

Final Report:

THE NATIONAL CAPACITY NEEDS SELF ASSESSMENT (NCSA) REPORT



Prepared For:

**Bahamas Environment Science
and Technology (BEST)
Commission**

Prepared By:

SENES Consultants Limited

August 2005

THE NATIONAL CAPACITY NEEDS SELF-ASSESSMENT (NCSA) PROJECT

Prepared for:

**Bahamas Environment Science and Technology (BEST) Commission
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EXECUTIVE SUMMARY

The Government of The Bahamas (GOB) recognizes the importance of enhancing its capacity to implement international environmental Conventions to which it is a Signatory and contribute to its goal of sustainable development.

In August 2003, the GOB initiated with the assistance of the United Nations Environment Programme (UNEP) and funding from the Global Environmental Facility (GEF), a National Capacity Needs Self- Assessment (NCSA) Project. The objectives of The Bahamas NCSA Project are to:

1. identify and prioritize the most critical needs for implementing four key international environmental Conventions, namely those related to biodiversity, climate change, land degradation and wetlands and addressing the country's other environmental issues;
2. assess existing capacity to meet its commitments to implement the four key international environmental Conventions and address other priority environmental issue; and
3. determine how best to enhance the country's capacity to meet its commitments to implement the Conventions and address other priority environmental issues.

Under the leadership of the Bahamas Environment, Science and Technology (BEST) Commission, a National Coordinating Body (NCB) was established and a consultant (SENES Consultants Limited) retained to assist in the development and implementation of the NCSA Project.

Using the GEF's comprehensive self-assessment methodology, information to meet the objectives of the NCSA Project was obtained through:

1. review of existing literature and reports (SENES);
2. interviews with members of the NCB (SENES and BEST);
3. broad public consultations (BEST); and
4. a national workshop of experts (BEST and SENES).

The review of existing literature and reports was used to provide contextual information, including the current state of The Bahamas environment and the existing legal, policy and institutional framework and arrangements for implementing the international Conventions and environmental management in The Bahamas.

Interviews conducted in July, August and October 2004 with members of the NCB and public consultations were instrumental in identifying and prioritizing the most critical needs for

implementing the four key international environmental Conventions at three levels, systemic, institutional and individual. The following were identified as the most critical needs:

1) Systemic Level:

- i strengthening the legislative and policy basis for environmental management: A National Environmental Policy (NEP), a comprehensive environmental management Act and supporting regulations and standards, guidelines and codes of practice;
- ii improving the governance structure for environmental management: A decision-making Cabinet Committee on Environmental Management, a senior level priority-setting Committee Environmental Management and technical thematic sub-committees aligned with the four Conventions, and a national multi-stakeholder Advisory Committee on Environment Management;
- iii defining a program activity architecture for environmental management that identifies: a) Expected Results: (expected outcomes at various timeframes (short (1-3 years), medium (3-5 years) and long term (5 years +)), a logic model (showing link between resources-activities-outputs- expected outcomes with final outcome linked to the government's strategic outcome (from NEP); and b) Monitoring and Evaluation (program performance measurement and evaluation plans);
- iv allocation of dedicated human and financial resources for the Environmental Management portfolio.

2) Institutional Level:

- i establishing clear accountabilities (roles and responsibilities and reporting structures) for Ministries and Departments and partners;
- ii allocating equipment and materials required to undertake activities, e.g. monitoring equipment;
- iii developing operational policies and guides for staff;
- iv establishing environmental management mandatory training program;
- v developing a geo-referenced environmental data and information system.

3) Individual Level:

- i developing generic work descriptions for staff involved in environmental management;
- ii preparing staff learning plans.

BEST undertook broad-based public consultations on a number of the Family Islands during January to March 2004. The consultations included some 64 meetings and discussions with students, the general public and Local Councils. These consultations were valuable in identifying with Bahamians issues and concerns related to the four thematic areas as well as to highlighting other key environmental issues and concerns among the public. They also provided

an opportunity to solicit opinions on the possible solutions to issues and concerns raised at the meetings.

While the specific issues and concerns varied from island to island, in general, many of those raised relate to all the thematic areas. Of the four thematic areas, climate change was the least identified and discussed by participants. Biodiversity was the most frequent theme raised while land degradation was second followed by wetlands.

The major concerns raised were:

1. the need for new regulations and for strengthening monitoring and enforcement of existing laws and regulations;
2. greater clarity regarding responsibility and accountability among government agencies for environmental management;
3. the public's exclusion from important decisions affecting the environment; and
4. the lack of adequate infrastructure and basic facilities for waste management.

A number of other environmental issues were raised during the public consultations and these included vector/pests control, solid waste, sewage, chemical and medical wastes, air pollution, marine and groundwater pollution and poor quality of potable water.

A number of recommendations were provided to address the concerns and issues identified. These included:

1. more and better laws and regulations;
2. better enforcement of existing laws and regulations;
3. improved public awareness and education programmes;
4. more public consultations and involvement in decision-making related to development projects;
5. enhanced training for government staff; and
6. greater allocation of resources for dealing with environmental issues.

In April 2005, a national workshop was convened by BEST in cooperation with SENES. The national workshop is the last part of the capacity assessment process initiated in mid-2004. The workshop included representatives from government agencies (members of the NCB). The purpose of the workshop was to:

1. review and recommend next steps for approval of a draft National Environmental Policy (NEP) and a Program Activity Architecture (PAA) and Performance Indicators for The Bahamas Environmental Management Program;

2. review and confirm the findings of the interviews and public consultations; and
3. confirm and prioritize the recommendations for actions and next steps for enhancing The Bahamas capacity to meet its commitments for implementing the four international environmental Conventions and for addressing other priority environmental concerns and issues.

The results of the workshop included the following:

1. received comments on and updated the NEP, PAA and Performance Indicators along with recommendations for their approval;
2. confirmation of the results of the agency interviews and public consultations and identification of other environmental issues and concerns;
3. development of recommendations for actions and next steps, including schedules for submitting the NEP, PAA and NEMAP for public review and comments; and
4. tentative scheduling for submitting draft NEP, PAA and NEMAP to GOB for approval.

The results of the assessment provide the foundation for The Bahamas National Environmental Management Action Plan (BNEMAP) that is provided under separate cover for the consideration of the GOB.

LIST OF ACRONYMS

AOSIS	Alliance of Small Island States
BEST	The Bahamas Environment, Science and Technology
BNT	Bahamas National Trust
CDI	Capacity Development Initiative
DEHS	Department of Environmental Health Services
EEZ	Exclusive Economic Zone
GEF	Global Environment Fund
GHGs	Greenhouse Gases
GIS	Geographic Information Systems
GLOSS	Global Sea Level Observing System
GOB	Government of The Bahamas
EIA	Environmental Impact Assessment
IPCC	Intergovernmental Panel on Climate Change
MOPW&U	Ministry of Public Works and Utilities
NCB	National Coordinating Body
NCSA	National Capacity Self-Assessments
NEAP	National Environmental Action Plan
NEMAP	National Environmental Management Action Plan
NGOs	Non-Governmental Organizations
NOAA	National Oceanic Atmospheric Administration
SIDS	Small Island Developing States
UNDP	United Nations Development Program
UNFCCC	UN Framework Convention on Climate Change
WRMU	Water Resources Management Unit
WSC	Water and Sewage Corporation

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1.0 INTRODUCTION

Over the past decades, the international community has reached unprecedented international agreements on global environmental issues such as climate change, biodiversity, desertification/land degradation and wetlands mainly in the form of binding Conventions. While these international Conventions are viewed as crucial to achieving the goal of sustainable development and resource conservation, their effective implementation places significant demands on the capacity of participating countries and in particular developing countries and small island developing states (SIDS). Recognizing this capacity constraint as a major obstacle to these countries abilities to achieving the goal of sustainable development, the United Nations Development Program (UNDP) and the Global Environment Fund (GEF) launched the Capacity Development Initiative (CDI) in January 2000.

The UNDP-GEF CDI partnership is intended to produce a more comprehensive and strategic approach to building the capacity of developing countries and SIDS to meet their commitments under key international environmental Conventions. As a first step, an extensive program of consultation was undertaken with governments, non-governmental organizations (NGOs), international agencies, academic institutions, and other key stakeholders to identify the basic elements of a potential collaborative approach to assist developing countries and SIDS in achieving the capacity needed to meet the requirements of international environmental Conventions.

In September 2001, the GEF Secretariat released the *GEF Operational Guidelines for National Capacity Self-Assessments (NCSA)*. The primary objective of an NCSA is to identify country level priorities and needs for capacity building to address global environmental issues, in particular the three identified in the GEF Guidelines – biological diversity, climate change and land degradation, with the aim of catalyzing domestic and/or externally assisted action to meet those in a coordinated and planned manner. While these thematic areas are central to the needs of the country, it is understood that NCSA will need to explore the synergies among them as well as linkages with other broader concerns of environmental management and sustainable development.

The over-riding goal of each NCSA is to identify and analyze country level priorities and capacity development needs within the context of implementing the key international environmental Conventions. The following are the basic series of outputs that each NCSA is expected to deliver:

- a stock-taking or quick review of previous and ongoing activities related to capacity building;
- an account of the process by which the NCSA was prepared;
- a list and description of capacity building needs in the three thematic areas;

- an identification of cross-cutting issues and synergies; and
- a plan of action to meet the prioritized needs and a mechanism for monitoring and evaluating the progress made in meeting those needs (optional).

Initial NCSA's are not intended to be definitive and final as the identification of needs and priorities is a dynamic and evolving process that depends on a number of factors including emerging scientific and technological information, collective decisions through global environmental Conventions and the development of national legal and policy frameworks. As a result, it will be important to incorporate a performance monitoring and evaluation component to allow for a feedback mechanism that will enable continuous improvements to be made to the NCSA.

The Bahamas is a small island developing state which is Signatory to a number of international environmental Conventions. The Bahamas has identified a lack of capacity as a key obstacle to its effective implementation of these Conventions, representing a major impediment to the country's aspiration of sustainable development. While its size and available resources represent a major factor contributing to its limited capacity to implement the international environmental Conventions



Photo taken by Lynn Gape



Photo taken by Lynn Gape

to which it is a Signatory, this is further compounded by the vast number and archipelagic nature of its islands and their differing ecosystems, the scarcity of freshwater reserves, the limited options for and high cost of waste disposal and the rate and pace of economic development.

Recognizing the importance of building its capacity to effectively implement these Conventions so it can achieve its goal of sustainable development, the Government of The Bahamas (GOB) has initiated a NCSA Project. The Bahamas NCSA Project is intended to review its global

environmental responsibilities; assess its existing capacity to meet its commitments to international environmental Conventions, in particular those related to biodiversity, climate change, land degradation and wetlands; identify and prioritize their most critical needs; and determine how best to build its capacity to meet its commitments to these Conventions. This is being accomplished through the use of a comprehensive self-assessment methodology and broad consultations with stakeholders and the public. The end result of this process will be the development of a National Environmental Management Action Plan (NEMAP) for The Bahamas that can serve as a tool for the GOB to identify gaps and deficiencies in meeting its environmental international commitments and in addressing other environmental management issues in the country. It will also define appropriate actions as well as provide a baseline to evaluate the effectiveness and efficiency of its capacity development efforts to address these gaps and deficiencies.

The Bahamas Environment, Science and Technology (BEST) Commission, the primary advisor to the GOB on environmental matters and the national focal point for international environmental Conventions, has the responsibility for coordinating the NCSA Project. The BEST Commission has set out the following as the major goals of the NCSA Project for The Bahamas:

- identification, review and confirmation of priority issues within the four thematic areas of (1) biodiversity, (2) climate change, (3) land degradation and (4) wetlands;
- identification of the needs and priorities required for building the countries capacity to meet its international commitments under the Conventions dealing with (1) biodiversity, (2) climate change, (3) land degradation and (4) wetlands;
- definition of synergies across the four thematic areas;
- development of programmes for the four thematic areas;
- development of a framework/mechanism for targeted and coordinated action, including requests for external funding assistance;
- linkage of the country's framework National Environmental Policy (NEP) with respect to a broader national environmental strategy for The Bahamas; and
- development of a NEMAP.



Photo taken by BEST

Table 1.1 outlines the process for the NCSA Project, including key tasks, outputs (deliverables), responsibility, initial dates and activities. As part of the process for the NCSA Project, the BEST Commission undertook comprehensive public consultations with the residents within the chain of inhabited islands of The Bahamas. These were facilitated through a number of public outreach

activities involving churches, civic organizations, schools and local governments. Through these public consultations, information on environmental concerns, needs and priorities was obtained from all sectors of the population.

The BEST Commission also retained the services of SENES Consultants Limited (SENES) to assist in completing its NCSA Project. SENES' key deliverables include:



Photo taken by BEST

- 1 – A report on the NCSA Study focusing on gaps and deficiencies in capacity that need to be filled for implementation of international environmental Conventions dealing with four thematic areas (biodiversity, climate change, land degradation and wetlands) to which the Bahamas is a Signatory.
- 2 – A framework for a NEP highlighting:
 - the uniqueness of The Bahamas;
 - the constitutional basis for environmental management in The Bahamas;
 - NEP policy, goals and objectives;
 - the priority issues of national concern relating to environmental protection and sustainable resource management; and
 - strategies and actions.
- 3 – A NEMAP incorporating the NEP and presenting a 10-year action plan that:
 - details practical government and private initiatives and investments to address priority issues;
 - recommends effective approaches for ensuring the on-going implementation and review of the NEMAP within macro-level planning in The Bahamas;

- identifies opportunities to attract environmental technologies and environmentally sustainable investments; and
- provides for regular monitoring, evaluation and adjustment to ensure that the plan achieves its targets in the most effective and cost efficient way.

Information for this report was obtained from:

- 1) use of existing documents;
- 2) review of results of BEST public consultations;
- 3) interviews with government officials/experts; and
- 4) national workshops.

This report presents the results of the Deliverable 1. In addition to this introductory chapter, the rest of the report includes:

- Chapter 2 – An overview of the state of The Bahamas’ environment.
- Chapter 3 – A summary of the legal and institutional framework for environmental management in The Bahamas.
- Chapter 4 – A review of The Bahamas’ commitment to various international environmental Conventions.
- Chapter 5 – Gaps and deficiencies in the capacity of The Bahamas to effectively implement the international environmental Conventions addressing the four thematic areas and to address other environmental issues and concerns.

Deliverables 2 and 3 will draw on the results of this report and be provided as separate reports.

**TABLE 1.1
NCSA ACTIVITY SUMMARY**

Task	Output	Responsibility	Date	Preparatory Activities
1. Initiating the planning process			August 2003	
2. Establishing high level co-ordination and supervision				
Appointment of Project Coordinator (PC)	TORs and appointment	NCB and BEST	August 15	TORs
Formal establishment of NCSA National Coordinating Body (NCB)	Meeting minutes	BEST	August 19	Letters of invitation
Stakeholder identification	Analysis matrix	BEST and PC	August 19	Circulate to SBC members for completion by August 25
First planning session of NCB, Project Coordinator and Subcommittees	Meeting minutes	BEST and PC	August 27	Develop information documents and presentation
3. Stock-taking and gap identification				
NCSA/NEMAP National Consultation Workshop	Workshop report	BEST and PC	Sept. 15-18	Liaison with LG Development of agenda, presentations, discussion material, surveys/questionnaires
1 st Report to UNEP on project status and finances	Project Report 1	BEST	Sept. 30	Use formats provided
Training workshop in capacity building and assessment	Workshop report and training evaluation	BEST and PC	October	Organize workshop (venue, agenda, letters, pr, etc.)
4. Thematic assessments				
Thematic assessments for biodiversity, climate change, land degradation and wetlands	Draft assessments	NCB, PC and Subcommittees	Oct. – Nov.	Develop formats for completion by subcommittees
Consultation and development of thematic profiles/ programmes	Thematic profiles/ programmes	Subcommittees	Nov. – Dec.	Programmes developed in time to be formatted for inclusion in NEMAP document
5. Synergies and Cross-cutting				
Identification of synergies and cross-cutting analyses	Draft report on synergies	NCB, PC, BEST and Subcommittees	Jun. 15	One-day workshop (organization associated with formats to be filled)
2 nd Report to UNEP on project status and finances	Project Report 2	BEST	Dec. 31	Use formats provided

TABLE 1.1 (Cont'd)
NCSA ACTIVITY SUMMARY

Task	Output	Responsibility	Date *	Preparatory Activities
6. Framework for domestic action				
Systemic, institutional and individual level assessments	Needs assessment	BEST and PC	Jun. – Nov.	Contract a consultant with specific TORs
Second planning session of NCB, Project Coordinator and Chairs of Subcommittees	Meeting minutes	BEST and PC	May 25	
Development of NCSA Framework	Draft Framework	NCB, PC, Subcommittees and BEST	Jun. – Nov.	Drafting to be formatted by publisher as a single document/inclusion in NEMAP document
7. Developing thematic programmes				
Respective subcommittees to develop programmes with long term goals	Draft Programmes	Subcommittees	Nov. – Dec.	
8. Developing a NEMAP				
Third planning session of NCB, Project Coordinator and Chairs of Subcommittees	Meeting minutes	BEST and PC	Oct.	
NCSA/NEMAP National Planning Workshop	Workshop report	BEST and PC	Nov.	
Development of NEMAP	Draft Action Plan	NCB, PC, Subcommittees and BEST	Oct. – Jan.	
National workshop to present project outputs	Revised Framework and Action Plan	BEST and PC	Jan 2005	
9. Monitoring mechanisms				
Development of mechanisms to monitor progress	Final Framework and Action Plan	NCB, PC, Subcommittees and BEST	Dec.	
Final report to UNEP with accompanying documents produced during the project (including workshop reports)	Project Report 3	BEST	Feb.	

