements. The Dutch Minister of Foreign Affairs represents the Kingdom and signs. Each country or territory in the Kingdom can decide independently whether to join and implement such agreements. Sint Maarten is autonomous when it concerns internal affairs and the environment.

4.2 REVIEW OF CURRENT INSTITUTIONS

The Ministry of Public Housing, Spatial Planning, Environment and Infrastructure (VROMI) has 5 executive services and a policy department:²¹

- New Projects: ensures the realisation of high quality level of diverse building, utility and civil engineering projects for Sint Maarten.
- Infrastructure Management: responsible for equipping and proactively managing the public areas in order to safeguard a good quality of the spatial surroundings in the interest of the public of Sint Maarten.
- Domain Affairs: deals with all aspects of policy and administration in regard to land and real property in the broadest sense of the word. The department does this by rendering its service to internal and external clients in a direct, clear and accurate manner.

¹⁸ Electriciteits Concessie

¹⁹ The minister can make an exemption for the 500 kVa upon request

²⁰ http://www.dcnanature.org/wp-content/uploads/2013/10/EZ_BO_NaturePolicyPlan%20Car.NL_ENG_2.pdf

²¹ <http://www.sintmaartengov.org/government/VROMI/Pages/About.aspx>

- Permits: focuses on a professional, efficient and client friendly manner of processing and issuance of permits within the work-sphere of the ministry of VROMI.
- Inspection: responsible for the inspection and control of domain, building, (public) properties, environment and work safety to safeguard an environmentally safe, structured and safe living and work surroundings for the public.

Policy Department. Its tasks includes policy advising in all areas of the ministry, including the environment and nature, spatial planning and infrastructures in the broadest sense (related to waste, drainage, utilities). The last annual report (over 2011) shows how well organised the ministry is, but also how many critical vacancies could not be filled.²²

The ministry and the parliament holds regular Townhall meetings to discuss zoning plans (Greater Philipsburg).²³

The Ministry of Tourism, Economic Affairs, Transport & Telecommunication plays a leading role in providing information and is instrumental in developing the economy by means of diversification in industries which are complementary to the tourism based economy. The Tourism Department has as tasks: marketing, training, data and information for more sustainable and targeted marketing and better development of tourism policy.

The Meteorological Service is responsible for the hurricane warning service. However, it is the responsibility of the local island governments to maintain and activate a disaster preparedness organisation. This is done by the Department of Disaster Management.

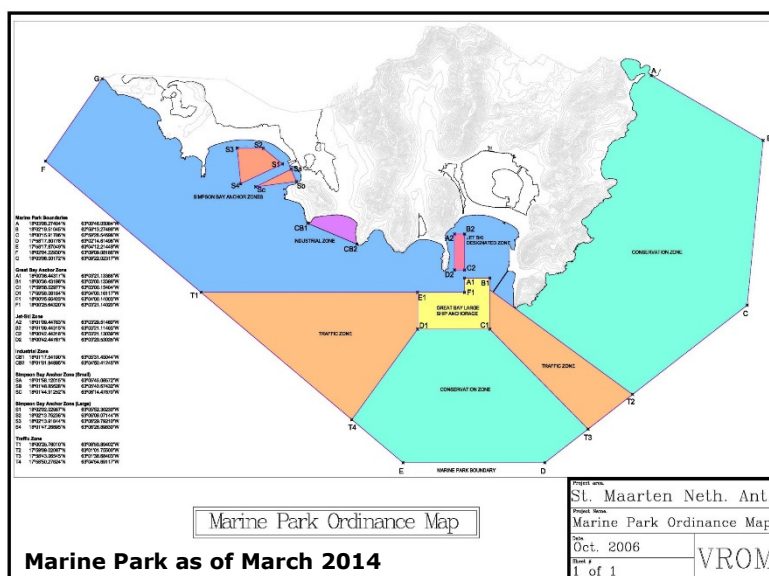
NGOs

Several NGOs in Sint Maarten are undertaking tasks that are normally a government's responsibility.

The Nature Foundation in Sint Maarten has created, monitors and is the official manager of the Man of War Shoal Marine Park (since 2010). The Foundation was established in 1997 with the objective of enhancing the local environment through effective management, education, awareness and protection of the island's natural resources.²⁴ It receives a yearly subsidy from the Government of Sint Maarten (a monthly fee to cover their operational budget). The Ministry VROMI has a Management Agreement appointing the Nature Foundation as the Management and Scientific Authority for the island.

The Nature Foundation also receives grants from international agencies as well as subsidies and donations from local companies.

The Emilio Wilson Estate Foundation (EWEF) has as its primary goal the creation of an official protected area around the culturally and biologically rich former plantation. The buying of the estate by the



²² <http://www.sintmaartengov.org/Policy%20and%20Reports/Jaarrapport%20VROMI%202011.pdf>

²³ <http://www.sxmparliament.org/documents/parliament-annual-reports.html?task=document.viewdoc&id=63>

²⁴ <http://www.naturefoundationsxm.org/>

government, which would make it a nature park, is pending. The current 2013 budget, approved by Parliament in April, only has some ANG 30 million (~ € 12.2 million) allotted for capital investment. That amount would have only covered the purchase of the Emilio Wilson Estate, the prime minister said.²⁵ The EWEF is financed through subsidies as well as gifts from local companies.

EPIC (Environmental Protection in the Caribbean) is an organisation based in both Sint Maarten and the United States with the mission of protecting the Caribbean environment through research and community-based action. The organization has a number of initiatives to accomplish their mission including establishing bird observation huts, conducting bird monitoring and research, restoring habitats and providing educational programs to local communities

4.3 POLICY, STRATEGY, PLANS, PROGRAMMES

The Ministry VROMI's Plan for 2012-2014,²⁶ aims at "improving the organization and its performance to gain the respect of the community and meet the expectations of the citizens through consistent actions and perseverance". The plan is being implemented with an action plan.²⁷ The policy objectives include:

- the promotion of a well-functioning organization that lives up to the expectations of the citizens;
- the promotion of an effective and sustainable management of spatial development and the environment;
- to facilitate the realization of affordable housing and to promote home ownership;
- the improvement of mobility through expansion of the road network;
- to achieve long term and sustainable solutions for the management of solid waste, sewage and surface drainage; and
- to pursue the improvement of the living environment in neighbourhood.

Currently a Nature Policy Plan and an Environmental Policy Plan are being drafted and will be completed and implemented in 2014. The Nature Policy Plan concerns the natural environment on the island and the Environmental Policy Plan encompasses the gray area of the environment such as waste, energy, soil, air and water pollution. There is a separate Energy policy plan, a climate change management plan for coastal zones and a coral bleaching management plan.

There is a draft "Structure Vision" document in preparation with a chapter on sustainability, water, nature, environment and energy. And a "Hillside Policy Plan" which relates to Hill Side Conservation Areas Zoning Plan. It consists of measures to protect nature and environment.²⁸

Based on the National Ordinance on Spatial Planning, the government of Sint Maarten has undertaken to prepare development plans with zoning regulations (zoning plans).²⁹

Sint Maarten has the intention to include Environmental Impact Assessment (EIA) in the evaluation of projects.³⁰ Currently there is no law binding developers to include EIAs of projects. However, the intention is to formulate a law encompassing requirements, criteria, etc.

There is a cooperation agreement between Sint Maarten and the city of Amsterdam (2013-2017) among others on management plans, waste, energy, etc.³¹

25 <http://www.dcnanature.org/emilio-wilson-estate-purchase-pending/>

26 <http://www.sintmaartengov.org/Policy%20and%20Reports/VROMI%20Ministry%20Plan%202012%20-%202014.pdf>

27 <http://www.sintmaartengov.org/government/VROMI/Pages/VROMI-Ministry-Plan-2011%E2%80%8F.aspx>

28 Info from VROMI.

29 <http://www.sintmaartengov.org/government/VROMI/Pages/Zoning-Development-Plans.aspx>

30 EIA EU study

31 http://www.google.nl/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&uact=8&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.amsterdam.nl%2Fpublish%2Fpages%2F568695%2Fsamenwerkingsovereenkomst_2013_sxm.pdf&ei=sL0cU_7RCovnygOWwoH4Cw&usg=AFQjCNFGMnFP3QF9iVePOEIGfBEHsPFpDA

4.4 LEGAL FRAMEWORK, MONITORING AND ENFORCEMENT

Article 22 of the Constitution³² says “It shall be the constant concern of the government to keep the country habitable and to protect and improve the natural environment and welfare of animals”.

