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International Union for Conservation of Nature

A Situation Analysis for the Wider Caribbean



IUCN Caribbean Initiative

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It is hoped this document will guide the development of an innovative biodiversity conservation programme that will reflect the interests and aspirations of the Caribbean people.

LIST OF ABBREVIATIONS AND ACRONYMS

ACP African, Caribbean and Pacific group of countries	CCA Caribbean Conservation Association	CRFM Caribbean Regional Fisheries Mechanism
ACS Association of Caribbean States	CCRIF Caribbean Catastrophic Risk Insurance Facility	CSEDNet Caribbean Sustainable Economic Development Network
AECI <i>Agencia Española de Cooperación Internacional</i>	CCCCC Caribbean Community Climate Change Centre	CSME Caribbean Single Market and Economy
AIDS Acquired immunodeficiency syndrome	CDB Caribbean Development Bank	CTO Caribbean Tourism Organisation
AMEP Assessment and Management of Environmental Pollution	CDERA Caribbean Disaster Emergency Response Agency	DFID Department for International Development (United Kingdom)
BACONGO Belize Alliance of Conservation NGOs	CDMF Caribbean Disaster Management Framework	DGCS Italian Directorate General for Cooperation in Development
BPOA Barbados Programme of Action for Sustainable Development in Small Island Developing States	CEBSE Center for the Conservation and Ecodevelopment of Samaná Bay and its Environs	DIREN <i>Direction Régionale de l'Environnement</i>
CAD Environmental Consortium of the Dominican Republic	CEHI Caribbean Environmental Health Institute	DR-CAFTA Dominican Republic-Central American Free Trade Agreement
CaMPAM Caribbean Marine Protected Areas Network	CEP Caribbean Environment Programme of UNEP	EAG Environmental Awareness Group
CANARI Caribbean Natural Resources Institute	CERMES Centre for Resource Management and Environmental Studies	EDF European Development Fund
CARICAD Caribbean Centre for Development Administration	CHA Caribbean Hotel Association	EIA Environmental impact assessment
CARICOM Caribbean Community	CIDA Canadian International Development Agency	ENGO Environmental non-governmental organization
CARIFORUM Caribbean Forum of African, Caribbean and Pacific States	CITMA Cuba Ministry of Science, Technology and Environment	EPA Economic partnership agreement
CARDI Caribbean Agricultural Research and Development Institute	COPE Council of Presidents of the Environment	ESDU Environment and Sustainable Development Unit (of the OECS)
CARMABI Caribbean Research and Management of Biodiversity Foundation	CORDEM <i>Comité de Résistance à la Destruction de l'Environnement Martiniquais</i>	EU European Union
CAST Caribbean Alliance for Sustainable Tourism	CPDC Caribbean Policy Development Centre	FAO Food and Agriculture Organization of the United Nations
CBD Convention on Biological Diversity	CREP Caribbean Regional Environment Programme	FFEM <i>Fonds Français pour l'Environnement Mondial</i>
CBRM Community-based resource management		FOPROBIM <i>Fondation pour la Protection de la Biodiversité Marine</i>

FPRTD Framework Programme for Research and Technological Development	NEMS National environmental management strategy	UNCCD United Nations Convention to Combat Desertification
GCFI Gulf and Caribbean Fisheries Institute	NEPT Negril Environment Protection Trust	WINFA Windward Islands Farmers Association
GDP Gross domestic product	NEST National Environment Societies Trust	WTO World Trade Organization
GEF Global Environment Facility	NGO Non-governmental organization	UNAIDS Joint UN Programme on HIV/AIDS
GTZ <i>Deutsche Gesellschaft für Technische Zusammenarbeit</i>	NRCA Jamaica Natural Resources Conservation Authority	UNDP United Nations Development Programme
HIV Human immunodeficiency virus	OECS Organisation of Eastern Caribbean States	UN-ECLAC United Nations Economic Commission for Latin America and the Caribbean
IWCAM Integrated Watershed and Coastal Area Management	OPAAL OECS Protected Areas and Associated Livelihoods Project	UNEP United Nations Environment Programme
IDB Inter-American Development Bank	ORMA (IUCN) Oficina Regional para Mesoamérica	UNEP-ROLAC UNEP Regional Office for Latin America and the Caribbean
IIED International Institute for Environment and Development	PROGRESSIO Foundation For Human Progress	UNESCO United Nations Educational, Scientific and Cultural Organization
IITF International Institute of Tropical Forestry	RAC Regional Activity Centre	UNFCCC United Nations Framework Convention on Climate Change
IRF Island Resources Foundation	ROfE (IUCN) Regional Office for Europe	UNICA Association of Caribbean Universities and Research Institutes
IUCN World Conservation Union	SEMARN Dominican Republic State Secretary for Environment and Natural Resources	UK United Kingdom
JET Jamaica Environment Trust	SIDS Small island developing state	USA United States of America
JCDT Jamaica Conservation and Development Trust	SGD St George's Declaration of Principles for Environmental Sustainability in the OECS	USAID United States Agency for International Development
JICA Japan International Cooperation Agency	SMMA Soufrière Marine Management Area	WCPA World Commission on Protected Areas
LBS Land-Based Sources of Marine Pollution	SPAW Protocol Concerning Specially Protected Areas and Wildlife	WIDECAST Wider Caribbean Sea Turtle Conservation Network
MACC Mainstreaming Adaptation to Climate Change	SUSTRUST Trust for Sustainable Livelihoods	
MEDAD <i>Ministère de l'Ecologie, du Développement et de l'Aménagement Durables</i>	SSC (IUCN) Species Survival Commission	
MPA Marine protected area	TNC The Nature Conservancy	

EXECUTIVE SUMMARY

The purpose of this situation analysis is to guide the development of a Caribbean programme for IUCN in accordance with a Resolution passed by the membership at the 3rd World Conservation Congress in Bangkok in 2004. The analysis generally employs the structure of IUCN's current programme, and comprises five sections. The first provides an overview of the region's environmental and social characteristics; the second looks at trends in human well-being; the third at environmental issues and trends; the fourth at policy and management responses, and at the relationship between IUCN and the region; and the last at future challenges and opportunities.

Overview

The 35 independent countries and territories that are covered reflect huge ecological, historical, political and cultural diversity but also many commonalities that make regional programming relevant and useful. The main defining characteristics of the region include high levels of biological diversity; small size (of islands, countries, markets and social institutions) and scarcity of many resources, resulting in frequent conflicts; economic dependency on natural resources; vulnerability to hazards and shocks; and openness to external forces (e.g., global markets, diseases such as HIV/AIDS, alien invasive species).

Trends in human well-being

With the exception of Haiti, Caribbean countries range in the middle to high range on international development indices, but high levels of economic inequity mask persistent and in some cases increasing poverty.

The main drivers of Caribbean economies are tourism, construction (much of which is tourism-related), mining and oil exploration. The agricultural sector, while declining in recent years as a result of the ascendancy of tourism and the decline of preferential markets (especially for bananas, rum and sugar), remains important and socially significant. All these sectors have a substantial dependency and impact on the environment. Energy use is generally high and largely derived from petroleum, although some countries are beginning to exploit alternative sources including hydro and wind power and ethanol co-generation. The region is heavily dependent on external trade, and the recent loss of preferential agreements with traditional trade partners has increased competition in international markets.

Most countries collaborate through regional mechanisms, the most widespread of which are the Association of Caribbean States, which includes all Caribbean Basin countries except the USA, and the Caribbean Community (CARICOM), which includes the

countries of the Commonwealth Caribbean plus Suriname and Haiti. The smaller Organisation of Eastern Caribbean States comprises the small Commonwealth countries and territories of the Lesser Antilles.

Environmental issues and trends

Environmental change has been a major feature of Caribbean history, with the introduction of species from South America occurring even before European colonization. The widespread plantation economy of the 18th and 19th centuries caused extensive environmental degradation and change. The main current drivers of environmental change include:

- global markets and external trade relations, which determine patterns of resource use, disrupt local livelihood strategies, and concentrate pressure on particular areas and resources;
- consumption patterns and increased demand for environmental goods and services, particularly energy and water;
- demographic change, towards greater concentration of population in environmentally sensitive areas such as coastal zones;
- dependency and fragmentation, which limit options for addressing environmental issues.

All these drivers can be either exacerbated or mitigated by public policies and institutional arrangements,

at national and regional levels and also of international partners.

Climate is expected to be an increasingly important driver of environmental change, especially through projected warming sea temperatures, sea level rise, and shifts in precipitation patterns.

Ecozones of most importance to human well-being include watersheds, forests, coastal zones and coral reefs. All have been subject to severe and in some cases increasing pressure. Given the high dependency of poor people on natural resources, negative environmental trends have been a significant driver of poverty, and the degradation of these critical ecosystems has impacted particularly on the poor.

Policy and management responses

Environmental policy is a mosaic of national and regional statements, agreements and initiatives, with most responses at all levels focusing on environmental issues and impacts rather than their underlying drivers. Civil society participation is provided for in many national and international policies, and NGOs and community organizations are important actors in environmental management in most countries. Nonetheless, the public policy framework remains oriented towards control and regulation.

Regional mechanisms and institutions play a significant role in supporting national actors and in promoting harmonization and cooperation among countries. CARICOM in particular provides a forum to debate issues and has a range of institutions addressing aspects of environmental management. Each country however still has full responsibility for addressing its environmental issues. The Caribbean Environment Programme, implemented by UNEP, is another important mechanism for regional cooperation, particularly on issues relating to coastal and marine conservation, resource management and sustainable development.

At national level, countries have made significant progress in establishing comprehensive policy, institutional and legal frameworks for environmental management and sustainable development, although these vary widely. The countries are active participants in the main environmental treaties and conventions, but these put a burden on small states with limited staff and technical resources.

The region has been active in the establishment of protected areas, with more than 1,000 sites covering 2.8 million terrestrial ha and 10.9 million marine ha. However, only a few countries have comprehensive and

effective national protected area systems. Of the range of categories of protected areas, forest reserves and marine protected areas are particularly significant for human well-being, but both have proven problematic in execution.

Bilateral and multilateral donors have played a significant role in environmental management, although their focus has been narrowing and shifting, with an emphasis on disaster management, governance and social sectors. The main bilateral partners are Canada, France, Japan, Spain, the UK and the USA. Main multilateral partners include the EU, the World Bank and the two regional development banks, the Inter-American Development Bank and the Caribbean Development Bank. Among international agencies involved in environmental management, the most significant are the FAO (in fisheries and forest management), UNDP (largely through its national programmes), and UNEP. Private foundations and INGOs now working in the region include the MacArthur Foundation, The Nature Conservancy, World Resources Institute, and WWF/Canada (in Cuba).

Status of the relationship between IUCN and the region

IUCN has 20 members in the insular Caribbean, including four governments and 16 NGOs, as well as three NGO members from Belize and one in French Guiana. Recent involvement of IUCN has been limited and uneven, with most activity concentrated in Cuba and to a lesser extent the Dominican Republic. However, some commissions, especially WCPA and SSC, have a significant membership and WCPA has carried out a few regional activities recently.

Challenges and opportunities for a sustainable future

The main factors and options on which the future sustainability of the region will depend include the effectiveness of regional approaches and integration; innovation to design creative approaches that address the small scale of the region's ecosystems, resources and capacities; and resilience and capacity to adapt to global impacts and trends, while recognising the specificity, diversity and uniqueness of the region.



PREFACE

This situation analysis has been prepared in response to a Resolution passed by the membership of IUCN at the 3rd World Conservation Congress held in Bangkok, Thailand in 2004, which requested the IUCN Secretariat “to increase IUCN’s presence in the Insular Caribbean, through regional implementation of relevant components of the IUCN Programme”. Consequently, a Framework Agreement was signed between IUCN and the Government of France, which included a grant from the French Ministry of Ecology and Sustainable Development for the purpose of exploring the basis of such a programme. This situation analysis is one of the components of this programming process.

This is a working document that is intended to provide a sound foundation to guide programme development and implementation in the region. It is primarily the product of a desk study, but it has also benefited from consultations with IUCN members, IUCN commissions, donors and partners. It should be considered in concert with IUCN’s Programme 2009–2012 as well as the situation analysis that informed it. This document will provide the basis for further consultation with IUCN members and partners over the next few weeks and months, in order to develop a strategic approach and a programme to take

advantage of IUCN’s strengths and comparative advantages, and to complement and enhance the actions of others. It is also hoped that this document will encourage and trigger initiatives and new partnerships aimed at natural resource conservation and sustainable development in the Caribbean.

The document provides an overview of the region’s biological diversity and of the issues and trends related to ecosystems and well-being; pressures on the environment and the forces driving them; current responses at local, national, regional and international levels; and the actors involved in these responses. The analysis employs a framework similar to that developed for the Millennium Ecosystem Assessment (Millennium Ecosystem Assessment 2003), which identifies the most important ecosystems contributing to human well-being in the region; looks at how these ecosystems have changed or are changing, and the impacts these changes are having on human well-being; examines the current and future drivers of ecosystem change; and broadly examines the responses employed by the main environmental actors in the region in terms of their effectiveness and constraints. The analysis also explores briefly some of the likely scenarios and the main implications of current trends.

Because of the tremendous diversity and complexity of the Wider Caribbean region, the study concentrates on issues and responses that are general across the region, while also highlighting the differences among countries and sub-regions.

Nonetheless, a regional approach makes sense for IUCN’s programming, because there are many commonalities and because most of the countries and territories as well as the issues that are the focus of this assessment are ones that have not received much of IUCN’s attention in the past. By working regionally on conservation and sustainable development in the insular and coastal Caribbean, IUCN would meet tangible needs, and would fill an important gap in its geographic coverage of needs and issues.

1. SETTING THE STAGE

GEOGRAPHIC SCOPE AND BOUNDARIES

For the purpose of this assessment, the Caribbean is defined as the islands of the Greater and Lesser Antilles as well as Trinidad and the Bahamas, together with the countries and territories of South and Central America that have strong historical, political and cultural links with the insular Caribbean, namely Belize, French Guiana, Guyana and Suriname (see Figure 1). It takes into account the features and issues that are common to all coastal areas around the Caribbean Basin, including those in Central and South America. It does not however cover the Caribbean and Gulf coastal areas of North America, which share many ecological features with the rest of the Caribbean, but where issues, trends, capacities, needs and opportunities are significantly different from those in other parts of the region.

Geopolitically, the Wider Caribbean comprises 35 political units, including 24 sovereign nations (14 island nations and 10 continental), five overseas territories of the United Kingdom, two overseas *départements* of France, two self-governing units of the Netherlands, one territory of the United States, and the US-associated Commonwealth of Puerto Rico.

While this is a region of high ecological, cultural, political and economic diversity, the geographic scope of the study encompasses countries and territories



Figure 1. The Wider Caribbean

that share commonalities in terms of their ecology (insular and coastal ecosystems), history (European colonization, dominance of the plantation system), culture (Creole societies built on the violent and early elimination of indigenous societies, the forced importation of slave labour and the blending of traditions originating from various continents) and ethnic compositions (high diversity, relatively small indigenous Amerindian populations, large numbers of people of African descent).

THE CARIBBEAN ENVIRONMENT: A BRIEF OVERVIEW

Caribbean societies, environments and ecosystems are characterized by their youth (in geological and biological terms), distinctiveness (including high rates of species endemism and originality of Caribbean cultural traditions and expressions), small size (of islands, countries, ecosystems, domestic markets and economies) and the resulting scarcity of some resources (especially land, as well as water in the drier islands), vulnerability (to natural

hazards, social and cultural change, and economic shock) and diversity (of species, ecosystems, cultures, political systems, economic performance). These characteristics are in turn responsible for three critical regional features:

- The high dependence of economies and livelihood strategies on the local natural resource base, primarily in agriculture (with a limited number of dominant export crops), mining, tourism and fisheries.
- The openness of human and biological systems (to invasive species, external cultural and political influences, trade) and the resulting dependency on external forces and factors.
- The frequency of conflicts over natural resource use, because multiple uses must co-exist on very limited space (this is particularly true in the coastal zone, where much of the human activity has historically been concentrated, and which is the object of increasing pressure, especially as a result of urbanization and tourism development).