Note * - Many of the tasks listed were completed at dates later than as shown in this table.

2.0 THE STATE OF THE BAHAMAS ENVIRONMENT

The purpose of this chapter is to provide an overview of the current state of the environment focusing on the valued environmental components (VECs) in The Bahamas and to identify the key related concerns and issues. The chapter is organized as follows:

- 2.1 Geography
- 2.2 Population
- 2.3 Climate
- 2.4 Economy
- 2.5 Valued Environmental Components
 - 2.5.1 Air Quality
 - 2.5.2 Soils
 - 2.5.3 Freshwater Resources
 - 2.5.4 Marine Resources
 - 2.5.5 Biological Resources (Terrestrial and Aquatic)

The chapter draws mainly on information from The Bahamas Environmental Handbook and the First National Communication on Climate Change.

2.1 GEOGRAPHY

Geographically considered part of the Caribbean, The Bahamas comprises an archipelago of over 700 low-lying islands plus more than 200 cays, islets and rocks, covering approximately 100,000 mi² (260, 000 km²) that include the area of the country's Exclusive Economic Zone (EEZ) in the Atlantic Ocean. The total land area is approximately 5,380 mi² (13, 934 km²). The islands extend 50 miles (km) east of Florida to 50 miles (km) northeast of Cuba. In addition to the United States and Cuba, neighbours include Haiti and the Turks and Caicos Islands, located to the southeast of The Bahamas, as shown on Figure 2.1 (*First National Communication on Climate Change, p.5; Bahamas Environmental Handbook, pp.2-4*).

**FIGURE 2.1
THE BAHAMAS AND SURROUNDING COUNTRIES**



As noted, the islands have low relief. The highest point in The Bahamas is 206 ft (63 m), above mean sea level, at Mt. Alvernia on Cat Island. There are no rivers, but several islands have large brackish lakes, and many others are deeply penetrated by tidal creeks, notably Andros and Grand Bahama. These creeks are generally navigable by small boats. The potable freshwater resources of The Bahamas overlay brackish and saline waters and mostly occur within five feet of the land surface (*Bahamas Environmental Handbook*, pp.2-3).



Photo taken by BEST

Around the islands, especially on their windward sides, are extensive fringing of coral reefs. There are also areas of patch reefs on the interiors of the banks, as well as extensive sea grass beds. Collectively, the Bahamian shallow seas provide the largest body of coral reef and other marine organisms in the Atlantic/Caribbean region. The estimated reef area is 3,800 mi² (10,000 km²) (*National Biodiversity Strategy Action Plan p.10*).

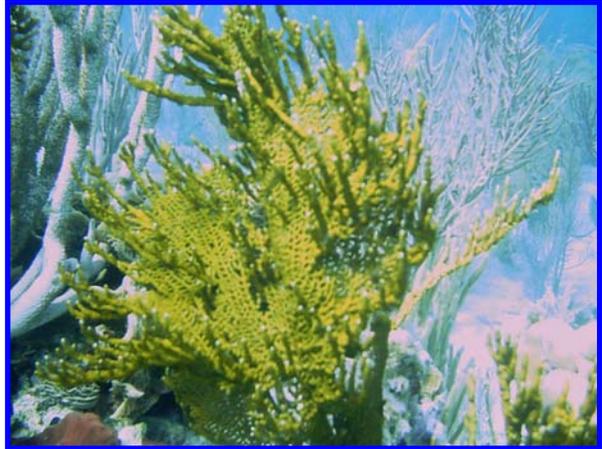


Photo taken by Sharrah Moss



Photo taken by Fred Bernard

The landscape of the islands consists of a mixture of rolling hills and ridges, flat rockland, and extensive wetlands. Vegetation provides a superficial cover where it has not been cleared for settlement or agriculture. The natural vegetation consists of forests of Caribbean pine in the four northern islands and various levels of broadleaf hardwood forests and coppice vegetation elsewhere, although this becomes less diverse and more stunted in the drier southern islands (*Bahamas Environmental Handbook, pp.2-4*).

2.2 POPULATION

Approximately 30 of the over 700 islands are inhabited. The population of The Bahamas was estimated to be about 295,000 in 2000, growing at a rate of just over 1%. Thirty percent of the population is under 15 years old, and about 94% is less than 65 years old. [BEST will provide more recent statistics from most recent census]. The two major population centres are the capital, Nassau which is located on New Providence Island and Freeport, located on Grand Bahama Island. Over 80% of the population reside in these two centres ([wysiwyg://5/http://geography.about.com/library/cia/blcbahamas.htm](http://5/http://geography.about.com/library/cia/blcbahamas.htm)).

2.3 CLIMATE

The climate of the Bahamas is described as sub-tropical, moderated by the warm north-flowing Gulf Stream. The Bahamas has two distinct seasons: a hot wet summer season (May to October)

and a warm drier winter season (November to April). Mean annual rainfall varies from about 34 in (865 mm) to 58 in (1470 mm). Mean daily temperature varies between 63°F and 90°F (17°C to 32°C).

The climate of The Bahamas poses some environmental problems. Hurricanes and tropical storms are a regular occurrence during the Atlantic hurricane season that extends from June to November. The high winds, rains, storm surges and associated flooding caused by this severe weather conditions can result in significant damage. High evaporation rates and low rainfall, makes the southern half of The Bahamas semi-arid and water deficient. Even in wetter areas such as New Providence which receives on average 50 in (127 mm) of rainfall annually, potable water has to be barged from nearby Andros, and is also supplemented by desalination plants.

2.3.1 Vulnerability to Climate Change/Climate Variation

Trends in climate extremes for the Caribbean show that climate change is manifested in the Caribbean by an increase of about 1C° in average temperature in most countries over the last century, with most of the change occurring in the last 30 to 40 years (Peterson, Taylor, 2002). Averaged over the Caribbean, the percentage of hot days when maximum and minimum temperatures were higher than the 90% percentile (1977-1997) has risen from 4% to 8% since 1960. The percentage of annual rainfall that comes from very high intensity one-day rains has increased from 24% to 28%. These trends of increasing frequency of extreme events are projected to continue with further increases in greenhouse gas concentrations in the atmosphere (*Adapting to Climate Change in the Caribbean, May 2004*).

Bahamian data show that the mean daily maximum temperature for July have increased at a rate of 3.6 F° (2 C°) per 100 years, and more recently at the rate of 4.8 F° (2.6 C°) per 100 years. Climate models also predict increased heavy rain events, and drought in some areas. The data show that over the past 95 years rainfall in Nassau has decreased at a rate of 4.2 in (107 mm) per 100 years, but since 1959, has been increasing at a rate of 21.8 in (554 mm) per 100 years (*First National Communication on Climate Change, April 2001*).

Like many other SIDS, The Bahamas with its fragile coastal ecosystems is extremely vulnerable to the effects of global climate change and sea level rise, as some 80% of the landmass is within 5 ft (1.5 m) of mean sea level. Coastal areas, holding the vast majority of the population and economic activity, are vital to the prosperity of these islands. Coastal areas are also the most productive areas, supporting a wealth of living marine resources



Photo taken by Fred Bernard

and high biological diversity.

The vulnerability of coastal resources, human settlements and infrastructure to sea level rise, increases in sea surface temperature, and changes in wind and ocean currents, etc., is a significant concern to The Bahamas (*CPACC brochure*).

2.4 ECONOMY

The Bahamas is a developing nation with an economy heavily dependent on tourism and offshore banking. Tourism alone accounts for more than 50% of the Gross Domestic Product (GDP) and directly or indirectly employs about 40% of the labour force. About 60% of the visitors arrive by sea and the rest by air, contributing about \$1.5 billion to the Bahamian economy annually.



Photo taken by Fred Bernard

The banking and financial sector accounts for approximately 15 % of GDP, which is about \$300 million annually (*wysiwyg://5/http://geography.about.com/library/cia/blcbahamas.htm, First National Communication on Climate Change, and p.6, Bahamas Environmental Handbook*).



Photo taken by Fred Bernard

Other sectors of economic importance to The Bahamas include agriculture, fishing and manufacturing. In 2002, the value of agricultural production in The Bahamas was approximately \$50 million, with large-scale crop production concentrated on Abaco, Andros, and Grand Bahama. Commercial fishing generates about \$70 million to the economy annually. Recreational fishing is also an important aspect of the local tourism industry. The Bahamas manufacturing sector is small, accounting for only 4% of GDP.

Most of the industrial operations are located in and around Freeport Harbour on Grand Bahama Island and include cement bagging, oil bunkering, ship dry-dock and repair and pharmaceuticals manufacture (*Bahamas Environmental Handbook*).

2.5 VALUED ECOSYSTEM COMPONENTS

The following subsections briefly describes the valued ecosystem components of The Bahamas and discusses the key issues and concerns related to the maintenance of these components as summarized mainly from The Bahamas Environmental Handbook.

2.5.1 Air Quality

Ambient air quality in most of The Bahamas is relatively good for the following reasons:

- The local meteorology is dominated by strong easterly trade winds for the majority of the year, and multi-directional but still windy conditions in the remainder of the year. The strong winds will tend to transport emissions from sources located on the Islands out over water, rather than allowing them to accumulate and concentrate in ambient air over areas of population. This same effect will also preclude the chance for sufficient accumulations of ozone precursors that could lead to elevated levels of ambient ozone.
- The density of industrial activity (and emission) on the islands is low. Areas of relatively low industrial activity tend to have acceptable concentrations of air contaminants.
- The population density is relatively low.

Table 2.1 shows carbon dioxide emissions from fossil fuel sources in The Bahamas for 1990 and 1994, and Table 2.2 shows estimated emissions from other GHGs in The Bahamas for the same years.

TABLE 2.1
CARBON DIOXIDE EMISSIONS FROM FOSSIL FUEL ENERGY SOURCES IN THE
BAHAMAS FOR 1990 AND 1994 (Gigagrams of CO₂)

Fuel Type	1990	1994	% Total
Gasoline	470.7	476.5	25.2
Jet Kerosene	55.0	43.6	2.6
Gas/Diesel Oil	802.4	593.5	37.1
Residual Fuel Oil	424.8	696.9	29.8
LPG	39.7	40.8	2.1
Other Oils	101.5	14.9	3.1
Total (Gg CO ₂)	1894.1	1866.2	

Note: 1 A Gigagram (abbreviated to Gg) is 1,000,000,000 grams or 1,000 metric tonnes.

Source: *First National Communication on Climate Change*.

TABLE 2.2
ESTIMATED EMISSIONS OF OTHER GREENHOUSE GASES IN THE BAHAMAS
FOR THE YEARS 1990 AND 1994 (Gg)

Year	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Carbon Monoxide (CO)	NMVOCs
1990	2	0	4	3
1994	1	1	4	3

Source: *First National Communication on Climate Change*.

Due to its small industrial base and low population density, the Bahamas is not a major contributor to greenhouse gases (GHGs). Electricity generation and the transportation sector (through the burning of petroleum products) were determined to be the two most significant sources of GHG emissions in The Bahamas. Carbon dioxide emissions produced by the consumption of gas/diesel oil and residual fuel oil for electricity generation, account for some 65% of total CO₂ emissions in The Bahamas. Heavy use of air conditioning and refrigeration also releases CFCs into the atmosphere when equipment is damaged, poorly maintained, or discarded.



Photo taken by Fred Bernard

With its extensive vegetation cover and marine production of calcium carbonate, The Bahamas can be considered a major absorber, or 'sink' for carbon dioxide. Forests sequester CO₂ by photosynthesis, and Bahamian forests include pine, coppice (or hardwood), and mangrove forests. The extensive shallow marine areas sequester carbon dioxide through chemical, mechanical and biological processes. An estimated 370 to 739 kg CO₂ per year is sequestered over a 277 km² area of shallow marine banks around Abaco. This equates to a carbon sequestration of some 121,968 to 243,930 Gigagrams (Gg) of CO₂ over the entire shallow water banks of The Bahamas (*First National Communication on Climate Change*).

2.5.2 Soils

Very little of the total area of The Bahamas is land (some 5.4%) therefore, there are competing demands for the limited land resources, including urban use, agriculture, forestry, tourism and conservation.

Bahamian soils are thin, coarse-textured and fragile, and quickly become exhausted. Various attempts at commercial agriculture have been tried, and some have had some success. Land use has changed dramatically on New Providence over the past thirty (30) years with the building of several large resort hotels, and large tracts of land have been cleared for housing, business complexes and roads. A great deal of land clearing and construction has also taken place on Grand Bahama Island. The forest



Photo taken by Fred Bernard

resources of The Bahamas comprise pine forest, coppice forests and mangrove forests, with approximately 80% of forest resources on state land (Crown land). Pine forests are considered the most productive of the three forest types, and pine is now a protected species. Coppice (hardwood) forests are found in the central and southern Bahamas [*First National Communication on Climate Change*].

The key issues and concerns related to soil in The Bahamas include:

- the use of arable land for infrastructure development including roads, resorts, housing, etc.;
- pollution associated with chemical spills from industrial facilities;
- indiscriminate dumping of solid wastes, including derelict vehicles, on undeveloped lands; and
- leachate contamination from improperly designed landfills/waste dumps and septic systems.



Photo taken by BEST

2.5.3 Freshwater Resources

Rainfall is the only source of freshwater in The Bahamas. Throughout the islands, the average annual rainfall varies from about 34 inches (in)/865 millimetres (mm) to about 58 in (1470 mm). There is a distinct northwest to southeast gradient to decreasing rainfall (*First National Communication on Climate Change*). There are no rivers or major freshwater lakes in the country. As rainwater seeps through the soluble limestone rock, it comes to rest on top of the

denser seawater, where it forms lenses of freshwater throughout the islands. There is generally an intervening brackish layer between the two, and freshwater can be discharged along the shoreline during periods of heavy rain.

Wetlands

The amount of rainfall received and the size of each island ultimately determines the volume of its freshwater resources. Andros accumulates the largest quantities of freshwater, but Grand Bahama Island and Abaco also have large reserves. Thousands of gallons of water are pumped from the lenses on these islands and shipped to New Providence daily. In many places, this freshwater forms wetlands and small pools at the surface, and seasonal ponds exist on all islands. Freshwater wetlands in The Bahamas tend to be small, seasonal and widely scattered.



Photo taken by The Bahamas Ministry of Tourism

Wetlands are components of larger biophysical systems that include bordering (and sometimes more distant) terrestrial and aquatic systems underlying groundwater systems, diverse biotic systems, and complex nutrient cycling and sequestration systems. The functions provided by wetlands often affect or benefit an area beyond the confines of the wetland itself. They help to regulate water levels within watersheds; improve water quality; reduce flood and storm damages; provide important fish and wildlife habitat; and support hunting, fishing and other recreational activities (BEST, www.best.bs/wetlands.htm).

There are several concerns regarding the management of wetlands in The Bahamas. These include:

- There is no recent national inventory of wetlands in The Bahamas. As a result, the necessary information for designation and conservation/protection is unavailable to guide effective decision-making.



Photo taken by BEST

- There is insufficient legislation to protect wetlands, which poses a significant threat to their conservation.
- Many wetlands are in locations that are attractive to development and are thus under threat by activities such as illegal excavation and reclamation.
- There is a general decline in the number of healthy wetland ecosystems in The Bahamas.

Potable Water

Water is also obtained from shallow wells, trenches, pits, freshwater marshes, and rainwater catchments in lesser-developed areas. Distillation and reverse osmosis have become common methods of obtaining freshwater in The Bahamas. Reverse osmosis is cheaper and faster than distillation and is currently used in many industrial sectors. In addition, some Bahamian companies use reverse osmosis to produce thousands of gallons of drinking water a day for the commercial market [*Bahamas Environmental Handbook, p. 27*].