Before October 10, 2010, when Sint Maarten was part of the Netherlands Antilles, these two ordinances were valid (and still are):³³

- the National Nature Conservation Ordinance of 1998 (P.B. 1998,49 about how protection should be organised).³⁴
- an ordinance about implementation of the above ordinance (based on Article 15), adopted in 2003.³⁵ This second ordinance, the Nature Conservation Ordinance Sint Maarten of 2013 (AB 2013, GT no 809) ³⁶ regulates:

Adopted, regulates	Implements
Protection of flora and fauna	Protection of Flora and Fauna: the protection of the island’s Flora and Fauna is regulated in the Nature Conservation Ordinance Sint Maarten (AB 2013, GT no. 809). Addendums I and II of the Sea Turtle Treaty (Inter-American Convention for the Protection and conservation of Sea-Turtles) Addendum I of Bonn Convention on Migratory Species
Conservation of biodiversity	Convention on Biological Diversity
Management and conservation of habitats and ecosystems	Ramsar Convention on Wetlands of International Importance Recently an advice has been approved by the Council of Ministers to designate Mullet Pond as Sint Maarten’s first protected wetland area. After the approval of the Ramsar Convention, Mullet Pond, a part of the Simpson Bay Lagoon, will be protected as an international wetland. Addendums I and II of the SPAW-protocol (Specially Protected Areas and Wildlife Protocol) of the Cartagena Convention
Trade in endangered species	Addendum I of the CITES or Washington Convention
Legislation on waste	In 2013 the Waste Ordinance Sint Maarten was implemented (AB 2013, GT no. 137). This ordinance regulates the waste when it concerns collection and disposal of household waste, bulk waste, liquid waste, commercial waste, car wrecks and other forms of waste.
Nature parks	The Nature Foundation manages the Sint Maarten Marine Park, the only designated nature park area of the island (Man of War Shoal Marine Park. There is currently no designated terrestrial nature park. The intention is in the future to establish another one and, with these two nature parks combined, a national parks system.
NEW - protection of sharks	In October 2011 an important step was taken by the Sint Maarten government for shark conservation in Dutch Caribbean waters by prohibiting the targeted fishing for and killing of sharks in the territorial waters around Sint Maarten. ³⁷
NEW - Asbestos	Basel Convention on transboundary movement and disposal of hazardous waste Rotterdam Convention on international trade of (and exchange of information on) hazardous substances The is currently a Ministerial Decree stating that it is forbidden to trade asbestos and asbestos containing goods on the island (Ab. 2007, Nr. 73)

³² Grondwet

³³ Texts: <http://www.naturefoundationsxm.org/downloads/index.htm>

³⁴ http://www.naturefoundationsxm.org/downloads/legislation_treaties/National_Nature_Conservation_Ordinance-Ao2001-41.pdf

³⁵ Two years after this National Ordinance comes into effect (at its latest), the Island Council establishes regulations for the execution of the island territories’ obligations that arise from this National Ordinance.

³⁶ Eilandsverordening natuurbeschermer en -bescherming

http://www.naturefoundationsxm.org/downloads/legislation_treaties/D5_SXM_Nature_Conservation_Ordinance-AB2003-35.pdf

³⁷ <http://www.dcnanature.org/shark-research-st-maarten/>

Others	There is also a tree ordinance protecting monumental trees (with a list) among others a regulations for removing trees Also a Hindrance ordinance: AB 2013, GT no. 139 And Hindrance besluit (decision) AB 2013 no 140
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There is no new legislation for nature protection, the new policy plans are being made for both Nature and Environment. There is however a National Ordinance on Spatial Development Planning of 2013.³⁸

MEA	Remarks
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)	Convention, together with the Oil Spills and SPAW Protocols will be implemented in national law. But this has not yet been implemented in the laws of Sint Maarten. The intention is in the future to incorporate all treaties that Sint Maarten is a party to in national laws.
Convention on Biological Diversity (CBD)	Enabling law is included in the National Nature Conservation Ordinance, but for full implementation island legislation is required, but has not yet been done.
Ramsar Convention	Recently, an advice was approved by the Council of Ministers to designate Mullet Pond as a RAMSAR site.
CITES	Requirements implemented through the National Nature Conservation Ordinance by directly referring to the relevant texts in the convention text.
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Enabling law is included in the National Nature Conservation Ordinance, but for full implementation island legislation is required. Not yet done.

Monitoring

The Nature Foundation has different monitoring activities for the protection of nature. It is assisted by the island's dive operators. It uses its own monitoring protocol; based on Reefcheck and coral watch protocols. The nature foundation also monitors water quality, marine mammals, invasive species (e.g. lionfish), seagrass, and mangroves.

The Foundation started a Shark Research Project, tagging individual sharks on a regular basis, to see whether the 2011 legislation prohibiting shark killing is effective. An integral part of this project is the creation of awareness among the local population.

Monitoring goes hand in hand with creating / having/ maintaining a database. The Dutch Caribbean Nature Alliance (DCNA) is setting up a Dutch Caribbean Biodiversity Database (DCBD). This started in 2013. The DCNA will be responsible for the content management.³⁹

Enforcement

There is a general lack of enforcement of existing environmental legislation. A main problem with the enforcement of environmental legislation is the lack of qualified staff. There is currently one environmental inspector and his main problem is dealing with the discharge of sewage water on private properties and public roads. This problem can only be solved when there is an island wide sewage system/plan in place.⁴⁰

³⁸ Dutch 'Landsverordening Landsverordening ruimtelijke ontwikkelingsplanning', AB 2013, GT no. 144

³⁹ <http://www.dcnanature.org/tool-for-conservationists/>

⁴⁰ Info from VROMI.

4.5 ENVIRONMENTAL AWARENESS

Extensive information about environmental issues, policy and legislation is available on the website of the government.⁴¹ All the laws including environmental laws and all policies can be found under the tabs of the respective Ministries. Environmental policies can be found under the tab Ministry VROMI.

Also, extensive environmental information is given by the Nature Foundation on Sint Maarten. The coalition of nature organisations DCNA (Dutch Caribbean Nature Alliance) has a site with a lot of information on flora, fauna, nature parks and nature initiatives concerning sharks and lionfish.⁴²

The Nature Foundation is re-launching an island wide outreach programme on sharks. There is still a lack of awareness with regards not only to the importance of sharks and rays to the marine ecosystem and to the economy of Sint Maarten, but also to the still existent belief that sharks are inherently dangerous to humans. Outreach will, amongst others, feature public service announcements in the local media, presentations and featured speakers.⁴³

The Nature Foundation also has the snorkel club and junior ranger program and environmental education is given in schools.

4.6 FINANCE FOR THE ENVIRONMENT

The Ministry of VROMI had a budget of ANG 33.87 million for operational expenses in 2013.⁴⁴ In addition, VROMI had ANG 14 million was available for Capital Expenditure. In the VROMI report on 2011 an amount of approximately ANG 48 million was mentioned for investments in infrastructures as well for the upgrading of the organization of VROMI. This amount was divided into about ANG 12 million from the European Development Fund (EDF) targeting the urban improvement in the area of Middle Region and the remainder of about ANG 36 million funded by the Dutch Development Cooperation budget.

Other funds come from user fees for diving in the Marine park (at USD4,- per daily dive or USD20,- per annual pass) and from various permits.

Serious concern has been voiced in the Netherlands (by the Parliament and by the Dutch minister Plasterk for Internal affairs and Kingdom Relations) that the 2013 budget was showing a deficit which is not allowed in the October 10, 2010 agreements.⁴⁵

In 2007 a Trust Fund was set up for financing nature projects in the 6 Dutch OCTs. Funding came from the IUCN, the Dutch government, WWF, the Dutch National Lottery. DCNA (Dutch Caribbean Nature Alliance) is involved in this initiative (as an umbrella organization that handles capacity building and funding of nature parks in the 6 Dutch OCTs) but the Trust Fund is managed by an independent board.

41 www.sintmaartengov.org

42 <http://www.dcnanature.org/islands/st-maarten/>

43 <http://www.dcnanature.org/shark-research-st-maarten/>

44 VROMI Ministry Action Plan 2013 – 2014, ANG 10 million are approximately € 4.06 million

<http://www.sintmaartengov.org/Policy%20and%20Reports/VROMI%20Ministry%20Plan%202012%20-%202014.pdf>

45 <http://caribischnetwerk.ntr.nl/2013/08/30/plasterk-financien-sint-maarten-moeten-snel-op-orde/>

Sint Maarten, as an independent country in the Kingdom of the Netherlands, is autonomous as concerns its internal affairs and the environment. It has and wants to have good relations (also concerning the environment) at several levels: with the Netherlands, in the Caribbean, at the UN level (SIDS Small Island Developing States and UNDP Poverty assessment), the European Union (10th EDF).

The Council Decision on the association of OCTs with the EU, which governs EU-Overseas Countries and Territories (OCTs) relations, supports co-operation and development projects. In the framework of the 10th EDF, the Dutch Antilles (that is, including Sint Maarten) received aid for economic growth and social recovery: incentives for small companies, education, health, combatting crime and building new infrastructures in deprived areas. These infrastructures were for socially deprived areas, including improvements in water supply, drainage, roads, electricity and promotion of innovative house-building technologies. Some of these measures were expected to have a positive effect on the environment but EU funding was not aimed at reducing environmental threats as such.

