



The Government of Curaçao

NATIONAL REPORT OF CURAÇAO

for
The Third International Conference on Small Island Developing States
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MINISTRY OF
HEALTH, ENVIRONMENT AND NATURE

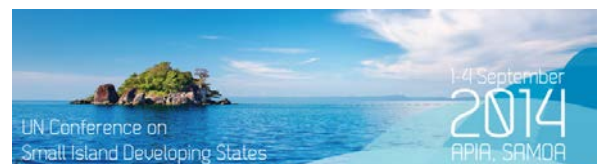


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ACRONYMS

BPoA	Barbados Plan of Action
BT&P	Bureau Telecommunication and Post
CariWet	Caribbean Wetlands Regional Initiative under the Ramsar Convention
CARMABI	Caribbean Research and Management of Biodiversity
CBSC	Central Bureau of Statistics of Curaçao
CTB	Curaçao Tourism Office
DBB	Directie Buitenlandse Betrekkingen (Office of Foreign relations)
DCNA	Dutch Caribbean Nature Alliance
EOP	Eilandelijk Ontwikkelingsplan Curaçao (an island wide plan with zoning rules)
EROC	Eilandsverordening ruimtelijke ontwikkelingsplanning (Planning and Zoning Ordinance)
FADs	Fish Attracting Devices
FAO	Food and Agricultural Organization of the United Nations
GIS	Geographic Information Systems
HDI	Human Development Index
IPCC	Intergovernmental Panel on Climate Change
MAB	Man and the Biosphere
MDGs	Millennium Development Goals
MSI	Mauritius Strategy for the Further Implementation of the BPoA
NGOs	Non-Governmental Organizations
SD	Sustainable Development
SIDS	Small Island Developing States
SLR	Sea Level Rise
TAC	Thierry Apoteker Consulting
UN	United Nations
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UoC	University of Curaçao Dr. Moises da Costa Gomez
USONA	Uitvoeringsorganisatie Stichting Ontwikkeling Nederlandse Antillen (Financial Institute for Development Projects)



EXECUTIVE SUMMARY

Curaçao has made preparations for the Third International Conference on the sustainable development of Small Island Developing States (SIDS), scheduled to take place in Apia, Samoa in September 2014. The process began with national multi-stakeholder consultations from June to November 2013, where the implementation of the Barbados Programme of Action (BPoA), agreed upon in 1994, and the Mauritius Strategy for the further Implementation of the BPoA (MSI), agreed upon in 2005, were assessed and reviewed. Several governmental agencies, civil society groups, and business entities participated and gave input to compile this report. The process continued with a National Conference on Sustainable Development in March 2014 funded by the University of Curaçao.

The national report committee established for this report reviewed the 14 priority areas identified in the BPoA and MSI: climate change and sea-level rise, natural and environmental disasters, management of wastes, coastal and marine resources, freshwater resources, energy resources, land resources, tourism resources, biodiversity resources, human resource development, national institutions and administrative capacity, regional institutions and technical cooperation, transport and communication, and science and technology.

The priority areas which need critical attention due to current challenges appears to be the management of wastes, freshwater resources, national institutions and administrative capacity, and land resources. In addition to any successes in the fourteen areas, this report also incorporates challenges and opportunities of each priority area.

Curaçao should take advantage of the sustainable development framework provided by the BPoA and the MSI to address environmental, social, and economic challenges. A joint commitment must be established through an organized, coherent, and collaborative approach between Curaçao and other nations for a greater support of sustainable development of SIDS.

The commitment of the Government of Curaçao towards integrating and achieving sustainability must be comprehensive. A political framework of the government should be created to ensure stability, continuity, accountability, and a broad platform for effective dialogue between stakeholders on sustainability issues.

Climate Change and Sea-level Rise

Temperature rise due to climate change can be harmful for human health, marine environment, agriculture, and air quality, and causes an increase in waterborne and airborne diseases. Temperatures are expected to rise between 1.5 and 3 degrees Celsius. Precipitation is expected to decrease during the wintertime in the Southern Caribbean. The sea level rise can cause great stress on the marine environment. It can cause salinization, which can affect the quality of fresh water reservoirs. A global average sea level rise between 45 and 82 cm is expected by the end of the century.

Public awareness about climate change and dissemination of information are regularly provided by the Meteorological Department. The department also collects climatological information and performs studies to establish the level of climate change in Curaçao. Overall, national efforts are being made to address climate change adaptation in Curaçao.

Natural and Environmental Disasters

Curaçao is vulnerable to damaging natural disasters. A hazard analysis from August 2011 shows that the primary hazards are flash flooding generated by tropical storms, due to both heavy rainfall and breaching of the dams, and other risks connected to severe thunderstorms. Other hazards like drought and marine hazards such as storm surge and tsunamis are also possible on the island.

Under the local project "Regional Risk Reduction Program," both a preliminary risk and hazard assessment have been conducted, and preliminary hazard maps have been produced to identify both natural and environmental hazards.



The current Disaster Management Structure and Plan are being updated and revised at the moment. There is need for an analytical model to conduct scientific, and in depth-investigations. With regards to this aspect, many efforts are being made to assess these threats and risks. The challenges identified for natural and environmental disasters in Curaçao are the availability of technical, financial, and human resources to implement measures to mitigate the effects of disasters.

Management of Waste

One of the major challenges is the management of waste. The problems in waste management that threaten environmental sustainability in Curaçao include pollution of marine areas from domestic sewage, inadequate sewage treatment facilities, industrial effluents and agricultural runoff, the management of toxic substances, and ineffective regulations.

Small business groups recently started to collect solid waste and used cooking oil to recycle and re-use. Public awareness programs have been established.

Critical for dealing with the waste management issue is the transformation in focus from pollution prevention to materials management, to find flexible and protective ways to conserve resources.

Recent assessments and studies have shown that responsibility has to be shared for achieving success in improving environmental sustainability through partnerships and collaborations between businesses, consumers, and the government to work together to make changes across the whole supply chain.

The reefs of Curaçao are subjected to a variety of natural and human related stressors: overfishing, coastal development, underground sewage discharge, chemical pollution, and artificial beach construction have caused the decline of the shallow reef. Massive coral bleaching whereby corals lose their symbiotic algae in response to elevated seawater temperatures has been documented for Curaçao reefs.

Curaçao still harbors some of the best reefs in the region. The island of Curaçao is surrounded by a fringing reef with a total surface of 103 km². Especially the island's undeveloped, north shore, and eastern and western sides of the south shore still harbor extremely healthy coral communities.

Recently, a policy document was drafted and approved by the government with the aim to an enactment to restore the fish population.

It is imperative to start effective management strategies to reverse the degradation of Curaçao's reefs. This issue should be addressed at various spatial and organizational levels. The government should directly promote such community groups while also discussing this topic with more organized structures such as corporations, fishermen, and representatives of the construction and tourism industry.

Future management efforts on Curaçao should focus on the following main stressors: (1) overfishing, which reduces the ability of the wider reef ecosystem to oppose replacement of coral and other reef building species by algae and (2) the reduction in the quality of water overlying reefs due to increased dissolved inorganic nutrients, enrichment with particulate organic matter, light reduction from turbidity, and increased sedimentation.