Ninety percent of The Bahamas' freshwater lenses are within five feet of the land surface. The fresh groundwater resource is therefore, fragile and highly vulnerable to contamination and overexploitation. Some of the major natural and anthropogenic related issues and concerns on fresh water resources are described below:

Salt Water Intrusion

Intrusion of salt into fresh water sources due to over-pumping and inundation from storm surges arising from tropical storms and hurricanes.



Photo taken by Philip Welch

Uncontrolled Extraction

The lack of controls on water extraction methods, sites of extraction, and the rates of extraction are endangering the water supply in some areas and hence its availability for domestic and other important uses.

Groundwater Contamination

The close proximity of The Bahamas' groundwater resources to the ground surface makes these ground waters particularly vulnerable to contamination by pollutants released or spilled onto the ground surface or released by underground storage tanks, pipes, lagoons, or other structures. Some of the key threats include:

- sewage (if not properly handled, sewage can contaminate groundwater with dangerous pathogens and/or nitrates);
- leachates leaking from landfill sites;
- industrial wastes such as dry cleaning wastes and photo processing solvents;
- agriculture products (pesticides, fertilizers, fungicides, and herbicides);
- spills or leaks from underground fuel storage tanks;
- hazardous wastes from dumps and spills, and releases of toxic chemicals and oils;
- waste handling from automobile service and repairs (in the past, activities such as the dumping of lead-acid automobile batteries, antifreeze, lubricants, hydraulic fluids, and solvents have caused serious contamination); and
- zinc from the normal wear of automobile tires on the road.

Public Health Concerns

Chemical contamination of freshwater poses a major health risk for humans and the surrounding ecosystems. Microbial contamination of the freshwater also presents risk of disease, including serious and potentially deadly disease outbreaks.



Photo taken by Fred Bernard

Tourism

Tourists use substantially more water than resident Bahamians. With an expanding tourism industry, the availability and distribution of freshwater may present difficulties in the future.

2.5.4 Marine Resources

Marine environments cover the greatest area of The Bahamas and are linked in both the flow of energy and matter through biological and ecological cycles. The marine environment can be classified into four main categories: sea grass beds, coral reefs, pelagic ecosystems and deepwater ecosystems.

Sea Grass Beds

Sea grasses beds, the most common tropical shallow-water environment worldwide, grow in a few inches of water or up to depths of 100 ft (33 m) and more and cover thousands of acres of the Bahama Banks. The grass blades trap sediment by forming a small forest of leaves and

provide food and a refuge for fish, crabs, and other marine life that are critical to sustaining the benefits derived from all aspects of the commercial and recreational fisheries.

Sea grass also stabilizes sediment and traps small particles, helping to maintain the clear waters of The Bahamas. When sea grass beds are destroyed, the water can become more turbid, making the area an unsuitable habitat for many animals and less attractive for use by tourists. Threats to sea grass beds include:



Photo taken by Page Gill

- careless boating practices which cause sea grass beds to be scarred by propellers and allow the sea grasses to be severely eroded in storms;
- long-term anchoring of boats in grass beds can cause erosion and damage to the root system of sea grasses and should be avoided except in emergencies;
- the widespread use of jet skis can result in the destruction of sea grass beds, causing murky water and excessive seaweed on the beach;
- dredging areas of sea grass for channels, marinas and sand, destroys the sea grass and the suspended fine sediments suffocate adjacent sea grass beds and reefs;
- pollution run-off, especially sewage or excess nutrients, can also kill sea grasses, nutrients in sewage can cause algae to overgrow the grass, and smother the grass blades;
- silt from works and undertakings on land;
- direct discharge of contaminants/pollutants from industrial and other human activities; and
- discharges from boats; etc.

Coral Reefs

Coral reefs are the most spectacular of the marine environments of The Bahamas. Every year, thousands of people come to The Bahamas to dive on the reefs, fish on the reefs, or cruise the islands to appreciate the reefs and surrounding environment. Coral reefs are valuable for the protection of ecosystems including:



Photo taken by Sharrah Moss

Production of sand: The sand on beaches consists of pieces of coral, shell and algae that make up the sand grains. Much of this sediment production comes from reefs and their associated fauna.

Tourism: Coral reefs have proven to be important economically as tourist attractions. Visitors enjoy scuba diving and snorkelling amongst colourful fish, marine organisms, and intricate coral structures.

Educational and scientific opportunities: The coral reefs offer humans an opportunity to learn about complex biological processes and serve as a laboratory for scientist.

The coral reefs of The Bahamas are threatened by the following:

- the ‘physical destruction’ of reefs from dredging and development, the creation of navigation channels through reefs, and destructive fishing methods such as bleaching or dynamiting reefs;
- chronic destruction of reef environments occurs from anchor damage that breaks corals, or damage coral heads to the point that the coral is more susceptible to disease or predation;
- over-harvesting marine animals from the reef environment has a primary impact on the population of that animal itself and secondary impact on the reef ecology; and
- changes in water quality as a result of discharges of chemicals, nutrients, sediment can adversely affect coral reefs.

Pelagic Ecosystems

The pelagic zone discussed here is the top 3000 ft (938 m) of water – the epipelagic and midwater zones of the ocean – that support a vast oceanic food. The proximity of this deep water offshore creates exciting sport fishing opportunities and convenient shipping lanes for cargo and cruise ships alike.

The clear, warm pelagic environment of The Bahamas is also attractive to species seeking winter protection such as the great whales and dolphins. Marine pollution, overharvesting by local fishermen and poaching by foreign vessels are some of the major threats to these ecosystems.

Deep Water Ecosystems

The deep sea environments of The Bahamas include the waters at depths greater than 3000 ft (938 m), the deep ocean floors of submarine canyons, and the adjacent deep Atlantic. These deep sea environments hold a variety of fishes and marine life. Even areas as remote as the deep sea environment are threatened by human activity such as deep water disposal of cars, trash and other unwanted material.

2.5.5 Biological Resources (Terrestrial and Aquatic)

Within The Bahamas archipelago a mosaic of natural systems exists, representative of the tropical Americas: coral reefs, mangroves, sea-grass meadows, lagoons and beaches. The coral reefs are rich with fish and marine life. Biologically, The Bahamas can be described as an oligotrophic system because its waters and land are low in nutrients. This tightly associated group of organisms recycle and reuse organic material to produce forests, wetlands, and reefs from near-desert conditions (*Bahamas Environmental Handbook, p.22*).

The natural resources of The Bahamas are limited. More than 80% of the land surface is only a meter or less above mean sea level. The economy is built on tourism and services. Bahamians, like other island peoples, have historically had a close relationship with the land and sea. Until the advent of modern tourism and banking industries, most Bahamians relied on the resources of both land and sea for survival. This is still true in most of the Family Islands, where many of the inhabitants are either fishermen, or farmers, or both. Tourism, the main economic activity in The Bahamas, is largely fueled by the lure of tourists to the natural beauty of the country. Marine biodiversity, in particular, has been an attraction to visitors seeking scenic beauty, recreational fishing, scuba diving, other water sports and fresh seafood (*First National Communication on Climate Change, p.4, Bahamas Environmental Handbook, p.5*).

2.5.5.1 Terrestrial Environment

Very little of the total area of The Bahamas is land. About 40% is shallow water bank easily accessible to man, and the remainder is deep oceanic water and the seabed. Further, more than 80% of the land surface is only about 1.5 m or less above mean sea level. (*Bahamas Environmental Handbook and First National Communication on Climate Change*). As was stated earlier in Section 2.3, high evaporation rates and low rainfall, makes the southern half of The Bahamas semi-arid and water deficient. Even wetter areas such as New Providence, depend on potable water barged in from nearby Adros, and is also supplemented by desalination plants.

There are three major terrestrial vegetation environments in The Bahamas based on vegetation classification: Northern Bahamas pine forests found on Abaco, Andros, and Grand Bahama; Central Bahamas broadleaf hardwood forests, commonly known as coppice, including mahogany and brasileto found on islands such as Cat Island; and Southern Bahamas drought-resistant woodlands. To a large degree, The Bahamas supports a flora and fauna that are distinct from the rest of the Caribbean.



Photo taken by Fred Bernard

The unique biodiversity of the pine forest includes the ground-nesting Bahama Parrot and the rare Kirtland's Warbler which winters in the Bahamian pine forests. Other wildlife found in pine forests include the quail, Wood dove, White-crowned pigeon, and several hummingbird and duck species.



Photo taken by Fred Bernard

In the Central Bahamas broadleaf hardwood forest, animals are limited to a relatively few small species, including snakes, crabs, lizards, bats and the hutia, a brown, rabbit-sized member of the rodent family. The bird life, both resident and migratory, is abundant (*Bahamas Environmental Handbook p.25*).

The forest ecosystem of The Bahamas provides these important ecological benefits:

- habitat for many animals, including rare and endangered species;
- protection of soil and freshwater resources;
- recreational opportunities like bird-watching, camping and hunting;
- scenic landscapes; and
- a variety of plants used in horticulture and traditional bush medicine.



Photo taken by Fred Bernard

The primary threats to the forest ecosystems of The Bahamas are:

- fires which may be started carelessly or deliberately by humans;

- indiscriminate tree clearing for development destroys natural habitat;
- overexploitation in the past has caused the near-extinction of some tree species; and
- competition from exotic or introduced species like the Casuarina and the Brazilian pepper reduces the abundance of native vegetation and alters important native habitats. (*Bahamas Environment Handbook*)

2.5.5.2 Coastal Environment

Due to its island nature, The Bahamas has an extensive coastline, and few places are far from the sea. Most of the country can be considered coastal, and because of the pattern of settlement and nature of the economy, this is undoubtedly the most important of all Bahamian environments. Coastal environments are best considered according to the two processes usually acting on them, namely erosion and deposition.

Many features of eroding coastlines can be attractive and useful to humans. High cliffs, for example, erode slowly and protect the interior land from flooding. The cliff elevation provides attractive vistas and cooling breezes for residential and tourist development. Within the cliffs, there are caves found at, above, or below sea level. Other scenically attractive landforms, such as stacks, arches, finely sculpted headlands, and other features make the eroding coasts classic tourist attractions.

Deposition along the coast is an ongoing process. The material is mainly sand but can include finer particles such as silt and mud, and larger material such as stones and boulders. The most common areas of deposition are beaches, which may have great length and width. Smaller depositional areas, such as spits, tombolos and sand dunes, are not uncommon. Indeed, sand dunes are universal along the windward coasts of most islands.

The coastal zone includes many diverse and interconnected ecosystems and communities. If one is harmed, it directly affects the other ecosystems to which it is connected. Far ranging species such as seabirds, sea turtle, and marine mammals connect coastal zone ecosystems of The Bahamas with those of other islands in the greater Caribbean and even larger areas. Some of the more important services that coastal zone areas provide to the people of The Bahamas include:

- hurricane resistance/buffer zone;
- tourist attraction;
- educational opportunities; and
- living resources.

Potential threat to the coastal environment include:

- Sand Mining

If sand is removed from either the beach or dunes, its protective value is reduced. Even driving a vehicle over the sand dunes to park destroys the vegetation, which holds the dune together.



Photo taken by Philip Welch

- Infrastructure Development

Building roads, houses, or other structures on the beach or immediately next to it prevent sand dunes from recovering from storm damage, which most beaches can do naturally if left alone. Improper construction near sand dunes causes erosion of the dunes and loss of that protective buffer between the ocean and the inland areas of the islands. Loss of sand dunes can also result in significant changes in the location and extent of beaches that are maintained in part by the presence of the dunes.

- Construction of Penetrating Structures

Beaches are quite vulnerable to onshore and offshore activities, and structures that actually penetrate beaches are even more destructive than structures along the edge of beaches. Such penetrating structures include docks, marinas, groynes and canals, and any structure that interferes with the lateral movement of sand along a beach. Even seawalls intended to protect beaches can actually lead to increased sand loss and enhanced erosion.

The size, complexity and ecological isolation of The Bahamas has important implications for biodiversity. Each specie and life-form in an ecosystem plays a unique but significant role, which contributes to the robustness of the ecosystem. In small island states, such as The Bahamas, maintaining these ecosystem characteristics is a challenge (*BEST – The Commonwealth of The Bahamas National Biodiversity Strategy and Action Plan, June 30, 1999*).

Small islands are much more prone to loss and extinction of species than are large land masses. Removal of one or more components, invariably leads to ecosystem change or even loss. Ecologically diverse environments are more stable and better able to withstand the disturbances of adverse weather, and ultimately climate change. As was stated earlier, the archipelagic nature of The Bahamas makes it especially vulnerable to such environmental stresses (*Bahamas Environmental Handbook, p.11*) and for this reason, maintaining biological diversity is of

paramount importance. In marine ecosystems for example, destruction of coral reefs and sea-grass beds removes food and shelter for many life-forms, and leads to declines in commercial fish populations. Coral reefs and swamps also protect coastal areas from ocean storms and surges, and, swamps also reduce flooding. Mangrove swamps provide nurseries for many fish of commercial importance, as well as for crabs, and provide nesting sites for birds. In terrestrial ecosystems for example, development pressures are a continuing threat to the protected species like the Caribbean Pine, which is unique to The Bahamas.

3.0 LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

This chapter reviews the governance system of the GOB and the existing laws, policies and guidelines, international Conventions and institutions for environmental management in The Bahamas.

3.1 LEGAL FRAMEWORK

3.1.1 System of Governance

The Commonwealth of The Bahamas has over 270 years of uninterrupted Parliamentary Democracy. Prior to its independence in 1973, The Commonwealth of The Bahamas was a British Colony. To this date, The Bahamas remains a member of the Commonwealth and retains the British monarch as its chief of state, represented in the Bahamas by an appointed Governor General. The Bahamas also holds membership in the United Nations and Organization of American States. <http://www.bahamaweb.com/offshore/government.htm>

The 1973 Constitution proclaims The Bahamas a sovereign democratic state; sets requirements for citizenship; guarantees fundamental human rights; establishes the executive, legislative, and judicial branches of government; and creates three civil commissions: the Public Service Commission, the Judicial and Legal Commission, and the Police Service Commission.

<http://countrystudies.us/caribbean-islands/123.htm>



Photo taken by Fred Bernard

The political system is based on the British Westminster parliamentary system. The Parliament comprises the House of Assembly and the Senate. Members of the House are elected directly every five years. The members of the Senate are appointed by the Governor General. The Prime Minister is the head of the Executive Branch of Government and heads a Cabinet of minimum 8 other Ministers, one being the Attorney General.

The Bahamian Judiciary is fully independent from the rest of the government. English Common Law forms the basis of the judiciary system although many Bahamian statutory elements have been added over the years. The Supreme Court is the main court in The Bahamas. Its decisions may be appealed before The Bahamas Court of Appeal. Final appeals may be presented to the Privy Council in London.

Local government in the Family Islands falls administratively under the Department of Local Government of the Ministry of Agriculture and Fisheries, and Local Government. The Family Islands are divided into nineteen districts administered by twenty-three commissioners appointed by the government and supervised from Nassau. Several of the larger islands with relatively greater populations are split up into several districts. In addition to the commissioners, elected House of Assembly members often deal with local matters, thereby filling the void created by the absence of an elected local government.

<http://countrystudies.us/caribbean-islands/123.htm>.

Under the Constitution, Parliament may make laws for the peace and good government of The Bahamas. Laws are generally enacted by Parliament in the following manner. A Bill is introduced in the House of Assembly, read three times, debated, and, if passed, becomes an Act. The Act is read three times in the Senate and then sent to the Governor General. The Governor General signs the Act, which upon being published in the official journal of the government becomes a law. Bills may officially be introduced in either house of Parliament, except for money bills, which may only be introduced in the House of Assembly, and may be passed with or without amendment, subject to the agreement of both houses.

<http://countrystudies.us/caribbean-islands/123.htm>

3.1.2 Existing Environmental Laws, Regulations, Policies and Guidelines

There are only a few existing environmental laws and regulations in The Bahamas relevant to the implementation of its requirements under the international environmental Conventions. The key laws and regulations and their applicability to the international environmental Conventions covering the thematic areas of the NCSA Project are identified in Table 3.1 and summarized below.

3.1.2.1 Environmental Health Act

The *Environmental Health Act* (1987) provides a general framework for developing environmental regulations in The Bahamas. The *Act* authorizes the DEHS to develop regulations that prevent and control air pollution, soil contamination, and preserve water quality.

i) Wastewater (Effluent) Discharges

Water quality laws and regulations are enforced by the DEHS and the WSC. The draft Environmental Protection (Effluent Limitations) Regulations, 1995 address primarily effluent discharges from sewage and industrial sources. The regulations state that no person shall cause or permit the discharge of any effluent, solid waste or sludge generated from any production or manufacturing process in or on any soil or surface of land without prior written permission of the

DEHS. Effluent discharges include sewage or industrial effluent and exclude storm-water. The limits also apply to discharges to inland waters, including any part of the sea that is within the most seaward (5.5 m or 18 ft) depth contour line offshore from the island. Discharges into coastal waters up to the 5.5 m depth contour are subject to specific effluent discharge limits established by DEHS. The Effluent Limitations Regulations strictly forbid the discharge of any flammable liquids, tar or other related liquids into inland areas or into the marine environment.