Energy

Before 2007, the utilities of St Barthelemy, Sint Maarten and Anguilla had worked under the European programme INTERREG III-B towards the interconnection of the islands. This interconnection project, originally planned for the end of 2007, has not materialized. St Barthelemy authorities are now strongly opposed to any interconnection to other islands.

The Chief Minister of Anguilla highlighted at the 2010 OCT Forum that island proposals to established a submarine power transmission link to /from Sint Maarten had been rejected by the UK Government in the 1990s, despite the opportunity for importing more efficiently produced power (rather than relying on diesel generators). EC programming and other documents are silent on this matter.

Risk Reduction Strategy

A Regional Risk Reduction Strategy (also known as R3I = Regional Risk Reduction Initiative) is being developed with European assistance through the EU Regional Delegation in Barbados - and it is being implemented via a contribution agreement through UNDP Barbados and the OECS (Organisation of Eastern Caribbean States).

R3I achieved a significant result in terms of coordination of the British and Dutch OCT disaster management offices as UNDP organized several common meetings to formulate precise common activities to be implemented by R3I. The first concrete result achieved by this initiative is a Benchmarking vulnerability assessment exercise implemented in all Caribbean British and Dutch OCTs under a common Format (using the B-Tool = Benchmarking Tool). This study, implemented during May and June 2010, allowed for the identification of specific disaster management gaps to be addressed by the project. The European Commission reserved € 4,932 million for R3I, covering a period of three years (2009-2011).

6 CONCLUSIONS AND RECOMMENDATIONS

Environmental policy making is complex, time consuming and cumbersome. In practice it means that policy in many smaller countries like Sint Maarten is often not implemented. Environmental policies require an integrated approach, physical planning and a good insight in the carrying capacity of the island. This is in particular a challenge for a new country like Sint Maarten. Sint Maarten had to set up new administrative services, recruit expert staff, make new policy plans and laws while being in a sense under scrutiny of the Netherlands. In 2015 the new constitutional agreement (of October 10, 2010) will come under review.

However, Sint Maarten has been able to make progress. Currently both a Nature Policy Plan and an Environmental Policy Plan are being drafted and will be completed and implemented in 2014. The Nature Policy Plan concerns the natural environment on the island and the Environmental Policy Plan encompasses the 'grey' area of the environment such as waste, soil, air and water pollution. Also an Energy policy plan is in the making. Cooperation with the French side of the island, for some of these policy areas and projects is important for efficiency and effectiveness reasons.

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Energy saving and using more renewable energy	Build waste-to-energy plants	Project has started. An independent power producer has been chosen.					
	Activities						
	Draft a building and hindrance permit. Make building plans for the construction of the facility. Building will start at the beginning of the Summer of 2014. Facility in operation in the beginning of 2016.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Energy saving and using more renewable energy	Subsidise pilot projects using sun and wind energy	All energy on the island is produced with imported diesel and heavy fuel					
	Activities						
	Develop a programme and call for pilot projects using sustainable energy sources such as sun and wind. Start with placing solar panels (PV photo voltaic) on the roofs of government buildings. Subsidise promising private initiatives.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Diminish the ecological footprint	Awareness campaign	Income, population and tourism increase is spoiling nature beyond repair in certain places					
	Activities						
	Produce brochures, publications, videos, radio and TV commercials for local population and tourists. Set up an environmental hotline for info on nature and environment. Set up a campaigns, school competitions etc. Ban plastic bags. Stimulate a cleaner, safer island, saving water and electricity and reducing waste streams.						

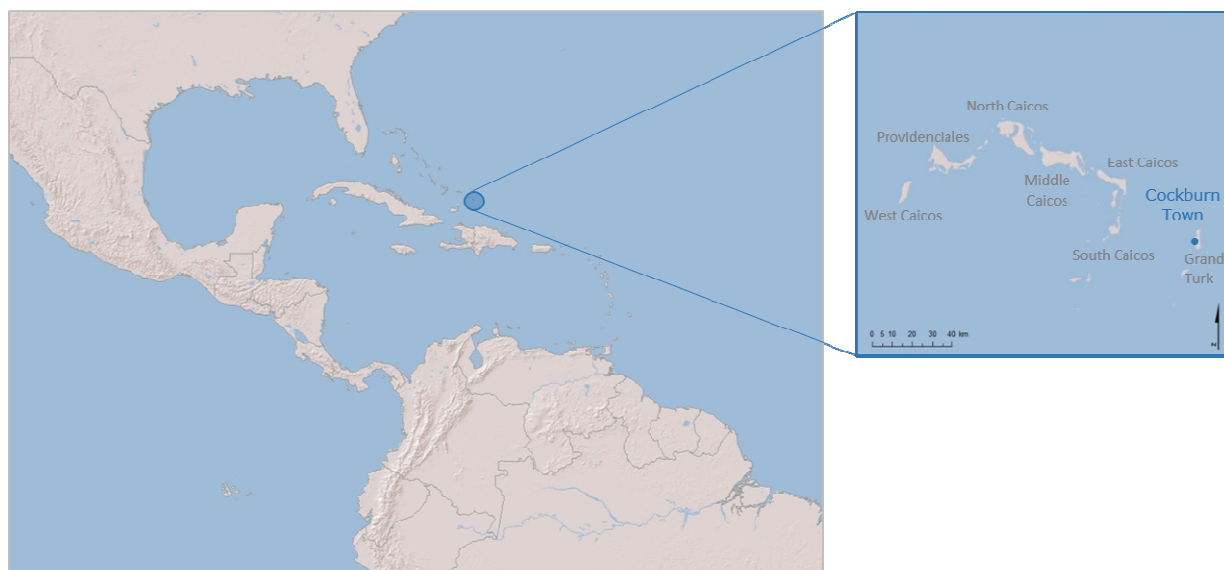
Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Update environmental legislation	Legal action	Most of the environmental legislation is outdated					
	Activities						
	Write legislation where it is lacking: in the areas of noise pollution, soil pollution, air quality, renewable energy, solid and liquid waste. Introduce enforcement.						

ANNEX L :

TURKS AND CAICOS ISLANDS

ENVIRONMENTAL PROFILE

TURKS AND CAICOS ISLANDS



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SUMMARY

Like many other Antillean islands, the Turks and Caicos Islands are highly dependent on tourism, and are concentrating particularly on the higher end of the tourism market. Development, particularly of the tourism industry, is taking place very rapidly, also generating work opportunities. There is a continuous influx on migrants and a yearly resident population growth of 5%, which is impacting on environment and utilities. There are some mechanisms in place to ensure that this development takes place sustainably, such as a comprehensive protected areas system, environmental legislation on key issues, and guidelines for Environmental Impact Assessment, but there is no National Physical Development Plan. Furthermore, the recent political upheaval associated with the dissolution of the Constitution, coupled with economic downturn has resulted in a scarcity of resources to manage the environment (loss of the Conservation Fund and reduction of department of environmental and marine affairs staff by a factor of 50%). The main environmental challenges are coastal zone issues, water and waste, forest management, and fisheries management.

1 BACKGROUND INFORMATION

Name of territory	Turks and Caicos Islands
Region	Caribbean
Land area	500 km ²
Exclusive economic zone¹	154,068 km ²
Population²	31 458 (2012 census)
GDP/capita³	\$ 23 100 (estimate 2012)
Literacy rate	98%
Unemployment rate⁴	17% (12% locals and 27% immigrants)

The Turks and Caicos Islands (TCI) consist of two Caribbean archipelagos southeast of the Bahamas, north of Haiti. Each archipelago lies on a shallow bank with deep ocean between them. The Caicos Bank is the larger of the two, covering some 8,000 km². Water depth ranges from a few centimetres along the inland coasts of the Caicos Islands to 20–30 m at the edge of the trench. TCI is made up of over 40 islands, cays and sandbanks of which eight are inhabited. They are low, flat limestone formations with extensive marshes and mangrove swamps. Over half the land area comprises wetlands. More than half the land area is either below sea level or just above sea level, and more than 70% of the settlements are located on coastal lowland. Flamingo Hill, on East Caicos, is the highest point rising to 46m.

Reef areas are extensive, totalling almost 1,200 km². The four largest islands (Providenciales, North Caicos, Middle Caicos, and East Caicos) have offshore fringing reefs along their entire northern coasts. The three larger islands in the eastern part of the chain have fringing reefs along their eastern coasts, and reefs are also found along the western coast of West Caicos, Grand Turk and Providenciales. Shallow-water patch reefs are common around all of the islands and cays.

The islands have a tropical, marine climate moderated by trade winds; sunny and relatively dry. Hurricanes can occur from June to November, but the islands are more often visited by 'tropical waves' with their strong winds and drenching rains. TCI has limited fresh water resources: private cisterns are

1 <http://www.seaaroundus.org/eez/796.aspx>

2 <http://www.eneews.tc/sites/default/files/files/Document1a2.pdf>

3 Country Poverty Assessment for the Turks and Caicos Islands, 2012, Press Briefing,

http://www.gov.tc/pressoffice/sites/default/files/TCI%20CPA_DFR%20Press%20briefing%20v1.pdf

4 Idem

extensively used to collect rainwater. Reverse osmosis facilities also provide a substantial amount of water on Providenciales and Grand Turk.