Due to Curaçao's semi-arid climate, with its irregular and sometimes heavy rainfall, it is very important to manage rainwater runoff control in a structured way, catching part of it, and managing all flows. Run off conservation helps improve the quality and quantity of groundwater resources available for watering of gardens and farms. In the year 1976/1977 2,754 wells were registered that has increased by 2011 to 7,885 wells. The majority of agricultural production and small cattle raising depends on groundwater.

There is a database of 30 years of data available on groundwater quality and quantity, and the capacity of dams (water catchment basins). The government policy is to implement a sustained protection of drainage areas on the island.



COUNTRY PROFILE

Parameters	Description
Capital	Willemstad
Location and Size	The island of Curaçao lies between 12-13°N and 68-70°W, 30-70 km off the coast of Venezuela in the Southern Caribbean Sea, with a total subsurface of 444 km ² in size.
Population	- Inhabitants: 149.679 (CBSC, 2011) - Inhabitants per area: 337/km ² - Human Development Index: 0.811 (CBSC, 2013)
Climate	Its climate is semi-arid, with its rainfall season occurring during the Northern Hemisphere winter. The average annual rainfall is 601 mm/year.
Topography	Curaçao is approximately 62 km long and 4 to 14 km wide, the smallest width being in the middle of the island Curaçao. Curaçao is predominantly flat, but has hills alongside its entire length. The highest hill, the Sint Christoffelberg, rises 372 m above sea level.
Geology	Curaçao is an island of volcanic origin with two sedimentary rock formations in several areas of the island and a band of limestone formation surrounding the island. The limestone terraces and hills formed gradually, as fringing coral reefs grew and fossilized under the influence of glacial and inter-glacial periods during the Quaternary period. The inner bays found along the coastline were formed due to sea-level rise after the last glacial period.
Vegetation	The vegetation of Aruba, Curaçao, and Bonaire can be generally characterized as dry woodland vegetation. The island comprises 22 different vegetation types (Beers <i>et al.</i> , 1997), ranging from dry climatic evergreen forest types and woodlands to seasonal desert-like scrublands and edaphic vegetation types, such as mangroves areas (approximately 55 ha) near salinas and manzaliña (manchineel) woodlands in and near seasonal streams (roi). The flora of Curaçao has 482 species (twenty endemic species and two globally endangered species), which is comparable with other arid and semi-arid areas of the Caribbean (DCNA, 2013).
Economy	Tourism, trade (container transshipment), oil refining industry, ship repair and maintenance, financial offshore, and trust sectors. Curaçao has a high average per capita GDP by regional standards: \$22,619 USD (2012) (MDG, 2011)



Map of Curaçao

1. INTRODUCTION

1.1 Background on the Involvement of Curaçao in SIDS

“Small Island Developing States and islands supporting small communities are a special case both for environment and development. They are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion and isolation from markets, place them at a disadvantage economically and prevent economies of scale (Agenda 21: 17.124).”

This was stated in the policy document Agenda 21. It is the first recognition for unique challenges of Small Island Developing States (SIDS) at the United Nations Conference at the Environment and Development (the Earth Summit) at Rio de Janeiro, Brazil in 1992. The First Conference on SIDS, which was held in 1994, produced the Barbados Programme of Action (BPoA), while the Second Conference held in 2005, resulted in the Mauritius Strategy of Implementation (MSI) for the Further Implementation of the BPoA. One of the key outcomes of the Rio +20 conference in 2012 was that the United Nations General Assembly should assemble a third international conference on SIDS in 2014. In preparation to this third conference, two additional regional and interregional preparatory meetings at Jamaica and Barbados were held in 2013 and were attended by a staff member of the Department of Foreign Relations of Curaçao.

1.2 National Preparatory Process

Many stakeholders and representatives from the civil society, business community and governmental agencies provided relevant material and information in preparation to assemble a position paper and national report for the Third International Conference on Small Islands Development States (SIDS), which will be held in September 2014 in Apia, Samoa. The report illustrates the country’s efforts, achievements, remaining gaps, challenges and obstacles to achieve the targets for sustainable development set out under the BPoA and the MSI. The Samoa conference aims to seek the following goals that we will elaborate upon further in this report:

- a) Assess the progress to date and the remaining gaps in the implementation of the BPoA and the MSI building on, *inter alia*, existing reports and relevant processes;
- b) Seek a renewed political commitment by all countries to effectively address the special needs and vulnerabilities of SIDS by focusing on practical and pragmatic actions for the further implementation of the BPoA and MSI, *inter alia*, through mobilization of resources and assistance for SIDS;
- c) Identify new and emerging challenges and opportunities for the sustainable development (SD) of SIDS and ways and means to address them including through the strengthening of collaborative partnerships between SIDS and the international community and;
- d) Identify priorities for the Sustainable Development of SIDS for consideration.

1.3 Multi-stakeholder Consultations

For the National Assessment on Sustainable Development of Curaçao, consultative meetings were held with different stakeholders from June 2013 to November 2013, and subsequently an extensive analysis of existing plans, procedures, programs and policies was conducted in advance of the conference of Samoa. A two-day National Conference on Sustainable Development of Curaçao was held on 25th and 26th of March 2014, during which participants provided a critical view of the discussed focal areas. This occasion was also valuable to address sustainability issues on Curaçao. This



report is the outcome of the consultative meetings, the critical review of documents and literature and the results of the conference. The working group, contributors and interviewees who were consulted are mentioned in Appendices 1 and 2.

1.4 The Scope of the Report

This report is structured around the 14-point priority areas of the BPoA and provides the achievements, the existing challenges and the possible opportunities. Lack of available and accessible data limited the possibility to provide a more representative overview and progress on certain priority areas. This is however a great starting point for further research on those areas. Despite this limitation, we want to give gratitude to all the contributing authors who provided enough data to review the progress on the BPoA and MSI. This is the first report on sustainable development produced by the government of Curaçao.

1.5 Definition of Sustainable Development and Sustainability in the context of SIDS

The definition of sustainable development is based on the definition mentioned in the Brundtland Commission Report, Our Common Future (1987):

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

This definition is the working definition of sustainable development according to the United Nations. Notwithstanding this definition, SIDS do have unique issues and challenges. Many SIDS, including Curaçao, need to move towards low-carbon, climate resilient economies. SIDS need to enhance coastal zone management and protection of local underwater and land biodiversity. Finally, they need to strengthen regional and national institutions with the aim to provide and establish more effective policies on social development and social inclusion.

1.6 Priority Areas

The following themes of the BPoA were assessed and addressed extensively in this report: climate change and sea level rise, natural and environmental disasters, waste management, coastal and marine resources, freshwater resources, land resources, energy resources, tourism resources, biodiversity resources, human resource development, national institutions and administrative capacity, regional institutions and technical cooperation, transportation and communication, and science and technology.