Permits must be obtained from the WSC for the installation of groundwater wells, extraction of water for domestic or commercial use, and disposal of sewage. The application process may require a developer to conduct hydrogeological investigations as well as to provide estimates of water requirements for construction, domestic, commercial, and emergency demands. The developer may also be required to include estimates of future water supply needs.

ii) *Air Quality/Atmospheric Emissions*

The draft Environmental Health Air Emissions Regulations are enforced under Section 31 of the *Environmental Health Act*. The Air Emissions Regulations require all projects/developments with associated emissions, depositions, or discharges of any regulated air contaminant to obtain permit approval by the Director of the DEHS prior to initiating discharges to ambient air.

iii) *Soil Contamination*

Soil contaminant levels are governed by regulations promulgated under the *Environmental Health Act*. The DEHS regulates and controls contamination of land and controls the methods for disposal of contaminated soil, and sets acceptable soil contaminant levels. These levels are determined by DEHS on a case-by-case basis, in conjunction with ERMA.

3.1.2.2 *Conservation and Protection of the Physical Landscape of The Bahamas Act*

Eleven tree species in The Bahamas are protected under the *Conservation and Protection of the Physical Landscape of The Bahamas Act* Number 12 of 1997. Harvest or removal of these species associated with any disturbance of landscape and vegetation requires a permit from the Department of Physical Planning. This Act also administers and regulates excavation and mining in coastal areas.

3.1.2.3 *Wild Animals Protection Act and Wild Birds Protection Act*

All wild animals and wild birds (including their eggs) are also protected under the *Wild Animals Protection Act* and *Wild Birds Protection Act* from any taking, capturing, or hunting activities. Written authorization is required for any taking or capturing of any wild animal or bird.

A permit is also required by the Agriculture and Fisheries Department for any potential disturbance of marine resources.

3.1.2.4 Existing Environmental Policies / Guidelines

Interim Environmental Impact Assessment (EIA) Guidelines for Projects Affecting Wetlands

Interim EIA guidelines are intended to be used within the context of the overall EIA process. They provide an approach for assessing the acceptability of a proposed project's impacts on wetland areas. The approach described in these guidelines is largely qualitative and leaves considerable latitude for best engineering practices and ecological judgement. The guidelines recognize that information currently available on the wetland areas of The Bahamas is incomplete. The following basic principles are reflected in the guidelines:

- the conservation of wetlands and their basic ecological functions is essential to the environmental and economic well-being of The Bahamas; and
- wetland management in The Bahamas will embrace the “wise use of wetlands” concept under the Ramsar Convention.

In general terms, the guidelines define wetlands, outline wetland functions and their value, provide criteria for defining acceptable impacts on wetlands, and outline an approach for the assessment of impacts on wetlands.

Acceptability Criteria for Proposed Projects Affecting Natural Areas

Acceptability criteria define the requirements of the GOB for projects located in natural areas. They are interim criteria intended to provide guidance in assessing proposed projects and the proposed siting of projects in areas without land use plans. Proposed projects that fail to meet these criteria are deemed environmentally unacceptable. Criteria are specified for environmental aspects including uniqueness and sensitive natural areas. Sensitive natural areas are defined as mangrove areas, aquifer recharge areas, coral reef areas, freshwater wetlands and steep slope upland areas.

Other Guidelines

The BEST Commission has provided other draft guidelines to assist proponents and other stakeholders in the preparation of environmental impact assessments for aquaculture and mariculture, agriculture and housing developments. While these guidelines are designed to be exhaustive, project proponents are ultimately responsible for ensuring that all environmental issues relevant to their project have been addressed in their EIA.

3.1.3 Existing International Environmental Agreements

Over the past several decades, the GOB has been a Signatory to many international environmental Conventions, Agreements and Protocols. Table 3.2 outlines some of the key Conventions, etc. and provides a brief description of each. The Bahamas signed four Conventions covered by the NCSA and identified in Table 3.2 as follows:

1. Convention on Biodiversity;
2. United Nations Framework Convention on Climate Change;
3. United Nations Convention to Combat Desertification;
4. Convention on Wetlands of International Importance Especially as Waterfowl (Ramsar Convention).

TABLE 3.1
ENVIRONMENTAL LEGISLATION OF THE COMMONWEALTH OF THE BAHAMAS

Title	Chapter	Act Title	Year Enacted	Applicability to Project
XX	196	<i>Water and Sewerage Corporation Act</i>	1976	Provides regulatory framework for the management of water resources in the Bahamas.
XXVII	232	<i>Environmental Health Act</i>	1987	Provides the framework for environmental regulations that will ensure compliance for the Project. <i>The Act</i> authorizes the DEHS to develop regulations that prevent and control air pollution, soil contamination, and preserve water quality.
XXVIII	242	<i>Agriculture and Fisheries Act</i>	1964	Agriculture and Fisheries Departments provides guidelines for the development of the area. The Minister of Agriculture and Fisheries may declare areas “protected.”
XXVIII	244	<i>Fisheries Resources (Jurisdiction and Conservation) Act</i>	1977	<i>Fisheries Resources Act</i> provides for conservation of fisheries resources of the Bahamas. Establishes exclusive fisheries zones and regulates harvesting of resources. <i>The Act</i> authorizes protected areas within exclusive fisheries zones, including land adjacent to it. Permission to fish within a zone is required; permission may include conditions necessary to conserve the resource.
XXX	248	<i>Wild Animals (Protection) Act</i>	1968	Prohibits the taking, capturing or hunting of any wild animal without a permit.
XXX	249	<i>Wild Birds Protection Act</i>	1952	Prohibits the taking, capturing or hunting of any wild bird without a permit. Protect birds and eggs during closed season.
XXX	250	<i>Plants Protection Act</i>	1916	Relates to plant disease and controls importation of plants to prevent outbreaks of exotic disease and establishment of unwanted species.
XXXI	260	<i>Conservation and Protection of the Physical Landscape of The Bahamas Act</i>	1997	Protects physical landscape from environmental degradation, flooding and removal of hills; regulates filling of wetlands, drainage basins or ponds; prohibits digging or removing sand from beaches and sand dunes; prevents harvesting or removing protected trees. In order to perform activities that may affect the physical landscape of The Bahamas, permits must be obtained for these activities. The Department of Physical Planning issues the permits and enforces the regulations (“Conservation and Protection of the Physical Landscape of the Bahamas Regulations, 1997).
XLVIII	391	<i>The Bahamas National Trust Act</i>	1959	Directs the Bahamas National Trust to promote permanent preservation of lands, buildings, underwater areas of beauty, and areas of natural interest. <i>The Act</i> also allows the Trust to identify sites for protection, and to administer areas declared protected.

TABLE 3.2
INTERNATIONAL ENVIRONMENTAL CONVENTIONS, AGREEMENTS AND PROTOCOLS
TO WHICH THE BAHAMAS IS A PARTY

Conventions/Agreements/Protocols	Objective	Concluded	In Force
Kyoto Protocol to the United Nations Framework Convention on Climate Change	To reduce greenhouse gas emissions by enhancing the national programs of developed countries concerned with this goal and by establishing percentage reduction targets for such countries.	16 March, 1998	(Not yet in force) Signed: 9 April, 1999
Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks	To encourage cooperation between States to ensure conservation and promote the objective of optimum utilization of fisheries resources both within and beyond the exclusive economic zone.	4 December, 1995	11 December, 2001
United Nations Convention to Combat Desertification	To fight desertification and minimize the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.	14 October, 1994	26 December, 1996
United Nations Framework Convention on Climate Change	To achieve stabilization of greenhouse gases at a low level in the atmosphere in order to prevent dangerous anthropogenic interference with the climate system.	9 May, 1992	21 March, 1994
Convention on Biological Diversity	To develop national strategies for the conservation and sustainable use of biological diversity.	5 June, 1992	29 December, 1993
Cartagena Protocol on Biosafety	To protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. It establishes an advance informed agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of such organisms into their territory.	29 January 2000	29 January 2000

TABLE 3.2 (Cont'd)
INTERNATIONAL ENVIRONMENTAL CONVENTIONS, AGREEMENTS AND PROTOCOLS
TO WHICH THE BAHAMAS IS A PARTY

Conventions/Agreements/Protocols	Objective	Concluded	In Force
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	To reduce transboundary movements of wastes consistent with the environmentally sound and efficient management of such wastes; to minimize the amount and toxicity of wastes generated; and to assist Lesser Developed Countries (LDCs) in environmentally sound management of the hazardous and other wastes they generate.	22 March, 1989	5 May, 1992
Montreal Protocol on Substances that Deplete the Ozone Layer, as amended	To protect the ozone layer by control of the production and consumption of the most commercially and environmentally significant ozone-depleting substances.	16 September, 1987	1 January, 1989
Vienna Protocol for the Protection of the Ozone Layer	To protect human health and the environment against the adverse effects resulting from human activities which modify or are likely to modify the ozone layer; and to establish protective control measures.	22 March 1985	22 September, 2001
United Nations Convention on the Law of the Sea (LOS)	To establish a comprehensive new legal regime for the sea and the oceans; to include rules governing environmental standards and enforcement provisions concerning pollution of the marine environment.	10 December, 1982	16 November, 1994
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	To protect certain endangered species from over-exploitation via a system of import/export permits.	3 March, 1973	1 July, 1975
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar)	To restrict the progressive encouragement on and loss of wetlands at present and in the future; to recognize the important ecological functions of wetlands and their economic, cultural, scientific and recreational value.	2 February, 1971	21 December, 1975

3.1.4 New Environmental Laws, Regulations,

The GOB, through BEST, drafted in 2000 a new *Environmental Planning and Protection Act* and various guidelines to enhance the conservation and protection of the environment of The Bahamas consistent with the goal of sustainable development.

3.1.4.1 Environmental Planning and Protection Act

As part of an institutional strengthening project in 2000, ICF Consulting recommended the creation of an entirely new Ministry of Environmental Planning and Protection under the portfolio of a Minister of Environmental Planning and Protection, having the responsibility of ensuring the integrated protection of the environment and ensuring the sustainable development of natural resources. The proposed Ministry would amalgamate the responsibilities of BEST, DEHS, the Department of Physical Planning and the Department of Land and Surveys. A draft Bill was presented to the GOB titled “*A Bill for an Act to Establish The Bahamas Ministry of Environmental Planning and Protection to Provide for Environmental Planning and Protection*”.

The Bill proposed to establish departments of Environmental Planning and Environmental Protection, and an Environmental Advisory Council to respond to request from the Ministry.

The Department of Planning would develop plans for the sustainable management of all land resources of The Bahamas, including both uplands and coastal areas. It would work cooperatively with other agencies such as The Bahamas National Trust, the departments of Agriculture and Fisheries, Water and Sewerage Corporation, etc. to develop plans for park management, surface water management, groundwater management and natural resource management. It would have three divisions:

- Land Use Planning Division with Crown Lands, Upland and Coastal Zone Management sections;
- Water and Wetlands Resource Management Division; and
- Parks Planning and Management Division.

The Department of Environmental Protection will be responsible for environmental emergency preparedness and prevention; environmental education, awareness promotion and outreach; the regulation, review and oversight of the environmental assessment program; issuing of environmental permits; the development of environmental objectives, standards, guidelines and regulations; environmental monitoring, etc. It would have the following divisions:

- Environmental Impact Assessment Division;
- Environmental Policy and Standards Division;
- Environmental Monitoring and Enforcement Division;
- Environmental Monitoring and Enforcement Division;
- Information Management Division;
- Division For International Environmental Agreements;
- Environmental Education, Awareness, Publicity, and Outreach Division.

The draft Bill was not accepted by the GOB, largely due to the costs involved in creating a new Ministry. As a result, the Bill has been revised to propose a Department of Environmental Planning and Protection. The Department would be smaller, only amalgamating the functions BEST and DEHS. The GOB Cabinet is currently reviewing the revised draft Bill and a decision is expected within months.

3.1.4.2 Environmental Impact Assessment Regulations

The Environmental Impact Assessment Regulations (Draft May 15, 2000) proposed (these are proposed and not promulgated as the Act has yet to be passed by Parliament and receive royal assent) under the *Environmental Planning and Protection Act* of 2002. The Regulations outline the purpose for the environmental impact assessment process, defines the roles, responsibilities and rights of project proponents, the proposed Ministry of Environmental Planning and Protection, and the public and interested parties. The Regulations also categorize projects subject to the EIA process and specifies the steps in the EIA process.

3.1.4.3 Pollution Control and Waste Management Regulations

The Pollution Control and Waste Management Regulations of 2000 were promulgated under the *Environmental Planning and Protection Act of 2000*. Part 2 of the regulations specify prohibitions on releases of certain hazardous wastes, contaminants and pollutants, including crankcase oil from motor vehicles, or vessels, battery acid, chlorine, ozone depleting substances and hazardous wastes. Part 3 establishes the ambient water quality and air quality criteria for The Bahamas. Permitting requirements for water quality and air quality discharges are specified in Part 4. Part 4 also stipulates that a Hazardous Waste Management Permit and Identification Number are required for the generation, transfer, acceptance, transport, import, export and operation of a hazardous waste storage treatment and disposal facility. Packaging and labelling standards are stipulated in Part 5, and Part 6 specify requirements for movement documents. Part 7 stipulates standards for storage, treatment and disposal facilities for solid and hazardous wastes, including monitoring, operating and closure/post closure care.

3.2 INSTITUTIONS

Responsibilities for environmental management, including resource management, in The Bahamas is shared among a wide range of government ministries, departments, agencies and organizations. These include:

- Office of the Prime Minister;
- Department of Lands and Surveys;
- Ministry of Health:
 - Department of Environmental Health Services (DEHS);
 - Bahamas Environment, Science and Technology Commission (BEST).
- Ministry of Labour and Immigration:
 - Department of Labour.
- Ministry of Public Works and Utilities (MOPW&U):
 - Department of Physical Planning
- Ministry of Agriculture Fisheries, and Local Government (MAF).

- Other Institutions:
 - Water and Sewerage Corporation (WSC);
 - Bahamas Agricultural and Industrial Corporation (BAIC).
- Bahamian Non-Governmental Organizations (NGOs):
 - The Bahamas National Trust.

Further details on the roles and responsibilities of these institutions are outlined in the following sub-sections.

3.2.1 Office of the Prime Minister

The Office of the Prime Minister ensures that the government's economic, environmental and sustainability policies are carried out. A Science Advisor, with responsibilities for environmental matters and an urban planner are also positioned at the Office of the Prime Minister. The Office is responsible for the Constitutional Review Commission and for relations with the BEST Commission, Public Utilities Commission, Bahamas National Trust, and the Department of Lands and Surveys. The Prime Minister also guides GOB's energy policies.

3.2.2 Ministry of Health and the Environment

This Ministry oversees the health care structure of The Bahamas, including environmental conservation in the interest of public health. The Ministry is responsible for regulating, monitoring, and controlling pollution. The Minister of Health administers the DEHS and the BEST Commission.

3.2.2.1 Department of Environmental Health Services (DEHS)

Under the *Environmental Health Act* of 1987, and the Environmental Health Regulations, the DEHS mandate is to promote and protect public health and ensure conservation and maintenance of the environment. From an environmental standpoint, the main role of the DEHS is to regulate, monitor, and control actual and likely contamination and pollution of the environment and establish minimum standards required for a clean, healthy, and pleasing environment. For proposed large projects, the DEHS evaluates the effectiveness of pollution control measures and initiatives to protect the health and safety of workers, and the natural environment. DEHS also issues the necessary effluent discharge and emissions permits. DEHS has created a new entity, the Environment Monitoring and Risk Assessment (ERMA) Division, formerly the Public Analyst, Laboratory attached to the DEHS, which has the responsibility for environmental monitoring.

The DEHS advises the Minister of Health and is advised by the Environmental Health Board, and also enforces environmental laws and regulations.

3.2.2.2 Bahamas Environment, Science and Technology (BEST) Commission

The BEST Commission, formed by a directive from the Chief of State in 1994, has in effect been the country's environmental agency since 1995. BEST has no regulatory powers, but is responsible for developing GOB's environmental and natural resource management policies. As mandated, the BEST Commission is responsible for the administration of the EIA process, overseeing the technical review of EIAs, coordinating the public review of EIAs, and providing advice to Cabinet for consideration in their decision-making process.