The population, currently estimated to be around 31,458, is growing at 5% per year due mainly to significant immigration from neighbouring countries Haiti (35% of population⁵) and Jamaica and from South-East Asia to meet demand for construction and hotel service works in the construction and tourism sectors. TCI islanders account for 42.5% of the total population: there are many immigrants (57% of non-belongers are on work permits) from other Caribbean Islands and North America as well as significant numbers of non-status immigrants (14%). Most of the people are of African descent, the rest being of mixed, Asian or European origin.

Most⁶ of the population of TCI is on Providenciales, with significant numbers also on Grand Turk, South Caicos and North Caicos, and smaller communities on Middle Caicos and Salt Cay. Providenciales is now the commercial centre of the country, with the government remaining largely at Grand Turk. It is to be noticed that Providenciales shows an 82.5% population increase since 2001 census, and some smaller islands experienced large increase in population, e.g. Parrot Cay more than doubled the population⁷. It is estimated that about 22% of the population or 16% of the households live below poverty line⁸. Poverty rates in the smaller islands are higher, but the majority of poor people live in Providenciales. As a small country, TCI has no capacity to patrol its oceanic borders, and undocumented migrants arrive to work on construction. Pristine forested areas are being cleared to create shanty towns and to manufacture charcoal, and IUU fishing is ongoing while the capacity of authorities for surveillance is limited. The environmental and social impacts have been significant.

Limited rainfall, coupled with poor soils and a limestone base, restrict the possibilities for agricultural development, which is most at the subsistence level. Most food for domestic consumption is imported. This notwithstanding, with technical assistance from the United Nations Development Program, the government is promoting agriculture development in the lesser developed Caicos Islands (Middle Caicos and North Caicos) and a pilot agriculture 'demonstration farm' and extension service has been established on North Caicos to promote commercial farming.

The economy of the TCI relies on the tourism industry (c. 45%), financial services (23%), real estate development and the exportation of seafood are also important. Most capital goods are imported. Foreign investors, mainly from Canada, the UK and the USA, play a significant role in the Islands' economic life.

Tourism is the driving force in TCI's economy. A total of 1,069,497 visitors⁹ arrived in 2013 to TCI mainly from USA, Canada and other Caribbean countries representing an increase of 10.4% over the previous year. Arrivals from Europe have declined 4% in 2013 representing only 6,671. Uncontrolled tourism development results in the loss of pristine coastal habitats caused by physical development, increased pressure on marine resources, such as coral reefs, from visitor impacts and degraded coastal water quality from increased wastewater production. This could destroy the tourism industry.

Offshore finance is TCI's second largest source of external revenue after tourism, and is a major source of government revenue. A wide variety of financial services are available in Turks and Caicos, including company formation, offshore insurance, banking, trusts, limited partnerships and limited life companies. The Financial Services Commission¹⁰ regulates, develops and promotes the industry in major world markets. Recently, the sector has been challenged by a number of international investigations and in

5 Country Poverty Assessment for the Turks and Caicos Islands, 2012, Press Briefing

6 75% according to Country Poverty Assessment for the Turks and Caicos Islands, 2012, Press Briefing

7 Preliminary findings of the 2012 TCI Government Population and Housing Census.

8 The indigence/ severe poverty line is based on the minimum cost of a food basket (MCFB) necessary to provide an adult male with a healthy diet. The general poverty line also includes an allowance for essential non-food expenditures (Country Poverty Assessment for the Turks and Caicos Islands, 2012, Press Briefing)

9 Turks and Caicos Islands Tourism Statistics 2013

<http://www.turksandcaicostourism.com/content/root/File/Turks%20and%20Caicos%20Islands%20Tourism%20Statistics%202013.pdf>

10 Financial Services Commission established by Financial Services Commission Ordinance 2001 amended by Financial Services Commission Ordinance 2007, <http://www.tcifsc.tc>

response the authorities have strengthen regulations of the sector. Seven banks are licensed to operate in TCI.

Fisheries are both economically and socially important in TCI. Fisheries constitutes the TCI only commodity exporting industry, with most of the export going to the USA. Commercial fisheries occur mainly on the Caicos Bank. The TCI fisheries industry consists of approximately 200 vessels and 500 "day fisher" fishermen¹¹, there are 5 fish processing plants based in Providenciales and South Caicos. Catches are dominated by lobster and queen conch. Total catch¹² of spiny lobster has declined from a recent peak of over 984,000 lbs in 2006 to 444,000 lbs in 2011. Annual harvests of queen conch have also declined in recent years with a total harvest in 2011 of just over 943,000 lbs against a quota of 1.6 million lbs. Other finfish species such as grouper, snapper and large pelagics are caught, but in smaller amounts, for local consumption or by sports anglers. According to the Department of Environment and Marine Affairs, overfishing and habitat degradation due to poor fishing practices and hurricane events of 2008 have resulted in significant declines in stocks for conch and lobster. Declines are also noted in some fin fish populations, such as pot snapper and grunt. There are also concerns about poaching in the reefs. The Government is promoting aquaculture as part of its diversification strategy, but to date aquaculture remains limited, the exception being the conch farm in Providenciales which is growing.

From 2007 to 2009 the economy suffered from the impact of Hurricane Ike, the global economic crisis, and serious mismanagement. Combined, these impacts led to a significant decline in tourism revenues (about 28%) and therefore construction and other associated services, resulting in diminished public revenues and expenditure. The GDP in market prices fell by 18.49% in 2009 followed by a further fall of 2.33% in 2010. In 2012, the economy started to recover.

Hurricane Ike and tropical storm Hanna hit TCI in 2008, within three days of each other. Ike passed just south as a category 4 hurricane, with 135 mph winds, affecting primarily the islands of Grand Turk, Salt Cay, and South Caicos. Severe flooding, beach erosion, accumulation of debris, and destruction of vegetation occurred. Fortunately no deaths were reported as a direct result of these cyclones. But utilities such as electricity and water were disrupted during and for an extended period after the hurricane's passage. There was damage to 95% of the buildings particularly on Grand Turk, Salt Cay, and South Caicos; over 700 persons lost their homes, and 80% of the houses in Grand Turk were damaged. Remediation costs as well as economic losses incurred were conservatively estimated at US\$ 214 million.

In 2009 a gross mismanagement of public finances, corrupt practices and unsustainable levels of debt servicing were revealed following the suspension of parts of the Constitution. In 2011, in response to the unfolding financial plight of the Turks and Caicos Islands Government, DFID put in place a five year guarantee with commercial lenders, to provide the TCI Government with access to a maximum capital amount of US\$260 million over the guarantee period. A Chief Financial Officer was appointed to meet the urgent task of addressing the TCI Government's structural deficit. Once the territory is in fiscal surplus it will be able to start to pay off its debt and should, after the five year period is over, if not before, be able to secure new and reduced bank lending without the need for a UK Government guarantee. On 12 June 2012 the UK Government announced that it judged there had been significant and sufficient progress on the eight milestones and on putting in place robust financial controls and set 9 November as the date for elections. A new government was elected but TCI is under extreme pressure to eliminate its debt and balance its budget. This results in basic infrastructural needs for conservation (and many other needs of the territory) not being met due to a lack of funding.

¹¹ Turks and Caicos Development Strategy 2013-2017 (http://www.tcinewsnow.com/documents/development_strategy2013-2017.pdf)

¹² Idem

The TCI form a complex of natural coral reefs, tidal flats, mangroves and marshlands which provide a haven for wildlife, as well as crucial life support systems for the fisheries and tourism industries. The East Caicos, Middle Caicos and North Caicos wetland complex forms probably the best example of its type in the Caribbean. Mangrove stands grow along the inland margin of the islands fringing the Caicos Bank. TCI possesses some of the least adversely affected coral reefs in the Caribbean region

Vast areas of the Caicos Bank are covered by bare sand, fleshy and calcareous algae, and seagrass. These habitats are crucially important as nursery grounds for conch and lobster and in spite of the size of the areas in question (thousands of km²) and their remoteness from population centres, they are under some threat due to marine development pressures.

The islands provide a home for at least 20 endemic plants, reptiles and insects. The Turk Islands have an unproductive, fine, sandy dune topsoil which supports a sparse vegetation of sedge and cacti, while the Caicos Islands are more fertile, and support an understorey of scrub bush and cacti below a canopy of low trees. This 'scrub-like' dwarf dry tropical forest is one of the most threatened tropical forest types, mostly by illegal charcoal manufacturing. This forest type covers some 90% of the total land area. Pine forests are particularly noteworthy on North Caicos, Middle Caicos and Pine Cay. The Pine Forest is also infected by a pine scale insect.