2. NATIONAL THEMATIC ASSESSMENT OF THE IMPLEMENTATION OF THE BPoA

Critically looking back and assessing what has been done is significant for moving forward. In the following chapter an overview of the national actions undertaken to implement the BPoA and MSI will be provided. The chapter highlights the progress made within the main priority areas identified by the BPoA. As well, challenges experienced within each priority area will be elaborated. The chapter concludes how far we have come after the BPoA and MSI.

2.1 Climate Change and Sea Level Rise

Basis for Action

Curaçao, consciously aware of the effects of the increasing carbon emissions (CO₂) which pose many threats on vulnerable islands, has made climate change adaptation and mitigation a national priority. In contrast to many SIDS, Curaçao contributes to global carbon emissions due to its oil refinery activities and methods used to produce local electrical energy and water.

The changes due to air and sea surface temperature rising can be harmful for the human health, marine environment, agriculture, and air quality, which causes increase in waterborne and airborne diseases. According to the fifth assessment report of the Intergovernmental Panel on Climate Change (IPCC), temperatures in the Caribbean region are expected to increase between 1.5 to 3 degrees Celsius this century. Precipitation is projected to decrease during the wintertime in the Southern Caribbean. The sea level rise can cause great stress on the marine environment, such as corals and coastal areas. This phenomenon can cause salinization, which can affect the quality of fresh water reservoirs. IPCC estimates a global average sea level rise between 45 and 82 cm by the end of the century.

Potential risks due to climate change and possible adaptations are given in the following table:

Small Islands				
Key risk	Adaptation issues & prospects	Climatic drivers	Timeframe	Risk & potential for adaptation
Loss of livelihoods, coastal settlements, infrastructure, ecosystem services, and economic stability (<i>high confidence</i>) [29.6, 29.8, Figure 29-4]	<ul style="list-style-type: none"> Significant potential exists for adaptation in islands, but additional external resources and technologies will enhance response. Maintenance and enhancement of ecosystem functions and services and of water and food security Efficacy of traditional community coping strategies is expected to be substantially reduced in the future. 			Very low Medium Very high
			Present	
			Near-term (2030-2040)	
			Long-term (2080-2100)	2°C 4°C
The interaction of rising global mean sea level in the 21st century with high-water-level events will threaten low-lying coastal areas (<i>high confidence</i>) [29.4, Table 29-1; WGI AR5 13.5, Table 13.5]	<ul style="list-style-type: none"> High ratio of coastal area to land mass will make adaptation a significant financial and resource challenge for islands. Adaptation options include maintenance and restoration of coastal landforms and ecosystems, improved management of soils and freshwater resources, and appropriate building codes and settlement patterns. 			Very low Medium Very high
			Present	
			Near-term (2030-2040)	
			Long-term (2080-2100)	2°C 4°C

Achievements

Public awareness on climate change and dissemination of information are regularly provided by the Meteorological Department. Nationally, the sea level is being monitored at the Mega Pier (central location) and Bullenbaai (western location). There are ongoing deliberations with the Curaçao Ports Authority about the collected data from the 70's. The main issue is that the 70's data still have to be digitalized and need to be compared to previous data. Climate studies have been performed by the Meteorological Department to establish the level of climate change in Curaçao, showing the number of cold nights has decreased during the last decades and the numbers of hot days have increased, indicating a warming trend.

Challenges and Opportunities

Overall, national efforts have been made to address climate change adaptation in Curaçao. For example, the Meteorological Department Curaçao continues to address climate change adaptation and mitigation in Curaçao while observing, analyzing, and archiving Curaçao's weather data (e.g. rainfall, droughts, daily maximum and minimum temperatures, etc.) and providing scientific climatological information. Still, challenges prevail on the level of availability of technical, financial, and physical resources to implement measures to mitigate the effects of climate change.

2.2 Natural and Environmental Disasters

Basis for Action

Curaçao, like many other small islands, is vulnerable to damaging natural disasters. A preliminary hazard analysis conducted in August 2011 shows that the primary hazards for Curaçao are flash flooding generated by tropical storms, due to both heavy rainfall and breaching of the dams, and risks connected to severe thunderstorms. Other hazards such as drought and marine hazards, such as storm surge and tsunamis, are also possible on the island. Disasters do not only cause mayor destructions to the environment, but they have a long-term effect on the economy, especially small and medium size businesses. They often set back development up to 10–20 years. With the expected changes in sea level and weather patterns due to climate change in the near future, we should expect more extreme weather (rainfall, storms, etc.). Even if Curaçao does not receive direct hits from storms, past experience has shown that storm surge is powerful enough to damage coastal zones and underwater ecosystems. However, the main issue is that we must invest financially and prepare technically early enough against such events as a hurricane, tsunami, storm surge, etc.

Achievements

Under the Regional Risk Reduction Initiative (R3I) project, both a preliminary risk and hazard assessment has been conducted and preliminary hazard maps have been produced. This hazard assessment identified both natural and environmental hazards. In addition, a document repository system has been created to archive all the documents related to disaster management. The project also focused on building capacity in the area of hazard mapping and working with GIS.

The current Disaster Management Structure is being updated and revised at the moment. A business plan for the new structure has been drafted and presented to the Prime Minister. An approval of this structure from the government has not been communicated as yet. The objective of the new structure is to improve disaster response, with recommendations such as a multi-incident management system. This structure can provide an integrated view of the issues and risks that Curaçao will face in the near future and will help to take care of the necessary legislation that needs to be put in place to make development sustainable. A hazard and risk assessment has been conducted for tsunami and other marine coastal hazards and the local response plans are being revised to encompass the tsunami threat. The next step with respect to this hazard plan is to develop preparedness of the community and implement preventive and mitigation measures. Another hazard that has been investigated is oil spills and the current oil spill plan is also being revised.

A need for an analytical model to conduct scientific and in depth-investigations has been identified. With regards to this aspect, many efforts are being made to assess these threats and risks. One such example is the effort that is currently being made with help from the financing institute for development projects in the Dutch Kingdom, USONA. This project will encompass the preparatory phases to conduct an in depth investigation on marine hazards and flooding. The Ministry of Health, Environment and Nature and the Meteorological Department are currently working on several projects related to e.g. flooding, subterranean water and water management.

On a regional level, there exists cooperation between Barbados and Curaçao to measure the Sahara dust in the Caribbean and how it impacts our sea life as well as the health of our coral reef. Another



regional collaboration can be identified in the project that is being conducted with the UNDP and the Metrological Department to establish a platform for an early warning system for flooding and tsunami's.

Challenges and Opportunities

The challenges identified for natural and environmental disasters in Curaçao are the availability of technical, financial and human resources to implement measures to mitigate the effects of disasters. There is still a great need for international agreements and joint cooperation with other SIDS.

2.3 Management of Wastes

Basis for Action

One of the major challenges identified for many SIDS, including Curaçao, is the management of waste. Curaçao is confronted with waste management problems that threaten environmental sustainability in Curaçao: pollution of marine areas from domestic sewage, inadequate sewage treatment facilities, industrial effluents and agricultural runoff, the management of toxic substances such as pesticides, waste oil, and heavy metals, and ineffective regulations.