BEST is also the lead agency in ensuring that the GOB implements its requirements under the various international Conventions on environmental matters such as biodiversity, climate change, wetlands, land degradation, etc. In this role, BEST establishes committees, drawing on appropriate staff from different government agencies, for promoting actions to implement the specific requirements of the various conventions. To date, committees have been struck on wetlands, climate change and biodiversity. Also, BEST is mandated to secure funding under the Conventions for projects that support their implementation and is the focal point for GEF in The Bahamas.

Working in conjunction with BEST is an Ambassador to the Environment, appointed by the government of the day.

The BEST Commission also collaborates closely with other government agencies with responsibilities for environmental matters such as the Water Resources Unit, Ministry of Agriculture and Fisheries and Department of Meteorology, and The Bahamas National Trust.

3.2.3 Ministry of Labour and Immigration

The Ministry of Labour and Immigration oversees labour relations and occupational health and safety, through the Department of Labour. The Department is the lead agency for regulating occupational health and safety under the *Health and Safety at Work Act* (2002). Through its Inspection Unit, the Department also conducts inspections to insure adequate worker safety and compliance with regulations.

3.2.4 Ministry of Public Works and Utilities (MOPW&U)

The MOPW&U oversees and maintains physical infrastructure and the environment. It is entrusted with the administration of the *Building Control Act (BCA)* and Regulations, sharing responsibility with the Ministry of Health and Environment, and is also entrusted with the preparation of land use plans and physical planning activities. MOPW&U issues water supply franchises to developers in areas where the supply of water is impractical for GOB or its agencies to undertake.

3.2.4.1 Department of Physical Planning

The Department authorizes activities such as dredging, filling, harvesting or removal of protected trees, and any work that will affect coastlines.

3.2.5 Ministry of Agriculture, Fisheries and Local Government

The Ministry of Agriculture (Incorporation) Act, 1993 gives the Minister of Agriculture authority to hold, lease, and dispose of agricultural land. The Department of Agriculture oversees conservation of wild animals, birds, and plants, as well as forest health. The Ministry has the mandate to enforce the *Fisheries Act*, including arrest and seizure powers, authority that is currently shared with the Coast Guard. Under the previous Caribbean Planning for Adaptation to Global Climate Change (CPACC) project, the Department of Fisheries was responsible for coral reef monitoring, and is currently participating in some of the BEST Commission's sub-committees on international environmental Conventions such as wetlands and biodiversity.

3.2.6 Water and Sewerage Corporation (WSC)

The WSC, with its Water Resources Management Unit (WRMU) has responsibility for optimal development of the country's water resources and the control of water quality. It shares (with DEHS) the responsibility for monitoring water quality.

3.2.7 The Bahamas National Trust

The Bahamas National Trust was created by an *Act of Parliament* in 1959. The mandate of the trust is to conserve and protect the natural and historic resources of The Bahamas. The Trust in some ways was the first environmental agency in The Bahamas and continues to work with BEST and others on environmental aspects and is represented on all of the committees struck by BEST to address compliance with international environmental Conventions. The Trust is responsible for establishing and developing the national park system and protected areas, as well as protecting the biodiversity of the country's unique ecosystem.

Table 3.3 lists the key government institutions discussed above and identifies the NCSA thematic area(s) in which they have responsibility. The table shows a fair degree of overlapping responsibilities, an issue discussed later in Chapter 5.

3.2.8 Committees and Working Groups

The BEST Commission has instituted various committees to develop national policies and strategies specific to the various Conventions. At present, committees have been struck on biodiversity, climate change, wetlands and science and technology. The committees comprise representatives from all agencies with mandates affecting these thematic areas, as well as representatives from the public. These committees are completely voluntary and their members generally have full-time jobs while many committee members are very dedicated and contribute significant time and efforts to assigned tasks, others are sometimes unable or unwilling to do so. However much has been accomplished by the committees in spite of this.

Several initiatives have been successfully completed regarding biodiversity including a National Invasive Species Strategy (NISS) and a National Biodiversity Strategy and Action Plan (NBSAP). Activities underway include a National Biosafety Framework (NBF) and National Biosecurity Strategy (NBS). A grant was received under the Ramsar Convention in June 2004 to assist the National Wetlands Committee in preparing a wetlands policy. Thus far, the Committee has held stakeholder consultations throughout most of The Bahamas. The National Climate Change Committee has prepared a draft policy document that is currently in the review stage. A recent workshop on land degradation was convened by BEST.

TABLE 3.3
INVOLVEMENT OF GOVERNMENT INSTITUTIONS IN THEMATIC AREAS

Government Institutions	Thematic Areas			
	Biodiversity	Climate Change	Land Degradation	Wetlands
Office of the Prime Minister	✓	✓	✓	✓
Ministry of Health and the Environment	✓	✓	✓	✓
Department of Environmental Health Services	✓	✓	✓	✓
BEST Commission	✓	✓	✓	✓
Ministry of Public Works and Utilities			✓	
Department of Physical Planning	✓		✓	✓
Ministry of Agriculture, Fishing and Local Government	✓	✓		
Water and Sewage Corporation				✓
The Bahamas National Trust	✓		✓	✓

Responsibilities for environmental management, including resource management, in The Bahamas is shared among a wide range of government ministries, departments, agencies and organizations. These include:

- Office of the Prime Minister
 - Department of Lands and Surveys – **B, CC, LD, W**
- Ministry of Health
 - Department of Environmental Health Services (DEHS) –**B,CC, LD, W**
 - Bahamas Environment, Science and Technology Commission (BEST) - **B, CC, LD, W**
- Ministry of Public Works and Utilities (MOPW&U) –
 - Department of Physical Planning - **B, CC, LD, W**
 - Subdivisions – **B, LD, W**
 - Buildings Control – **B, LD, W**
- Ministry of Agriculture, Fisheries, and Local Government (MAF)
 - Department of Agriculture – **B, LD,**
 - Department of Fisheries – **B, CC, W,**
- Water & Sewerage Corporation – **CC, W**
- Bahamian Non-Governmental Organizations (NGOs)
 - The Bahamas National Trust – **B, LD, W**

Thematic Areas:

B (Biodiversity);
CC (Climate Change);
LD (Land Degradation); and
W (Wetlands).

4.0 NCSA PROJECT'S FOUR THEMATIC AREAS

This chapter summarizes the Conventions addressing the four thematic areas of importance for this project and describes some of the significant issues and challenges in their implementation. The four thematic areas selected for this study were biodiversity, climate change, land degradation and wetlands and were selected by BEST for the following reasons:

- The Bahamas, because of its archipelagic nature, is quite vulnerable to loss in biodiversity, potential sea level rise associated with climate change and the degradation of its lands, including wetlands.
- The GOB is a Signatory to international environmental Conventions specific to these thematic areas, and is required to fulfill its commitments relative to these Conventions.

4.1 BIODIVERSITY

In the Convention of Biological Diversity that came into force on December 29, 1993, the term biological diversity (biodiversity) is defined as “the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; that includes diversity within species, between species and ecosystems” (*UNEP – Maintenance of Biological Diversity, p.1*). Therefore, biodiversity is intrinsically linked to the other three thematic areas. Climatic change, land degradation and wetland destruction all have potential significant adverse implications for biodiversity.



Photo taken by Derek Smith

The Bahamas face the following key issues/challenges related to biodiversity, particularly as they relate to meeting its commitments under the Convention on Biological Diversity:

- The Convention stresses conservation of the total portfolio of biological diversity to maintain the structure and function of ecosystems. Many Bahamian ecosystems and species are already depleted and under threat of further degradation and /or endangerment for example coral reefs, pinelands, iguanas, etc. (*Draft National Report to the Conference of the Parties to the Convention on Biological Diversity, p.5*).

- The Convention stresses sustainability of resource use. Many Bahamian resources are already depleted, for example, several species of commercial fish, coppices of valuable forest species, etc., and are under threat of further degradation (*Draft National Report to the Conference of the Parties to the Convention on Biological Diversity, p.5*).
- A lack of appreciation and understanding of the value of the fragile Bahamian environment and biodiversity among the Bahamian population.
- Wildlife and fish habitats such as those provided by pine forests and coral reefs, respectively, are damaged or fragmented by economic development occurring on land and in or near water.
- The introduction of exotic species to The Bahamas, accidentally or intentionally, threatens the survival of native species.

The Bahamas signed the Convention on Biological Diversity (CBD) on the 12th of June, 1992, and ratified it on the 2nd of September, 1993. The main objectives of the CBD are the following: conservation of biodiversity; sustainable use of its components; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Bahamian National efforts to fulfill the CBD as noted in The Bahamas Environmental Handbook includes:

- The National Invasive Species Strategy project developed on 2002, builds in initial work under the Inter-American Biodiversity Information Network Project in which databases on invasive species; exercise and programmes were developed and made available on the world wide web. To date, close to 40 invasive plant species have been identified, along with 4 bird species, 17 terrestrial animal species and 19 aquatic species.



Photo taken by Fred Bernard

- Development of the Bahamas Biodiversity Data Management (BDM) Plan in 1997 and of the Bahamas National Biodiversity Strategy and Action Plan (NBSAP) in 1998. The BDM Plan was developed to provide for the efficient management and application of data and information in support of natural resource policy development, biodiversity conservation and the implementation of the CBD. The NBSAP provides a comprehensive program for biodiversity conservation and sustainable-use activities.

- Conducting of a Country Study of Biodiversity in 1995 as a means to identify components of biodiversity.
- Identification of processes or activities that may have significant impact on biodiversity through requirement for environment impact assessments (EIAs) for development projects and review of these EIAs by the BEST Commission.



Photo taken by Fred Bernard

- The Bahamas National Park System consists of 25 National Parks, covering over 700,000 acres of protected marine and terrestrial sites. Among these are the Abaco National Park, Central Andros National Park, Exuma Cays Land and Sea Park, Harrold & Wilson Pond National Park, Inagua National Park, Lucayan National Park, Moriah Harbour Cay National Park, Rand Nature Center, The Retreat and Union Creek National Reserve. The BNT has recommendations for at least 52 additional National Park sites to protect the country's biodiversity and significant historic and natural resources.
- Protection of ecosystems, natural habitats and maintenance of populations of species through establishment of the aforementioned national parks.
- Establishment of the Botanical Gardens.
- Under the *Conservation and Physical Landscape Act of The Bahamas*, 11 trees, including Caribbean pine, are protected by law and a permit is required for harvest or removal.
- Under the *Wild Birds Protection Act* and the *Wild Animals Protection Act*, all wild birds and wild animals in The Bahamas are protected. Protection within these acts refers specifically to the taking, capturing, or hunting of wild animals, wild birds, or their eggs.
- Plans by the BEST Commission to encourage and promote understanding of the importance of biodiversity conservation include a school outreach program, development of public awareness brochures and celebration of international environmental days with activities.
- National arrangements for emergency responses include the oil spill emergency response plan and the hurricane preparedness plan.
- Presentation of a draft National Report in 1998 to the Conference of the Parties to the Convention. The report outlines measures taken by The Bahamas to implement the provisions of the CBD. The text of the report can be found at the website www.biodiv.org/natrep/Bahamas/Bahamas.pdf.

The Bahamas also recognizes that agricultural expansion must be made compatible with the maintenance of biodiversity. This will require the creation of buffer zones and limitations on the use of pesticides. Lease agreements encourage environmentally friendly patterns of land use by offering incentives to leave shelter belts and to avoid cultivating areas of unusual biodiversity. Particularly important are: (a) the protection of wetlands, where adjacent to agriculture areas, and (b) the protection of freshwater resources from contamination by fertilizer nutrients, pesticides and animal wastes. Since much of the projected agricultural expansion will depend on good quality water for irrigation, it is a matter of self interest for the agricultural sector to protect water resources. Already, agricultural land, and land for forestry and conservation are being set aside. <http://www.un.org/esa/agenda21/natlinfo/countr/bahamas/natur.htm>

4.2 CLIMATE CHANGE

The UN Framework Convention on climate change (UNFCCC) was opened for signature in Rio de Janeiro in June 1992 and entered into force on 21 March, 1994 sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other heat-trapping gases.

Under the Convention governments:

- gather and share information on greenhouse gas emissions, national policies and best practices;
- launch national strategies for addressing greenhouse emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and
- cooperate in preparing for adaptation to the impacts of climate change.

http://unfccc.int/essential_background/convention/items/2627.php

The Convention established a process for responding to climate change.

The Kyoto Protocol of the UNFCCC was signed on April 9, 1999 but has yet to come in force. In particular, it set up a system whereby governments report information on their national greenhouse gas emissions and climate change strategies. This information is reviewed on a regular basis to track the progress of the Convention. Further, developed countries agreed to promote the transfer of funding and technology to help developing countries respond to climate change. Developed countries also committed to taking measures to reduce their greenhouse gas emissions to 1990 levels by the year 2000.

The Bahamas signed the UNFCCC on June 12, 1992 and ratified it on June 2, 1994. To respond to its obligations under the Convention, a National Climate Change Committee was established in 1996. This committee was formed as sub-committee of the BEST Commission and is responsible for several projects, including coral reef monitoring and research.

A study of climate change in The Bahamas was part of the effort by the Bahamian Government to develop a National Action Plan on climate change to meet its obligations to the UNFCCC. The findings of the report formed an integral part of The Bahamas First National Communication to the UNFCCC. The First Communication on Climate Change for the Bahamas identified sectors of the economy that were vulnerable to the direct and indirect impacts of climate change. These included:

- Tourism: A rise in sea level would result in beach and coastal erosion. Since most of the tourist hotels are located along the coast, they could be directly affected. Climate change is also expected to introduce additional stresses to coral reefs. Coral reefs, an important aspect of marine tourism, are also a significant source of food and shelter for many marine life-forms and form physical barriers to storm surges and ocean waves.



Photo taken by Fred Bernard

- Health: It is generally believed that increases in temperature is likely to increase the incidence of certain tropical diseases such as dengue and malaria.
- Agriculture: Many of the short-term crops grown in the Family Islands are seasonal, and any significant shift in climatic conditions could affect productivity. Sea level rise and inundation from storm surges will result in the loss of agricultural land due to salt water intrusion and salinization of the soil.
- Fisheries and biodiversity: Damage to coral reefs and coastal wetlands could adversely affect fish spawning. Likewise, terrestrial biodiversity will be impacted by the increase in incidence of coastal flooding.

As part of a regional effort to expand sea-level monitoring stations in the Caribbean, two stations were established in The Bahamas. One was established by National Oceanic Atmospheric Administration (NOAA) as part of the Global Sea Level Observing System (GLOSS) at the Centre for Coastal and Marine Sciences in England and the other was established by private researchers.

The Government of The Bahamas is involved in the Intergovernmental Panel on Climate Change (IPCC), has signed the Kyoto Protocol, and is a member of the Alliance of Small Island States (AOSIS).

The Bahamas National Climate Change Committee is currently drafting a National Policy for Adaptation to climate change. The aim of the policy is to foster and guide a national plan of action to address short-, medium- and long-term effects of climate change. Policy directives will be specified for coastal and marine resources and fisheries, terrestrial biodiversity, forestry, agriculture, human settlement, human health, water resources, energy, tourism, financial and insurance sectors and transportation.

4.3 LAND DEGRADATION

The UN Convention to Combat Desertification came into force on December 26, 1996. As defined in the Convention, desertification is a process of “*land degradation in arid, semi-arid dry sub-humid areas resulting from various factors; including climatic variations and human activities*”. The Convention establishes a framework for national, sub-regional and regional programmes to counter the degradation of drylands, including semi-arid grasslands and deserts. (www.un.org/ecosocdev/geninfo/sustdev/desert.htm)

The Bahamas has undertaken the following actions to address the issue of land degradation:

- The Bahamas signed the UN Convention to Combat Desertification.
- BEST held a two-day workshop in Nassau on November 23-24, 2004 on the UN Convention to Combat Desertification. The attendees included government agencies, representatives from the Family Islands and environmental interest groups. Attendees participated in brain-storming sessions and work groups. The objectives of the workshop were to:
 - make attendees aware of the Convention and the commitments of The Bahamas under the Convention;
 - discuss the steps for the development of an action plan for moving forward with meeting The Bahamas responsibilities under the Convention;
 - discuss the process for undertaking a capacity assessment of technical, human and financial resources needs for meeting The Bahamas obligations under the Convention; and
 - discuss strategies for increasing public awareness and public involvement.

The following further actions have been taken by the GOB to protect against coastal environment degradation:

- The Conservation and Protection of the Physical Landscape of *The Bahamas Act* of 1997, administers and regulates excavation and mining of coastal areas.
- The Port Department regulates all docks and mariners. A Dock Committee has been struck as part of the Port Department. The Committee reviews all proposals for docks and mariners and undertake site inspections to ensure that ecologically sensitive areas are not adversely impacted.
- The Department of Land and Surveys regulates dredging in The Bahamas. A permit is required from the Department before any dredging can occur. The Department works closely with BEST and BNT because it does not possess the in-house environmental expertise.
- BEST requires an Environmental Impact Assessment for any major work in coastal areas.