Three species of gecko, Turk island boa, Ambergris Cay dwarf boa, the curly-tail lizard *Leiocephalus psammodromus* and the Turks and Caicos ground iguana (CR) are endemic to TCI. The iguanas are preyed upon by domestic animals (cats, dogs, livestock) and iguanas are generally not found where these domestic animals occur, or occurred in the past. Big Ambergris Cay is the largest island refuge for the endemic iguanas, supporting more than 50% of the total estimated population.

About 204 species of bird have been recorded on TCI, of which 58 breeding and further 110 regularly occurring non-breeding species. The small cays of both the Caicos and the Turks Banks, as well as some cliffs and stacks of the main islands, are important breeding sites for substantial numbers of seabirds. For some species, these are the largest recorded colonies in the Caribbean. Two threatened species of wetland bird are found on the islands: the non-breeding Kirtland's warbler (VU) and the breeding West Indian whistling duck (VU). But the dry woodlands also support important breeding populations of characteristic local birds, some widespread but others endemic to the islands (sometimes including the Bahamas, Cuba or Hispaniola).

Marine turtles are common, nesting on many of the cays. Hawksbill, loggerhead and green turtles are considered to be moderately abundant but declining. DEMA has completed a research study to identify the nesting beaches of TCI Sea turtles and the foraging ranges of TCI turtle. This project has met with much success, with the tagging of a turtle named "Suzie". For the first time ever, it was discovered that TCI turtles often swim as far south as Martinique and return back to TCI in an epic journey in which the turtle stopped at 7 islands¹³.

During November to March migrating humpback whales (VU) move through the deep Turks Island Passage on their way south to their breeding grounds. Sperm whales (VU), sei whales (EN) and manatees may occasionally also occur in TCI waters.

TCI has a network of 11 national parks and 15 nature reserves. The East Caicos, Middle Caicos and North Caicos wetland complex is considered the best example of its type in the Caribbean, and is a Ramsar site. The decision to gazette a protected area is the responsibility of the Cabinet, which is advised by the National Conservation Committee. Statutory protected areas have existed since the early 1990s. Since 1998, the TCI Government develop and implement management plans for three of the Turks and Caicos Islands' marine National Parks, in the seas adjacent to Providenciales and West Caicos with the support

13 http://www.fieldstudies.net/news/After-644000-km-Suzie-Comes-Home_1642

of DFID. In May 2006 the Executive Council approved the management plan for the Columbus Landfall National Park and other protected areas in and around Grand Turk, prepared by DEMA and being implemented. In turn, the TCI National Trust has centred on terrestrial and wetland areas, developing in the mid-1990s the effective management of Little Water Cay, as well as several historic sites. The management plan for the large Ramsar site on North, Middle and East Caicos and its surroundings¹⁴ was developed jointly with the local community, the UK Overseas Territories Conservation Forum and some of the other member bodies of that, and with support from the UK Government Darwin and OTEP.

3 STATE OF THE ENVIRONMENT

3.1 OVERVIEW

The importance of the tourism industry and the very low altitude of the land mean that climate change poses a critical threat to TCI.

The rapid development of the islands as a tourism centre is leading to a loss of characteristic features of the islands such as ground cover, mangrove stands and seagrass which maintain their physical integrity and comprise habitats for the rich characteristic wildlife.

Most of the development has taken place in coastal areas, vulnerable to inundations. But this extensive development is centred, to a large degree, on Providenciales. Habitat loss in the rest of the Caicos Islands is minimal so far. The natural wetlands formerly extended to Providenciales and South Caicos. On Providenciales, some of the wetlands have suffered severe environmental degradation, although areas of value remain through the protected area and national parks system. The majority of the reefs are still healthy, but are showing signs of declining health due to natural and anthropogenic causes. Generally the decline in reef health can be attributed to the naturally high nutrient background, and to a lesser extent diving and coastal development.

A further threat to the natural environment is posed by proposals for large-scale developments on the uninhabited islands, currently prime habitats for endemic species such as rock iguana and the remaining breeding sites for turtles. Environmental guidelines¹⁵ have been established based on comprehensive EIAs carried out for these developments. In addition, the DEMA has developed national environmental standards for development.

Rainfall in the Turks and Caicos Islands is insufficient to meet the needs of the territory; therefore, a significant proportion of the potable water for distribution/consumption on the more populous islands of Grand Turk and Providenciales is produced by reverse osmosis desalination distributed by truck. Additionally, more than two-thirds of households harvest rainwater via private catchments and store it in cisterns and/or drums for personal use. Effective fresh water management will be an increasing challenge as the islands develop. On Grand Turk, Providenciales and South Caicos there are some piped water systems. The public water supply is chlorinated and regularly checked for chemical and bacterial contamination.

With regard to sanitation most households use septic tank systems and soakaways, with relatively few pit latrines being used. However, large facilities such as hotels and newer coastal developments have mechanical treatment plants. There are 75 sewerage treatment plants to service the hotel industry, primarily on Providenciales.

¹⁴ Available at www.ukotcf.org

¹⁵ For example, in Ambergris Cay, which is an ecologically sensitive area, motor vehicles and feral animals are prohibited to ensure protection of the Rock Iguana.

Solid waste management remains a major challenge throughout the territory and plans are underway to address this issue beginning on Grand Turk and Providenciales. Waste is disposed in landfills. Progress has been achieved on upgrading and improving the landfills on Providenciales and Grand Turk; however, neither of these facilities is lined and both therefore pose a serious threat of toxic contamination to ground and coastal waters. The Government has decided to involve the private sector in the waste collection and disposal system as a way to improve the overall efficiency and performance.

Overfishing exacerbated by destructive practices and the two severe weather events in 2008 resulted in extensive fisheries resources losses offshore. There is little overexploitation of reef fishes, although there are concerns about poaching. In recent years, significant reductions in conch (*Strombus gigas*) and lobster (*Panulirus argus*) catches have occurred. These reductions in catch are likely a result of habitat degradation and loss and overfishing. Even with increased regulations and enforcement, fishers continue to engage in detrimental practices, such as netting bonefish and using bleach to catch lobster. TCI is now undertaking a conch visual survey to re-assess queen conch stock characteristics for better management. In addition, a feasibility study for the development of commercial exploitation of pelagic stocks is also underway. At Mouchoir Bank, until the assessment of stocks takes place no commercial fishing licences are being issued. A ban on fishing for parrotfish has been recently established. Additional amendments to the Fisheries Protection Ordinance are being worked aiming at increased protection of sharks, rays, stone crab, bonefish and Nassau grouper.

3.2 MAIN CHALLENGES

In 2005, the Environmental Vulnerability Index¹⁶ indicated Turks and Caicos as *Vulnerable*, despite significant information gaps as only 52% of topics were covered.

The most pressing issues identified were the percentage of land lower than 50 m above sea level; number of known species that migrate outside the territorial area at any time during their life spans (including land and all aquatic species) / area of land; number of endangered and vulnerable species per 1000 km² land area (IUCN definitions). Turks and Caicos also have a large border length to country area ratio and are a bit isolated.

The main environmental challenges faced by TCI were also identified in the 2006-07 Environmental Profiles and their seriousness is summarised in the table below.

Issues	Situation in 2006-07	Current Situation
Climate Change	Severe	Severe – low lying territory with protection such as mangroves and coral reefs under threat from anthropogenic activities. Territory vulnerable to severe weather events.
Habitat Degradation due to development	Severe	Severe - The lack of a Physical Development Plan has led to unplanned and haphazard development throughout the country. Many important ecological and cultural assets have been negatively impacted as a result. EIA is not always applied properly (e.g. Airport extension and North/Middle Caicos Causeway).
Water quantity and quality, wastewater and solid waste were referred as significant pressures		

¹⁶ http://www.vulnerabilityindex.net/EVI_Country_Profiles.html

New Emerging issues are:

Issues	Current situation
Decline of fisheries stocks due to overfishing and habitat degradation	Poor fishing practices and hurricane events of 2008 have resulted in 50% declines in stocks for conch and lobster. Declines are also noted in reef fish stocks and some fin fish populations, such as pot snapper and grunt. DEMA lacks enforcement capacity to be able to adequately patrol and enforce coastal areas and regulate fisheries
Deforestation (problem related to poverty)	Deforestation is ongoing, particularly by non-documented migrants, to build shanty towns and for charcoal production. DEMA and other enforcement agencies lack capacity to enforce. This problem has increased exponentially due to inadequate border control (probably due to the extreme poverty experienced in Haiti).
Water and waste	DEMA lacks funding and labour to implement appropriate watershed management plans. There is no lining on the landfills of Providenciales and Grand Turk which poses pollution threats to groundwater and coastal water.
Lack of resources of the Department of Environment and Marine affairs	Severe austerity measures are being implemented in TCI in result of the political upheaval associated with the dissolution of the Constitution, coupled with economic downturn. DEMA's staff has been reduced by a factor of 50%. The Conservation Fund has been lost preventing DEMA to fund required research and monitoring activities. The infrastructure is also in decline. Most of the vessels require major mechanical upgrades, in South Caicos and Grand Turk there are vehicle limitations.