Table 1 provides a summary of the Caribbean's main ecosystem services and their contribution to economic development:

Ecosystem	Main benefit/service
Land	<ul style="list-style-type: none"> • Provision of a base for agricultural and industrial activities • Reserves of oil and minerals • Food security • Property rights/land tenure • Habitat • Biodiversity
Forests/other plant species	<ul style="list-style-type: none"> • Promotion of infiltration of rainwater • Moderation of local climate • Promotion of rainfall • Timber products • Non-timber forest products (honey, handicraft materials, thatch, ornamental and household plants, spices, oils, medicinal plants, pharmaceutical products, seeds, tree seedlings, orchids, fruits)
Mangroves	<ul style="list-style-type: none"> • Export of nutrients to other ecosystems such as coral reefs and sea-grass beds through tides and currents • Provision of a variety of habitats for a wide array of terrestrial and aquatic species • Provision of feeding, nursery and breeding areas for fish and other species • Fish and shellfish stocks (support artisanal fisheries) • Stabilization of coastlines, acting as a buffer between the land and the sea • Protection of adjacent coral reefs from suspended solids and drastic changes in salinity due to inflow of freshwater • Removal of contaminants from surface inflows • Nutrient retention and removal
Beaches	<ul style="list-style-type: none"> • Habitats and nesting sites for fauna such as sea turtles • Provision of a base for small-scale fisheries, tourism and recreational activities
Coral reefs	<ul style="list-style-type: none"> • Provision of a habitat for a large number of species • Provision of a hydrodynamic barrier to wave energy, thereby protecting the shoreline from erosion and facilitating the formation of sandy beaches and growth of sea-grass beds • Fish and shellfish stocks (support artisanal fisheries) • Provision of sediment for the formation and maintenance of sandy beaches from the breakdown of carbonate skeleton • Ecotourism attraction • Source of seashells used in craft
Sea-grass meadows	<ul style="list-style-type: none"> • Habitat for a variety of animals • Provision of nursery and feeding areas and shelter for fish and crustaceans • Source of detritus to reef system and nutrient cycling • Settlement and binding of suspended sediments and encouragement of accretion • Habitat for algae, including calcareous algae such as <i>Halimeda</i> sp. These algae have high concentrations of calcium carbonate and contribute to the sediment budget of beaches
Other marine systems (continental shelf, open ocean)	<ul style="list-style-type: none"> • Fish and shellfish stocks (support artisanal, commercial and recreational fisheries)

Table 1. Main ecosystem services and their contribution to development (Heileman, 2005)

In a 2006 survey by IUCN, Caribbean countries identified freshwater, coastal defence from storm or tidal waves, fisheries, fertile soils, tourism attraction and natural defence against erosion and inland floods as the most important services provided by nature (Rietbergen *et al.*, 2007).

ECOSYSTEM AND SPECIES DIVERSITY

The Wider Caribbean has been identified as one of the world's biodiversity "hot spots" (www.biodiversityhotspots.org). The IUCN Red List evaluated 2074 species in the Caribbean islands alone and found that 2.2% were extinct and 38% threatened. Of the 1,920 terrestrial species, 206 marine species and 347 freshwater species evaluated,¹ respectively 38, 22 and 22% are threatened. Predictably, the largest numbers of threatened species are found on the larger islands, which have more species. Appendix 2 lists the number of threatened species by taxonomic group and country.

Despite extinctions, the Caribbean is one of the most biologically diverse regions in the world, and due to its insular nature also has an unusually high proportion of endemic species. A review for IUCN's World Commission on Protected Areas (WCPA) in 2003 estimated that 54% of vertebrates and

59% of plants are endemic to the region (Heileman, 2005). In Jamaica, for example, there are 3,003 species of flowering plants, 28% of which are endemic, and more than two thirds of the 61 species of reptiles and amphibians found there are endemic.

HISTORICAL AND CULTURAL CONTEXT

Patterns of natural resource use that preceded European colonization had very little negative impact on the environment, but they prefigured an important feature of Caribbean ecology with the early introduction into the islands, primarily from South America, of plant and animal species that have since become integral parts of Caribbean landscapes. A main characteristic of the region's modern environmental history is this "creolization" of the flora and fauna through importations from South and Central America, Africa, Asia, Europe and the Pacific, and the radical transformation of the natural environment and destruction of natural ecosystems, primarily to accommodate the widespread establishment of the plantation system, based on slave labour and geared exclusively towards export markets.

Several aspects of the region's colonial legacy can help explain current patterns of natural resource use, and inform environmental policy and action:

- The plantation system which has dominated most landscapes, especially in valleys, on flat lands and in coastal areas, is responsible for existing land tenure and ownership patterns, with the prevalence of large estates and the continued ownership of a large proportion of land by a small number of holders.
- Typically, therefore, small holdings are located on less favourable terrains that were not occupied or have been abandoned by large plantations, especially in mountainous areas with steep slopes and shallow soils.
- In several countries, however, the historical pattern of land ownership has been dismantled through land reform programmes aimed at establishing small peasantries, as in the case of St Vincent, or through the transfer of land to the state in revolutionary Cuba.
- People have used many informal ways to resist or respond to the dominant system of land tenure and distribution, including the establishment of maroon communities in mountainous areas during the time of slavery (Jamaica), settlement of marginal lands following emancipation in the 19th century, and establishment of forms of communal land and resource management systems, especially through undivided family lands.

¹ This amounts to more than 2,074 species as some species occupy more than one type of habitat.



- Many non-farming resource use and production systems, notably artisanal fishing and forest-based activities, are an expression of this response to the dominant system, where people have developed alternative livelihood strategies that are autonomous and highly dependent on natural resources.
- In this picture, Haiti stands out as a special case, because it dismantled the colonial plantation system and established a small peasantry much earlier than other countries, but political and environmental factors (including those provoked by the large-scale use of charcoal production as a source of hard currency to proudly repay its “debt” to its former masters) have created very peculiar conditions that are in large part responsible for the country’s extreme poverty.
- The smaller islands are also a special case: islands such as the Grenadines or parts of the Bahamas that were too small and too dry to permit the establishment of plantations in the colonial era, and where completely different production systems were established, based largely on marine resource use (fishing and seafaring).
- Since colonial times, women and men in the region have utilized distinct species to support their livelihoods, based on household or economic needs that result from their separate and gender-based responsibilities.

2. TRENDS IN HUMAN WELL-BEING: DEVELOPMENT AND GOVERNANCE

DEVELOPMENT AND POLITICAL OVERVIEW

Regional heterogeneity is not restricted to culture, language, population size, and geography. Although the products and services of Caribbean countries are similar, there is considerable variation in their economic and social profiles. The region includes one beneficiary of the multilateral Heavily Indebted Poor Countries (HIPC) Initiative, Guyana, and the developing countries with the highest and lowest GDP per capita in the Western Hemisphere, the Bahamas and Haiti respectively (UN-ECLAC 2005). Trinidad and Tobago has a plan to achieve developed country status by 2020 and Jamaica is preparing its strategy to do the same by 2030.

Like other Small Island Developing States (SIDS), the sustainable economic development of Caribbean countries is challenged by:

- the small size of their economies, which makes it difficult to realize gains from economies of scale;
- a high degree of openness and exposure to shocks from the international economy, as has been seen with tourism downturns and volatility in commodity prices;
- lack of diversification and dependence on a narrow range of exports;
- dependence on imports, notably energy and industrial supplies, and limited import substitution possibilities;

- high energy communication and transportation costs (Briguglio, 1999; Witter, 2003);

- vulnerability to climate change.

The Caribbean is as much defined by its history as its geography. The dependent territories have a range of relationships with the metropolitan powers, for example Martinique and Guadeloupe are overseas *départements* of France and elect members to the national assembly in Paris, while the British, Dutch and United States (US) territories have locally elected national governments. There is a great variety of political systems in the independent countries, with a revolutionary government in Cuba, parliamentary democracies modelled on the Westminster system in most of the Commonwealth Caribbean, other forms of presidential and parliamentary systems in the Dominican Republic and Suriname, and a fragile democracy emerging from decades of dictatorship in Haiti. Patterns of social, economic and political association between countries have traditionally reflected former or current colonial affiliations, but changes to the external environment have prompted new forms of regionalism (Girvan, 2000).

The formal regional mechanism with the broadest membership is the *Association of Caribbean States (ACS)*, based in Trinidad and Tobago, which includes all countries around the Caribbean Basin

except the USA. The ACS focuses on four areas: trade, transportation, tourism and natural resources. Its objectives are stated as “the strengthening of the regional co-operation and integration process, with a view to creating an enhanced economic space in the region; preserving the environmental integrity of the Caribbean Sea which is regarded as the common patrimony of the peoples of the region; and promoting the sustainable development of the Greater Caribbean”.

The *Caribbean Community (CARICOM)*, with a secretariat in Guyana, is the other major intergovernmental grouping. Its membership includes the countries of the Commonwealth Caribbean, plus Suriname and Haiti. Moves towards regional integration within CARICOM have recently been strengthened with the establishment of the Caribbean Single Market and Economy (CSME) and the Caribbean Court of Justice. The CSME provides for the free movement of people, goods, services, and capital, and will lead to harmonized laws and social, economic, environmental and trade policies in participating Member States.

The *Organisation of Eastern Caribbean States (OECS)*, with its headquarters in Saint Lucia, is a sub-regional grouping comprised of Anguilla, Antigua and Barbuda, the British Virgin Islands, Dominica, Grenada, Montserrat, St Kitts-Nevis, St Lucia, and St Vincent and

the Grenadines. It facilitates regional cooperation in a number of sectors, including education, environment, health and sports, and is in the process of establishing an Economic Union that makes provisions for common legislation across Member States. It is anticipated that environmental legislation is the first area in which Member States will move on this front.

While the dependent territories of the eastern Caribbean are members of the OECS, most are not members of CARICOM or the ACS, but are part of the Caribbean Development and Co-operation Committee of the United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC). Appendix 3 provides an overview of membership of the main regional inter-governmental organizations.

DEVELOPMENT DRIVERS

After near-zero growth in 2000 and 2001, the region has been experiencing positive growth rates since 2003 (UN-ECLAC, 2007). The main growth sectors are tourism and construction, with financial services, mining and energy also making significant contributions in selected countries. Once the main engine of growth, agriculture has remained stagnant or contracted in most countries but continues to be important and to play a significant social role (ECDPM, 2006).

- *Tourism* makes up approximately half of the Caribbean's earnings from goods and services exports (UN-ECLAC, 2005). In 2000, tourism revenues equalled US\$19.6 billion (Silva, 2002). Visitor arrivals fell in the immediate aftermath of 11 September 2001, but have since increased, although some countries have seen a drop in their global market shares. While the product has typically emphasised "sea, sun and sand", countries are attempting to diversify. Ecotourism and community-based heritage tourism are being developed in several countries including Dominica, Jamaica and Saint Lucia. However, the continued construction of large-scale resorts across the region (see below), the encouragement provided to the cruising industry, and recent investments in mega-yacht facilities in several countries, in the face of low levels of investments in community and heritage tourism, point to a certain disconnect between discourse and action.
- *Construction* increased by 14% in 2005 (UN-ECLAC, 2006c), fuelled in part by tourism and the 2007 Cricket World Cup. In many cases, this has been accompanied by inflows of foreign direct investment. All of the countries that hosted the Cricket World Cup (Antigua and Barbuda, Barbados, Grenada, Guyana,

Jamaica, St Kitts and Nevis, Saint Lucia, and St Vincent and the Grenadines) built and/or refurbished stadiums and improved infrastructure.

- *Mining* is an important economic activity in Guyana, Jamaica, and Trinidad and Tobago, (Heileman, 2005). Along with *oil exploration*, it is an important source of foreign exchange for some countries and both are expected to increase even in states where the activities have so far not been significant. For example Cuba is increasing its exploitation of oil and nickel reserves (Caribbean Net News, 21 March 2007). Increases in international demand for bauxite translated into sectoral growth in Jamaica in 2006 (CDB, 2007). However, concern about the negative impacts of open-pit bauxite mining on human health, communities and the environment is growing.
- Although faced with the loss of guaranteed markets for traditional exports, notably sugar and bananas, the *agricultural sector* continues to be important in many countries. The Windward Islands and Guyana are still "heavily dependent on a limited number of agricultural commodities, such as sugar, rice, bananas and rum, for their export earnings and socio-economic stability" (ECDPM, 2006). While some countries, like Jamaica, have sought to diversify agricultural production, others, like St Kitts (which

closed down its sugar industry in 2005, bringing to an end the last sugar monoculture in the eastern Caribbean) are developing alternatives.

- Ninety percent of *all energy* used is derived from petroleum, most of which is imported at high cost to the countries (UWICED, 2002). Per capita energy consumption is high in general but particularly so in the US Virgin Islands, the Netherlands Antilles, and Trinidad and Tobago. Faced with high energy prices, some countries are investing in renewable energy alternatives such as wind power in Barbados or hydroelectricity in Dominica and St Vincent. Large-scale hydroelectricity production for export is also being considered in Guyana. From the demand side, generating electricity from ethanol produced from biomass feedstock is being considered in sugar-producing countries such as Barbados, the Dominican Republic and Jamaica. Bagasse, a by-product of sugar cane, is already used to co-generate electricity in Cuba. Export of ethanol to the US market is being considered as this market has moved from oversupply to undersupply as a result of a ban on methyl tertiary-butyl ether now replaced by ethanol.

Caribbean economies are heavily dependent on trade. The dismantling of preferential trade agreements has

Box 1. The Cotonou Agreement

The Cotonou Agreement is a 20-year partnership that covers politics, development cooperation and trade relations between the EU and the ACP countries. The Agreement aims to reduce poverty and contribute to sustainable development while supporting the integration of ACP countries into the global economy.

The Cotonou Agreement replaced the four Lomé Conventions that previously provided the framework for EU-ACP relations. A critical difference between the regimes is in economic and trade cooperation: whereas Lomé gave ACP goods preferential, non-reciprocal access to European markets, Cotonou provides for reciprocal access. This change will make EU-ACP trade relations compatible with WTO rules.

As of 2008, under a series of EPAs, the EU and ACP countries will each provide duty-free access to each other's goods and services. In keeping with Cotonou's principle of differentiation, the least developed (LDC) members of the ACP group will not be required to immediately provide duty-free access to their markets and those non-LDCs that are not ready to enter into an EPA can trade under the EU's Generalized System of Preferences. EPAs are negotiated on a regional basis between the EU and the six ACP regions. CARIFORUM, the Caribbean Forum of ACP States, has been responsible for the EPA negotiations in the region.

contributed to the decline of the traditional agricultural sector and increased competition in the international marketplace. The World Trade Organization (WTO) waiver to the 2000 Cotonou Agreement (Box 1) between the European Union (EU) and the African, Caribbean, and Pacific (ACP) group of countries will expire at the end of 2007; and an Economic Partnership Agreement (EPA) between the Caribbean ACP countries and the EU is expected to enter into force in 2008. The potential impact on national economies and livelihoods of the level of liberalization of domestic markets that would occur under the EPA causes serious concern among governments. One result is that countries traditionally

dependent on export of sugar or bananas to the EU market are exploring alternatives, especially tourism and biofuels.

Poverty

All countries ranked in the Human Development Index of the United Nations Development Programme (UNDP) fall within the high and medium development categories except Haiti, where the level of development ranks low (UNDP, 2006). In the World Bank's classification system, based on gross national income per capita, Caribbean countries are considered middle- and high-income,² except Haiti, which is classified low-income. Despite generally favourable social development rankings,

² The lower-middle income Caribbean countries are Cuba, Dominican Republic, Guyana and Jamaica. Upper-middle income countries are Barbados, Belize, Dominica, Grenada, St Kitts, St Lucia, St Vincent and the Grenadines, and Trinidad and Tobago. High-income countries are Aruba, Bahamas, the British Virgin Islands, Cayman Islands, the French départements, the Netherlands Antilles, and the US Caribbean Territories

poverty is a concern across the region. Studies carried out in 2003 found that 25% of the overall Caribbean population can be categorized as poor, and looking closer within those impoverished groups, more women than men live in poverty (Trotz, 2003).