Photo taken by Bruce Hallet

4.4 WETLANDS

Article 1.1 of the Ramsar Convention that came into force on December 21, 1975, defines wetlands as “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters”. Under the criteria established by the Ramsar Convention, the definition of wetlands have been broadened to cover all of the aquatic systems not only important for waterfowl, but also for fish, plants and other aquatic organisms, including coral reefs, which is of great significance to The Bahamas. In the context of The Bahamas, wetlands include mangrove areas, blue holes, tidal creeks, tidal flats, coastal lagoons, coral reefs, freshwater marsh (*Wetlands of the Bahamas – Draft National Issues paper, pp.1-2*).



Photo taken by Fred Bernard

The Bahamas signed the Ramsar Convention on wetlands on 7th June 1997. The Convention's objective is the conservation and wise use of wetlands by national action and international cooperation.

The BEST Commission has established a Wetlands Subcommittee whose mandate is to implement the requirements of the Ramsar Convention. Participation in the Subcommittee is voluntary and it is comprised of individuals from a variety of government agencies with responsibilities for wetlands management. BEST has secured funding (in June 2004) under the Ramsar Convention for the development of a wetlands policy. This will be closely integrated with the National Biodiversity Action Plan Policy for The Bahamas. Initial activities have begun, including stakeholder consultations.

Other actions undertaken to date by The Bahamas include:

- Two wetlands in The Bahamas have been designated under the Ramsar Convention. They are: Harold and Wilson Lands in New Providence and Inagua National Park. Both of these areas have been designated as protected areas not primarily because they are wetlands, but because of their biodiversity function. BNT is seeking to designate additional parks.
- No action is taken at this time. The Bahamas participated in the Neotropical Ramsar meeting in Costa Rica in June 1998. The Bahamas has no transfrontier wetland sites.
- Forestry legislation has been reviewed and will impact wetlands as mangroves are treated as forests for the purposes of the legislation. The Conservation and Protection of the Physical Landscape of The Bahamas Act of 1997, administers and regulates excavation and mining of coastal areas.
- BEST has prepared "Interim Environmental Impact Assessment Guidelines for Projects Affecting Wetland".
- Preliminary studies have been carried out on the island of Andros and two restorations are planned for the near future in conjunction with an International NGO. A major wetland in New Providence (the Adelaide Wetland) was restored a few years ago. This was spearheaded by The Bahamas National Trust.
- There is an environmental component in the curricula at the primary and secondary levels which addresses all major ecosystems in The Bahamas.
- A Lands Conservation Committee had been established by a Cabinet Conclusion to the Ministry of Agriculture and Fisheries to identify and recommend conservations sites in The Bahamas, including wetlands.

5.0 FINDINGS OF SYSTEMIC, INSTITUTIONAL, AND INDIVIDUAL LEVEL ASSESSMENTS

This chapter presents the findings of the systemic, institutional and individual level assessments based on interviews completed with individuals in a broad cross-section of government institutions. It also summarizes the results of public consultations completed throughout the Family Islands and the results of the national workshop held in Nassau in April 2005. The chapter identifies gaps and deficiencies that may hinder the effective and efficient implementation of International Conventions and addresses other environmental issues.

5.1 THE ASSESSMENT PROCESS

A four-pronged process was used to conduct the capacity assessments related to the four themes namely:

- (1) collation of information through the review of existing reports and documents on environmental management in The Bahamas. This information has been incorporated in the earlier chapters [SENES];
- (2) face-to-face interviews with NCB members [SENES and BEST];
- (3) public consultations [BEST]; and
- (4) a national workshop [BEST and SENES].

5.2 NCB INTERVIEWS

As part of this project, individuals on the National Coordinating Body (NCB) of this NCSA Project were interviewed. These NCB members represent a broad cross-section of government agencies and The Bahamas National Trust, with direct responsibilities for environmental matters pertaining to international environmental Conventions. Most of these individuals are at the Senior Manager or Director level with a very good understanding of the human, financial and material resources within their agencies.

Appendix A provides a list of the individuals who were interviewed. A copy of the interview questions is included as Appendix B. The following section summarizes the key findings from the interviews.

Systemic Level

- Legislation: There is a lack of appropriate legislation in place to implement the requirements under the international environmental Conventions.
- Responsibilities: Institutional responsibilities are not always clearly defined.

- **Management Accountability Framework:** Institutions are generally held publicly accountable. There are requirements for reporting to the relevant Minister or Cabinet on performance.
- **Resources:** Human and financial resources are often lacking, but information resources are generally available.
- **Communications:** For the most part, institutions interact and work effectively together. There is, however, room for improvement in expediting responses to information requests. Most inter-departmental or inter-ministerial communication is transferred on a direct peer-to-peer basis. However, there is no coordinating body and no apparent avenues for expediting responses.
- **Public Awareness:** Institutions make broad use of the media, including newspapers, television, and radio to inform the public of programmes, projects, policies, etc.
- **Public Consultation:** Public Consultation is not a legal requirement under Bahamian environmental laws and regulations and the level of public consultation is often determined by Cabinet. The NCSA project is probably the first time in The Bahamas where broad public consultations were conducted in all of the Family Islands.

Institutional Level

- **Institutions Purpose and Reporting Structures:** For the most part, institutions have clearly defined and understood missions and mandates, and their reporting structure is well understood.
- **Institutions Structures and Management:** Institutions were often not seen to be effectively structured and managed.
- **Staff:** Most institutions are lacking in human resources, but the available staff are generally sufficiently skilled and appropriately deployed.
- **Budget:** Financial resources are inadequate to enable effective operation.
- **Information:** Information resources are available, but are not always effectively managed and distributed. Institutional libraries with appropriate inter-institution computer networking are needed.
- **Equipment and material:** There is a general lack of material requirements such as buildings, offices and vehicles. However, computers are widely available and a significant percentage of employees have internet access.

Individual Level

- **Work Description:** Jobs are most often correctly defined and some institutions provide written job descriptions to all staff.
- **Competency:** Individuals generally have the required skill to perform their jobs.

- Staff Retention: The rate of staff retention is high as employment within the civil service is considered prestigious and offers a good degree of security.
- Training: Training is inadequate due to limited financial resources. Staff seldom get the opportunity to participate in international training.
- Staff Development: Career path is often not well defined for most staff.
- Responsibility and Accountability: Responsibilities are effectively delegated but individuals are not always held accountable.
- Access to Information: For the most part, individuals have adequate access to information maintained within the institution and from international sources via the internet. Obtaining information from local institutions is generally more difficult due to a lack of enforceable procedures for information transfer.
- Communications/networking: Personal/professional networking is not given high priority. Most networking occurs outside of the workplace on the employee's own time.
- Performance Measurement and Evaluation: Performance evaluation criteria have been developed for the civil service and are widely used.

5.2.1 Gaps and Deficiencies Identified by NCB Members

Based on the interviews conducted, the following key gaps and deficiencies have emerged as significant challenges to The Bahamas meeting its requirements under the international environmental Conventions to which it is Signatory.

5.2.1.1 Legislation (Laws and Regulations)

For the most part, The Bahamas lack the types of laws and regulations necessary to implement the international environmental Conventions to which it is a Signatory. In particular, there are no regulations specific to wetlands or biodiversity protection and where these exist, i.e., the *Wild Animals (Protection) Act (1968)*, *Wild Birds Protection Act (1952)* and *Plants Protection Act (1916)* they are outdated. There are also no laws or regulations for protecting endangered species or for controlling invasive species

5.2.1.2 Policies and Guidelines

As noted above, BEST has instituted a series of “*Interim Environmental Impact Assessment Guidelines for Projects Affecting Wetlands*” and “*Acceptability Criteria for Proposed Projects Affecting Natural Areas*”. These are intended to serve as guidance in assessing the environmental impacts of proposed projects. Additional draft guidelines have been developed under the guidance of BEST for the preparation of EIAs for agriculture, aquaculture, mariculture and housing developments. While these guidelines are an attempt to implement aspects of the

Conventions, they are not officially approved by government and are mainly procedural in nature (*ICF Interim Wetlands Guidelines, p.1*).

Policies and initiatives to address land degradation are less developed.

5.2.1.3 Institutions

Under the current institutional structure, The Bahamas does not have a Cabinet Committee on the environment or sustainable development nor does it have an environment ministry with a clear mandate and responsibilities for all aspects of environmental planning and protection. As noted earlier, the BEST Commission has in effect been the country's environmental agency since 1995, and operates under the Ministry of Health and Environment. Traditionally, the Ministry has been more focused on public health aspects, rather than on the environment. BEST has no regulatory powers, but is responsible for developing GOB's environmental and natural resource management policies.

A Bill is currently before the GOB to create a new Department of Environmental Planning and Protection amalgamating BEST and DEHS.

In the absence of a central coordinating agency for all aspects of environmental management, there appears to be a degree of jurisdictional conflict and misunderstanding between the various agencies with responsibilities for the environment such as the BEST Commission, DEHS, Department of Fisheries, Bahamas National Trust (BNT), Ministry of Public Works, Water and Sewerage Corporation, etc. For example, DEHS has constituted the Ozone Depletion Office; the Department of Meteorology which is under the Ministry of Transportation and Aviation is responsible for climate change, the BNT can designate marine parks, and BEST is the focal point for GEF and the international environmental Conventions.

The disaggregation of responsibilities is confusing to both Bahamians and outsiders. A common sentiment expressed by the various institutions was that the decision making process for implementing the Conventions was either unknown, or at least unclear.

5.2.1.4 Financial Resources

Almost all of the institutions interviewed for this study indicated that a lack of financial resources was a significant impediment to them meeting their requirements for implementing the various Conventions. They indicated that this lack of financial resources is reflected in their inability to:

- hire the full complement of staff they require to undertake the mandate of their individual institutions, particularly monitoring and enforcement;
- provide ongoing training to staff to improve their knowledge, abilities and skills;
- purchase the necessary material requirements such as buildings, offices, vehicles and up-to-date computers; and
- undertake long-term planning.

Most institutions, however, were either unwilling or unable to specify the actual additional financial resources that they require. With regard to implementing the Conventions, institutions depend almost exclusively on funding provided under the Conventions and from other international funding agencies such as GEF. However, because of its relatively high standard of living, The Bahamas does not always meet the criteria for receiving certain types of international aid. It was reported that once international funding is exhausted, continued support tends to fall for the initiatives since the GOB often does not provide the ongoing financial support to sustain them.

While most of the regulatory agencies call for long-term stable funding, they maintain that the GOB generally only responds in times of crisis. BEST, BNT, DEHS, and others have indicated that the GOB provides as little as 10% of their requested budget. The general opinion is that current levels of government funding are insufficient to adequately support the implementation of the four international environmental Conventions covered in this assessment and to which The Bahamas is committed to implement let alone other Conventions and other environmental issues.

5.2.1.5 Human Resources

While most institutions reported having highly skilled employees, who are capable of undertaking their tasks effectively, they also acknowledged that they are hampered by a shortfall in staffing. As stated above, the lack of financial resources to hire new staff is a key factor for this shortfall. Further, other factors such as better wages in the private sector, the perceived shift in government policy from hiring full time permanent staff to hiring contract staff in the public sector, are seen as hindrances to attracting new skilled employees.

The shortfall in staffing has resulted in many institutions utilizing staff in multiple areas, including areas in which they have no formal training. Without financial resources to implement appropriate training programs, these staff must learn their responsibilities “on the job”, through trial and error. This creates concerns about the quality of the analysis and causes delays in decision making at critical times, as well as other operational problems.

The shortfall in staffing also hinders the execution of many important functions, including policy development, monitoring and enforcement. This is especially so for agencies such as the DEHS, the Department of Fisheries, BNT, etc., whose officers and wardens, respectively, are

responsible for monitoring illegal activities and enforcing regulations throughout the entire archipelago.

Table 5.1 shows the gap in staffing in critical agencies as reported during the agency interviews. Other agencies including the Ministry of Agriculture (animal control, alien invasions, etc.) are reported to be significantly short-staffed; however, the numbers could not be confirmed for inclusion in the table.

TABLE 5.1
EXISTING AND ESTIMATED HUMAN RESOURCES REQUIREMENT FOR ENVIRONMENTAL MANAGEMENT

Agency	Approx. Current Staffing	Estimated Required Staffing
Ministry of Health and Environment	4000 (includes DEHS)	
Department of Fisheries	23	38
BEST	12 (includes 3 contract positions)	80
BNT	15	40-50
DEHS	100 (includes Vector Control and Health Inspectors)	500
Land and Surveys	50	Shortage of senior staff
Meteorology	50 (includes 13 forecasters)	57 (7 additional forecasters)
Port Department	120	
WRMU	3	6

Note: The estimated required staffing takes into consideration the service needs of the Family Islands.

5.2.1.6 Family Island Services

Environmental management functions, including monitoring and enforcement, are highly centralized, being primarily located on New Providence Island. In fact, apart from agricultural officers located on all islands, many key institutions do not have resident officers in the Family Islands and as a result, there is no quick response capability in the Family Islands. Considerable time and costs are expended for travel to the Family Islands. As well, due to the lack of a permanent presence, the general public in the Family Islands have developed a sense of detachment from the regulatory agencies, and their decision-making processes as discussed later in Section 5.3.

The interviews reveal that while BEST has staff assigned to groups of Family Islands, all of its staff are permanently located on New Providence Island; DEHs has about 24 of its 100 staff permanently located in the Family Islands and is now in the process of trying to recruit new staff for the Family Islands; all of WRMU staff are located in New Province; the Department of Land and Surveys has no offices in the Family Islands; Department of Fisheries has officers only in Abaco, Grand Bahama, Andros and New Providence; the Department of Meteorology has no staff in the Family Islands; BNT functions out of New Providence and has only three wardens to serve all of the islands.

5.2.1.7 Training

A lack of financial resources at the systemic and institutional levels were identified as a key obstacle to staff training. Furthermore, permission for involvement in training, in particular international workshops, is most often granted at the ministerial level, and not at the institutional level, where training needs are best assessed. As a result, the process of approving staff involvement in training can be very onerous and lengthy and in some instances approval is granted after key dates for registration and payments have elapsed, thus effectively eliminating the opportunity for the staff to participate in training.

Since many of the government institutions are understaffed, and individuals are often responsible for a multiplicity of tasks, managers have expressed a reluctance to “lose” staff time through training. Managers have indicated that in some cases staffing levels are so low that they require the full complement of their staff in order to meet the most basic responsibilities of their departments.

There is also a lack of learning plans and a specific environmental management training program.

The inability to effectively participate in training results in lost opportunities:

- to improve skills through exposure to new technologies, procedures, research, etc.;
- for networking with professional peers; and
- for gaining recognition by sharing expertise through presentation of and participation in training activities both locally and internationally.

5.2.1.8 Information Management

Based on the interviews conducted, the general consensus is that the process for inter-departmental information transfer has to be significantly improved. Currently, there appears to be no mechanism or procedures in place for ensuring that when requested, legitimate information

is expeditiously transferred to the institution requesting it. This also applies to instances where inter-departmental input is required for joint submission of information.

Further, many institutions do not have libraries, or even a system for documenting and filing important information. Significant volumes of important information, including reports, datasets, etc. reside in the offices of individuals, often without the knowledge of others who are seeking the information. Interviewees noted that it is generally much easier for individual staff with internet access to obtain information from institutions from around the world, than it is for them to obtain information from local institutions.

5.2.1.9 Compliance and Enforcement

The following issues were identified pertaining to compliance and enforcement:

- a lack of new and/or updated regulations with “teeth” specifically geared to implement the requirements of the international environmental Conventions;
- insufficient trained field officers in the areas of investigations and enforcement;
- insufficient material hardware including vehicles, watercraft, etc. dedicated to compliance and enforcement activities;
- lack of coordination between agencies with shared jurisdiction in areas such as fisheries protection; and
- while public vigilance is a crucial element in regulatory compliance, due to the public’s misunderstandings of jurisdictional responsibilities between agencies such as BEST, DEHs, Fisheries Department and others, the general public often fails to establish contact with the responsible authority in the crucial first minutes or hours after an offence is deemed to occur.

5.3 PUBLIC CONSULTATION PROCESS

As part of this NCSA study, BEST undertook broad-based public consultations in the period of January to March 2004 to ensure that most, if not all, environmental issues and concerns can be ascertained from Bahamians and subsequently prepare an action plan for implementation throughout all of The Bahamas that would be responsive to these issues and concerns. While many of the environmental issues and concerns raised by the public relate to the thematic areas discussed above, a number of other environmental issues and concern were also highlighted during the consultations held in the following Family Islands:

- Acklins;
- Andros;

- Cat Island;
- Grand Bahama;
- Inagua;
- Long Island;
- Mainland Abaco, Moores Island, Great Guana, Elbow Cay, Man-O-War Cay;
- Mayaguana; and
- San Salvador.