4 ENVIRONMENTAL GOVERNANCE

4.1 CONSTITUTION

The Turks and Caicos Islands are an internally self-governing British Overseas Territory with a ministerial system of government. The 2011 version of the Constitution came into force on October 15, 2012. It provides for an elected Government comprised of a Ministerial Cabinet and an elected House of Assembly. The Governor is appointed by the Queen and has responsibility for defence, external affairs, the regulation of international financial services and internal security, including the police force. There are 19 seats in the TCI' House of the Assembly. Fifteen of these seats are filled directly by candidates whom have been directly elected. There are also four other members, one each nominated by a leaders of the two parties that make up the House, two of whom are appointed by the Governor.

There is a ministerial system including the Premier political leader and head of government and six Ministers with the responsibility for the business of government including the Ministry of Environment, Home Affairs and Agriculture.

The legal system is based on laws of England and Wales, with a few adopted from Jamaica and the Bahamas, and locally enacted ordinances.

4.2 INSTITUTIONAL FRAMEWORK

The Ministry of Environment and Home Affairs (MEHA) comprises *inter alia* the Planning Department, the Department of Agriculture (DOA) and the Department of Environment and Maritime Affairs (DEMA). The Planning Department with a total of 14 staff and an annual budget of \$ 599,215 oversees territorial planning and is responsible for all development control. The DOA counts with a total of 13 staff and is responsible for agricultural oversight and regulation, aquaculture, animal welfare, animal and plant health (APHIS), biosecurity.

DEMA (former Department of Environment and Coastal Resources - DECR) has the responsibility of

sustainably managing, preserve and improve Fisheries and coastal and marine resources, as well as protected areas and in general the quality of the environment. DEMA counts with a total of 25 staff and an annual budget of \$ 1,213,055, and is divided into three divisions: the Protected Areas Division oversees the management of national parks, nature reserves, sanctuaries and historic areas; the Fisheries Division responsible for the management and conservation of fish populations and habitats; the Maritime Affairs Division mandated to protect and improve the fisheries through the effective management of fish stocks to promote economic prosperity. The Fisheries Division monitors the catches of lobster and conch and regulates successful quota systems for both local use and export. The focus of its activities is the maintenance of a profitable and sustainable fishery. The three Divisions work closely together and are also involved in research and assessment, planning, public awareness, policy and legislation development and enforcement. The DEMA also assesses and monitors development activities for possible environmental impacts and fulfils a public information function. It is also responsible for maintaining the marine and terrestrial park boundary markers, signs and regulatory buoys and the many permanent moorings for recreational vessels installed around the islands.

The Department of Environmental Health, within the Ministry of Health, is responsible for, amongst other matters, monitoring water supplies and solid waste collection and disposal. Environmental health officers are stationed throughout the islands. The Public Environmental Laboratory, the main laboratory within the National Public Health Laboratory System, monitors environmental quality.

The Department of Disaster Management and Emergencies (DDME) was established in 2001, as a department of the Chief Secretary's Office falling under the Ministry of Government Support Services. DDME is in charge of coordinating and monitoring for disaster management and promote a uniform approach to disaster management. The TCI now has a Turks and Caicos Emergency Response Task-Force. The TCI Royal Police is an operational arm for civil protection, as is the TCI Fire and Rescue.

The National Health Emergency Management Unit (NHEMU), established in 2009, is responsible for the coordination of activities designed to prepare for, monitor, mitigate, and respond to public health threats and disasters.

The Climate Change Committee was appointed by the Advisory Council in April 2010 which is comprised of the heads of the environment, planning, disaster management, education and economics departments.

The Environment Charter Working Group consists of relevant government agencies, including the director of the Planning Department, Department of Economic Planning and Statistics, Environmental Health, the DEMA, representatives from the AG's Chamber and the Governor's Office, the National Trust and the Museum. Vested with the responsibility to monitor and advise implementation of the Environment Charter implementation strategy.

The Tourist Board, within the Ministry of Tourism and Culture, is responsible for enforcing and monitoring the projects implemented by the Ministry. The Investment Union is a "one-stop shop" for the delivery of information and assistance to prospective investors and operates directly under the Ministry of Finance.

The Turks and Caicos National Trust¹⁷ is a statutory, non-profit independent organisation responsible for safeguarding the environmental, cultural and historical heritage of the islands, founded in 1992 after some enabling legislation by the TCI Government. It is governed by an elected Council which includes representatives from all the inhabited islands. The Trust works in partnership with the government, local businesses, national and international conservation organisations, schools and the community. The Trust is supported by membership fees, government grants, private sponsorship, project grants and funds self-generated through projects and initiatives. The Trust manages some of the Protected Areas. It carries out a range of activities including education and public awareness.

¹⁷ <http://www.tcinationaltrust.com/>

4.3 POLICY FRAMEWORK

Following up on the Environment Charters which include statements of principles and undertakings by both UK and OCTs, TCIs, with the support of UK OTCF formulated a detailed strategy for action implementation of the Environment Charter in 2003. This exercise should serve as an example for other UK overseas territories. The Environment Charter Working Group has been charged with the task to ensure that the objectives as laid out in the strategy are accomplished. This has, however, not yet materialised.

In addition a 10-Year National Socio-economic Development Strategy - NSDS (2008-2017), sets the framework within which national and sectoral sustainable development will take place. The actions to be undertaken within the NSDS are identified in the National Socio-economic Action Plan¹⁸. Those have been updated by the TCI Development Strategy (2013-2017), which focus on further reforms and establishes a medium-term economic strategy on which budget formation is based. The Government declares its strict adherence to Environmental Conservation and Protection with the implementation of measures which at least maintain ecological value of physical resources and the services they provide, and preserve our cultural and heritage resources, shored up by the inculcation of universal respect for the environment and for its sustenance for future generations.

Overall TCI has no overarching policy to align decision making for the environment.

The government has produced a policy for the management and development of the fisheries sector. The Fisheries Policy was adopted in 2006.

As part of the TCI's ongoing efforts to strengthen private and public sector institutional capacities to respond to climate change, the MEHA and District Administration, in collaboration with the Caribbean Community Climate Change Centre (CCCCC) and DFID are developing a National Climate Change Adaptation Strategy and Action Plan and a Climate Change Public Education and Outreach Strategy. The Climate Change Green Paper¹⁹ launched by the CCCCC was intended to serve as a platform to facilitate consultations with stakeholders in the public and private sectors and civil society.

The Plan for Biodiversity Management and Sustainable Development around the Turks and Caicos Ramsar Site²⁰ from October 2002 aims at providing a practicable means to conserve the rich biodiversity and cultural integrity of the TCI through enabling the local people to protect the area by generating sustainable usage involving eco-tourism-based activities, as well as educating both visitors and the next generation of citizens. This Plan is outdated and an update is required.

There is no current Tourism Strategy nor Disaster Management Plan. The last existing ones were the Revised Tourism Strategic Plan (2006-2010) and the Disaster Management Plan (2006-2010).

18 National Socio-Economic Development Framework (2008-2017) - Implementation Plan:

http://www.depstc.org/ndp/ndp_downloads/NDP_draft_reports/NSEDF%20Implementation%20Plan1.pdf

19 Climate Change Green Paper (February 2011):

http://www.caribbeanelections.com/eDocs/strategy/tc_strategy/tc_Climate_Change_Green_Paper.pdf

20 Plan for Biodiversity Management and Sustainable Development around the Turks and Caicos Ramsar Site:

http://www.ukotcf.org/pubs/tci_ramsar.htm

4.4 LEGAL FRAMEWORK

The TCI participate in the following MEAs:

MEA	Remarks
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)	Extended to TCI in February 1986, including the Oil Spills Protocol. The UK FCO has provided legal advice on the extension of the Specially Protected Areas for Wildlife (SPAW) Protocol to TCI. Further species legislation will be required to implement this (SPAW).
Ramsar Convention on Wetlands	Extended to TCI in 1976. There is presently one Ramsar site, the North, Middle, and East Caicos Islands wetland. The National Trust has begun to implement a management plan for this site. A further 7 sites have been proposed but not yet accepted.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Not yet extended to TCI. But TCI government intends to join, and a scientific panel has been informed to review research proposals, draft conservation legislation, and advise Government on CITES. The UK FCO has provided legal advice on this issue.
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Extended to TCI in July 1985. There is some confusion as to whether or not the UK is satisfying its obligations under this Convention with respect to the legal harvests of marine turtles in British Virgin Islands, Cayman Islands, Montserrat and the Turks and Caicos Islands. These legal harvests involve commercial trade of marine turtles that may or may not qualify as accommodating 'the needs of traditional subsistence users' (undefined in the Convention).
Convention on Dumping of Wastes at Sea (London Convention)	Became effective in December 1975.
Convention for the Prevention of Pollution From Ships (Marpol 73/78)	
World Heritage Convention Concerning the Protection of the World Cultural and Natural Heritage	Adopted by the General Conference of UNESCO in 1972. The islands have a high number of endemic species and others of international importance, partially dependent on the conditions created by the oldest established salt-pan development in the Caribbean.
Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS)	A supplementary agreement to the Convention on Biological Diversity which has been ratified by TCI. It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

TCI is also moving towards inclusion in the UK's ratification of the Convention on Biological Diversity.