The region's poverty profile points to a lack of equity, with variations between and within countries (UNDP, 2004). The percentage of the population below the poverty line ranges from 79% in Haiti and 35% in Guyana to 12% in Antigua and Barbuda (World Bank, 2005). The high debt burdens of Guyana and Jamaica have led to restrictions in social sector spending, and contractions in the traditional agricultural sector have contributed to increasing poverty among rural populations in the eastern Caribbean. The retreat of the state as welfare provider in many countries affects the poor and the marginalized in particular (CANARI, 2005).

Poverty is not new, but it is becoming more nuanced (CDB, 2007). Of particular concern is the high level of youth unemployment and the poverty-crime nexus linked to a growing drug and gun culture. The new forms and dimensions of poverty include the growth in urban poverty and its associated social problems of crime and insecurity, new forms of rural poverty, the socio-economic impact of HIV/AIDS, particularly on productive young adults, the ageing of populations, and the

absence of adequate social protection networks (CDB, 2007).

Human security

Crime and violence are a main threat to human security and welfare and are hampering economic growth. The Caribbean has the dubious distinction of having the highest regional murder rate, and assault rates are above the world average. It has been estimated that if Jamaica and Haiti were to reduce their crime rates to the level of Costa Rica, each country would increase its annual economic growth by 5.4%. The drug trade and associated organized crime are closely linked to the increase in illegal activity and violence across the region. Young men are disproportionately represented among the victims and perpetrators of crimes (UNODC and World Bank, 2007).

HIV/AIDS

The Caribbean is the region in the Western Hemisphere most affected by HIV/AIDS, which is the leading cause of death among adults between the ages of 15 and 45 in the region. HIV prevalence is particularly high in the Bahamas, Haiti, and Trinidad and Tobago. In sharp contrast, Cuba has one of the lowest prevalence rates in the world (UNDP, 2006). UNAIDS estimates that an HIV prevalence rate approaching 1% can rapidly affect the economic stability and overall health of the region.

Gender equality

In the Gender-related Development Index (GDI), Barbados ranks highest (27) while Haiti is the lowest country (122). The Caribbean is one of many regions dealing with "feminized poverty", due to women's unequal access to natural, economic, and household resources. While labour force participation rates are higher for women in the Caribbean than in other regions, Caribbean women face higher unemployment rates, greater obstacles to entering the workforce, and unpaid labour at home and in agriculture. The Caribbean's heavy debt burdens that have channelled public funds away from health and education are particularly onerous for women, who carry the greatest responsibility for family and community care-giving. Another growing phenomenon of gender inequity in the region is the increased marginalization of young men and male under-achievement in the formal educational system.

3. ENVIRONMENTAL ISSUES AND TRENDS

MAIN DRIVERS OF ENVIRONMENTAL CHANGE

The status of natural resources and biological diversity is determined, to a large extent, by the main features of ecology, geography, history and political economy described in Sections 1 and 2. In addition, much of the environmental change currently taking place in the Caribbean is driven by one or more of four factors:

- *Global markets and external trade relations* determine patterns of resource use, shift local livelihoods and concentrate pressure on particular areas and resources. Bananas and tourism are classic illustrations of this phenomenon. As the banana market has declined, so have its negative environmental impacts, especially on watersheds and forests. Tourism's impacts continue to increase, driven by trends towards bigger, more all-inclusive resorts and mega-cruise ships. However, the issues related to global markets are complex. Banana expansion, especially in the Dominican Republic, Jamaica and the Windward Islands, contributed heavily to loss of forest cover and watershed degradation, but the income from the sector improved the living standards of thousands of poor rural families, with positive impacts on health, education and social mobility. Similarly, tourism, where much of the

private foreign investment has recently taken place, has been a major contributor to environmental degradation, particularly affecting coastal and marine ecosystems. But the foreign exchange and job opportunities that it generates have helped governments provide services and increased family income and livelihood options, and the sector has created a demand and provided incentives for conservation and environmental management.

- *Consumption patterns and increased demands for environmental services* are also responsible for environmental change. Energy and water use are the most significant. In the case of water, this is caused in part by the huge demands from the tourism sector, and it is ironic that the countries that experience the highest rates of water scarcity, such as Antigua and Barbuda or the Bahamas, are also the most attractive to mass tourism, and thus have the greatest needs for water. The changes in consumption patterns are also caused, in part, by cultural change, but such change is not always negative. Indeed, Caribbean societies are witnessing a rise in environmental consciousness that is partially induced by external influences, especially the media.
- *Demographic change* has increased the concentration of people in ecologically sensitive areas, including

coastal zones and hillsides. In many countries this is driven by a growing middle class; in others, such as the Bahamas, and the Turks and Caicos, intra-regional migration from poorer countries is also a contributing factor. Meanwhile, all countries are witnessing rapid rates of urbanization and migration from rural to urban areas, resulting in increased demands for water and energy, and in increased problems associated with waste management and sanitation.

- *Dependency and fragmentation* remain very significant forces shaping Caribbean societies and economies, and thus determining their relationships with natural resources and the environment. Because of their small size and the characteristics of their natural resource base, most countries are dependent on trade and external sources of energy. As a result of fragmentation, cooperation and collective action within the region remain weak, environmental management often does not take place at the scale at which it is needed, and countries often compete with each other, especially for investment, in a manner that is eventually detrimental to the environment.

Some analysts would also include *poverty* in the above list, but it may be more accurate to say that it is environmental change that is a driver of

poverty. In the dramatic case of Haiti, the refugees who risk their lives to leave the country are environmental refugees as much as they are economic or political refugees. Recent research in the Dominican Republic and Saint Lucia (Renard, 2005; Lamelas and Lum Lock, 2006) suggests that even very poor people manage natural resources effectively and sustainably when they have the institutions to do so. Control over natural resources and their use has been, and remains, in the hands of the wealthy and powerful (including governments), and the poor have been forced to exploit the ever-decreasing margins.

Public policies and institutional arrangements, which are part of the responses described in Section 4, also contribute significantly to environmental change, in both positive and negative terms. In most countries, the fact that the main source of fiscal revenue is import duties encourages patterns of consumption and development that may be detrimental to biological diversity and environmental sustainability. In the French overseas territories, for example, there are special policies aimed at encouraging investment and filling the gap between continental France and these territories. Palasi *et al.* (2006) have analysed these policies and concluded that they encourage the multiplication of development projects without taking into account their impact on biodiversity. The

report reaches the same conclusion regarding the allocation of EU funding and subsidies to overseas territories, structural funds for French *départements*, and European Development Fund (EDF) investments for UK and Dutch territories.

Lastly, it is expected that *climate* will become a major driver of change. SIDS and low-lying coastal areas are vulnerable to climate change because of their degree of exposure and limited capacity to adapt. The prospect of sea-level rise leading to shoreline erosion, flooding, higher water tables, salt water intrusion and property loss, is a major concern. Warming will impact habitats including coral reefs that are already experiencing significant stress, and practices in forestry and agriculture will also be affected. Shifts in precipitation patterns are expected; in small islands with little storage capacity, this will contribute further to water scarcity, and catchment protection will be vital to adapting to climate change and population growth, including tourism growth. Lastly, tropical storms are projected to increase in number and intensity with higher water temperatures, leading to greater storm damage in the future (London, 2004; IPCC, 2007). While climate change is a clear threat, it could also present opportunities, especially if the region takes advantage of markets for carbon offsets.

MAJOR ENVIRONMENTAL ISSUES AND TRENDS, AND THEIR RELATION TO HUMAN WELL-BEING

At a fundamental level, many trends affecting ecosystems contributing to human well-being in the insular Caribbean are a reflection of the limited land available for an ever-widening number of uses and users, and the limited human, technical and financial resources of countries that often have good environmental laws and policies but little ability to implement them effectively. Finally, they reflect continued patterns of inequitable resource allocation that have allowed valuable public goods such as beaches and forests to be managed for the short-term benefit of a few rather than sustainable use by all.

Just as economic and social history have shaped the Caribbean landscape as it appears today, trends now occurring are reshaping it in ways that have both negative and positive implications for ecosystem health and human well-being.

One defining characteristic of SIDS is the close relationship between ecosystems and the rapid movement of impacts from “ridge to reef”, which makes an ecosystem-based approach to environmental management particularly appropriate. The following analysis looks at issues and trends in four broad ecozones that are of most

importance to human well-being: watersheds, forested areas, coastal areas, and coral reefs, and then identifies issues that relate to biological diversity. A summary of the analysis in this section and identification of some of the major current and recent responses, which are discussed in more detail in Section 4, can be found at Appendix 4.

Watersheds. Many countries rely almost entirely on a single source of water such as groundwater, import and surface flow. The situation is most critical in the low limestone islands of the eastern Caribbean where rainfall seasonality is very pronounced (Heileman, 2005). Watersheds are the most important source of water for human use in most countries. Not surprisingly, protection of watersheds was perhaps the first conservation concern to appear, and forest reserves established to protect watersheds preceded other categories of protected areas on many islands by decades or even centuries.³

Demand for watershed services, and particularly reliable provision of clean water, has been increasing with population, tourism and industrial growth, and rising incomes. However, watersheds are under pressure in nearly all countries. Water supply, quality and reliability have diminished as a result of upper watershed forest conversion, water source pollution, and soil erosion. In Dominica, rivers which are the main source of potable and irrigation water

are being harnessed for power generation and declining flows are of serious concern. Changes in rainfall pattern and pronounced periods of localized drought associated with climate change are expected to increase water stress. By international standards (water availability of 1000m³ per capita per year), Barbados, Antigua and Barbuda and St Kitts and Nevis are already considered water-scarce countries.

Conversion of upper watershed forests, particularly for agriculture and housing, is also resulting in losses of biodiversity, timber and other forest products, and nature tourism opportunities. Land-use decisions in watersheds rarely take the provision of services such as water production into account. The use of agrochemicals, particularly for crops grown for global markets, and inadequate sanitation and waste disposal in hillside communities contribute to reduced water quality and reliability, affecting consumers as well as key economic sectors and raising the cost of providing safe water.

Many upstream activities also have serious downstream effects. Soil erosion and landslides result in substantial economic losses each year. Floods as a result of unregulated run-off are a frequent phenomenon, and are especially damaging on steep islands with flat coastal plains such as the Dominican Republic, Haiti and Jamaica.

Sedimentation and pollutants flowing downstream affect coastal water quality, smother corals, kill fish and reduce the touristic and recreational value of beaches in many countries.

Those hurt the most are often the poor, and particularly the rural poor, whose hillside crops suffer from soil erosion, whose access to markets can be cut off by landslides and floods, and who are given the lowest priority when water supplies must be rationed. Among the rural poor, the most marginalized groups such as women and indigenous peoples are often given the lowest priority of all. Haiti offers the classic example of the effects of watershed degradation on the lives of the poor, but the problems exist throughout the region.⁴

Caribbean countries have relied on a range of tools for watershed management, including regulation and enforcement, state management of critical areas, education, and encouragement of stakeholder participation, and have more recently experimented with market incentives. While all of these have had some successes, they have not been able to reverse the loss of tree cover and deterioration of watershed services.

Forests. Whether primary or secondary, upland or coastal, forests have long been and remain important to human well-being. Timber production is a major industry in Guyana and an important contributor to local economies in many

³ For example, forest reserves for watershed protection were established in St Vincent and Tobago in the latter part of the 18th century and in Puerto Rico in 1876.

⁴ Recent reports on water management issues for Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominica, Grenada, Jamaica, St Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines, and Trinidad and Tobago, available online at www.oas.org/reia/IWCAM/IWCAM_Documents.htm. Reports on watershed management for Grenada, Jamaica, Saint Lucia and Trinidad available online at www.iied.org/NR/forestry/documents/Combined_Caribbean_diagnostics_June_03.pdf.

other countries. In the Dominican Republic, Guyana, Haiti, Jamaica and the Windward Islands, large numbers of people continue to depend, either steadily or periodically, on wood for fuel. Forest-based ecotourism has been developed in several countries (e.g. Dominica, Dominican Republic, Guyana, Jamaica, Saint Lucia and Suriname), providing employment and entrepreneurial opportunities for rural people. Forest-based recreation and education programmes provide important social services to people in countries such as Cuba, Puerto Rico, and Trinidad and Tobago. A wide range of non-timber forest products of social, economic and medicinal importance are harvested in virtually every country, even those with limited forest resources (John, 2005).

Statistics on forest cover are compiled every decade by FAO, providing a picture of trends over time (see FAO 2005 for the latest figures). These statistics indicate that forest cover is declining seriously in some countries (particularly Guyana, Haiti, Jamaica and the Windward Islands), holding steady in others (particularly the Leeward Islands), and increasing in only a few (Cuba and Guadeloupe). However, these figures need to be treated with caution, as no reliable systems of monitoring are in place in most Caribbean countries; reported figures therefore reflect estimates, sometimes based on past

trends (Eckelmann, pers. comm.). For example, Jamaica's Department of Forestry has published work contesting FAO's figure and maintaining that the rate of loss of Jamaica's forests during the 1990s was virtually negligible (Evelyn and Camirand, 2003).

Patterns of forest cover change are closely related to the region's economic history. Much native forest was destroyed during the 18th and 19th centuries to make way for plantation crops; on some of the smaller islands, virtually no native forest remained. The rise of new agricultural export markets has led to periods of intense deforestation, and the eventual loss of those markets has stimulated the expansion of secondary forest. This pattern has been apparent in the Windward Islands during and after the banana boom of the 1970s and 1980s. However, economic decline has also resulted in forest loss, when increasing numbers of people have had to depend on wood, from both upland and coastal forests (including mangroves) for fuel.

Because of the early widespread loss of primary forest, secondary forest has become critical to the protection of species and ecosystem services. However, forest conservation efforts have largely focused on the remaining vestiges of primary forest, and secondary forest is often seen by planners as fair game for development (Massol González *et al.*, 2006).

Coastal zones. The Caribbean is essentially a coastal region, and many critical natural habitats, species, and human activities are concentrated in the coastal zone. Given past patterns of land ownership that have concentrated access to fertile farm land in the hands of the wealthy, the coastal zone has been particularly important for the livelihood strategies of the poor, who have been able to exploit common pool resources such as fish and mangroves. Although the economic value of some coastal areas, especially those with prime beachfronts, has increased enormously with the emergence of tourism and a middle class in most countries, many coastal communities remain very poor and dependent on coastal resources for their survival. In the poorer countries, uncontrolled and squatter settlements have expanded rapidly in coastal areas, generating negative impacts on coastal water quality and coastal ecosystems.

Efforts to protect coastal zones, although considerable, have been unable to stay ahead of the anthropogenic and natural impacts on these areas. Tourism development is a major contributor to coastal degradation. The placement of hotels and tourism infrastructure close to the shoreline interferes with natural coastal processes and thus can exacerbate erosion, and the creation of yacht harbours and marinas has been

destructive of near-shore habitats critical to biodiversity, particularly mangroves and sea-grass beds.

Mangroves and coastal forests are among the region's most biologically diverse habitats. However, they were long seen as prime sites for development, and there were few controls on their destruction. While awareness of their ecological importance has increased considerably over the past two decades, and appropriate management measures have been introduced, huge areas of mangrove forest on many islands have already been lost to oil refineries, airports, tourism resorts, and solid waste dumps.

Increasing pollution is a major issue in most coastal areas. Many polluting industries are concentrated in the coastal zone in order to be accessible to sea transport. Moreover, because of the ridge-to-reef nature of small islands, regardless of where it originally occurs, pollution tends to end up in the coastal zone. Oil slicks and algal blooms are among the many diverse and common manifestations of pollution on coastal waters.

As the value of coastal areas for this range of uses has increased, change is occurring far more rapidly there than elsewhere and there is intense pressure to streamline or waive development controls. While a few countries, such as Barbados and Belize, as well as the

French *départements* and US territories, have legislation and management institutions specifically dealing with the coastal zone, many countries have no special instruments for regulating development in this ecologically critical zone.

Coral reefs. Coral reefs, which are the most biologically diverse habitats in the world, are important to human well-being in at least three ways. The nearshore fisheries that they protect form an important part of the diets of local people and also provide considerable revenue, especially to poorer fishers lacking the means to exploit offshore fisheries. Reefs help maintain shorelines by protecting the coast from heavy seas and storm surges, a role that will grow in importance with climate change-induced sea level rise. Finally, dive and yacht tourism have greatly increased their economic value to many countries (Burke and Maidens, 2004).