The consultation process included discussion with students at elementary and high schools, public meetings held with the general public and meetings held with Local Councils.

This section presents the key environmental concerns and issues facing The Bahamas and possible solutions as perceived by the general public in the consultation program undertaken by BEST.

Table 5.2 lists the locations (island and town/village/community) and dates of the consultations).

TABLE 5.2
SCHOOL VISITATIONS / PUBLIC CONSULTATION MEETINGS

Island	Location	Grade Level	Meeting Date
Acklins	<ul style="list-style-type: none"> • Lovely Bay Primary School • Acklins High School • Acklins High School, Pompey Bay 	<ul style="list-style-type: none"> • Grades 1-6 • Grades 7-12 • N/A 	<ul style="list-style-type: none"> • March 4th, 2004 • March 4th, 2004 • March 5th, 2004
Andros			
<ul style="list-style-type: none"> • North 	<ul style="list-style-type: none"> • Nicholl's Town Primary School • North Andros High School • Courthouse in North Andros 	<ul style="list-style-type: none"> • Grades 4-6 • Grade 9 • Public Meeting 	<ul style="list-style-type: none"> • March 11th, 2004 • March 12th, 2004 • March 12th, 2004
<ul style="list-style-type: none"> • Central 	<ul style="list-style-type: none"> • Fresh Creek Primary School • Behering Point Primary School • Central Andros High School • Courthouse in Central Andros 	<ul style="list-style-type: none"> • Grade 6 • Grade 6 • Grades 7-12 • Public Meeting 	<ul style="list-style-type: none"> • March 16th, 2004 • March 17th, 2004 • March 16th, 2004 • March 16th, 2004
<ul style="list-style-type: none"> • Mangrove Cay 	<ul style="list-style-type: none"> • Burnt Rock Primary School • Mangrove Cay High School • Courthouse in Mangrove Cay • Courthouse in Mangrove Cay 	<ul style="list-style-type: none"> • Grade 6 • Grade 11 • Public Meeting • Council Meeting 	<ul style="list-style-type: none"> • March 18th, 2004 • March 19th, 2004 • March 17th, 2004 • March 17th, 2004
<ul style="list-style-type: none"> • South Andros 	<ul style="list-style-type: none"> • High Rock Primary School • South Andros High School • South Andros High School • Courthouse in South Andros 	<ul style="list-style-type: none"> • Grades 4-6 • Grades 7, 12 • Public Meeting • Council Meeting 	<ul style="list-style-type: none"> • March 19th, 2004 • March 19th, 2004 • March 18th, 2004 • March 18th, 2004
Cat Island	<ul style="list-style-type: none"> • New Bight Primary School • Bennett's Harbour Primary School • Arthur's Town High School • Old Bight High School • Media Center, Knowles' • Arthur's Town High School Auditorium, Arthur's Town 	<ul style="list-style-type: none"> • Grades 3-6 • Grades 5-6 • Grades 9-10 • Grades 7-12 • Public Meeting • Public Meeting 	<ul style="list-style-type: none"> • March 8th, 2004 • March 9th, 2004 • March 9th, 2004 • March 10th, 2004 • March 8th, 2004 • March 9th, 2004

TABLE 5.2 (Cont'd)
SCHOOL VISITATIONS / PUBLIC CONSULTATION MEETINGS

Island	Location	Grade Level	Meeting Date
Grand Bahama	<ul style="list-style-type: none"> • McCleans Town Primary School • West End Primary School • Freeport Anglican High School • Eight Mile Rock High School • Grand Bahama Catholic High School • St. George High School 	<ul style="list-style-type: none"> • Grades 4-6 • Grades 4-6 • Grades 10-11 • Grades 10-11 • Grade 10 • Grades 10-12 	<ul style="list-style-type: none"> • March 24th, 2004 • March 25th, 2004 • March 26th, 2004 • March 25th, 2004 • March 26th, 2004 • March 25th, 2004
Inagua	<ul style="list-style-type: none"> • Inagua All Age School • St. Phillips Community Center • Court House 	<ul style="list-style-type: none"> • Grades 4,5,6,8,9,10,11 • Public Meeting • Council Meeting 	<ul style="list-style-type: none"> • February 19th, 2004 • February 19th, 2004 • February 18th, 2004
Long Island	<ul style="list-style-type: none"> • Morrisville Primary School • Simms Primary School • N.G.M. Major High School • North Long Island High School • Clarence Town, Admin Office • Clarence Town Community Centre • Simms Primary School 	<ul style="list-style-type: none"> • Grades 4-6 • Grade 6 • Grade 10 • Grade 10 • Council Meeting • Public Meeting • Public Meeting 	<ul style="list-style-type: none"> • March 3rd, 2004 • March 3rd, 2004 • March 3rd, 2004 • March 3rd, 2004 • March 2nd, 2004 • March 3rd, 2004 • March 4th, 2004

TABLE 5.2 (Cont'd)
SCHOOL VISITATIONS / PUBLIC CONSULTATION MEETINGS

Island	Location	Grade Level	Meeting Date
Mainland Abaco	• Fox Town Primary	• All ages up to Grade 6	• February 19 th , 2004
	• S.C. Bootle High School	• Grade 10	• February 19 th , 2004
	• St. Francis De Sales School	• Grades 6, 11	• January 20 th , 2004
	• Long Bay School	• Grades 11-12	• January 20 th , 2004
	• Forest Heights Academy	• Grade 10	• January 20 th , 2004
	• Central Abaco Primary	• Grade 6	• January 20 th , 2004
	• S.C. Bootle High School – Cooper’s Town (North)	• Public Meeting	• January 19 th , 2004
	• Anglican Church Hall – Marsh Harbour (Central)	• Public Meeting	• January 20 th , 2004
	• JA Pinder Primary School – Sandy Point (South)	• Public Meeting	• January 22 nd , 2004
	Moores Island	• Moore’s Island All Age School	• All Ages
• Cherokee Sound Primary		• Grade 11	• January 22 nd , 2004
• Crossing Rocks Primary School		• Grades 1-6	• January 22 nd , 2004
• Sandy Point Primary School		• Grades 1-6	• January 22 nd , 2004
• Moore’s Island		• Council Meeting	• January 21 st , 2004
Great Guana	• Councillor Glen Laing	• Council Meeting	• January 23 rd , 2004
Elbow Cay	• Hope Town Local Council	• Council Meeting	• January 23 rd , 2004
Man-O-War Cay	• Chief Councillor Walter Sweeting	• Council Meeting	• January 23 rd , 2004
Mayaguana	• Pirate’s Well All Age School	• Grades 1-9	• February 16 th , 2004
	• Abraham’s Bay All Age School	• All Ages	• February 17 th , 2004
	• Pirate’s Well All Age School	• Public Meeting	• February 16 th , 2004
	• Abraham’s Bay All Age School	• Public Meeting	• February 17 th , 2004
San Salvador	• San Salvador High School	• Grades 7-12	• February 24 th , 2004
	• United Estates Primary School	• Grades 5-6	• February 25 th , 2004
	• Riding Rock Inn Photo Lab	• Public Meeting	• February 25 th , 2004

5.3.1 Key Issues and Concerns Related to the Thematic Areas

Key environmental issues and concerns, specific to the four thematic areas, raised in each island during the public consultation process are summarized in Table 5.3.

While the specifics of the issues and concerns varied from island to island, in general, many of those raised relate to all of the thematic areas. Of the four thematic areas, climate change was the least discussed by the participants. This is probably due to the fact that there is limited awareness and understanding of climate change and its effects are least evident compared to other of the thematic areas.

Overall, the most frequent issues/concerns were raised relative to biodiversity. Damage to coral reefs, over fishing, deforestation and destruction of endangered/protected species were the most common issues/concerns raised. The general consensus is that existing laws/regulations are to be enforced and/or new regulations developed, and that monitoring and enforcement be strengthened to prevent further loss of biodiversity.

Land degradation was the second most frequent concern raised. The most common concerns in this thematic area related to coastal/beach erosion, and the impacts of sand mining.

The need for the protection of wetlands was also frequently raised throughout the consultations. The filling-in of wetlands due to infrastructure development such as new roads, and the discharge of contaminants to wetlands were two of the issues of greatest concern in this thematic area.

5.3.2 Legal and Institutional Issues and Concerns

The public identified several legal and institutional challenges hindering environmental management in The Bahamas. A common sentiment expressed in the island reports is that existing environmental laws are not being enforced. It is felt that polluters, both local and international (mainly ships and pleasure yachts) are not being held accountable. This lack of enforcement reflects the concerns raised in the institutional interviews. Insufficient financial, human and material resources present a significant challenge for agencies with enforcement responsibilities.

From the public's perspective, a key institutional challenge is a perceived lack of clarity pertaining to the responsibilities of various government agencies for environmental management. In simple terms, the public needs to know who is responsible for investigating polluters, monitoring environmental conditions and enforcing regulations.

TABLE 5.3
KEY ISSUES AND CONCERNS RELATED TO THEMATIC AREAS

Island	Key Issues Related to Thematic Areas			
	Biodiversity	Climate Change	Land Degradation	Wetlands
Acklins	<ol style="list-style-type: none"> 1. Damage to coral reefs (HS) 2. Fisheries management (GP) 		<ol style="list-style-type: none"> 1. Erosion (GP) 	
Andros	<ol style="list-style-type: none"> 1. Loss of tree and plant life (PS, HS, GP) 2. Endangered sponges (PS, LC) 3. Damage of coral reefs and marine life by fisherman (HS, GP) 4. Over fishing by foreign boats (HS, GP) 5. Killing of leatherback turtles (PS) 6. Forest fires (PS, HS, P, LC) 7. Destruction of animal habitats (PS) 8. Harvesting juvenile fish and spawning crab (PS) 	<ol style="list-style-type: none"> 1. Fumes from burning garbage destroys the ozone layer (PS, GP) 2. CFCs contribute to air pollution (HS) 	<ol style="list-style-type: none"> 1. Random clearing of land (HS, GP, LC) 2. Erosion of beaches and coastlines (HS, GP, LC) 3. Soil erosion (HS) 4. Gas/chemical spills on land (HS) 5. Sand mining (HS, LC) 6. Illegal quarrying (LC) 	<ol style="list-style-type: none"> 1. Filling of wetlands (PS, HS, GP, LC) 2. Discharges to wetlands (GP) 3. Lack of flushing for mangrove areas (GP) 4. Destruction of ponds and swamps (HS)
Cat Island	<ol style="list-style-type: none"> 1. Need to protect plant and animal life (HS) 2. Need to protect fish and their habitat (PS) 3. Over fishing (HS) 4. Impact on coral reef due to abandoned iron shipment (HS) 5. Tourists remove coral without permission (GP). 6. Bleaching of coral reefs (GP) 7. Birds and other animals are leaving their habitats (GP) 		<ol style="list-style-type: none"> 1. Removal of sand and rock from shoreline for construction material (P) 2. Creating beaches by removing sand (P) 3. Beach erosion (P) 4. Slash and burn farming method (GP) 5. Deforestation (HS) 	<ol style="list-style-type: none"> 1. Need to protect wetlands (PS, HS) 2. Building roads in sensitive wetlands (PS, GP) 3. Lack of public input on development projects affecting wetlands (GP) 4. Deterioration of mangrove swamps (GP)
Grand Bahama	<ol style="list-style-type: none"> 1. Bleaching of coral reefs (PS) 2. Over fishing (HS) 3. Need for national and marine parks (HS) 4. Deforestation and land clearing (HS) 		<ol style="list-style-type: none"> 1. Removal of sand from beaches (PS) 	<ol style="list-style-type: none"> 1. Destruction of mangrove swamps (PS)
Inagua	<ol style="list-style-type: none"> 1. Over fishing, including poaching (PS, HS, LC) 2. Destruction of coral reefs (GP) 		<ol style="list-style-type: none"> 1. Depletion of trees due to brine (GP, LC, PE) 2. Beach erosion (GP) 	<ol style="list-style-type: none"> 1. Wetland near dumpsite is almost dead (PE)
Long Island	<ol style="list-style-type: none"> 1. Fishing juvenile conch and fish species (PS) 2. Protection of coral reefs (PS) 3. Illegal fishing (PS, HS, GP) 4. Clear-cutting of trees (PS, HS, GP) 5. Over Fishing (HS) 6. Illegal hunting of bird species such as White Crown Pigeon (GP) 7. Vehicle traffic killing the Whistling Duck (GP) 		<ol style="list-style-type: none"> 1. Land pollution from indiscriminate littering (HS) 2. Lack of designated sand mining sites (LC) 3. Destruction of sand dunes (LC, GP) 	<ol style="list-style-type: none"> 1. Destruction of mangrove community (HS) 2. Threat to Diamond Crystal wetland system (LC) 3. Filling of valuable wetlands (GP)

TABLE 5.3 (Cont'd)
KEY ISSUES RELATED TO THEMATIC AREAS

Island	Key Issues Related to Thematic Areas			
	Biodiversity	Climate Change	Land Degradation	Wetlands
Mainland Abaco, Moores Island, Great Guana, Elbow and Man-O-War Cays	<ol style="list-style-type: none"> 1. Frequent forest fires (HS) 2. Over Fishing (HS) 3. Poaching by outside fishermen (HS) 4. Catching juvenile fish (PS, HS, GP) 5. Need to protect coral reefs (PS) 6. Need for marine protected area (GP) 7. Need to protect fish habitat and spawning areas (GP) 8. Missing bird species may be linked to pesticide spraying on farms (GP) 		<ol style="list-style-type: none"> 1. Land pollution from garbage disposal (PS) 2. Coastal erosion (HS, LC) 3. Indiscriminate Mining and lack of regulations (GP) 4. Lack of expert advice on land use planning (GP) 5. Sand mined for road construction (LC) 	<ol style="list-style-type: none"> 1. Mangrove areas stagnant-blocked by road (GP) 2. Air boat has damaged mangrove areas and flats, destroying sensitive habitat (GP) 3. Dumpsite affecting wetlands (GP) 4. Duck Pond wetland and Rockey Point should be protected (GP) 5. Flooding of homes in wetland area (LC) 6. Large areas of mangrove damaged by dredging in Man-O-War Cay (LC) 7. Joe's Creek wetland areas in Man-O-War Cay should be protected (LC)
Mayaguana	<ol style="list-style-type: none"> 1. Over Fishing by local fishermen and poachers (PS, HS) 2. Mass burning of undergrowth destroys habitats (GP) 3. Depletion and harvesting of undersized conch (PS, HS) 		<ol style="list-style-type: none"> 1. Beach erosion due to sand mining (PS, HS) 	
San Salvador	<ol style="list-style-type: none"> 1. Over Fishing by fishermen and poachers including the removal of eggs and catching of undersized fish (PS, HS, GP) 2. Coral is destroyed by bleach used in fishing and by visiting boats that anchor on coral reefs (PS) 3. Freshwater turtles dieing from ingesting solid wastes and are impacted by garbage in the lakes (PS) 4. Iguana dieing from lack of food and rising tide. 5. Coral reefs are continually being destroyed by visiting boats (GP) 			<ol style="list-style-type: none"> 1. Destruction/decline in wetlands due to people filling in the wetlands for construction (GP)

Legend:

- HS - High School
- GP - General Public
- LC - Local Council
- PE - Private Entities
- PS - Public School

Comments from the island reports indicate that there is a significant shortage of basic facilities for waste management such as public waste receptacles, engineered landfill, hazardous waste disposal area, etc. Without appropriate facilities, the public is more inclined to engage in illegal dumping. For example, it is quite difficult to enforce laws on littering if the public has no facilities to dispose off their trash.

Based on the comments provided in the island reports, it is evident that the general public (including students) has a good understanding of, and strong interest in, the environmental problems related to wetlands, biodiversity, land degradation, etc.; however, a consistent theme throughout the general public's perception of exclusion from the decision-making process. The perception is that important decisions affecting the environment, such as infrastructure development affecting wetlands, are made at the political level without input from the public. Public participation in environmental conservation and protection is strongly related to public awareness of environmental issues and is especially enhanced when there are avenues for meaningful participation in the decision-making process.

5.3.3 Other Environmental Issues and Concerns

Other issues and concerns raised at the public beyond the four thematic areas selected for this study are summarized in Table 5.4. Further details are included in the island reports prepared by BEST. The most common issues may be summarized as follows:

Vector/Pests

- Mosquitoes;
- Sand flies;
- Stray dogs; and
- Rodents.