Recent studies by Thierry Apoteker Consulting (TAC) brought to surface some significant deficiencies in the country's dealing with waste management issues. These are:

- (a) marine pollution from land based sources such as domestic sewage, industrial effluents and agricultural runoff: they carry risks for human health and degrade habitats such as coral reefs and tourist attractions such as beaches;
- (b) the management of toxic substances such as pesticides, waste oil, and heavy metals: Curaçao has limited physical capacity to isolate and dispose of such substances in an environmentally sustainable manner;
- (c) sewage treatment facilities: in Curaçao such facilities are inadequate resulting in poorly-treated effluent being discharged into the environment; and
- (d) ineffective regulations: Curaçao has devoted much time and resources on developing regulations; Nevertheless, the TAC study states that regulations have not always been very effective because of inadequate institutional and human resource capacities to enforce them.

Simply disposing wastes in a landfill is no longer viewed as environmentally sustainable. Sustainable waste management must include measures such as prevention and awareness, separation by waste type, and recycling. Currently some facilities exist at the Malpais Landfill and elsewhere to separate wastes and to drop off already separated wastes but only on a small scale. Action must be taken as the Malpais Landfill is filling up and its remaining lifespan is estimated to be only 10–15 years.

Achievements

Until recently, small business groups started to collect solid waste and used cooking oil with the purpose to recycle and re-use. Many public awareness programs have been developed and waste drop-off centers established, although many are not functioning efficiently. There is also some commercial recycling. One major achievement is that all the island's large supermarkets joined a national campaign to ask shoppers to bring their own grocery bags and voluntarily agreed to stop using plastic bags at checkout. The supermarkets still have large and small paper bags for customers.

Challenges and Opportunities

These are the main challenges and opportunities in the waste management area:

- A growing trend of trans-boundary movement of toxic and hazardous waste should be addressed;
- The passage of ships carrying toxic and hazardous wastes, chemicals, and radioactive materials is of international concern and of priority concern to SIDS;
- More public awareness and education campaigns are urgently needed to make people more conscious of the waste challenges on Curaçao;



- Long-term continuous waste management planning needs to be developed;
- Hazardous and chemical waste is not yet legally defined or regulated;
- A lack of regulation;
- Inadequate enforcement;
- Few incentives to prevent, reduce, and recycle waste;
- Diminishing capacity of the landfill.

Recent assessments and studies have shown that responsibility has to be shared for achieving success in improving environmental sustainability. Partnerships and collaborations between businesses, consumers, and the government can make changes across the whole supply chain—from easier product reuse to recyclability. Most of the partnerships are voluntary while others are alternatives to regulatory control. Benefits include recognition for activities that result in resource conservation (TAC, 2013; Amarica/Selikor, 2014). Over the past years substantial progress has been made regarding the proper collection and transportation of waste; however reduction of wastes destined for final disposal and adequate final disposal itself have lagged behind. There must be a shift to reduce waste through prevention, reuse, and recycling of selected waste components, with waste preferably being separated at the earliest stage (Amarica/Selikor, 2014).

2.4 Coastal and Marine Resources

Basis for Action

The reefs of Curaçao are subjected to a variety of natural and human related stressors that have also affected reefs elsewhere on the planet. Curaçaoan reefs currently suffer from overfishing due to the uncontrolled use of spear guns, fish traps and gill-nets (van 't Hof, Debrot, Nagelkerken, 1995; Le Loup, van der Mark, 1984). Coastal development, underground sewage discharge, chemical pollution and artificial beach construction have caused the decline of most shallow reefs (Bak, Nieuwland, 1998). Massive coral bleaching whereby corals lose their symbiotic algae in response to elevated seawater temperatures has affected Curaçao reefs in 1987, 1990, 1995, 1998 and 2010, whereby large coral species that contribute most to reef formation were most heavily affected (Vermeij, 2014).

From a Caribbean perspective, Curaçao still has some of the best reefs in the region providing the island with a unique opportunity to take advantage of the economic benefits coral reefs provide, as well as to protect a unique ecosystem that is becoming increasingly rare elsewhere in the Caribbean. Curaçao is surrounded by a fringing reef with a total surface of 103 km². Reefs occur from the low water line to 20-250 m offshore. Coral cover can be extremely high (>70%) and 65 coral species occur around the island. The island's undeveloped north shore, as well as the eastern and western sides of the south shore, harbor the healthiest coral communities. Reefs along the southern coast are degrading or have degraded. In addition to fringing reefs, large inland bays can be found around the island in which mangrove/sea grass communities occur. Curaçao is not only part of one of the five richest hotspots for biodiversity and endemism on Earth (i.e. the Caribbean), but also represents a hotspot center by itself within this eco-region. The fact that growing reefs (e.g., those at Oostpunt) still exist on Curaçao makes the island unique in the Caribbean.

On Curaçao, the ecological importance of the island's inland bays as important nursery areas for fish and invertebrates is well known. Densities of several fish species on coral reefs are higher near bays containing mangroves and sea grass beds that function as nurseries. The abundance of fish is lowest near populated areas and likely attributable to local fishing efforts. Herbivorous fish that are important in controlling algal growth are most abundant in the eastern-southern shore.

Achievements

Recently, a policy document was drafted and approved by the government with the aim to restore the fish population and halt overfishing in the Curaçao waters through no-fishing zones. Another goal of introducing protected areas is to reduce the lionfish population. Four areas—from shore to 150 meters



off the coast—will become no-fishing zones along nearly 30% of the island’s coast. Trawling is still allowed in these no-fishing zones for high-migratory fish species such as dradu (common dolphin fish), mula (wahoo), tuna, marlins, and masbangu (bigeyed scad). Fish Attracting Devices (FADs) have been deployed since 1993 as part of the sustainable fishery program. Recent projects were implemented that indicate that Curaçao is taking the decline of its marine resources increasingly more serious, such as the installment of four RAMSAR areas, a ban on the use of gill nets, legislation to prevent more invasive species from entering the island, etc. (Vermeij, 2014). Furthermore, Curaçao has various long term monitoring programs in place for coral reefs (since 1972, Carmabi), reef fish (since 2010, Carmabi), water quality (since 2013, Carmabi) and recently started a prestigious deep water monitoring program when it became part in 2012 of the Deep Reef Observation Program (DROP) led by the Smithsonian Institute in collaboration with Substation Curaçao.

Challenges and Opportunities

To start effective management strategies aimed at reversing the degradation of Curaçao’s reefs, it is imperative that these are created at various spatial and organizational levels and discussed with local stakeholder groups such as corporations, fishermen, and representatives of the construction and tourism industry. Future management efforts on Curaçao should focus on the following main stressors: (1) overfishing, which reduces the ability of reef communities to oppose replacement of coral and other reef building species by algae; (2) the reduction in the water quality due to increased dissolved inorganic nutrients, uncontrolled sewage discharge, chemical pollution and increased sedimentation. The latter problem is basically an unanticipated side-effect of coastal urbanization resulting leading to unmanaged influxes of nutrients (including fertilizers and chemicals) into Curaçao’s near-shore waters, which in turn cause eutrophic conditions of a marine system historically characterized by near-absence of nutrients (Vermeij, 2014).