Recent attention has focused on the impacts of coral reef decline on biodiversity. Although research has been restricted to a few sites, long-term trends point to continuing decline in reef extent, diversity and health, particularly over the past twenty years. Nearly two-thirds of the coral reefs in the Caribbean are threatened by human activity. Major causes of reef degradation include coastal development impacts such as sewage discharge, urban runoff, and construction; pollution, particularly from sewage, agricultural chemicals, and marine-based wastewater discharge and oil leaks (one third of the reefs); sedimentation from land-based erosion (one third); and overfishing (over 60% of the reefs), including selective removal of desirable species. Diseases and rising sea temperatures and ineffective management of protected areas further threaten Caribbean coral reefs (Burke and Maidens, 2004).

Box 2. Estimated values of good and services provided by Caribbean coral reefs

Total net economic value in 2000: US\$3.1 billion to US\$4.6 billion

- Reef fisheries (Net annual revenues): US\$ 310 million
- Dive tourism (Net benefits) in 2000: US\$ 2.1 billion per year
- Shoreline protection: US\$700 million to US\$2.2 billion per year

Estimated annual loss in net revenues if trends in coral reef degradation continue

- Fisheries: US\$95 million to US\$140 million by 2015
- Tourism industry: US\$100 million to US\$300 million by 2015
- Shoreline protection: US\$140 million to US\$420 million within the next 50 years

Source: Burke and Maidens, 2004

Most of the initiatives in coral reef conservation and management take place within the framework of protected areas (see Section 4) or as part of integrated coastal zone management schemes.

Biological diversity. The terrestrial species composition in all countries was profoundly altered centuries ago and very few places can be considered ecologically “pristine”, but healthy and productive ecosystems have re-established themselves following eras of intense alteration. The biodiversity of the islands today reflects past patterns of exploitation and regeneration, and despite the fact that many species have been lost, others whose numbers have been reduced can still be saved.

Forest destruction is a major contributor to biodiversity loss, particularly when coupled with other factors. For example, endemic parrots on several islands whose numbers had been sharply reduced by habitat destruction have been brought to the edge of extinction following hurricanes that further destroyed forest cover.

Trends in marine biodiversity loss are more recent in origin than those for terrestrial species, except for selected species (e.g. marine turtles) and in critical habitats of the coastal zone (mangroves, sea-grass beds and coral reefs). Fish stocks have been declining on some islands, such as Jamaica, for many decades, and exploitation of

desirable species has contributed to changes in ecosystem species composition in some heavily fished areas.

Alien invasive species are another major contributor to species extinction and loss of both terrestrial and marine habitats (Kairo *et al.*, 2003). The introduction of alien invasive species started with colonization but has accelerated with the growth of transport for tourism and trade. Trade of agricultural products is especially conducive to the introduction and propagation of alien invasive species. Climate change is another cause of propagation because it causes species to dominate new areas to adapt to the changes. Genetically modified organisms can also be considered potentially invasive species. While many species have become important constituents of Caribbean habitats and contributors to local livelihoods, others have been hugely destructive. For example, the Indian Mongoose (*Herpestes auropunctatus*), introduced to many islands in the 19th century to control another invasive alien, the rat, has been linked to the extinction of five endemic species in Jamaica alone (Kairo *et al.*, 2003). A recent compilation of existing information found that a total of 118 marine invasive species were known in the region (Lopez and Krauss, 2006).

4. POLICY AND MANAGEMENT RESPONSES

OVERVIEW

Environmental policy is a mosaic of national, regional and international statements and initiatives that includes the major international environmental conventions; the United Nations Convention on the Law of the Sea and enforcement of maritime boundaries; regional agreements such as the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention) and its Protocols; sub-regional agreements and policy statements such as the St George's Declaration of Principles for Environmental Sustainability in the OECS (SGD); and national policies and legislation. In many ways these are mutually reinforcing, with an effort in recent years to build national policy and capacities on the basis of regional and international institutions and agreements. However, the sheer complexity of the policy framework and the demands it places on governments often overtax the limited resources of national environmental management institutions. This is a particular concern because, while the policy environment is multi-layered, environmental management is mainly national in character, although donors, international assistance agencies and international NGOs often play major roles in defining and enabling management interventions.

Most responses at all levels tend to focus on environmental issues and impacts rather than their underlying drivers. Climate change is to some extent an exception as it is the focus of several initiatives; however Caribbean countries do not consider themselves to be net contributors to climate change and therefore responses are limited to adaptation.⁵

Most countries have made efforts to mitigate the negative impacts of development and demographic change through instruments such as land-use regulations and EIA legislation; however capacity to implement such provisions is limited and political interference in favour of constituents and powerful economic interests is common.

Public sector investments in environmental management have been significant in many countries, particularly for sewage treatment, solid waste management and water catchment management. Multilateral development banks, including the World Bank, the Inter-American Development Bank (IDB) and the Caribbean Development Bank (CDB), have supported large public sector initiatives in these areas over the past three decades.

Most recent national and regional policies include provisions for stakeholder participation. NGOs have been leading efforts to increase awareness and understanding of environmental issues for the past 30

years, and since the 1980s, national environmental NGOs have proliferated, with many development NGOs also addressing the linkages between development and environment. Community-based organizations have been important actors in environmental management, with many examples of collaborative and participatory management institutions, especially for protected areas. Women's organizations have also played an important role in bringing attention to environmental issues and the community impacts of environmental devastation.

Private sector involvement in environmental management has largely come from small locally-owned businesses. Efforts to encourage greater participation of mainstream tourism and major resort chains have had generally disappointing results; however there are signs of change resulting from external threats (e.g. possible change of travelling behaviour in countries where tourists come from) and external opportunities (e.g. markets for carbon offsets). Some private sector companies have sought environmental certification such as Green Globe (hotel industry), Blue Flag (beaches and marinas), ICAN MAR standards (marine recreation) and ISO2000 and 1400 (industry).

In spite of these advances, the public policy framework for environmental management remains largely oriented towards control, regulation and a

⁵ The dependence of the tourism industry on air travel is however being mentioned as a contribution to climate change that the region's countries are not taking into account when computing their net use of fossil fuels.

reactive approach to environmental issues. Economic instruments, including environment service markets, have been promoted by some donors and governments as means of changing destructive patterns of behaviour. Further experimentation is needed to understand under which conditions they could provide suitable incentives to change behaviour and reduce biodiversity loss

REGIONAL COOPERATION FOR ENVIRONMENTAL MANAGEMENT

Because of their small size, limited national capacity, and interlocking environmental, economic, political and social systems, both countries and international agencies depend heavily on a wide variety of regional mechanisms and institutions. At the same time, the region's fragmentation, by language, politics and colonial history, means that only a few mechanisms serve the entire Wider Caribbean.

Intergovernmental bodies

The regional institutions mentioned earlier are all involved in environmental management and sustainable development. The main environmental focus of the ACS is sustainable tourism; it also hosts the Caribbean Sea Commission and is responsible for implementation of the UN Resolution of December 2006 which recognises a status of Special Protection for the

Caribbean Sea. CARICOM serves a coordinating and policy advisory role, and many of the main regional institutions and programmes of relevance to environmental management and biodiversity conservation are linked to it. These include the following:

- The *Caribbean Centre for Development Administration* (CARICAD) in Barbados is the CARICOM institution charged with “upgrading and strengthening the managerial capability of the public sector for the more effective implementation of public policy”. Although not currently active in environmental management issues, CARICAD has in the past supported the development of Sustainable Development Councils on several islands.
- The *Caribbean Community Climate Change Centre* (CCCCC) in Belize was established in August 2005 to coordinate research and provide expertise to help countries prepare for and adapt to climate change and to meet obligations under the United Nations Framework Convention on Climate Change (UNFCCC). It is also the official repository and clearing house for regional climate change data and is responsible for coordinating the GEF-funded Mainstreaming Adaptation to Climate Change (MACC) project.

- The *Caribbean Disaster Emergency Response Agency* (CDERA), based in Barbados, is charged with providing support to countries in response to disasters as well as offering guidance and assistance on disaster preparedness and management.
- The *Caribbean Environmental Health Institute* (CEHI), based in Saint Lucia, provides advice and technical assistance to governments on issues related to environmental health, including water and waste management. It is also a co-executing agency (with the UNEP Caribbean Environment Programme) of the recently launched Integrated Watershed and Coastal Area Management Programme.
- The *Caribbean Regional Fisheries Mechanism* (CRFM), established in 2002 and based in Belize, provides support to national efforts to manage and conserve fisheries resources, as well as those shared by CARICOM Member States.
- *CARIFORUM*, the mechanism established to coordinate regional assistance programmes of the European Union, has recently become a function of CARICOM and therefore no longer exists as an independent entity.
- CARICOM also implements the *Caribbean Renewable Energy Development Project*, whose aim is

“to reduce barriers to the increased use of renewable energy thus reducing the dependence on fossil fuels while contributing to the reduction of greenhouse gas emissions”.

The OECS has an *Environment and Sustainable Development Unit* (ESDU) that provides services related to natural resource and environmental management to its Member States. ESDU has been responsible for coordinating the development, implementation, review and revision of the SGD and has provided support to Member States to develop National Environmental Management Strategies (NEMS) for implementing the SGD at a national level. ESDU's programme areas include biodiversity and protected areas; environmental management and planning; environmental training and awareness; and sustainable livelihoods. Among its current activities is the coordination of the OECS Protected Areas and Associated Livelihoods (OPAAL) project, which examines approaches to enhancing livelihoods benefits through the protection of biodiversity. The OPAAL project is co-funded by the Organization of American States, the French Government through the French GEF, *Fonds Français pour l'Environnement Mondial* (FFEM), and GEF through the World Bank.

Regional development banks

The region is served by two regional and multilateral development banks, the Inter-American Development Bank (IDB), which also serves Central and South America, and the Caribbean Development Bank (CDB).

The IDB's assistance is largely defined by a Regional Strategy for Support to the Caribbean Community (2007–2010), whose overall objective is to help countries transform their regional integration process into an effective instrument of global integration, competitiveness and economic growth. It also provides assistance to Member Countries in a range of areas related to the environment, including ecotourism development, disaster and climate change management (it is one of the agencies involved in the recent establishment of the Caribbean Catastrophic Risk Insurance Facility – CCRIF), forestry, natural resource management and conservation, environmental institutions, pollution control, and waste management. Its current portfolio includes projects in several countries, including the Bahamas (ecotourism), Haiti (forestry) and Suriname (forestry). It is also one of the major supporters of the MACC project mentioned above. It is providing support to CDERA to develop township-planning strategies for storm surges and a regional disaster risk management strategy for sustainable tourism.

The CDB's focus is “the systematic reduction of poverty through social and economic development”. Its membership includes most of the CARICOM members plus a few continental Caribbean countries and several bilateral donor countries. In the field of the environment, CDB maintains a Disaster Mitigation Facility to assist Member Countries to improve their capacity to respond to natural hazards and climate change, and it is an active participant in the process of establishing the Caribbean Disaster Management Framework (CDMF) and the CCRIF.

Caribbean Environment Programme

The main regional environmental programme in the field of marine and coastal conservation is UNEP's *Caribbean Environment Programme*, with a Regional Coordinating Unit based in Kingston, Jamaica and responsible for promoting and monitoring the implementation of the Cartagena Convention and its three Protocols: Protocol Concerning Cooperation in Combating Oil Spills, Protocol concerning Specially Protected Areas and Wildlife (SPAW) and Protocol on Marine Pollution from Land-Based Sources (LBS Protocol). CEP is a source of regional expertise in a range of issues related to the marine environment, particularly protection of marine ecosystems and wildlife, marine pollution, and land-based impacts on the marine environment. It operates



through sub-programmes addressing individual Protocols; the sub-programme for the Protocol on Specially Protected Areas and Wildlife (SPA) has been very active in supporting regional cooperation on marine biodiversity conservation and protected area management. It is responsible for the regionalization of global conventions and initiatives including the Convention on Biological Diversity (CBD), the International Coral Reef Initiative, and the Global Coral Reef Monitoring Network. It has developed a “training of trainers” course in marine protected area (MPA) management which it offers periodically to both the English and Spanish-speaking Caribbean. It has also supported countries to develop action plans for the protection of endangered marine species including turtles (in collaboration with WIDECAS; see below) and marine mammals. SPA’s programme is carried out with the assistance and support of the Regional Activity Centre (RAC) in Guadeloupe, which operates under the auspices of the Government of France. It is also a co-executing agency (with CEHI) of the recently launched Integrated Watershed and Coastal Area Management Programme (IWCAM). This GEF-funded project is one component of the CEP sub-programme on Assessment and Management of Environmental Pollution (AMEP). The second component is a GEF project on Reducing Pesticides Runoff to the Caribbean Sea.

Other mechanisms for regional cooperation

CaMPAM: The Caribbean Marine Protected Areas Network began as an initiative of the SPAW Programme to create a mechanism through which MPA managers could share information and experiences. It consists of an electronic forum as well as periodic meetings, which are currently linked to the annual meetings of the Gulf and Caribbean Fisheries Institute (GCFI).

Caribbean Foresters’ meetings. These regional meetings held every two years are organized by the International Institute of Tropical Forestry, and they bring together foresters and other government officials working in forest and natural resource management at the national level. Meetings take place in a different country each year, and each meeting addresses a specific theme; for example, the theme of the 2006 meeting, held in Jamaica, was “possibilities and approaches to idle lands in the Caribbean”.

Caribbean Hotel Association (CHA), based in Puerto Rico, has been a major supporter of sustainable tourism, particularly through the Caribbean Alliance for Sustainable Tourism (CAST) described elsewhere in this report, and through its promotion of the Green Globe and Blue Flag certification programmes. It has recently developed, in collaboration with the Caribbean Tourism Organisation (see below) a

position paper on Caribbean tourism and climate change⁶ and is supporting an initiative to make Caribbean tourism carbon neutral.

Caribbean Tourism Organisation (CTO), based in Barbados, is the region's main tourism trade organization with a far-reaching membership. CTO organizes an annual regional conference on sustainable tourism and works closely with CHA and CAST to promote Green Globe and Blue Flag certification initiatives.

WIDECAST: The Wider Caribbean Sea Turtle Conservation Network comprises scientists and conservationists from both the region and the international community concerned with the management and recovery of endangered, threatened, and vulnerable sea turtle stocks. Working through Country Coordinators and local partners, it has helped many countries to develop national Sea Turtle Recovery Action Plans and to implement specific sea turtle conservation measures.

In addition to these institutions, it is worth mentioning the initiative taken by Cuba, the Dominican Republic and Haiti in 2007 to establish the first *Caribbean Island Biological Corridor* in order to contribute to the reduction of biodiversity loss and to facilitate the human-nature relationship. It offers important linkages among landscapes, ecosystems, habitats and cultures to maintain essential and evolutionary

ecological processes and environmental services and to promote sustainable development.

NATIONAL GOVERNMENTS

National institutions

Caribbean countries have made significant progress in establishing comprehensive policy, institutional and legal frameworks for environmental management and sustainable development. The arrangements for the management of the environmental portfolio vary from country to country, and the main formulas are:

- establishment of ministries that are exclusively or principally dedicated to the environment, as in the case of Barbados (Ministry of Energy and the Environment), Belize (Ministry of Natural Resources, Environment and Industry), Cuba (*Ministerio de Ciencia, Tecnología y Medio Ambiente*), the Dominican Republic (*Secretaría de Estado de Medio Ambiente y Recursos Naturales*) and Haiti (*Ministère de l'Environnement*);
- establishment of a national environmental management institution, as in the case of Cuba, Guyana (Environmental Protection Agency), Jamaica (National Environment and Planning Agency) and Trinidad and Tobago (Environmental Management Authority);

- allocation of the environmental portfolio to the Ministries responsible for Agriculture (Dominica and St Kitts) or Health (Grenada, and St Vincent and the Grenadines);
- creation of a sustainable development or environment portfolio under the Ministries responsible for national planning and development (Nevis and Saint Lucia);
- creation of a coordinating body bringing together the main agencies responsible for environment, as in the case of Grenada's National Sustainable Development Council and Barbados' National Commission on Sustainable Development.

Some countries have also established agencies to deal with specific aspects of environmental management. Examples include the Coastal Zone Management Unit of Barbados and the Coastal Zone Management Authority of Belize. Most countries have well-established departments that are responsible for forestry, fisheries and water management, and these are typically (but not always) housed within the Ministries responsible for agriculture.