The legislation most relevant to environmental protection in TCI is indicated in the table below:

Legal Instruments	Remarks
Marine Pollution Ordinance, 2010	Sets up the rules for prevention of pollution by oil, by noxious liquid substances bulk, by packaged harmful substances, by sewage, by garbage and during transfer operations.
Physical Planning Ordinance, rev 2009	Sets up the rules and procedures for EIA and Strategic Environment Assessment.
National Parks and Protected Areas Ordinance, rev. 1998 Amendments are currently being drafted.	Establishes regulations for four different categories of protected area: national park (ecosystem and biological conservation with emphasis on recreation); nature reserve (ecosystem and biological conservation with recreation as a subsidiary goal); sanctuary (protection of the natural ecology, or animal or plant, and the avoidance of disturbance by people); and area of historic interest. To date the following 34 protected areas have been designated (5 terrestrial and 28 marine): 11 national parks; 11 national reserves; 4 sanctuaries; and 7 which occupy 42% of the total land area and a large proportion of inshore waters and reefs. But the provisions

	of the Ordinance allowing the Governor to make specific regulations for the areas, provide for their management, appoint wardens, etc. have generally not yet been implemented, partly as a result of resource limitations.
Coast Protection Ordinance, rev.1998	Provides protection for the coastal zone. Minerals may only be removed from coast with a licence. No depositing of objects or waste on coast.
Fisheries Protection Ordinance, rev.1998	The legal basis for managing fishery resources. Provides for licences, minimum size of caught fish, close seasons, restrictions on gear and prevention of IUU fishing. Regulations can be made to protect specific marine species. Legal protection for sea turtles is provided by this legislation. A minimum size for take is specified, eggs are totally protected as are turtles on beaches.
Fisheries Limits Ordinance, rev. 1998	Provides for the fishery limits to be set (by a Proclamation of the Governor), and the powers of fishery officers within them.
Public and Environmental Health Ordinance, rev. 1998	Sets up rules for Integrated Pollution Prevention and Control (air, water, waste, noise, hazardous substances).
National Trust Ordinance, rev.1998	Regulates the purpose and procedures of the National Trust. It gave the Trust powers to hold land inalienable and in trust for the nation, with the ability to prepare by-laws for its protection. This is an alternative means of giving protection to areas.
Plant Protection Ordinance, rev. 1998	Intended to prevent introduction of disease from the import of plants.
Wild Birds Protection Ordinance, rev. 1998	This protects all wild bird species from hunting, collection or egg taking, with the exception of the migrant blue-winged teal.
Water and Sewerage Ordinance, 1994	Sets the rules for water abstraction, water supply and sewerage services.

The following three important bills for the protection of the environment were drafted but their approval is pending:

- the Wildlife and Biodiversity Conservation Bill which would ratify the Convention on Biological Diversity, the Nagoya Protocol and the Bonn Convention;
- the Endangered Species Bill which will expand the CITES convention to the TCI; and
- the Protected Areas Act.

Amendments are currently being made to the National Parks and Protected Areas Ordinance and to the Fisheries Protection Ordinance both revised in 1998, the later will provide for the protections of sharks, rays, stone crab, bonefish and Nassau grouper.

In addition there is a priority action to amend the Plant Protection Ordinance dealing with invasive plant species – both those already present and those that might be imported. It is also proposed to carry out a major project to implement port environmental security in order to control invasive species and for other environmental health reasons. This project would include restricting ports of entry, introduction of new legislation, establishment of quarantine facilities for both plants and animals and technical training for customs and other officials.

The legal framework for development control is weak. EIA is only required for large developments. In the past, this process has not stopped undesirable development, due to a lack of sufficient oversight. Additionally, TCI Government (TCIG) has often not followed its own requirement for EIA and did not conduct EIAs for the Providenciales international airport extension or the North/Middle Caicos Causeway.

There is no current national development plan in place, and the relationship of other legislation with the Encouragement of Development Ordinance is unclear. Illegal and unregulated development sprawl is a particular challenge. There are issues related to lack of accountability in decision making. The Encouragement of Development Ordinance 1998 makes no reference to environmental or conservation concerns and appears to give the Governor great discretion to issue Development Orders.

The National Parks Ordinance is enforced by conservation officers (10 for Fisheries and Protected Areas Divisions). Although the marine police also has an enforcement function, the activities of the latter are

more oriented towards narcotics trafficking and illegal immigrants. It is understood that the lack of enforcement training of conservation officers is a constraint.

Significant steps have been taken to build capacity within the government sector to increase enforcement of Fisheries and National Parks legislation, and enforcement has improved dramatically since 2000 with regular prosecutions. The DEMA owns 5 patrol vessels, which help implement the responsibilities but need major repairs.

Enforcement officers with the DEMA are stationed at the five processing plants (landing sites) to inspect catches as fishermen off-load their product for commercial sale. Lobster and conch are weighed and measured for legal size and the daily catch recorded.

The judicial system provides an infrastructure for enforcement officers to prosecute for fisheries violations, marine pollution events, damages to coral reefs, seagrass beds and other natural assets. Land areas are largely unprotected, unless they are located within a protected area.

4.5 MONITORING

The DEMA has several monitoring programmes in place, including, beach and fisheries monitoring. About 24 reef monitoring sites have been established, beach monitoring is performed in 6 sites along the west coast of Grand Turk 13 sites along the north coast of Providenciales, and 4 established in South Caicos. The beaches are surveyed each quarter to obtain information on the width and slope. DEMA has currently no capacity for coral reef monitoring due to lack of funding.

The Department of Environmental Health performs monitoring of water supplies and solid waste collection and disposal.

The National Trust has also continued its involvement with the Turks and Caicos Rock Iguana research conducted by the San Diego Zoo.

4.6 ENVIRONMENTAL AWARENESS

DEMA in collaboration with Department of Planning, Department of Environmental Health, Department of Community Empowerment, Department of Education, Department of Culture and the National Trust are, in accordance with the NSDS, to establish within the National Environmental Education and Outreach sub-programme, *inter-alia*: a Public Environmental Education Programme; an Environmental Education/Awareness Steering Committee; an eco-programme for Schools; co-action programme for Communities. DEMA is, since 2011, in the process of recruiting a new Education Officer - nevertheless, the Department has been able to maintain educational outreach activities including: the development of brochures and public awareness campaigns, using public media, town hall meetings and other methods; environmental education programmes in schools; research into archaeological heritage, fisheries stocks, coral reef health and other areas in partnership with universities and NGOs with the purpose of increasing the information base.

Training courses on environmental topics for civil servants or others are offered by UK Joint Nature Conservation Committee (JNCC)²¹, the Caribbean Regional Fisheries Mechanism²² and others.

The Community Conservation Partner Programme (CCPP) has been approved by Cabinet and is in the implementation phase. The CCPP will provide certification for private sector entities who commit to regular stewardship, monitoring or other conservation activities.

²¹ <http://jncc.defra.gov.uk/>

²² <http://www.crfm.net/>

The Turks and Caicos Reef Fund²³, a non-profit organisation, has been promoting the installation of moorings by dive operators to prevent anchor damage.

The DEMA have embarked on a series of awareness initiatives aimed at encouraging the general public to report sighting of lionfish²⁴, and promote the consumption of this fish by humans.

4.7 FINANCE FOR THE ENVIRONMENT

The TCIG established the Conservation Fund²⁵ funded by 1% tax of Hotels and Restaurants revenues. It was used specifically to fund the operations of the Protected Areas Division of the Department, the operation of the National Environment Centre and the Community Conservation Projects. The U.K Interim government dissolved the Conservation Fund in 2012 and no replacement has been provided. The funds at the time (approximately \$9 million) were absorbed by the General Territorial Fund. DEMA has presently no ability to fund required research and monitoring activities.

5 INTERNATIONAL COOPERATION

TCI is an associate member of: the Association of Caribbean States (ACS); the Caribbean Community and Common Market (CARICOM); and the Caribbean Development Bank (CDB)

TCI graduated from financial support in 2003 but have suffered acute short term fiscal crises since the global economic downturn. UK is part-way through a five year financial relationship with TCI through guaranteeing commercial bank lending.

All environment funding from the United Kingdom is granted based on a competitive bid programme, Darwin Initiative and Overseas Territories Environment Programme (OTEP). There have been successful and important projects in TCI. The two programmes became Darwin + which is broader in scope and thus more competitive, and somewhat more difficult for small territories to manage. Besides, small amounts of funding have been available from JNCC and have been put to use very effectively.