2.5 Freshwater Resources

Basis for Action

Freshwater resources are essential for meeting the basic needs of SIDS. Currently potable water is produced by industrial processes using seawater distillation and reverse osmosis. Due to Curaçao’s semi-arid climate, with its irregular and sometimes heavy rainfall, it is very important to organize rainwater runoff control in a structured way, catching part of it and managing all flows. Runoff conservation helps improve the quality and quantity of groundwater resources available for watering of gardens and farms. Groundwater flow occurs in fractures and fissures and in secondary (solution) channels. The later formations in the middle and western parts are mostly aquacludes. The only two permanent springs on the island (at Hato and San Pedro) are fed from calcified aeolian limestone terraces. The groundwater in the limestone shows tidal influence and the formation of freshwater lenses is rudimentary. In the year 1976/1977 there were 2,754 wells registered. In 2011 there were 7,885 wells registered—an increase of almost three times the number registered in the ’70’s. The majority of agricultural production and small cattle raising depends on groundwater from wells. Farmers rely on it to irrigate fruits, vegetables, and fodder crops, and even for animal watering. Besides being used in the agricultural sector, groundwater keeps many parts of the landscape and urban areas green, both as a natural and an irrigation water source. Groundwater usage has increased these last years due to the high cost of drinking water. During 1977 and 1978 a dam survey was carried out in 45 (mostly non urban) drainage areas. A total of 1,290 dams were surveyed.

Achievements

There is a database of 30 years of data available on groundwater quality and quantity and the capacity of dams. Much of this information needs to be digitalized.



Challenges and Opportunities

The main objective of government policy is to implement a sustained protection of drainage areas on the island. In order to realize this aim a program has to be developed on local level, in which the government not only contributes to the repair, conservation, and maintenance of dams, but where the public and private sectors and the public at large participates in taking care of and conserving the structures within the drainage areas and helps to conserve nature. In addition, there must be congruence between the urban development plan and the protection of dams.

The following goals and actions should be achieved for a sustainable freshwater management:

- When urban development plans are made, dams have to be considered not only for their water conservation aspect but also for their role in the ecology. Usually, tourist and housing development projects do not take existing water reservoirs into account. Most of the time these are demolished, destroyed, or poorly reconstructed;
- Focus on a long-term and sustainable protection policy on the works related to water aspects (dams) to help groundwater recharge and to contribute to the islands ecological improvement. These should also be protected by law;
- All strategies need to take account of the possible constraints to water supply from low groundwater recharge in times of drought, salt-water intrusion, and inundation as a result of climate change and sea level rise; and
- The lack of legislation on regulating the quantity and quality of water reservoirs, regulation of the use of wells, resources, and drainage. Investments should be made for acquiring equipment for maintenance and improvement of drainage systems and reinstating that maintenance and restoration work should be carried out on about 70 dams per year.

2.6 Land Resources

Basis for Action

The small size of most SIDS, coupled with land tenure systems, soil types, relief and climatic variation, limit the area available for urban settlement, agriculture, tourism, and other infrastructural developments, and create intense competition for land use options. Most aspects of environmental management in SIDS are directly dependent on, or influenced by, the planning and utilization of land resources, which in turn are intimately linked to coastal zone management and protection in those states.

With regards to the use of land resources, in Curaçao there are three competing land uses, namely commercial, tourism, and residential development projects. The lack of consistent planning and management results in uncontrolled and/or illegal development projects and unsustainable use of land resources. In order to mitigate this Curaçao adopted its Planning and Zoning Ordinance in 1980 (Eilandsverordening Ruimtelijke Ontwikkelingsplanning Curaçao, "EROOC"), and adopted a development plan with zoning rules against undesirable building developments in Curaçao (Eilandelijk Ontwikkelingsplan Curaçao, "EOP") in 1995 (Janga, 2013). For instance, with regard to land resources in the agriculture sector, the estimated total yearly agricultural production fluctuates between 10 and 12 million of crops. In 2010 this estimate was considerable lower due to a prolonged period of drought followed by a rainy season with excessive rainfall. The fluctuation is to a great extent a result of climatic circumstances with dry years often resulting in lower production.

Achievements

Agriculture Policy Plan 2013-2017

Recently, public officials established an Agriculture Policy Plan 2013-2017, in which the government supports, stimulates, and facilitates all processes and activities required to get to a well-organized and efficient agricultural sector based on cooperative structures and aimed at increasing the local production. In this plan the health aspects regarding both the producer and the consumer are taken



into consideration. The main objectives within this sector are to achieve food security for all of the population, to have economic growth and create jobs, to fortify the position of the primary sector in the economy, and to increase the economic resilience.

With regard to this policy, dealing with the natural resource utilization in this agricultural sector, the government of Curaçao strives and stimulates sustainable land use and the focus remains on the application of production technology such as greenhouses that require less land and may improve yields per square meter of land use. Besides national laws, the Kingdom of the Netherlands has signed also several international and regional treaties on behalf of Curaçao in order to guarantee the sustainable use of its natural resources. In order to guarantee and promote accessibility for the population to basic food products, maximum retail prices for the mixture of basic food products are set. Some other products like some fruits and vegetables also have fixed maximum retail prices (Min. GMN, 2014).

Challenges and Opportunities

The use of land resources remains a challenge on Curaçao. The sustainability of land resources will need to be fully assessed based on financial, technical, and environmental considerations. A long-term spatial and urban planning outlook of 50-100 years for land management would indicate critical sustainability issues. As the country is already pressured by increased population and carrying capacity of the island, the need is great for additional infrastructures and dealing with the complex dynamic between commerce, agriculture, housing and transportation sectors. There are a lot of unpopulated areas with the urban zone and there is little restoration of existing houses in bad condition, with nearly 7,000 houses remaining empty. The challenge in urban planning is making better use of existing land resources and ensuring city development is sustainable. More awareness on these issues should be prompted by local government officials and a clear vision on this matter should be formulated.

2.7 Energy Resources

Basis for Action

For decades Curaçao has been fully dependent on oil when it comes to energy production. Despite of the presence of a local refinery, run by Petroléos de Venezuela S.A. (PdVSA), oil prices were and are set by international markets and fluctuate heavily from time to time with a long-term tendency to rise to unacceptably high levels. Only after dramatic developments in the international petroleum market in 2008, were the first attempts made to formulate a National Energy Policy to mitigate the risks of the rising oil prices, as well as to break with the past and set a path towards a new future.

Curaçao became an autonomous country on October 10, 2010 and shortly thereafter the new government stipulated a new policy on electricity regulations, the first of more to follow as part of an overall Energy Plan. Bureau for Telecommunication and Post (BT&P), who was assigned with regulatory and advisory tasks on energy related matters by the former Executive Council for the Island Territory of Curaçao, prepared the electricity policy after an extensive sector analysis and consultation of all stakeholders. With a view to solving the problems that were identified, a new policy and supervision framework have been formulated. The general aim of the policy is to provide efficient, high quality sustainable electricity supplies for the corporate market and private households in the new country Curaçao. In order to make these macro-aims operational, based on the general points of departure for policy stated above, a new market model and six concrete policy aims regarding energy supply were formulated, which are realizing affordable provision of services, realizing reliable provision of services regarding the availability of electricity for the corporate and private markets, structurally safeguarding the interests of the end consumers of electricity, introducing more market forces in (parts of) the electricity sector, realizing more sustainable energy supply and requisite medium-term energy conservation, and introducing an independent form of market regulation.