In the case of the dependent territories of the Netherlands, the UK and the USA, environmental management is the responsibility of the decentralized government, as in the case of Anguilla (Environment Department in the Chief Minister's Office), the British Virgin Islands (Ministry of Natural Resources

⁶ See <http://www.caribbeanhotels.org/ClimateChangePosition0307.pdf>.

and Labour), the Cayman Islands (Department of the Environment), Montserrat (Ministry of Agriculture, Trade and the Environment), the Netherlands Antilles (Department of Nature and Environment in the Ministry of Public Health), Puerto Rico (Department of Natural Resources and Environment), the Turks and Caicos Islands (Department of Environment and Coastal Resources in the Ministry of Natural Resources), and the US Virgin Islands (Department of Planning and Natural Resources). In each of the three French *départements* of Guadeloupe, *Guyane*, and Martinique, the central government is represented by a *Direction Régionale de l'Environnement* (DIREN).

National legislation and planning

The strengthening of national institutions is itself a reflection of the significant strengthening of the national policy, legal and planning frameworks. Only a few countries have developed National Sustainable Development Strategies, but most have formulated a national environmental policy, a national environmental management strategy, or equivalent. A regional project funded by the Canadian International Development Agency (CIDA) has enabled most OECS countries to develop a NEMS. A table indicating the status of national environmental policies and plans of the independent countries is provided in Appendix 5.

Participation in international treaties

Caribbean countries are active participants in all the main international environmental treaties and conventions, especially the three Rio Conventions (United Nations Convention on Biological Diversity, United Nations Convention to Combat Desertification and United Nations Framework Convention on Climate Change). At the regional level, the main international agreement is the Cartagena Convention and its Protocols. A table showing the status of adoption of the main conventions by the independent countries is included at Appendix 6.

Dependent territories participate in these conventions through their respective metropolitan countries. This creates a situation that is a significant factor in environmental policy and diplomacy in this region: France, the Netherlands, the United Kingdom and the United States are all full participants in the regional multilateral agreements and processes.

International conventions place a substantial burden on small countries with limited staff and capacities, especially because of the planning and reporting requirements that each convention carries. Reporting, particularly in the absence of adequate systems for monitoring and data management, is perceived by many as a costly exercise that yields few tangible benefits. While systems of reporting on many international environmental obligations remain somewhat dysfunctional,

particularly for small states with limited resources, there appear to be few incentives for change from the top. Donors are prepared to fund projects to assist countries to 'build their capacity' to meet reporting obligations, which often means simply to engage external consultants to prepare reports. This 'projectization' of reporting addresses the issue in the short term, but may increase the dysfunctional nature of the arrangements over the longer term (Renard and Geoghegan, 2005). This burden is rendered particularly heavy by the fact that international conventions and leading donor agencies frequently require countries to prepare specific programmes and plans of actions which often duplicate each other, fail to build on earlier efforts, and cause a significant drain in the resources of the agencies that are expected to prepare them.

Participation, decentralization and local environmental governance

Systems of local governance vary greatly from country to country. Generally, governments are highly centralized, especially in the smaller island states. In the larger countries (Cuba, Dominican Republic and Haiti), there are two main levels of political and administrative decentralization, the province (Cuba has 15 provinces, the Dominican Republic 31 plus one National District, and Haiti nine) and the municipality. Dominica, Guyana, Jamaica, and Trinidad and Tobago have

elected systems of local government, with some of the responsibilities for planning and resource management (especially waste management and water) vested to these institutions. In most other countries, local government systems do not exist, or are very weak institutions appointed by the state. The smaller the country, the more important is the role of the local elected politician, and most parliamentarians see themselves as the ultimate authority in their constituencies.

The systems that prevail in the dependent territories and associated states vary. The *départements* follow the French pattern, each having two local elected assemblies (a *Conseil Régional* that assumes much of the responsibility for development planning and environmental management, and a *Conseil Général*) as well as strong municipal authorities (*Communes*) that have some planning and environmental management responsibilities. In Puerto Rico, the municipality is an important layer of government and local planning authorities deal with a range of environmental and land-use issues. In the Netherlands Antilles, government dealing with most aspects of environmental management is decentralized to the island level.⁷ The US Virgin Islands and the UK Overseas Territories have little that could be described as local government.

There is growing acceptance of the need for stakeholder participation in decision making and governance. Beyond the international conventions, such as Agenda 21 and the Barbados Programme of Action for Sustainable Development in Small Island Developing States (BPOA) that make the case for stakeholder participation in sustainable development processes, national governments have made their own commitments in domestic and regional fora. However, the gap between intent and action remains.

At the regional level, the potential of the CARICOM Charter of Civil Society has not been realized. Adopted in 1997, the Charter is a framework for participatory democracy that formally recognises the importance of civil society participation in seeking to “create a truly participatory political environment which will be propitious to genuine consultation in the process of governance”. However, neither the spirit nor the letter of the Charter have translated into meaningful participation at national level as the “legislation that would enable member states to implement the provisions of the Charter has not been put in place” (CANARI, 2005). And although CARIFORUM has been engaging civil society and other non-state actors since 1996, this has been at the level of information sharing rather than consultation (Babb, 2003).



⁷ Popular elections on all islands have resulted in these island governments requesting the disbandment of the Netherlands Antilles, with new separately negotiated relations between each island and the Netherlands. The target date for this transition is December 2008, but there is some question over whether it will be met.

Although spaces for government-civil society engagement exist (such as National Sustainable Development Councils, processes to develop Poverty Reduction Strategy Papers and discrete national policy development processes), participatory processes have not been adequately institutionalized. Government consultation processes in many countries, including Belize, Jamaica, and Trinidad and Tobago, have been criticised for being ‘cosmetic’. The spaces for civil society participation are often restricted to social and environmental issues, and civil society does not yet play a significant role in policy discussions on macro-economic strategies (Rennie, 2003; Witter, 2004; CANARI, 2005). Women’s participation in these processes has also been negligible, as in other regions. Some governments are however starting to address the issue. The Government of Jamaica for example developed a Code of Consultation for the Public Sector in 2004. This code establishes rules for the minimum acceptable level of consultation with the public, and a consistent process for doing so, with respect to any significant policy, programme or activity a government agency proposes to undertake.

Establishment of protected areas

The Caribbean has 2.8 million hectares of terrestrial protected areas and 10.9 million hectares of marine protected areas; the number of areas and size by category are indicated in Table 2.

Only a few countries have centralized and well-coordinated institutional arrangements for the management of protected areas. This is the case in Cuba, with the *Centro Nacional de Áreas Protegidas*, and in the Dominican Republic, with the *Subsecretaría de Áreas Protegidas y Biodiversidad*. In the case of the Dominican Republic, protected areas are legally established but weakly managed but in both instances protected areas constitute important instruments of conservation and development at local and national levels. National parks and other protected areas are also well established in many dependent territories, for example the Netherlands Antilles (Bonaire and Saba Marine Parks), the French *départements* (*Parc*

National de la Guadeloupe, Parc National de la Guyane and Parc Naturel Régional de la Martinique), Puerto Rico (a comprehensive system of state forests as well as the federally-managed Caribbean National Forest), and the British and US Virgin Islands.

Several countries have national plans for systems of protected areas (for example Saint Lucia, and Trinidad and Tobago), but these are not always implemented due to a combination of lack of capacity, resources and political will, and most countries do not have a systematic approach to the establishment of such management instruments. Jamaica is in the process of completing its Protected Area System Master Plan (PASMP) which will provide a framework for the

Terrestrial	Number of sites	Total area (ha)
National IUCN I-VI Protected Areas	253	1,541,602
National Other Protected Areas	332	740,585
International Protected Areas ^a	19	531,594
TOTAL	604	2,813,781
Marine	Number of sites	Total area (ha)
National IUCN I-VI Protected Areas	398	4,754,474
National Other Protected Areas	213	575,103
International Protected Areas	34	2,843,103
TOTAL	645	8,172,680
Grand Total	1,249	10,986,461

Table 2. Protected areas in the Wider Caribbean
Source: IUCN/UNEP, 2006. World Database on Protected Areas

^a This category refers to protected areas declared under international status as Biosphere Reserves, Ramsar Sites or World Heritage Sites.

sustainable management of Jamaica's existing and future protected areas. A Protected Area Committee has been established as the central coordinating mechanism for guiding the process of completing the plan and overseeing its implementation.

Protected area establishment and management have been less successful in the smaller, less developed countries, and it may be that the dominant protected area model is not well suited to small ecosystems with diverse uses and weak institutional capacities. Indeed, the past decade has seen the emergence of an alternative model based on the integration of conservation instruments into broader, multi-stakeholder management arrangements, perhaps best illustrated by the case of the Soufriere Marine Management Area (SMMA) in Saint Lucia, which was established in 1994, and which has since inspired similar approaches in countries such as Antigua and Barbuda, and Dominica.

Two types of protected areas are particularly relevant to current conservation issues and trends: forest reserves and marine protected areas. As noted elsewhere, most countries have long-established forest reserves, whose primary roles are watershed and biodiversity protection and timber management. Forest reserves have been critical components of most countries' environmental management

strategies, but their effectiveness has been limited by two factors. First, the administrations charged with forest management in many countries do not have sufficient staffing or other resources to manage reserves effectively. Second, encroachment, for agriculture and settlement, has occurred on forest reserves in many countries, along with other unregulated use. Often the boundaries of forest reserves are not demarcated, making it difficult to prosecute those who encroach. The other factor limiting effectiveness has been that as agriculture and development have moved upslope over the past few decades they have sometimes reached into critical catchment areas outside of or below forest reserves, with negative effects on water supply and quality. In some countries, community initiatives have attempted to respond to this issue.

MPAs have been increasingly employed as mechanisms for managing important marine and coastal areas and resources in the region, and their establishment has been heavily promoted and supported by regional and international conservation organizations. However, the objectives of MPAs are nearly always also linked to tourism, so that the most "successful" MPAs have also had the perverse effect of intensifying tourism-related use of coastal areas. The problem is compounded by prevailing models based on economic

self-sufficiency, which demand that MPA management be oriented towards uses that can generate revenue, such as for yachts mooring and scuba diving. Finally, the establishment of MPAs has been controversial in many countries because of a perception that they are established for the purpose of excluding fishing activity at the expense of tourism (see for example Valdés Pizzini 1990). Since fishing is permitted (although sometimes restricted) in nearly all the region's MPAs, this perception is not entirely true; however, management of many MPAs is certainly skewed towards the interests of the tourism sector. Nonetheless, a number of Caribbean MPAs, and particularly those that have managed to enlist fishers in their conservation efforts, have helped in reversing declines in fish stocks.

UNIVERSITIES AND NATIONAL RESEARCH INSTITUTIONS

Universities play a major role in research in support of conservation, environmental management and sustainable development. There are three main groupings that bring together national and sub-regional research institutes:

- the Association of Caribbean Universities and Research Institutes (UNICA), created in 1967 to support regional cooperation in higher education and research, currently



counts 26 full members in the Wider Caribbean;

- the concept of a SIDS Universities Consortium has been promoted in recent years, with the participation of organizations such as UNESCO and UNDP, for the purpose of supporting the implementation of the BPOA and Mauritius Strategy;
- under the auspices of UNICA, the Consortium of Caribbean Universities for Natural Resource Management offers a few courses that are jointly organized and taught by several participating institutions.

The role of universities in conservation and natural resource management is directly dependent on the size and capacities of these organizations, and it is therefore in Cuba and the Dominican Republic that academic institutions are the most active in conservation and natural resource management. Puerto Rican universities are also active and competent, with several programmes specifically dedicated to natural resource management, notably the Sea Grant Program at the University of Puerto Rico at Mayagüez, which is involved in and provides support to international research projects in the region. The University of the West Indies, with campuses in Barbados, Jamaica and Trinidad, is also directly involved in a range of initiatives, particularly through the Centre for Marine Sciences (and its Discovery Bay Marine laboratory) and the

Institute for Sustainable Development in Jamaica, the Sustainable Economic Development Unit in Trinidad and the Centre for Resource Management and Environmental Studies (CERMES) in Barbados. The University of Guyana has a School of Earth and Environmental Sciences.

In addition to research centres within its universities, Cuba has a number of highly qualified public research institutes that specialize in areas relevant to conservation and sustainable development, including the *Instituto de Oceanología*, the *Instituto de Ecología y Sistemática*, the *Instituto de Geografía Tropical* and the *Centro de Ingeniería y Manejo Ambiental de Bahías y Costas* which is the Regional Activity Centre for the implementation of the UNEP-CEP LBS Protocol in Spanish-speaking countries.

Other key national and international research institutions in the region include:

- The International Institute of Tropical Forestry (IITF) in Puerto Rico, which is part of the United States Department of Agriculture, US Forest Service. It works internationally, and particularly in Latin America and the Caribbean, on a range of forestry issues and has provided support to forestry research over the past four decades.
- The Institute of Marine Affairs in Trinidad and Tobago, a government institution that is also involved in

regional projects, particularly in impact and resource assessment and is the Regional Activity Centre of UNEP-CEP for the LBS Protocol.

- The Iwokrama International Centre for Rain Forest Conservation and Development in Guyana. Its mission is to promote “the conservation and the sustainable and equitable use of tropical rain forests in a manner that leads to lasting ecological, economic, and social benefits to the people of Guyana and to the world in general, by undertaking research, training, and the development and dissemination of technologies”.
- The International Research and Training Institute for the Advancement of Women (INSTRAW), which is the gender research arm of the United Nations located in the Dominican Republic. It has conducted relevant research on gender, environment, and sustainable development.
- The UNEP-CEP Regional Activity Center for Marine Pollution Emergency and Training for the Wider Caribbean (RAC/REMPEITC-Carib) located in Curaçao, Netherlands Antilles. The Centre was established in 1995 to assist countries of the Wider Caribbean Region to prevent and respond to major pollution incidents in the marine environment.

- The meteorological offices in the various countries. They are well equipped and qualified, and are all involved in collecting data that are particularly useful in monitoring climate change.

In addition, there are a large number of research institutions in North America and Europe that are active in the region, usually in partnership with regional or national institutions. One of these organizations is CAB International, which is working on invasive species in the insular Caribbean.

At the regional level, there is no institution specifically dedicated to research in conservation, but several regional organizations mentioned earlier include research activities within their programme. In addition, CEHI and the Caribbean Agricultural Research and Development Institute (CARDI) conduct research relevant to conservation and natural resource management, especially related to watersheds, land degradation and germplasm conservation.

CIVIL SOCIETY

Environmental NGOs

While there has been a long-standing conservationist tradition, over the past 15 to 20 years the number of national and community-based civil society organizations that work on environmental issues has increased

dramatically. Some of these have mandates that relate directly to environmental protection and/or management, while others address environmental issues as part of a broader social development and livelihoods agenda. The ENGO landscape is dominated by national and local organizations, with a few organizations that operate at regional level.

Like the wider NGO community, environmental NGOs (ENGOS) are a heterogeneous grouping. They include:

- organizations that work at national level, such as the Jamaica Environment Trust (JET) and the Environmental Awareness Group (EAG) in Antigua and Barbuda;
- organizations that work at sub-national level, such as the Northern Jamaica Conservation Association and the Center for the Conservation and Ecodevelopment of Samaná Bay and its Environs (CEBSE) in the Dominican Republic;
- special interest groups, such as the Guyana Marine Turtle Conservation Committee and the Pointe-à-Pierre Wildfowl Trust in Trinidad; and
- community-based groups, such as Nature Seekers, Inc in Trinidad and the Mayreau Environmental Development Organization in St Vincent and the Grenadines.

The landscape is somewhat different in Cuba, which has few independent non-governmental organizations; however a small number of groups are dedicated to conservation and have gained significant influence in the past few years.

ENGOS have traditionally played advocacy and public awareness roles in the Caribbean to positive effect. Recent advocacy initiatives in Jamaica to prevent mining in the Cockpit Country sparked a level of public outcry that led to the suspension of the Exclusive Prospecting License granted to a large bauxite company. A successful public education campaign in Antigua is changing public attitudes to the endemic Antigua racer snake.