The DEMA and the National Trust have been working with the UK Overseas Territories Conservation Forum (UKOTCF), to protect internationally significant wetlands throughout the islands.

The European Union allocated €14,635,000 from the 9th EDF to the TCIG by way of budget support for transport infrastructure projects. Over € 8 million has been used for this purpose whilst another €2 million is intended for technical support to the TCI Government's ongoing economic and legislative reform programme. The 10th EDF allocation amounts to € 11.85 million for private sector development. For the 11th EDF € 18 million will be allocated and work is underway on programming it, a process which will include consultations of non-governmental organisations.

The National Trust is engaged in a regional project to build capacity for management of three protected areas by the 9th European Development Fund (EDF)²⁶ - The Managing Protected Areas to Support Sustainable Economies (MPASSE).

²³ <http://www.tcreef.org/>

²⁴ Since 2007, TCI territorial waters have been rapidly invaded by lionfish. This species is commonly found in the Pacific Ocean. Through means unknown, this species was transferred to the Atlantic Ocean and have reproduced rapidly. Within 5 years the species has distributed from Florida to almost every island in the Caribbean. Research have shown that this species does not have any known predators in the Atlantic region.

²⁵ Conservation Fund: www.onecaribbean.org/content/files/Wesleystc10.pdf

²⁶ http://eeas.europa.eu/delegations/jamaica/projects/list_of_projects/20229_en.htm

Turks and Caicos hosts extensive reefs and mangroves, having one of the largest Ramsar sites in the Caribbean. Development, particularly of the tourism industry, is taking place very rapidly, also generating work opportunities. There is a continuous influx on migrants and a yearly resident population growth of 5%. Deforestation to clear site for settlements and for charcoal as well as poaching on reefs has been associated with this influx. The lack of a National Physical Development Plan led to unplanned and haphazard development throughout the country. There are some mechanisms in place to ensure that this development takes place sustainably, such as a comprehensive protected areas system, environmental legislation on key issues, and guidelines for environmental impact assessment, but there is also some discretionary on the implementation of these instruments.

There is limited planning and management capacity on forest and water resources. Despite progress achieved on solid waste management, the two main landfills have no lining hence imposing contamination risks. Besides, there is no recycling or waste valorisation policy. Poor fishing practices and hurricane events of 2008 have resulted in 50% declines in stocks for conch and lobster (main export and tourist sought commodities). Declines are also noted in reef fish stocks and some fin fish populations, such as pot snapper and grunt. Measures are being taken to improve controls.

Overall there is limited capacity on enforcement. Furthermore, the recent political upheaval associated with the dissolution of the Constitution, coupled with economic downturn has resulted in a scarcity of resources to manage environment (loss of the Conservation Fund and reduction of department of environmental and marine affairs staff by a factor of 50%).

One of the best practices in which TCI sets a good example for other OCTs is the fact that DEMA Director sits on the Planning Board and assists in the decision making process for development. The requirement for DEMA and planning to work closely together for all large development projects ensures that environmental concerns will always be considered during the planning phase.

Another good example regards fisheries. DEMA has several decades of landing statistics for queen conch and Caribbean spiny lobster. Besides, legislation accompanies the evolution of the resource which enables enforcement.

TCI was able to build a collection of over 110 native plant species in two nurseries. Plants are supplied to schools, parks, and functions and are used for awareness building. The Seed Collection Project with Royal Botanic Gardens, Kew's Millennium Seed Bank has safeguarded over 200 native plant species in the Seed Bank. All this is remarkable and will be very important given the prospects of climate change.

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible € sources
Improve physical and natural resources planning	Develop and implement National Physical Development Plan, watershed plans and forest plans.	Structuring documents, establishing guidelines and proposing plans to the sustainable use of land and natural resources are missing. This is destroying habitats, species and livelihoods and in the longer run will destroy the assets tourists look for. The ministry of Environment and Home Affairs (MEHA) comprises the Planning Department, DEMA and DOA, creating the opportunity for joint work on improving the physical and natural resources planning of the territory.	5 years	Turks and Caicos Government, MEHA		Political will and capacity to mobilize efforts, despite the urgent need to repay the debt	EU, UK
	Activities Involve and coordinate the various actors (environment, land, fishing, police, defence, ports, tourism, rural development, local authorities) Characterize the different areas of the territory and their possible uses. Develop a study on the economic potential and environmental risks in the different areas of the territory, including climate change scenarios. Engage on the development of an integrated National Physical Development Plan that is co-developed with a National Strategic Environmental Assessment and identifies the country's development priorities taking into consideration the economic development and the conservation of ecological assets, and take into account prospective scenarios and climate change. Conduct workshops to discuss options Characterize the watersheds and mobilize the users and stakeholders. Promote workshops and discussion to identify main issues and solutions and set goals. Set up a realistic programme of measures to achieve good ecological status, clearly identifying the possible uses and protection required. Mobilize funds for implementation. Make a forest inventory, identifying areas for protection and areas that can be used. Establish forest reserves. Identify areas that can be used by most vulnerable population, and set up community projects on sustainable use of forest. Establish forest management plans, including commercial forest management. Establish forest monitoring programmes. Tackle the issue of charcoal – assess best practice and lessons learned from other locations in the regional and in the world where incentives for the use of alternative to charcoal for cooking were used. Assess missing legislation to implement the plans and develop/update the legal framework. Promote co-management, eco-tourism, renewable energies, wherever possible. Coordinate regionally for whatever harmonization and collaboration possible.						

Goal	Action	Baseline situation	Priority and time frame	Implementing entity(ies)	€ and HR Needs	Risks and Assumptions	Possible sources	€
Promote Green Growth ¹ and Blue Growth ²	Change the development path, by reducing inefficiencies and seizing on possibilities	The two concepts are relatively new and they are inter-related. Green growth is broader, and in the case of TCI seizing and sustainably using the wealth of the oceans is a priority.	7 years	TCI government and particularly Ministry of Environment and Home Affairs.			EU WB and Regional Development Banks Private sector	
	Activities Establish a first set of issues to be addressed: governance (improve physical planning, EIA and SEA, standards for wastewater and waste, enforcement, integration of environment, green growth and integrated resource management ³ into policies and strategies); renewable energies and energy efficiency; water and waste management dealing with economic instruments (cost recovery, incentives to recycling, taxes on imported items that became waste) and valuation of waste. Place an accent as well on agro-ecology, increase food independency level and international valuation of certified niche products. On blue economy promote the elaboration of marine strategies, sustainable fisheries, transport and logistics, tourism activities. Develop studies on income generating activities in the coastal areas, with a view also to support activities at sea. Organise networking between the different stakeholders dealing with a particular issue. Promote debate and information sharing; establish dedicated websites for sharing of possible national solutions, and sharing of know-how and experience between regions. Promote regional articulation. Promote technical visits to other OCTs and countries in the region on specific topics. Organize trainings. Organize training on fund mobilization (internal and external), training and assistance on proposal writing. Study the business environment and study ways of engaging private sector. Support the implementation of the sustainable tourism certification schemes. Define indicators, or guidelines, for sustainable tourism.							

1 According to OECD Green growth means promoting economic growth while reducing pollution and greenhouse gas emissions, minimising waste and inefficient use of natural resources, and maintaining biodiversity (<http://www.oecd.org/environment/green.htm>)

2 According to EU's DG Mare Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole. It recognises that seas and oceans are drivers for the European economy with great potential for innovation and growth. It is the Integrated Maritime Policy's contribution to achieving the goals of the Europe 2020 strategy for smart, sustainable and inclusive growth (http://ec.europa.eu/maritimeaffairs/policy/blue_growth/)

3 Example : Integrated Coastal Zone management, Integrated Water management

Appendix - Financed Projects

Area/Topic	Name	Budget	Source(s) of Funding	Type of funding (loan, grant, co-financing)
Fisheries	Conch Visual Survey	\$50,000	Internal	Internal
Fisheries	Spiny Lobster Artificial Habitat	\$62,000	FCO	Grant
Fisheries	Nassau Grouper Study		JNCC	Grant
Biodiversity	Caicos Pine Recovery Project	£215,634	Darwin Plus	Grant
Biodiversity	Habitat Mapping Project		JNCC	Grant
Biodiversity	Wetlands Project		Darwin	Grant
Biodiversity	Millennium Seed Collection		Darwin Plus	Grant

The Caicos Pine Recovery Project has now been extended for two years by a Darwin Grant, up to April 2016¹ - This project consists of a multiyear study to identify the pine scale insect and devise approaches to combat the problem. This insect is infecting the National Tree, the Caicos Pine. The project is developed by DEMA in collaboration with the National Trust, Royal Botanical Garden - KEW UK, Environmental Health Department and the Department of Agriculture.

¹ http://fl.biology.usgs.gov/pineland/2008conf/Hamilton-Scale_insect-pine_recovery_project.pdf