Achievements

The initial target for renewable production was set at 25% in 2015. In 2012 two wind parks of 15 mw each became operational, supplying approximately 13% of the total electricity production due to excellent wind conditions. In 2011 the regulations for small-scale, renewable production was stipulated. Households and companies were allowed to produce their own renewable electricity up to their own usage including a grid connection and feed-in compensation. Extensive technical requirements and procedures were implemented to guarantee quality over time. Currently over 300 solar installations of in total more than 7 MWp have been granted and projections go up to 25 MWp over time. The oil import in volumes has already been decreased considerably. Although many steps need to be taken, the route is set. Energy storage, demand management, and electrical transport will be explored amongst other technologies as part of a continuous journey towards a new era of less oil and more renewables.

Challenges and Opportunities

The road ahead is not a smooth, paved highway. The market model becomes more complex as more parties, technologies and drivers are involved. The incumbent company needs time to adapt to its new role. As developments, markets and policy makers want to move on quickly, time is required to manage the changes to be made.

Legacy needs to be addressed, specifically related to old production plants. More than 50% of all production plants need to be replaced in a short time frame. Sunk costs play a role, new technologies impact the workforce, and many more elements play a role when changing an installed base completely. Legislation on renewable energy also needs to be renewed to keep up with the rapid developments. New legislation needs time and specialized expertise to be developed. The need to explore new technologies such as seawater air-conditioning (SWAC) for reducing carbon emissions should be stimulated (BT&P, 2014).

A positive foresight of green technology and a faster development of clean energy services in Curaçao face a major constraint in the form of knowledge gap and insufficient capacity on topics related to low carbon economies, climate compatible development, and the green economy (TAC, 2013).

2.8 Tourism Resources

Basis for Action

Tourism, like all forms of development in the coastal zone, needs to be carefully integrated within the existing cultural and environmental development plans present within SIDS. In this specific case, Curaçao has become a partially tourism dependent country, which means that sustainable tourism development should be continuously improved. Environmentally responsible practices by tourism companies are still limited on Curaçao. The key drivers are local environmental NGOs that stimulate voluntary environmental initiatives on Curaçao (Dinica, 2005). Uncontrolled and illegal development of construction and tourism projects and rapid expansion of tourism projects may alienate locals due to traffic congestion and restrictive access to private facilities (TAC, 2013). Eco-tourism is not yet elaborated in the Strategic Tourism Master Plan for the Island of Curaçao 2010–2014.

Achievements

An emerging trend in the tourism industry is the acquiring of internationally recognized eco-labels (Dinica, 2005) but the number of local companies that did acquire an eco-label has still to be identified. This phenomenon might address the following aspects such as improved wastewater disposal, runoffs to the sea, natural degradation, and energy consumption within this sector.

Challenges and Opportunities

There is a need for regulations regarding the type and intensity of tourism in tourism zones to regulate proper and controlled tourism development projects (Dinica, 2005). Another measure is to



make it mandatory for tourist companies to conduct an environmental impact assessment at the initial stage of a tourism development project. Legislation should be also developed by public authorities for the greening of operations at the established and nature-friendly behavior by local tour operators and other tourist companies. Finally, the Strategic Tourism Master Plan should be implemented to regulate avoidance of the overcapacity of hotel rooms (Dinica, 2005). Moreover, the marketing and product development role of the Curaçao Tourist Board (CTB) should be enhanced to deal further with sustainability practices (TAC, 2013).

2.9 Biodiversity Resources

SIDS are well-known for their rich biodiversity and endemism. Curaçao is no exception, as is illustrated by a recent inventory produced by the Dutch Caribbean Nature Alliance (DCNA). Based on recent studies and assessments, Curaçao's terrestrial biodiversity is threatened by unsustainable use of resources, habitat degradation and fragmentation, deforestation, and unplanned/uncontrolled development. The marine biodiversity is also threatened by habitat destruction, overexploitation, and destructive fishing methods. Protection of terrestrial and marine biodiversity (both flora and fauna) is essential. Measures to prevent or halt the introduction of non-indigenous and invasive species are vital to protect the local biodiversity.

Achievements

The Planning and Zoning Ordinance is currently one of the few local legislation protecting Curaçao's biodiversity (Jonker, 2013). The legal base for the nature policy Plan is the National Nature Conservation Ordinance (P.B. 1998, no.41), which implements several biodiversity treaties. In 2012, four important bird areas have been designated as Ramsar sites, which consist of locally, regionally, and internationally important biodiversity.

Obstacles and Challenges

A major challenge on Curaçao is the lack or improper management of institutional, human, financial, and technical capacity to safeguard adequate management of nature conservation areas, which are managed by NGOs. Budget cutbacks from the government remain a major constraint in this area. There is a critical need for programs and projects promoting monitoring and protection of biodiversity on the local level. Nevertheless, the already existing local scientific institutions need to be strengthened by continuous joint cooperation to establish long-term partnerships.

2.10 Human Resource Development

Basis for Action

Special attention should be provided to SIDS with regard to population issues, environmental education, and training. It is a matter of high relevance to strengthen national educational and training mechanisms to promote access to and at the same time to improve the quality of basic environmental education. The recent sustainable economic strategy study (TAC 2013) analyzed the human resource development aspect and it was pointed out that Curaçao, with a population of approximately 150,000 inhabitants (Central Bureau of Statistics, 2011), suffers from two major population related issues: significant brain drain of its qualified personnel (mostly to the benefit of the Netherlands) and relatively high levels of youth unemployment—estimated in the vicinity of 25% of its youth working population according to the Labour Force Statistics (Central Bureau of Statistics, 2011). Notwithstanding these issues, the social aspect should be more frequently addressed in sustainability issues.

Achievements

Nationally, through various initiatives, governmental organizations (i.e. Ministry of Economic Development, UNESCO Curaçao) and NGOs (i.e. CARMABI) continuously conduct environmental educational school programs, capacity building, and leadership projects to enhance the environmental



awareness and human societal skills. A recent ongoing project on this priority area is the UNDP project Capacity Building and Institutional Strength for Curaçao or better known as: Kòrsou Kapasità (Curaçao is Capable). This is done to achieve MDG number 1, eradicate extreme poverty and hunger, and MDG number 7, ensure environmental sustainability. In addition, Nature and Environment Education guided tours are provided by the scientific research center, CARMABI for 12,000 school children on the island.

Challenges and Opportunities

The two significant social issues are directly related to low economic growth and inadequate functioning of the overall education and training system. This is also replicated by the parallel shortage of skilled labor. It is found also that despite relatively large spending on the education system, the dropout rate from secondary school remains high. Overall, the education system is not responsive to the needs of the island in general and of employers in particular (TAC, 2013). With regard to sustainable development, there is still a need to infuse sustainable development ideas into education curricula at all levels and to improve access to scientific, mathematics and technical data. Given Curaçao's limited human capital, its future social paradigm with the sustainable development will depend largely on harnessing all human capital available to it.