The growing acceptance of participatory approaches has also opened spaces for collaborative management arrangements. For example, Jamaica's marine and terrestrial national parks have been delegated to national ENGOS, and in Saint Lucia, the management of the SMMA has been devolved to an ENGO. ENGOS have been demanding the space to influence policy debates and while there are shortcomings in these processes, organizations in countries such as Jamaica, Saint Lucia, Trinidad and Tobago, and the Dominican Republic are routinely included in policy development processes and consultations.

In some national contexts, ENGOS come together under an umbrella organization to share information and coordinate their work, such as the Belize Alliance of Conservation NGOs (BACONGO), the Council of Presidents of the Environment (COPE) in Trinidad and Tobago, the Environmental Consortium of the Dominican Republic (CAD) and the National Environment Societies Trust (NEST) in Jamaica. While the ENGO sector is fairly cohesive in Trinidad and Tobago, and the Dominican Republic, with organizations meeting regularly to share information, collaborate on selected projects and support each other in advocacy (Leotaud, pers. comm.), it is less so in Jamaica, where NEST is practically non-functional, following a persistent rift between the organization and its members, which has impeded the efficacy of this umbrella grouping for nearly a decade (McCaulay, 2000; Grant-Cummings, pers. comm.).

The main regional ENGO is the Caribbean Conservation Association (CCA), which plays a lead role in environmental education and advocacy in the region. However, this is not a comprehensive grouping as several ENGOS are not members of the Association. The Caribbean Sustainable Economic Development Network (CSEDNet) is another regional grouping that brings ENGOS together, however its membership includes a range of CSOs

and NGOs from other sectors. CSEDNet facilitates the exchange of ideas and influences the research policy agenda of regional institutions with respect to sustainable development. The network played an integral role in mobilising civil society in preparation for the International Meeting for the 10-year Review of the BPOA.

In addition to these networks, the following organizations with a sustainable development focus work throughout the region:

- The Trinidad and Tobago-based *Caribbean Natural Resources Institute (CANARI)* is an independent technical and research organization, which analyses and promotes the participatory management of natural resources.
- The *Island Resources Foundation (IRF)* has traditionally supported biodiversity conservation in the eastern Caribbean and now operates a number of electronic mailing lists aimed at sharing information among individuals and organizations working on environmental and sustainable development issues in the Caribbean and other island regions.
- From its headquarters in Haiti and a national office in Jamaica, *Panos Caribbean* works with and through the media to strengthen civil society by providing information and stimulating debate on sustainable development

issues that are overlooked and misunderstood.

- The Trinidad-based *Cropper Foundation* is a family-owned foundation that specializes in sustainable development policies, justice and equity, and education. It is coordinating the Caribbean Sea Assessment.
- The *Gulf and Caribbean Fisheries Institute* is a non-profit, membership organization based at the University of Florida which promotes information exchange and multi-stakeholder dialogue on use and management of marine resources in the Gulf of Mexico and the Caribbean Sea.

At the level of development policy, the main regional civil society actor is the Caribbean Policy Development Centre (CPDC), which is a Barbados-based grouping of civil society organizations. Its main function is advocacy with regional inter-governmental bodies and multilateral development banks.

Mention should also be made of the growing fair trade and organic farming movements and of the role of farmers' organizations such as the Windward Islands Farmers Association (WINFA).

Women's organizations such as the Network of NGOs for the Advancement of Women and the Caribbean Association for Feminist Research and Action (CAFRA) based in Trinidad and Tobago, and Development Alternatives

with Women for a New Era (DAWN) based in Barbados have played an important role on environment and development issues for a number of years.

Faith-based organizations also play a role, especially in relation to environmental awareness. In some countries, charismatic church leaders have successfully promoted and sustained local development and environmental activities, as in the case of the Association for the Development of San José de Ocoa in the Dominican Republic.

Community and stakeholder initiatives

Local communities have often played important roles in environmental management. In the absence of adequate national capacity to regulate and enforce environmental protection measures, resource users have effectively worked together to sustain common pool resources, as documented in the case of mangroves in Saint Lucia (Geoghegan and Smith, 2002) and fisheries in Barbados (Berkes, 1987) and Saint Lucia (Smith and Berkes, 1991), often with impressive results.

Local stakeholders, sometimes from the poorest and most marginalized communities, have also been at the forefront of efforts to halt major threats to the environment. In Puerto Rico, a group of concerned citizens brought

together a small and isolated mountain community to stop a plan for open pit mining in the 1980s. The community initiative has since successfully lobbied for the establishment of a forest reserve at the mining site and legally assumed management responsibility for the reserve, promoted and achieved the creation of a national conservation fund for the acquisition of important watershed lands, and worked together with government and other communities to establish a conservation corridor linking several forest reserves (Massol González *et al.*, 2006). In Trinidad, a group of Rastafarian squatters has over the past 15 years restored and protected the forest in a catchment area serving the capital city (Lum Lock and Geoghegan, 2007). In the Dominican Republic, a very poor forest community initiated measures to halt large-scale unsustainable logging that have now been replicated through a network of community organizations (Lamelas and Lum Lock, 2006). In all three cases, initiatives that were initially viewed by government authorities with suspicion and hostility are now held up as models of effective community-public sector partnerships.

During the 1980s and 1990s, local actors, donors and the international environmental community began to look towards community-based resource management (CBRM) as a way around the perceived failures of governments to

manage natural resources effectively. Many donor-funded programmes during that period took a CBRM approach, and while only a few of these were sustained beyond the end of the project cycle, they collectively had a lasting impact on both policies and practice in many countries, particularly those, such as Dominica, the Dominican Republic, Jamaica and Saint Lucia, that had a tradition of community and collective action.

Communities have been incorporated into formal natural resource management arrangements in a wide range of ways. Jamaica's national forest policy provides for the establishment of Local Forest Management Committees to guide decisions and assist in management activities in forest reserves, and several such committees have been established. Saint Lucia's Forestry Department encouraged the establishment of Water Catchment Groups in a number of communities to assist it in the restoration of degraded catchment areas; a few of these groups remain important management actors. The Barbados Fisheries Department undertook a project in the late 1990s to establish local fisherfolk organizations; not only do many of the organizations remain active, but their umbrella body has assumed a major national role in fisheries management policy and decision making. There is a growing list of similar examples.

Because of its different political structure, there is limited scope for community-based initiatives, outside of local government, in Cuba. Community approaches are also not significant in the French *départements* or the US Virgin Islands, where regulation and enforcement are seen as the central instruments for environmental management.

THE PRIVATE SECTOR

The business sector has supported numerous initiatives linking conservation to economic opportunity; examples include the Montego Bay and Negril Marine Parks in Jamaica, which were spearheaded by local tourism interests; the Saint Lucia Heritage Tourism Programme and Soufriere Marine Management Area in Saint Lucia; and the Waitukubuli national trail project in Dominica. What is particularly notable about these and similar cases is that the participants have been mainly smaller, locally owned businesses.

Many efforts have been made over the years to increase the participation of the private sector in environmental protection initiatives. Perhaps the most successful has been CAST, a non profit subsidiary of the CHA, which has been in existence since 1997. CAST's major accomplishment has been the promotion of the Green Globe tourism certification programme, which now counts more than 50 members in 12

countries.⁹ CAST, along with the CCA and the CEP and with support from the United States Agency for International Development (USAID), has also promoted the establishment of Blue Flag beach certification programmes; the Bahamas, Dominican Republic, Jamaica and Puerto Rico now have Blue Flag programmes and beaches.

The region has a few examples of private conservation. PETROTRIN in Trinidad has devolved the management of 25 ha of wetland within its petrochemical complex to the Pointe-à-Pierre Wildfowl Trust, which manages it as a nature reserve. The Asa Wright Nature Centre in Trinidad and the Springfield Guest House/Archbold Tropical Research and Education Centre in Dominica are also privately owned and managed for research and conservation.

Several countries have prominent private sector environmental “champions” who promote the need for sustainable practices and natural resource conservation, but the concept of Corporate Social Responsibility is not well developed. The Sandals hotel chain is to some extent an exception, especially with its efforts to link its demand to local agricultural production, but its involvement in local conservation issues is largely dependent on the interests of the current manager or community outreach officer of individual properties. The concept is also coming

to the region with the entry of foreign businesses. For example, the BHP Billiton, an international corporation involved, in Trinidad, in oil and gas exploration and which recently established a subsidiary in the northeastern part of the country, is emphasising its interest in community outreach and good corporate citizenship by assisting a local network of community organizations to develop a turtle conservation and ecotourism business plan for the area.

However, aside from the fairly widespread support from smaller, locally owned tourism businesses and one or two other exceptions such as those discussed above, the support of the private sector for improved environmental management and natural resource conservation has remained limited and grudging. Larger foreign-owned resort companies and the cruise ship and airline industries have been particularly impervious to attempts to secure their support. Caribbean citizens share a widespread feeling that governments are reluctant to encourage good environmental stewardship from the private sector, or even to hold them to standards and regulations related to the environment, out of fear that they will take their business elsewhere. While the records of many governments are slowly improving, with EIA a requirement of new development in most countries, political support for environmentally

damaging development projects remains a major source of friction between governments and environmental NGOs and community groups.

The potential use of trade agreements to induce foreign companies to pay greater attention to environmental management remains to be explored. Most agreements between CARICOM countries and major trade partners are collectively negotiated by the Caribbean Regional Negotiating Machinery (CRNM), guided by WTO directives and rules. Because the WTO has taken no position on the environmental aspects of trade, the CRNM does not currently address environmental issues in its negotiations. However, particularly given the harmful effects of intensive tourism development on the environment, the need to do so is seen by CRNM staff as a priority (Preville, pers. comm.). In some cases, new trade agreements such as DR-CAFTA between the Dominican Republic and Central America include an environmental policy component (Espailat, pers. comm.).

INTERNATIONAL ASSISTANCE

International actors play major roles in environmental management. The field is crowded and ever-changing, making it impossible to provide a comprehensive overview in this brief situation analysis. The discussion therefore focuses on the

⁹ The list is available at www.cha-cast.com/GGproperties.html.



most important donors and other international agencies and initiatives. Additional information on offices, programmes and key contacts in the region is included in Appendix 7. At present, donor priorities are disaster risk reduction, regional trade integration, economic competitiveness and renewable energy. The environment and especially biodiversity, which is often perceived as separate from environmental and natural resources management, ranks low in donor priorities. However opportunities exist to integrate biodiversity conservation into donor priorities, as is the case for example with the Small Grants Programme of the Global Environment Facility.

Bilateral donors and the EU

CIDA works in the Commonwealth Caribbean, Haiti, and to a limited extent the Dominican Republic, and has been very active in environment issues. It has supported institutional and capacity development of several forestry administrations (e.g., Trees for Tomorrow project in Jamaica) and an Environmental Capacity Development project for the OECS which has focused, among other things, on the revision and implementation of the SGD. Its current environmental focus is on mitigation and response to natural disasters and climate change, as a contribution to the CDMF.

France's priority countries for development assistance are Cuba, the Dominican Republic and Haiti, but it has also been active in the countries neighbouring Guadeloupe and Martinique through its Embassy in Saint Lucia. FFEM has provided recent funding for strengthening protected area management in Cuba and for the OECS's OPAAL project. Another mechanism, known as INTERREG, is also available to the French *départements* to promote regional cooperation in the Caribbean.

The EU is a major donor, both regionally through the Cotonou Agreement and its predecessors and through individual country programmes. Its current Caribbean strategy includes support for environmental protection through natural disaster risk reduction, especially within the framework of the CDMF. It has supported a range of other activities related to the environment, particularly in the areas of heritage tourism (in response to changes in the banana sector), forestry and natural resource management (under its Special Framework of Assistance). A major recent EU-funded initiative was the Caribbean Regional Environment Programme (CREP), which supported improved protected area management in several countries. It is currently funding a three-year programme on participatory forestry, implemented by CANARI in several countries.

French *départements* are eligible to receive structural funds to support regional cooperation with non-EU countries or regional institutions. Netherlands Antilles and UK territories are, like ACP countries, eligible for EDF funds, but benefit from more favourable conditions than ACP countries. All European territories (French, UK and Netherlands) are also eligible under the Framework Programme for Research and Technological Development (FPRTD); environment and climate change are among the priorities of the Cooperation component of the 7th FPRTD (2007–2013).

Environmental management is a component of the programme of Germany's development assistance agency, *Deutsche Gesellschaft für Technische Zusammenarbeit* (GTZ). GTZ has been a supporter of civil society participation in conservation and natural resource management in the Dominican Republic and supports approaches to improving local environmental management there. It is a main supporter of the Caribbean Renewable Energy Development Programme. It also provides support to partner countries in meeting obligations under the UNCCD, and implements a pilot project with the Dominican Republic and Haiti to support their compliance with the UNCCD and to test local and trans-boundary approaches to combating desertification.

The Japan International Cooperation Agency (JICA) is active in all the independent countries, and its regional programme includes support to environmental conservation, particularly promoting joint efforts across national boundaries and with a regional-level perspective, and disaster prevention. However, Japan's assistance has been controversial because of its support to Caribbean members of the International Whaling Commission that have joined it in voting against measures to curb whaling, and who have appeared to be rewarded through development assistance, particularly for fisheries development.

Spain's *Agencia Española de Cooperación Internacional* (AECI) is active in the Dominican Republic, where a focus of its current (2005–2008) programme is environmental sustainability. Activities include support to sustainable development in and around the Enriquillo-Bahoruco-Jaragua Biosphere Reserve and to community-based initiatives in disaster management.

The UK's Department for International Development (DFID) has supported improved environmental management, mainly in the Commonwealth Caribbean, with a focus over the last several years on coastal management issues. DFID is increasing the volume of its support, but with a reduced number of programmes. Its portfolio does not include an

environmental component, except for activities in disaster risk reduction, with support to the CDMF, which are part of DFID's global commitment to focus on climate change. Through Partnership Programme Agreements, DFID also provides funding to a number of international or UK NGOs that are active in the Caribbean, including OXFAM and the network of Panos institutes.

USAID has been very active, particularly in supporting protected areas (Parks in Peril Program and national programmes), sustainable tourism (especially in Jamaica), and watershed management (Jamaica's Ridge-to-Reef watershed programme). Although it has recently scaled down its work on the environment, it continues to be active in Jamaica, where it gave funding to establish a Forest Conservation Fund providing small grants to NGOs. Its main upcoming initiative is a soon-to-be launched Latin America and Caribbean successor to the Parks in Peril Program to develop self-sustaining national park systems by improving economic opportunities for people living near protected areas, "with focus on coastal and marine biodiversity". In the Dominican Republic USAID has supported policy strengthening for environmental protection, implementation of a national plan for rural electrification, and NGO strengthening at the border area (Haiti-RD).

China is another important donor, providing support to a range of sectors, with a focus on infrastructural projects, in communications, education, health and sports. A small number of countries have diplomatic relations with Taiwan, which provides support to several sectors, with a focus on agricultural diversification.

In addition to the assistance coming from external agencies, there is a significant volume of aid and technical assistance that is provided by countries within the region. Cuba offers a large number of scholarships to most countries of the region, and its agencies are involved in a number of technical collaboration and scientific programmes. Puerto Rico has fiscal instruments that encourage investment in the Caribbean, and has technical cooperation agreements with several regional institutions such as the OECS. Venezuela has an oil trade agreement with several countries, with concessionary loan provisions and the opportunity to make partial repayments in kind. Trinidad and Tobago provides funding and technical assistance to cooperation programmes with other CARICOM countries. All four countries also provide humanitarian and relief assistance in the event of disasters in the region.

Multilateral agencies

The Food and Agriculture Organization of the United Nations (FAO) has

provided considerable technical support to fisheries and forestry administrations and to regional networking through the Western Central Atlantic Fisheries Commission and the Caribbean Sub-Group of the Latin American Forestry Commission. The UNDP is a major actor in environmental issues, and it also plays an important role in donor coordination. Its programme for the OECS and Barbados includes capacity-building for environmental management as an area of focus, and activities have included assistance to countries to develop national biodiversity strategies and action plans, national communications under the UNFCCC, and national self-assessments for global environmental management. In Jamaica, it supports a range of activities under its programme for environmental management and sustainable development. Its national work in Haiti and Guyana also deals with natural resource and environmental management. In the Dominican Republic UNDP is also supporting development of national communications for several multilateral environmental agreements. Also the GEF/Small Grants Program has been supporting important community initiatives in protected areas and protected area buffer zones, including sustainable and organic agriculture and agroforestry, reforestation and community ecotourism initiatives.

UN-ECLAC, through its sub-regional office in Trinidad, has been responsible for coordinating regional participation in the BPOA and Mauritius Strategy for Small Island Developing States, and is now leading an initiative for follow-up and monitoring of the Mauritius Strategy.

Most of the regional activity of UNEP is through the CEP, described elsewhere. Its Regional Office for Latin America and the Caribbean (UNEP-ROLAC), based in Mexico City, also provides support, particularly in environmental law and education. It coordinates the implementation of the Plan of Action for the Sustainable Development of the Americas coming out of the Declaration of Santa Cruz de la Sierra (1996). UNEP-ROLAC also coordinates the Latin America and Caribbean Initiative for Sustainable Development, whose aim is to assess the progress of countries towards the achievement of sustainable development goals and international commitments. As such, it has particular interest in the development and monitoring of indicators of sustainable development. It also coordinates participation of OECS countries in the Montreal Protocol on Substances that Deplete the Ozone Layer through the Regional Ozone Action Network.

The World Bank has supported work related to environment in several countries in the past, including work in forestry, protected areas, and waste

management. It has recently provided a grant to the CCCCC to assist OECS countries to mitigate the impacts of climate change on coastal resources and biodiversity.

Private foundations and international environmental NGOs

Conservation International's Tourism and Biodiversity Program in the Caribbean seeks to encourage greater participation from the tourism industry in biodiversity conservation; however its current focus in this region is predominantly the continental Caribbean.

The John D. and Catherine T. MacArthur Foundation has been a major supporter of conservation over the past 20 years, and the Caribbean remains a priority region for its support. Its areas of involvement have included public-private conservation initiatives, protected areas, and biodiversity. It provided early support to the development of national environmental NGOs. It is currently developing a programme to understand and address the impacts of climate change on Caribbean biodiversity; partners in this initiative include CANARI and WWF-Canada.

The Nature Conservancy (TNC) has programmes in the Bahamas, Dominican Republic, Jamaica, and the eastern Caribbean (office in St Croix, US Virgin Islands). Its focus has been on

advocacy and leveraging international funding for protected areas and biodiversity protection. More recently, TNC has been promoting the concept of a Global Island Partnership, which seeks to mobilize commitment of island states towards biodiversity conservation.

The World Resources Institute, through its Reefs at Risk programme, carried out a comprehensive assessment of the status of coral reefs throughout the region (Burke and Maidens, 2004) and is undertaking pilot reef economic valuation studies in Saint Lucia and Tobago.

WWF/Canada has supported conservation work in Cuba since 1987. Its work focuses on biodiversity protection and assisting Cuba to meet its obligations under international environmental conventions. WWF/UK and WWF/US were previously active in conservation (WWF/UK particularly in the Overseas Territories), but have shifted their geographic focus and no longer have programmes in the region. WWF/France has an office in French Guiana.

BirdLife International is active in the region and is currently implementing an Important Bird Area and a Caribbean Endemic Bird Festival.

International programmes

Man and the Biosphere Programme: Cuba has established six biosphere



reserves, and the Dominican Republic has established one, the Bahoruco-Enriquillo Biosphere Reserve, which encompasses several protected areas.

The Virgin Islands National Park on St John, Guanica State Forest in Puerto Rico and a portion of the *Parc National de la Guadeloupe* have also been designated biosphere reserves.

Ramsar Convention: Countries with Ramsar-listed wetland sites include Antigua and Barbuda, Aruba, the Bahamas, Barbados, Bonaire, British Virgin Islands, Cuba, the Dominican Republic, French Guiana, Jamaica, Saint Lucia, Trinidad and Tobago, and Turks and Caicos Islands.

World Heritage Convention: A number of countries are signatories to the Convention, and there are natural World Heritage Sites in Cuba, Dominica and Saint Lucia, as well as cultural sites in Cuba, the Dominican Republic and St Kitts-Nevis.

Biological Corridor: In July 2007, the Dominican Republic, Haiti and Cuba created a 1,600 km long biological corridor that will connect several protected areas across the three countries.

STATUS OF RELATIONSHIP BETWEEN IUCN AND THE REGION

History of IUCN involvement in the region

IUCN has not been very involved in the Caribbean in recent times, and the main features of its collaboration can be summarised as follows:

- Cuba and, to a lesser extent, the Dominican Republic have been far more involved in collaborating with and receiving support from IUCN than the rest of the region, thanks to the active membership of several organizations and to their involvement in the programmes and projects of the Regional Office for Central America (ORMA), which formally includes Belize, Cuba and the Dominican Republic under its geographic scope, and which has also from time to time taken the initiative of involving other countries, for example in wetland management training.
- Over the years, several leading Caribbean conservationists have been associated with the work of IUCN Commissions. It is in such a context that Edward Towle and John McEachern collaborated in the publication of their seminal work on ecological guidelines for island development, which was published more than three decades ago, and which remains one of the most useful

documents on the subject (McEachern and Towle, 1974).

- In the late 1980s, with funding from CIDA, IUCN initiated a joint regional programme with the CCA managed from the CCA office in Barbados, which covered a number of areas, including protected area management, environmental impact assessment, environmental economics and public awareness. The programme was implemented over a six-year period.
- In December 2001, the IUCN Commission on Environmental, Economic and Social Policy and its Working Group on Collaborative Management convened a meeting in Cuba, for the purpose of developing a proposal for a regional project on participatory and collaborative coastal conservation and management, but the project did not get off the ground.
- The WCPA, which has sustained an active Caribbean membership for over three decades, is currently the main channel of Caribbean involvement in IUCN matters. For example, in November 2006 the Commission organized a training workshop in Anguilla on “Managing Protected Areas in Times of Change: Threats, Opportunities, Leadership in the Eastern Caribbean”. The Commissions with the largest membership in the Insular Caribbean are the WCPA with 30 members, and

the Species Survival Commission (SSC) with 23 members in the Invasive Species Specialist Group and five members in the Crocodile Specialist Group. The Commission on Education and Communication has ten members while the Commission on Environmental Law has two members in Cuba, which is the country with the largest number of commission members overall. In addition, a significant number of IUCN commission members who are active in the Caribbean are based in Europe and North America.

The IUCN Regional Office for Europe (ROfE) and the IUCN French Committee are developing biodiversity conservation programmes for European and French overseas territories. ROfE's programme focuses on raising awareness of the importance of biodiversity, influencing European policy, and thematic initiatives on climate change and biodiversity, mining and exotic invasive species (with SSC invasive species Specialist Group). Bioverseas,¹⁰ an informal network of stakeholders in the European overseas territories, was created to influence European policies and implement a joint programme of action, including a proposal to the European Commission to establish a small grant mechanism for regional and international cooperation and capacity building for the overseas territories. The main areas of focus for the programme of the French Committee include innovative financing

mechanisms to support the biodiversity action plan for French Overseas Territories (with WWF France), capacity strengthening of protected area managers (with WWF, *Réserves Naturelles de France*) and an invasive species initiative.

Status of membership in IUCN

IUCN has 20 members in the insular Caribbean including four government agencies and 16 NGOs (see Table 3). There is no State party of IUCN in the insular Caribbean. The Dominican Republic and Cuba are in the process of formalising their national committees.

In addition there are three NGO members in Belize: BACONGO, Belize Audubon Society and the Belize Zoo and Tropical Education Centre and one NGO member in French Guiana (Kwata Association).

Several international organizations that are members of IUCN are also active in the region. These include the Nature Conservancy, WWF, Conservation International, and the World Resources Institute. Similarly, there are a number of state agencies and NGOs in North America and Europe that are members of IUCN and that have links with the Caribbean.

¹⁰ Members of Bioverseas include the UK Territories Conservation Forum, the Dutch Caribbean Nature Alliance, the Royal Society for the Protection of Birds, the Ligue de Protection des Oiseaux, WWF International, WWF France as well as the French and Dutch IUCN National Committees.

Members	Status
Bahamas The Bahamas National Trust (www.thebahamasnationaltrust.org)	NGO
Barbados The Caribbean Conservation Association (CCA) (www.ccanet.net)	Regional NGO
Cuba 1. Ministerio de Ciencia, Tecnología y Medio Ambiente/Ministry of Science, Technology and Environment (CITMA) (www.medioambiente.cu) 2. Fundación Antonio Núñez Jiménez para el Hombre y la Naturaleza/Foundation Antonio Núñez Jiménez for Humanity and Nature (www.fanj.org/) 3. Cuban Environmental Protection Society (Pronaturaleza)	State Agency NGO NGO
Curaçao, Dutch Antilles Caribbean Research and Management of Biodiversity Foundation (CARMABI) (www.carmabi.org)	NGO
Dominican Republic 1. Secretaría de Estado de Medio Ambiente y Recursos Naturales/State Agency for the Environment and Natural Resources (SEMARN) (www.medioambiente.do) 2. Centro para la conservación y ecodesarrollo de la Bahía de Samaná y su Entorno, Inc./Center for the Ecocodevelopment of Samana Bay and its Environs (CEBSE) (www.samana.org.do) 3. Consorcio Ambiental Dominicano/Dominican Environmental Consortium (CAD) (www.cad-rd.org , www.helvetas.org.do/inst_cad.html) 4. Fundación para el Mejoramiento Humano/Foundation for Human Progress (PROGRESSIO) 5. Grupo Jaragua/Jaragua Group (http://grupojaragua.org/)	State Agency NGO Umbrella NGO NGO NGO
Haiti Fondation pour la Protection de la Biodiversité Marine/Foundation for the Protection of Marine Biodiversity (FOPROBIM) (www.foprobim.org)	NGO
Jamaica 1. Jamaica Natural Resource Conservation Authority (NRCA), acts on behalf of the National Environment and Planning Agency (NEPA) (www.nrca.org) 2. Environmental Foundation of Jamaica (EFJ) (www.efj.org.jm) 3. Jamaica Conservation and Development Trust (JCdT) (www.greenjamaica.org.jm/content/home/) 4. Negril Environmental Protection Trust (NEPT) 5. Negril Chamber of Commerce (NCC) (www.negrilchamberofcommerce.com)	State Agency NGO NGO Umbrella NGO NGO
Saint Kitts and Nevis Nevis Department of Physical Planning, Natural Resources and Environment	State Agency
Saint Lucia Saint Lucia National Trust (www.slunatrust.org/)	NGO
Trinidad and Tobago The Trust for Sustainable Livelihoods (SUSTRUST) (www.sustrust.org)	NGO

Table 3. IUCN membership in the insular Caribbean

5. MAIN CHALLENGES AND OPPORTUNITIES FOR A SUSTAINABLE FUTURE

While it may not be possible, on the basis of this short analysis, to identify the alternative scenarios on the Caribbean's horizon, it is possible to identify the main factors and options on which these scenarios will depend.

In this region, sustainable development demands *regional approaches and regional integration*, to allow for the effective management of large ecosystems; for the sharing of experience, expertise and resources; and for the coordination of efforts towards a common vision. In many areas, such as marine resource management and fisheries development, species conservation, energy, biotechnology or industrial development, sustainability cannot be achieved without harmonized policies and joint action. On a larger scale, there are many benefits to be gained from closer collaboration between the insular Caribbean and the coastal countries of Central and South America, as well as North America. Within sub-regions, coordinated and harmonized approaches must also be encouraged, in the eastern Caribbean, in the Greater Antilles, in the Guyanas or on the Caribbean coasts of Central America.

This *integration* is also critical in the design and practice of management and development initiatives. In small islands and in coastal regions, ecosystems are small and closely linked, activities in upper watershed areas impact on the

coastal zone and other systems, and most resources are subjected to multiple – and often conflicting – uses. It is therefore essential to approach management from an integrated perspective, and to accept that conservation, in such a context, is necessarily an exercise in conflict management that must involve a wide range of stakeholders and balance their needs and expectations. In this sense, the most vulnerable and impacted groups, particularly the poor and women, must be prioritized.

The specific conditions of small island states and coastal regions, as well as the conservation, environment and development issues currently faced by the Caribbean, demand that investment be made in *innovation*, to design creative approaches to conservation that are suited to these specific conditions, to enable investments and strengthen livelihood strategies that are based on positive linkages between natural resources, business and communities, to create new markets for local services and goods, and to test and implement institutional arrangements – based on the principles of participation and partnership – that reflect the realities and match the capacities of small states and societies.

Innovation will be particularly critical to build *resilience and capacity to adapt*, in the face of the current and forthcoming impacts from trade liberalization,

changes in energy production and costs, climate change, and global trends in environmental governance and consciousness. In many respects, the Caribbean is one of the regions of the globe where external factors have for a very long time been determinant in shaping local realities, and this region has a long history of coping with, integrating, adapting to and – when necessary – resisting external forces; it is therefore perhaps in its own experience that the Caribbean must look for the lessons that can guide its new efforts towards resilience and adaptation.

In order to build this necessary resilience and to encourage innovation, there is also a need to recognise the *specificity of the Caribbean*, both in terms of its vulnerability and of its richness. A region that is made primarily of small island states cannot survive and grow in a globalized world if it is not allowed to remain different, if its inherent weaknesses are not understood and respected, and if its unique natural and cultural attributes are not perceived, by the global community, as part of a world patrimony and thus worthy of protection, preservation and enhancement.

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- Claudius Preville, Trade Officer, Caribbean Regional Negotiating Machinery

RELEVANT WEBSITES

Agencia de Medio Ambiente (Cuba)
www.ama.cu

Association of Caribbean States
www.acs-aec.org

CaMPAM
www.gcfi.org/campam/CaMPAM.htm

Caribbean Agricultural Research and
Development Institute
www.cardi.org

Caribbean Alliance for Sustainable
Tourism
www.cha-cast.com

Caribbean Community Climate Change
Centre
<http://caribbeanclimate.bz>

Caribbean Conservation Association
www.ccanet.net

Caribbean Development Bank
www.caribank.org

Caribbean Emergency Disaster
Response Agency
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www.cep.unep.org

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APPENDIX 1. THE CARIBBEAN AT A GLANCE

Country	Area in km ² ¹	Population 2003 ²	Population density	EEZ to land Ratio ¹	GDP per capita (US\$ 2004) ²	Primary exports (% of merchandise export, 2004) ²	Official Development Assistance received (US\$ million 2004) ²	Human Development Index Rank ²	Life expectancy at birth (in years, 2004) ²	Population with sustainable access to an improved water source (%), 2004 ²	Traditional fuel consumption (% of total energy requirements, 2003) ²	Electricity consumption per capita (kilowatt-hours, 2003) ²	Internet users per 1000 people ²
Anguilla*	91	13,000	143										
Antigua and Barbuda	440	81,000	184	250	10,714		1.7	59	73.9	91			250
Aruba*	190	21,800	115										
Bahamas	13,880	300,000	22	76	16,728		4.8	52	70.2	97			292
Barbados	430	300,000	698	388	10,401	55	29.1	31	75.3	100	6	3,226.00	558
Belize	22,960	240,000	11	12	6,747	86	7.4	95	71.8	91	25	708.00	124
British VI*	150	23,000	153										
Cayman Islands*	260	52,000	200										
Cuba	110,860	11,200,000	101	3	11,245		90.5	50	77.6	91	18	1,407.00	13
Dominica	750	100,000	133	20	3,794	65	29.2	68	75.6	97		1,243.00	259
Dominican Republic	48,730	8,800,000	181	6	2,130		86.9	94	67.5	95	26.9	1,532.00	91
Guadeloupe	1,710	422,500	247										
Grenada	340	102,000	296	79	4,135	66	15.4	85	65.3	95	0	1,628.00	76
Guyana	214,970	767,000	4	Less than 1.1	4,439	70	144.6	103	63.6	83	44	1,172.00	193
French Guyana	83,992	157,000	2										
Haiti	27,750	8,400,000	303	6	420	15	242.7	154	52.0	54	80	61.00	59
Jamaica	10,990	2,600,000	237	27	3,352	30	75.4	104	70.7	93	17	2,696.00	403
Martinique	1,100	381,500	347										
Montserrat*	100	4,800	48										
Netherlands Antilles*	800	22,000	28										
Puerto Rico	8,950	4,023,000	433										
St Kitts and Nevis	360	42,000	117	30	8,447		-0.1	51	70.0	100		3,256.00	
St Lucia	620	200,000	323	26	4,663	68	-21.5	71	72.6	98		1,851.00	336
St Vincent and the Grenadines	390	100,000	256	84	3,412	73	10.5	88	71.3			940.00	68
Suriname	156,000	423,000	3				23.9	89	69.3	92	3.3	3,537.00	67
Trinidad and Tobago	5,130	1,300,000	253	15	9,640		-0.8	57	69.8	91	0.6	4,925.00	123
Turks and Caicos*	430	33,000	77										

* European Countries and Territories (OCTs)

Sources:

¹ UNEP Environmental Outlook, 2005. Land area includes areas under inland water bodies (major rivers and lakes).