2.11 National Institutions and Administrative Capacity

Basis for Action

The integration of environmental considerations into the national decision-making processes is considered to be a vital step to be taken by Small Island developing States to ensure that the principles of sustainability guide all future development. Therefore, institutional capacity within national institutions needs to be strengthened.

Achievements

Recently, as mentioned previously, economic imperatives on Curaçao have been assessed with the aim to assist the Government of Curaçao to develop a sustainable and stable long-term economic development strategy, through an in-depth and comprehensive analysis of the issues at stake and possible options, resulting in a set of policy recommendations, themselves translated into two operational action plans (short- and long-term) and an implementation mechanism (TAC, 2013). Most recently, Curaçao has established a public-private partnership on culture heritage with the international organization Blue Shield. The aim of Blue Shield is to protect cultural heritage in case there is a war or a natural disaster. The National Committee Curaçao will mainly assist in establishing awareness programs and formulating disaster and risk management plans for local cultural heritage organizations.

Challenges and Opportunities

Despite these achievements, there is a critical need for these following actions and objectives to strengthen national institutional and administrative capacity:

- There is need for continuous environmental governance and more sustainable development institutions based on overall vision and implementation plans and a body with mandates to execute;
- There is a need for mentorship within these institutions;
- Within the government a number of policies and strategies has been formulated; however the implementation of these new policies and strategies have been hampered by the lack of capacity (human capital, finance, capital equipment) within key implementing agencies;
- Implementing instruments needs to be integrated in the policy plans;
- There is a need to improve public-private-civil society partnerships; strengthening partnerships between all stakeholders will provide a strong foundation for project sustainability, cost reduction, and ensure stakeholder ownership;
- There is a need for synergy in individual sector plans;



- There is a need to establish a reliable environmental database on environmental indicators;
- There is a great need of stringent monitoring compliance and enforcement in rural areas to protect local biodiversity and water resources.

2.12 Regional Institutions and Technical Cooperation

Basis for Action

Curaçao has been involved in regional activities executed by UNESCO, UNEP, UNDP, CariWet, Ramsar, FAO, and others. This indicates that regional participation is active and ongoing.

Achievements

UN partnerships are still being fostered. Recently, RAC-Rampeitc provided an awareness presentation, a table-top summit of oil preparedness and response training and other issues on risk assessment of oil pollution.

Challenges and Opportunities

Continuity of stable governance remains a challenge within regional cooperation.

2.13 Transportation and communication

Basis for Action

Looking back, at the start of 2001 the monopolistic market model in the telecommunication sector came to an end. The policy that had been developed for the telecommunication sector introduced the gradual development of competition and was based on the following policy aims:

- Enforcing the competition position of Curaçao and stimulating economic and social development (e.g. education and employment);
- Stimulating development of high quality telecommunication infrastructure and access to such telecommunication infrastructure;
- Safeguarding social interests related to access to and the use of telecommunication facilities.

New initiatives and market developments were stimulated by means of this policy. Since then various concessions have been granted for implementation and exploitation of fixed telecommunication infrastructure, mobile telecommunication infrastructure, and international telecommunication infrastructure. The competition that has been introduced gradually to safeguard economic interests has led to development of various telecommunication infrastructures and services on Curaçao, including broadband Internet. In addition, national coverage of both fixed and mobile infrastructures has been realized. These developments resulted in a downward trend of end user prices increasing the affordability for telecommunication services and therefore enhanced access to those telecommunication facilities.

Achievements

While the introduction of competition stimulated the development of telecommunication infrastructure and services and resulted in a wider range of options for the end user, rapid developments in the telecommunication sector, such as convergence of markets and development of over-the-top services (e.g. VoIP), need to be addressed. Through this new legislation further development of competition, especially with regard to telecommunication services, is intended to be stimulated. Provisions for market entry and supervision on parties with significant market power are being revised to meet the standards of today.

Challenges and Opportunities

Eventual implementation of a broad master plan for ICT concerns many institutions, organizations and even individuals. The coordination of such implementation is therefore very complex and delay or insufficient support for implementation is a real risk, especially as there is currently no central



institution available to execute such coordination. Revision of legislation takes time and specialized expertise. Delay in this process is also an actual risk.

2.14 Science and Technology

Basis for Action

In many SIDS, science and technology capacity remains limited and underdeveloped in both terms of research and development institutions and the availability of scientists to serve such institutions on sustained basis. At the same time, traditional knowledge and practices should be fostered by locals. A better integration of present-day and traditional knowledge could be beneficial. In the case of Curaçao, science and technology is underdeveloped. Crucial technological change for sustainable development has limited accessibility. Despite this, a few sectors of the country engage in science and technology programs and initiatives.

Achievements

In the academic sector, the national university, the University of Curaçao Dr. Moises da Costa Gomez, made efforts to conduct pilot projects on wastewater treatment (sub-constructed wetlands/bio-filters). A conference on waste and wastewater in the pharmaceutical industry was organized for the academic, business community, the government, and the general public. In the private sector, a pilot project for wastewater treatment of cesspool trucks is being conducted by public-private partners.

Challenges and Opportunities

Challenges and opportunities in this priority area are:

- Outreach to the public is limited;
- Establish regional and international cooperation;
- Create interrelation between science and technology and national environmental strategies.

Conclusion on progress Implementation BPoA and MSI

The National Assessment of the implementation of the BPoA and MSI revealed many efforts but also many gaps, challenges, and opportunities. The following priority areas are critical and urgent due to its complex challenges and obstacles: Management of Waste; Freshwater Resources; National Institutions and Administrative Capacity, and Land Resources. Nevertheless, the other priority areas need ongoing attention as well. Stakeholders involved in this process unanimously agreed on an immediate action towards the critical priority areas and the need for a stable and continuous governance and political support.



3. Emerging Challenges and Opportunities to Ongoing Sustainable Development

In addition to other several challenges and opportunities previously mentioned, Curaçao is dealing with new emerging challenges. Fortunately, dealing with these challenges could yield various opportunities.

1. Water Resources Management

Integrated water resources management should be developed and enforced and a national water resources management plan created. Water resources are closely related to other priority areas such as tourism, waste, energy, and coastal and marine resources. Water continues to pose a vital role in public health, environmental protection, and economic development. For this reason, water should be integrated at all stages of planning and development.

2. Waste Management

The growth of the waste is a challenge. Waste is growing in volumes and the complexity of waste should be addressed. The identified opportunities are as follows:

- the overall increase in the volume and variety of the waste generated;
- rising political awareness of the need to better manage waste in the context of avoiding ecological and health risks and climate change;
- urbanization in emerging economies, which is typically accompanied with a growing interest in a better living environment including better waste management; and
- development of formal and informal trade in secondary raw materials recovered from waste (source).

3. Green Economy Initiative

Green economy is an approach or means to achieve sustainable development in economic sectors namely agriculture, fisheries, transport, building and tourism. A major emerging challenge for SIDS is persuading major stakeholders to embrace and to understand the concept of green economy initiative as an opportunity to develop the sustainability agenda.

4. Mindset and Awareness about Sustainable Development

In the public administration institutions and on the higher governmental levels there should be a clear understanding about the concept of sustainable development. During this learning process, we can start aiming on how to protect the environment, how to build better transportation systems, and how to design urban space more efficiently (energy saving, parks, health issues) etc.

5. Limits to Growth and Island Capacity

Curaçao is a small island, which still mainly depends on fossil fuels. This strategic and practical topic needs to be discussed in the near future.



4. Conclusions

The UN Conference for Sustainable Development held in Rio de Janeiro in 2012 (known as Rio + 20) called for the convening in 2014 of a Third International Conference on SIDS, which will be held at Apia, Samoa. This conference will assess the progress to date and the remaining gaps in the implementation of the Barbados Plan of Action and the Mauritius Strategy for Implementation.

Curaçao committed itself to assess the current state, progress, and challenges and opportunities in the implementation of the 14 priority areas of the BPoA. Of the 14 priority areas of the BPoA, four priorities need urgent attention in line of emerging challenges. These priority areas include the Management of Waste; Freshwater Resources; National Institutions and Administrative Capacity, and Land Resources.

In addition to this reinstated commitment, a multi-consultative process was undertaken between June 2013 to November 2013, and a National Conference on Curaçao's Sustainable Development was held in March 2014 to assess the current state of sustainable development. For Curaçao, the involved stakeholders emphasized the need to implement policies and programs instead of making more new plans. In this regard, participants at the consultations want stability and continuity at the political level.

The overall implementation status and progress based on the Barbados Plan of Action may be rated as "we came far, but we are not yet there." Additionally, the areas of the MSI still need to be addressed. These include public health and vulnerable groups, social equity, alleviation poverty, drinking water as part of fresh water resources, food security/agriculture, cultural heritage, sustainable trade, knowledge management and information for decision-making, education and capacity building, legislation and environmental governance, human rights, and gender equity.

There still needs to yield certain steps with regard to establishing a consistent approach to address the priority areas. Accordingly, there is a need to:

- 1) Establish a consistent and coordinated involvement of stakeholders from civil society, business organizations and the government;
- 2) Create and disseminate mechanisms, programs, and projects to create a sustainable mindset within the community;
- 3) Formulate and implement a plan of action for the critical and urgent priority areas.



Appendix 1: Multi-stakeholder Consultation Clusters

In order to gather the much-needed information, as stated in the Barbados Plan of Action (BPoA), stakeholder consultations were held with various expert parties. To be more efficient, the 14 priority areas mentioned in the BPoA were grouped in four clusters:

- Cluster One: Chapters 3 (Management of Wastes), 6 (Land Resources), and 9 (Biodiversity Resources);
- Cluster Two: Chapters 1 (Climate Change and Sea Level Rise), 2 (Natural and Environmental Resources), 4 (Coastal and Marine Resources), and 5 (Freshwater Resources);
- Cluster Three: Chapters 10 (National Institutions and Administrative Capacity), 11 (Regional Institutions and Technical Cooperation), and 14 (Human Resource Development);
- Cluster Four: Chapters 7 (Energy Resources), 12 (Transport and Communication), and 13 (Science and Technology).

The following agencies/organizations were consulted:

- Cluster One: Ministry of Traffic, Transport and Urban Planning
Ministry of Health, Environment and Nature
Selikor (Curaçao Waste Management Collection Company)

- Cluster Two: Meteorological Department
Ministry of Health, Environment and Nature
CARMABI

- Cluster Three: George Curiel
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- Cluster Four: FAPE
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Appendix 2: Contributors

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- George Curiel (Consultant)
- Participants of the National Conference on Curaçao's Sustainable Development (March 2014).



Appendix 3: Remaining Gaps

The main gaps are highlighted below in a tabular format.

Priority areas	Gaps
Climate change and Sea Level Rise	<ul style="list-style-type: none"> - availability of technical, financial, and physical resources to implement measures and to mitigate the effects of adaptation measures
Natural and Environmental Disasters	<ul style="list-style-type: none"> - building codes and hazard map - establish an early warning system for flooding and tsunamis - international agreements and joint cooperation with other SIDS
Management of Waste	<ul style="list-style-type: none"> - growing trend of trans-boundary movement of toxic and hazardous waste should be addressed - the passage of ships carrying toxic and hazardous wastes, chemicals and radioactive materials is of international concern and of priority concern to small island developing States - public awareness education campaigns are urgently needed to make people aware of the waste challenges on Curaçao and consumption patterns - lack of long-term continuous waste management planning - hazardous and chemical waste is not yet defined or regulated - missing regulation - inadequate enforcement - few incentives to prevent, reduce, and recycle waste - diminishing capacity of the landfill - the lack of continuous national policy to prevent, reduce, and recycle waste
Coastal and Marine Resources	<ul style="list-style-type: none"> - effective management strategies - joint cooperation between stakeholders
Freshwater Resources	<ul style="list-style-type: none"> - water resources management plan - data collection and management
Land Resources	<ul style="list-style-type: none"> - long-term spatial and urban planning outlook of 50-100 years - more awareness on these issues and on the small physical space available in SIDS should be prompted by local government
Energy Resources	<ul style="list-style-type: none"> - legislation renewable energy - new technology - fair decentralization of renewable energy
Tourism Resources	<ul style="list-style-type: none"> - regulations regarding the type and intensity of tourism in nature conservation - environmental impact assessment for new tourist development plans and projects - greening tourist operations - awareness programs - the implementation of the Strategic Master Plan - role of the CTB
Biodiversity Resources	<ul style="list-style-type: none"> - lack of institutional, human, financial, and technical capacity - lack of programs and projects to promote biodiversity on local level
Human Resource Development	<ul style="list-style-type: none"> - low economic growth - inadequate functioning of the overall education and training system to infuse sustainable development ideas into education curricula at all levels
Transportation and	<ul style="list-style-type: none"> - absence of central institution available to execute implementation

Communication	
National Institutions and Administrative Capacity	<ul style="list-style-type: none"> - continuous environmental governance and more sustainable development institutions - mentorship within these institutions - data mapping and information management - implementation of policies and strategies - improve public-private-civil society partnerships - synergy in individual sector-plans - a reliable environmental database on environmental indicators - stringent monitoring compliance and enforcement in rural areas - fair participation procedures for citizens
Regional Institutions and Technical Cooperation	<ul style="list-style-type: none"> - continuous and stable governance remains a challenge within regional cooperation
Science and Technology	<ul style="list-style-type: none"> - outreach to the public

The following themes were not assessed and addressed extensively in this report. However, these themes will be reviewed in the near future when addressing sustainability issues: public health and vulnerable groups, social equity, alleviation poverty, drinking water as part of fresh water resources, food security/agriculture, cultural heritage, sustainable trade, knowledge management and information for decision-making, education and capacity building, legislation and environmental governance, human rights, and gender equity.



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