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APPENDIX 2. NUMBER OF THREATENED SPECIES* BY TAXONOMIC GROUP IN CARIBBEAN COUNTRIES

Caribbean Islands	Mammals	Birds	Reptiles	Amphibians	Fishes	Molluscs	Other invertebrates	Plants	TOTAL
Anguilla	1	0	4	0	12	0	0	3	20
Antigua and Barbuda	1	1	5	0	12	0	0	4	23
Aruba	2	2	3	0	13	0	1	0	21
Bahamas	5	10	7	0	17	0	1	5	45
Barbados	1	3	4	0	12	0	0	2	22
Bermuda	2	3	2	0	13	0	25	4	49
Cayman Is.	0	3	6	0	11	1	0	2	23
Cuba	11	18	7	47	26	0	5	163	277
Dominica	2	5	4	2	13	0	0	11	37
Dominican Republic	5	14	10	31	12	0	6	30	108
Grenada	1	3	4	1	13	0	0	3	25
Guadeloupe	6	4	6	3	12	1	0	7	39
Haiti	4	13	9	47	13	0	4	29	119
Jamaica	5	12	9	17	13	0	5	208	269
Martinique	1	4	5	2	12	1	0	8	33
Montserrat	2	2	5	1	12	0	0	3	25
Netherlands Antilles	2	4	6	0	13	0	0	2	27
Puerto Rico	2	13	8	13	11	0	1	54	102
Saint Kitts and Nevis	1	1	5	1	12	0	0	2	22
Saint Lucia	2	5	6	0	11	0	0	6	30
Saint Vincent & the Gren.	3	3	4	1	12	0	0	4	27
Trinidad and Tobago	1	4	5	9	18	0	0	1	38
Turks & Caicos Is.	1	2	5	0	11	0	0	2	21
Virgin Is., British	1	1	6	2	11	0	0	10	31
Virgin Islands, US	2	5	5	2	10	0	0	11	35
Mesoamerica	Mammals	Birds	Reptiles	Amphibians	Fishes	Molluscs	Other invertebrates	Plants	TOTAL
Belize	5	3	5	6	19	0	1	30	69
Costa Rica	11	19	8	64	15	0	12	111	240
Guatemala	9	11	11	79	16	2	5	86	219
Honduras	9	6	11	59	16	0	1	110	212
Mexico	74	62	21	204	109	5	35	261	771
Nicaragua	6	8	8	10	19	2	3	39	95
Panama	18	20	7	60	19	0	2	196	322
South America	Mammals	Birds	Reptiles	Amphibians	Fishes	Molluscs	Other invertebrates	Plants	TOTAL
Colombia	38	88	16	217	28	0	2	225	614
French Guiana	9	0	7	3	18	0	0	16	53
Guyana	11	3	6	9	18	0	1	23	71
Suriname	11	0	6	2	19	0	0	27	65
Venezuela	26	25	13	71	26	0	3	69	233



* Threatened species are those listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU).

Source: IUCN, 2006. 2006 IUCN Red List of Threatened Species. www.iucnredlist.org, Downloaded on 19 July 2007.

APPENDIX 3. MEMBERSHIP OF REGIONAL GROUPINGS

Country	Grouping			
	ACS	CARICOM	UN-ECLAC	OECS
Anguilla		A	A	A
Antigua and Barbuda	F	F	F	F
Aruba	A		A	
The Bahamas	F	F	F	
Barbados	F	F	F	
Belize	F	F	F	
Bermuda		A		
British Virgin Islands		A	A	A
Cayman Islands		A		
Colombia	F		F	
Costa Rica	F		F	
Cuba	F		F	
Dominica	F	F	F	F
Dominican Republic	F	Observer	F	
El Salvador	F		F	
France	A		F	
Grenada	F	F	F	F
Guatemala	F		F	
Guyana	F	F	F	
Haiti	F	F	F	
Honduras	F		F	
Jamaica	F	F	F	
Mexico	F		F	
Montserrat		F	A	F
Netherlands Antilles	A		A	
Nicaragua	F		F	
Panama	F		F	
Puerto Rico			A	
St Kitts-Nevis	F	F	F	F
St Lucia	F	F	F	F
St Vincent & the Grenadines	F	F	F	F
Suriname	F	F	F	
Trinidad and Tobago	F	F	F	
Turks and Caicos Islands	A	A	A	
US Virgin Islands			A	
Venezuela	F		F	

Legend

	Dependent territory
	Independent country
A	Associate member
F	Full member

APPENDIX 4. OVERVIEW OF ENVIRONMENTAL ISSUES, TRENDS AND RESPONSES IN THE WIDER CARIBBEAN

Critical ecosystems and resources	Status and trends	Some key drivers	Social and economic impacts	Main stakeholders affected	Some current or recent responses
Watersheds	<p>Some upper watershed protected as forest reserves in most countries, but encroachment where management is weak</p> <p>Major expansion of agriculture, housing and infrastructure into middle and unprotected upper watersheds in recent decades in many countries</p> <p>Increased use of agrichemicals in watersheds, especially for export crops; poor sanitation and waste management also affects water quality</p>	<p>Global agricultural market trends and requirements</p> <p>Rising middle-class incomes spurring demographic shifts</p> <p>Urbanization and increased demands for water supply by urban areas</p>	<p>Effects on availability, quality and cost of water</p> <p>Soil degradation and loss</p> <p>Downstream pollution and sedimentation, including coastal waters</p>	<p>All water users</p> <p>Hillside farmers</p> <p>Residents of downstream flood-prone areas</p> <p>Coastal tourism interests (e.g., hoteliers and watersports operators)</p> <p>Nearshore fishers</p> <p>Poor urban dwellers</p>	<p>Major donor-funded national projects, e.g., Ridge-to-Reef, Jamaica; national watershed management project, Haiti; IWCAM regional project</p> <p>Exploration of watershed service markets (CANARI, IIED, others)</p>
Forests	<p>On smaller islands most forests wiped out during plantation era; remnant native forest now largely protected</p> <p>Central forests protected through national parks and forest reserves in larger countries, but intense exploitation for fuel wood continues in Haiti and for commercial timber in Guyana</p> <p>Secondary forest important for biodiversity and provision of forest goods and services, but generally not protected and often targeted for development</p> <p>Rates of deforestation are uncertain, but evidence of re-establishment of forest in abandoned agricultural lands in some countries (e.g., Cuba, Guadeloupe, Saint Lucia)</p>	<p>Agricultural expansion and decline in response to global market factors</p> <p>Urban and suburban expansion into forested areas</p> <p>Limited land availability for development needs and opportunities</p> <p>Added pressure, especially on remnant native forests, of hurricanes (which may become more frequent with changing climate)</p> <p>Inadequate or inappropriate institutional arrangements based on outdated understandings of role of forests in development and with inadequate provision for stakeholder involvement in forest management</p>	<p>Loss of forest livelihood and recreational opportunities</p> <p>Loss of economically and ecologically important wildlife and plant species</p>	<p>Timber, fuelwood and other forest product harvesters</p> <p>Forest recreational users</p>	<p>Forest reserves and other legal protections in all countries</p> <p>Numerous donor-funded projects to build capacity of forestry administrations in many countries, but impact not always sustained</p> <p>FAO, IITF and others provide technical assistance, training and forums for regional collaboration on forest management (e.g., Caribbean Foresters Meetings; FAO Forestry Sub-Commission for the Caribbean)</p> <p>CANARI has done work in support of participatory forest management in many countries</p>

Critical ecosystems and resources	Status and trends	Some key drivers	Social and economic impacts	Main stakeholders affected	Some current or recent responses
Coastal zones	<p>Concentration of development, particularly tourism infrastructure, in coastal areas, recently exacerbated in some areas by trends towards mega-resorts</p> <p>Widespread destruction of mangroves through 1980s, but recent increased awareness of value, and protection or managed use</p> <p>Destruction of sea grass and inshore reefs to create tourism infrastructure and improve amenities (e.g., swimming beaches)</p> <p>Coastal erosion, exacerbated by shoreline construction, reef degradation, and sand mining; likely to increase with projected sea level rise and increased storm frequency</p>	<p>Tourism</p> <p>Economic strategies that focus on coastal-based sectors (e.g., ports, oil refineries, sand mining for construction)</p>	<p>Loss of beach-related economic and recreational opportunities</p> <p>Loss of/damage to coastal buildings and infrastructure</p>	<p>Coastal residents</p> <p>Fishers</p> <p>Tourism sector (especially coastal hoteliers and related businesses)</p>	<p>Coastal zone management legislation and institutions established in some countries (e.g., Barbados, Puerto Rico)</p> <p>Protected areas and other management measures established for critical coastal areas of many countries</p> <p>Coast and beach stability in the Caribbean project (UNESCO, University of Puerto Rico) examined root causes of coastal erosion and recommended measures to address them</p>
Coral reefs	<p>Rapid reduction in hard coral abundance and increase in macroalgae regionwide over past 20 years</p> <p>Associated changes in reef fish communities, particularly declining large carnivorous species</p> <p>Increased frequency of epidemics and disease affecting corals and stress on corals manifested in more frequent and severe bleaching events over past 30 years, both likely to be exacerbated by climate-change induced sea level rise and increasing hurricanes</p>	<p>Coastal development (sewage and sedimentation)</p> <p>Watershed degradation (downstream effects of erosion and agricultural chemicals)</p> <p>Marine pollution, especially from cruise industry</p> <p>Unsustainable levels of fishing, driven by increasing demand and complex economic forces on coastal livelihoods</p> <p>(Source: Burke and Maidens, 2004)</p>	<p>Reduced revenue from near-shore fishing and reef-related tourism and recreation</p> <p>Reduced shoreline protection; accelerated erosion</p>	<p>Fishers</p> <p>Tourism sector (especially ecotourism and water-based operators)</p> <p>Coastal property-owners and residents</p>	<p>Establishment of MPAs</p> <p>Establishment of coastal zone management units (Barbados, Belize) and formulation of coastal management plans</p>

Critical ecosystems and resources	Status and trends	Some key drivers	Social and economic impacts	Main stakeholders affected	Some current or recent responses
Biodiversity	<p>Exploited marine species declining in most countries (especially near-shore fish stocks and desirable species such as lobster, grouper and snapper)</p> <p>Many endemic terrestrial species declining for decades from habitat loss, alien species predation and competition, and uncontrolled exploitation</p> <p>Some species targeted for conservation slowly recovering (e.g., parrots on several islands) but populations remain small and vulnerable to shocks such as natural disasters</p>	<p>Increased demand for food species stemming from tourism, population growth and changes in household income (both up and down)</p> <p>Reduction of other economic options driving increased pressure in some countries (e.g., increased numbers of fishers in Jamaica post-banana boom).</p> <p>Cultural change</p>	Direct and indirect users of threatened or endangered species or their products	<p>All water users</p> <p>Hillside farmers</p> <p>Residents of downstream flood-prone areas</p> <p>Coastal tourism interests (e.g., hoteliers and watersports operators)</p> <p>Nearshore fishers</p> <p>Poor urban dwellers</p>	<p>UNEP's SPAW protocol and programme</p> <p>National Biodiversity Strategies and Action Plans</p>

APPENDIX 5. STATUS OF NATIONAL POLICIES AND PLANS IN THE INDEPENDENT COUNTRIES OF THE INSULAR CARIBBEAN, PLUS BELIZE, GUYANA AND SURINAME (YEAR OF ADOPTION)

Country	National Sustainable Development Strategy	National Environmental Strategy or Action Plan	National Biodiversity Strategy and Action Plan	UNFCC National Communication on Climate Change	UNCCD National Action Programme
Antigua and Barbuda	No	2004	2001	2001	2005
Bahamas	No In prep.	NEMAP	1999	2001	2006
Barbados	2003	No	2002	2001	2001
Belize	No	No	1998	2002	No
Cuba	No	1997	2002	2001	2003
Dominica	No	In prep.	2001	2001	2004
Dominican Republic	No	2001	1994	2003	2007
Grenada	No	2004	2000	2000	No
Guyana	No	NA	1999	2002	2006
Haiti	No	1999 (NEAP)	No	2001	No
Jamaica	No	2006 (NEAP)	2003	2000	2002
St Kitts and Nevis	No	2004	NA	2001	2007
Saint Lucia	No	2004	2000	2001	No
St Vincent and the Grenadines	No	2004	NA	2000	No
Suriname	No	NA	2006	2006	No
Trinidad and Tobago	Vision 2020 2006	1998	2001	2001	No

NA: information not available

NEAP: National Environmental Action Plan

NEMAP: National Environmental Management Action Plan

APPENDIX 6. STATUS OF RATIFICATION OF MAIN INTERNATIONAL CONVENTIONS, WITH DATE OF RATIFICATION

Country	Cartagena Convention	SPAW Protocol	United Nations CBD	UNFCC	UNCCD
Antigua and Barbuda	1986	No	1993	1993	1997
Bahamas	No	No	1993	1994	2001
Barbados	1985	2002	1993	1994	1997
Belize	1999	No	1993	1994	1998
Cuba	1988	1998	1994	1994	1997
Dominica	1990	No	1994	1993	1998
Dominican Republic	1998	1998	1996	1998	1997
Grenada	1987	No	1994	1994	1997
Guyana	No	No	1994	1994	1997
Haiti	No	No	1996	1996	1996
Jamaica	1987	No	1995	1995	1998
St Kitts and Nevis	1999	No	1993	1993	1997
Saint Lucia	1984	2000	1993	1993	1997
St Vincent and the Grenadines	1990	1991	1996	1996	1998
Suriname	No	No	1996	1997	2000
Trinidad and Tobago	1986	1999	1996	1994	2000

APPENDIX 7. SUPPLEMENTAL INFORMATION ON MAJOR DONORS AND INTERNATIONAL PROGRAMMES

CIDA: Has a Barbados office serving the eastern Caribbean, and country programmes in the Dominican Republic, Guyana, Haiti and Jamaica. Key contact: Yuri Chakalall, Senior Environment Officer, CIDA/Barbados (Yuri.Chakalall@international.gc.ca).

FAO: Key contacts in FAO's sub-regional office in Barbados: Bisessar Chakalall, Senior Fisheries Officer (Bisessar.Chakalall@fao.org) and Claus-Martin Eckelmann, Forestry Officer (claus.eckelmann@fao.org).

GTZ: Key contacts: Wolfgang Lutz (Wolfgang.Lutz@gtz.de) and Rosa Lamelas (rosa.lamelas@gtz.de), GTZ Dominican Republic.

Spain (AECI): A description of its current work in the Dominican Republic is available at www.aeci.es/03coop/2coop_paises/dep/01coop_mex_acentral_caribe/ftp/DEP_rep_domin_2005_2008.pdf.

USAID: Information on USAID's upcoming regional environmental programme is available at www.usaid.gov/locations/latin_america_caribbean/environment/new_program.html. Key contact in the Jamaica office (which also serves the eastern Caribbean): Karen McDonald-Gayle (kmcdonald-gayle@usaid.gov).

UNDP: For information on its Jamaica country programme, see www.undp.org/fojam/environment.htm. Information on its work in the OECS countries: www.bb.undp.org/energyenvir.html. Information on its Dominican Republic country programme, see www.pnud.org.do.

World Resources Institute: For a description of its work on economic valuation of coral reefs in the region, see www.wri.org/biodiv/project_description2.cfm?pid=222.

WWF/Canada: For information on its work in Cuba see www.wwf.ca/AboutWWF/WhatWeDo/ConservationPrograms/Conservation.asp?program=international.