Solid Waste

- Littering;
- Improper waste collection and disposal system;
- Lack of engineered landfills;
- Illicit dumping on land and in the ocean; and
- Derelict vehicles.



Photo taken by BEST

**TABLE 5.4
OTHER KEY ENVIRONMENTAL ISSUES/CONCERNS**

Island	Key Issues Raised						
	Vector/ pests	Solid Waste	Sewage	Chemical and Medical Wastes	Air Pollution/Quality	Water Pollution (Marine and Groundwater)	Drinking/Potable Water
Acklins	<ol style="list-style-type: none"> 1. Mosquitoes (PS, HS, GP) 2. Sand flies (PS, HS, GP) 3. Rodents (GP) 4. Stray dogs (GP) 	<ol style="list-style-type: none"> 1. Improper landfill (HS, HS, GP) 2. Infrequent garbage collection (PS, HS, GP) 3. Littering (HS, GP) 4. Illicit dumping (HS, GP) 	<ol style="list-style-type: none"> 1. Improper management of septic systems (PS, HS) 	<ol style="list-style-type: none"> 1. Improper disposal of "sharps (GP) 2. Use of chemicals to catch fish (GP) 	<ol style="list-style-type: none"> 1. Air pollution from burning garbage (HS, GP) 	<ol style="list-style-type: none"> 1. Groundwater is brackish (PS, HS,). 2. Polluted water (HS) 	<ol style="list-style-type: none"> 1. Brackish potable water (PS, HS, GP) 2. Lack of potable water (GP)
Andros	<ol style="list-style-type: none"> 1. Mosquitoes (PS, HS, GP, LC) 2. Stray dogs (HS) 3. Fire ants (GP) 	<ol style="list-style-type: none"> 1. Illicit dumping-land and sea (PS, HS, GP) 2. Improper landfill (HS,LC) 3. Littering (PS, HS) 4. Infrequent garbage collection (HS, LC) 5. Derelict vehicles and large appliances (HS, GP) 6. Blue holes are used as dumpsites (PS, HS, GP) 	<ol style="list-style-type: none"> 1. Improper management of septic systems (HS, LC) 2. Dumping of raw sewage into harbour (LC) 	<ol style="list-style-type: none"> 1. Chemicals in the sea (PS) 2. Dumping of petroleum products in port area (GP) 3. Potential oil spills from gas stations and oil storage facilities (GP) 4. Gasoline and oil in abandoned boats in shallow waters (GP) 5. Sharps are burned along with other wastes (GP, LC) 6. Fishing with chemicals (HS) 7. Pesticides and fertilizers pollute water (HS) 8. Household solvents (LC) 	<ol style="list-style-type: none"> 1. Air pollution (odour and smoke) from burning garbage (PS, HS, GP) 2. Dumpsite burns tires, plastic and batteries (GP) 	<ol style="list-style-type: none"> 1. Water pollution (HS) 2. Ocean dumping by boats (HS, GP) 	<ol style="list-style-type: none"> 1. Excessive chlorination (GP) 2. Poor drinking water quality (GP, LC)

TABLE 5.4 (Cont'd)
OTHER KEY ENVIRONMENTAL ISSUES/CONCERNS

Island	Key Issues Raised						
	Vector/ pests	Solid Waste	Sewage	Chemical and Medical Wastes	Air Quality	Marine and Groundwater	Potable Water
Cat Island	1. Fire ants (GP)	1. Littering- including beaches and ocean (PS, HS, GP) 2. Poor condition of dump sites (PS, GP) 3. Improper disposal of derelict vehicles (HS, GP)	1. Improper sewage disposal (GP) 2. Need to manage septic tanks properly (GP)	1. Disposal of motor oil directly onto soil (GP) 2. The practice of disposing medical waste by burial (GP)	1. Air pollution from burning garbage (PS, HS, GP)	1. Marine pollution caused by adding bleach to ocean (PS, HS) 2. Marine pollution due to oil spills (HS) 3. Low freshwater supply (GP) 4. Drains discharging rainwater directly to the sea may adversely affect groundwater recharge (GP)	1. Poor quality of potable water (PS, HS, GP) 2. Need safe drinking water supply (GP)
Grand Bahama	1. Stray animals (HS)	1. Littering- including roadsides and mangrove swamps (PS, HS) 2. Needs proper waste collection and disposal (HS) 3. Bulk solid wastes discarded in bushes (HS) 4. Recycling center needed (HS)	1. Land pollution by sewerage (HS)	1. Hazardous chemical waste (HS)	1. Air pollution from forest fires (PS) 2. Noise pollution from construction (HS)	1. Dredging in the harbour area (HS) 2. Marine pollution due to oil (HS)	

TABLE 5.4 (Cont'd)
OTHER KEY ENVIRONMENTAL ISSUES/CONCERNS

Island	Key Issues Raised						
	Vector/ pests	Solid Waste	Sewage	Chemical and Medical Wastes	Air Quality	Marine and Groundwater	Potable Water
Inagua	<ol style="list-style-type: none"> 1. Mosquitoes (PS, HS) 2. Stray animals such as donkeys, dogs, etc. (HS, GP) 	<ol style="list-style-type: none"> 1. Littering (PS, HS, LC) 2. Improper dump site (GP, LC, PE) 3. Dumping by foreign vessels and yachts (GP, LC) 4. Indiscriminate dumping of solid wastes including appliances (LC) 	<ol style="list-style-type: none"> 1. Improper sewage disposal (PS, HS, GP) 2. Problems with septic tanks (GP, LC, PE) 3. No sewage treatment plant (LC) 4. Sewage contributing to mosquito breeding (PE) 	<ol style="list-style-type: none"> 1. Asbestos in building materials (PS, HS, LC) 2. Old chemicals in storage (PE) 	<ol style="list-style-type: none"> 1. Air pollution , including dust, odour, and burning garbage (PS, HS) 2. Burning garbage releases toxins that are harmful to humans (LC) 3. Spent oil is burnt at landfill without a permit (PE) 	<ol style="list-style-type: none"> 1. Water pollution, including dumping by boats and improper disposal of chemicals.(PS, HS) 2. Leachate from dumpsites may affect groundwater (GP) 3. Oil spills in the ocean (GP). 4. Septic tanks polluting groundwater (LC) 	
Long Island	<ol style="list-style-type: none"> 1. Mosquitoes (PS, GP) 2. Roaming animals including sheep, goats, dogs and cat are a nuisance and destroy crops (PS) 	<ol style="list-style-type: none"> 1. Indiscriminate dumping of solid wastes on roadsides, canals, wetlands and the ocean (PS, HS) 2. Location and proper management of dumpsites (PS) 3. Improper disposal of derelict vehicles (PS, HS, GP) 4. Littering (PS) 5. Existing dumpsites are too small (HS) 6. Need to close old dumpsites and designate new ones (LC, GP) 	<ol style="list-style-type: none"> 1. Septic tank overflow (GP) 	<ol style="list-style-type: none"> 1. Use of chemical weed killers (PS) 	<ol style="list-style-type: none"> 1. Burning garbage release substances that are harmful to humans (PS) 2. Air pollution (PS) 	<ol style="list-style-type: none"> 1. Depletion of freshwater lenses (PS) 2. Flooding from storm surges (PS, HS) 3. Marine pollution from bleach, oil and solid wastes (HS, LC. GP) 	<ol style="list-style-type: none"> 1. Drinking water quality is unsuitable (GP)

TABLE 5.4 (Cont'd)
OTHER KEY ENVIRONMENTAL ISSUES/CONCERNS

Island	Key Issues Raised						
	Vector/ pests	Solid Waste	Sewage	Chemical and Medical Wastes	Air Quality	Marine and Groundwater	Potable Water
Mainland Abaco, Moores Island, Great Guana, Elbow and Cays	<ol style="list-style-type: none"> 1. Mosquitoes in trenches and swampy areas and rainwater containers (HS, LC) 2. Increasing stray dog, cat and raccoon populations that are nuisances and threaten wildlife and crops (HS, P) 3. Sandflies (PS) 4. Rats (LC) 	<ol style="list-style-type: none"> 1. Littering on land and sea (PS, HS) 2. Illegal dumping (PS, HS) 3. Insufficient garbage cans (HS) 4. Improper disposal of derelict vehicles (PS, LC) 5. Need for landfills (GP) 6. Dumpsite should be relocated (LC) 7. No official dumpsite on the Cay (LC) 	<ol style="list-style-type: none"> 1. Lack of sewage treatment facilities (HS, LC) 2. Sewage from yachts are emptied into the marine environment (GP) 3. Septic tanks from businesses leaking into the harbour (GP) 	<ol style="list-style-type: none"> 1. Closed service station and storage tanks on the coast (PS, HS) 2. Use of restricted pesticides (GP) 3. Concern over disposal of sharps from clinic (LC) 	<ol style="list-style-type: none"> 1. Air pollution from smoke, fire, fossil fuels, car exhaust (PS, HS) 2. Air pollution from burning garbage (HS, LC) 	<ol style="list-style-type: none"> 1. Water pollution from gasoline, garbage, bleach, oil, detergent (PS, HS) 2. Flooding in low-lying areas (PS, HS) 	<ol style="list-style-type: none"> 1. The pump at the wellfield is unsanitary (GP)
Mayaguana	<ol style="list-style-type: none"> 1. Mosquitoes (PS, HS, GP) 2. Stray dogs disrupting solid waste containers (PS, HS) 	<ol style="list-style-type: none"> 1. Littering – even from improperly covered garbage trucks (PS, HS, LC) 2. Indiscriminate dumping (PS, HS) 3. Proper waste collection truck and disposal site are needed (GP, LC) 4. Derelict vehicles in a few areas (LC) 	<ol style="list-style-type: none"> 1. Sewage (PS, HS) 2. Homes with septic tanks without water overflow (GP, PS, HS) 	<ol style="list-style-type: none"> 1. Medical wastes (sharps) not effectively managed (PS, HS) 2. Fogging chemicals use for mosquito control kill/harm plants (PS, HS) 	<ol style="list-style-type: none"> 1. Air pollution from burning garbage, vehicle exhaust and mass burning of undergrowth (PS, HS, GP) 	<ol style="list-style-type: none"> 1. Groundwater pollution from septic tanks built close to wells, improperly designed septic tanks, and waste oil (PS, HS, GP) 2. Ocean dumping including chemical bleach and solid wastes (PS, HS) 	<ol style="list-style-type: none"> 1. Residents may be drinking contaminated rainwater (GP) 2. Drinking water may be contaminated with asphalt (GP) 3. Abraham's Bay does not have fresh water supply so homes must depend on private wells (PS, HS)

**TABLE 5.4 (Cont'd)
OTHER KEY ENVIRONMENTAL ISSUES/CONCERNS**

Island	Key Issues Raised						
	Vector/ pests	Solid Waste	Sewage	Chemical and Medical Wastes	Air Quality	Marine and Groundwater	Potable Water
San Salvador	<ol style="list-style-type: none"> 1. Mosquitoes inhabiting tires, cans and garbage bins (PS, HS) 2. Mosquitoes seem to be developing resistance to spraying (GP) 	<ol style="list-style-type: none"> 1. Littering caused by humans and stray dogs (PS, HS) 2. Derelict vehicles in several areas (GP) 3. Landfill operator needs more training to operate landfill properly (GP) 	<ol style="list-style-type: none"> 1. Sewage is pumped into empty lots or into the ocean (PS, HS, GP) 2. No wastewater treatment system exist on the island (GP) 	<ol style="list-style-type: none"> 1. Fogging chemicals use for mosquito control kill plants (PS, HS) 	<ol style="list-style-type: none"> 1. Air pollution from burning garbage, vehicle exhaust and bush fires (PS, HS, GP) 	<ol style="list-style-type: none"> 1. Water pollution from cruise ships, bleach, chemicals/oils, solid waste and sewage (PS, HS) 	<ol style="list-style-type: none"> 1. There is a lack of potable water. People depend on wells and rainwater (PS, HS) 2. Drinking water supplied by the Water and Sewerage Corporation is brackish , thus many people use private wells along with improper functioning septic systems in their yards (GP)

Legend:

- HS - High School
- GP - General Public
- LC - Local Council
- PE - Private Entities
- PS - Public School



Photo taken by BEST

Sewage

- improper management of septic systems;
- disposal of raw sewage on land and in water; and
- lack of wastewater treatment systems.

Chemical and Medical Wastes

- improper disposal of “sharps” from medical facilities;
- dumping of oils and other chemicals in the ocean;
- the widespread use of bleach in fishing; and
- asbestos in building materials.



Photo taken by BEST

Air Pollution Quality

- air pollution associated with the practice of burning garbage;
- air pollution from vehicle exhaust; and
- air pollution from slash and burn farming.

Water Pollution (Marine and Groundwater)

- water pollution caused by vessels involved in ocean dumping;
- water pollution due to improper septic systems; and
- water pollution caused by careless disposal of solid wastes, bleach used in fishing, waste oils.



Photo taken by BEST

Potable Water

- drinking water is often brackish;
- potential for water wells to be contaminated by improperly designed septic systems; and
- lack of potable water service.

Overall, concerns over solid waste were the most frequent of all concerns/issues raised by the general public throughout the consultations, while concerns relating to air pollution/quality and drinking/potable water were the least frequent. A significant cross-cutting theme in the public's comment relates to the need for properly engineered facilities for waste management including landfills, septic systems and other facilities for handling chemical and medical wastes. The lack of properly designed and engineered waste disposal facilities is related to several of the other concerns raised, such as air pollution associated with the burning of garbage, water pollution due to leachate, vector/pests infestations, etc. A second cross-cutting theme is the need for more stringent enforcement of existing regulations, and the development of newer more appropriate regulations.

5.3.4 Possible Solutions to Environmental Issues and Concerns

As part of the public consultation process, opinions were solicited on possible solutions for the environmental issues and concerns identified. Table 5.5 summarizes the solutions proposed by the general public for the most common environmental issues and concerns. Further details, in particular island-specific details are contained in the island reports prepared by BEST.

Irrespective of the environmental concern, several cross-cutting themes are evident in the solutions proposed by the public. The key themes include:

- **Laws and regulations:** The need for more and better laws and regulations to protect the environment.
- **Enforcement:** Better enforcement of existing laws and regulations to improve environmental conservation and protection.
- **Public Awareness and Education:** Improved public awareness and education programmes in all areas of environmental management.
- **Public Consultation/Involvement:** More public consultation in the decision-making process relating to development and activities that are likely to cause adverse environmental impacts.
- **Training:** The need for better training of government staff involved in all areas of environmental management including investigation, monitoring and enforcement.
- **Resources:** Greater allocation of resources, financial, human and otherwise, to ensure that sensitive and vulnerable natural resources are protected.

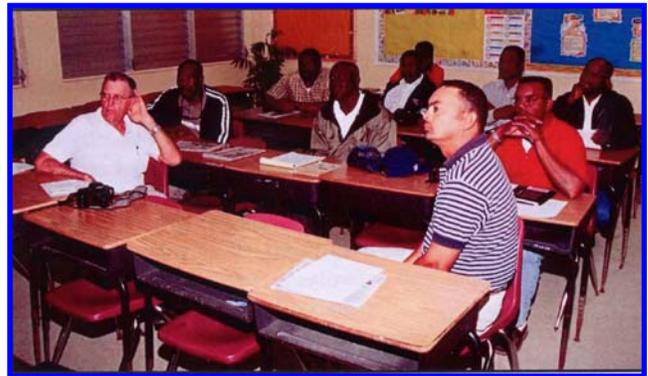


Photo taken by BEST

TABLE 5.5
POSSIBLE SOLUTIONS TO COMMON ENVIRONMENTAL ISSUES AND CONCERNS

Environmental Issues/Concerns	Possible Solution
Vector/Pests	<ol style="list-style-type: none"> 1. Improve spraying techniques for fighting mosquito infestation, including the more widespread use of aerial spraying. 2. Undertake actions to reduce potential breeding areas for vectors. 3. Enforce laws and licensing requirements for animal control.
Solid Waste	<ol style="list-style-type: none"> 1. Close unsanitary dumps and replace them with properly engineered landfills. 2. Improve waste collection system, especially as it relates to the availability of waste bins and frequency of pick-up. 3. Enforce laws on littering. 4. Provide facilities for handling large waste items such as appliances and derelict vehicles. 5. Introduce recycling programs.
Sewage	<ol style="list-style-type: none"> 1. Install properly engineered wastewater treatment systems. 2. Encourage residents to use, on a regular basis, an enzyme that speed up the growth of micro-organisms that break down the solid wastes in septic tanks. 3. Improve designs of septic tank systems. 4. Construct dedicated sewage storage facilities near existing landfills as a temporary measure until permanent waste treatment facilities are installed.
Chemical and Medical Wastes	<ol style="list-style-type: none"> 1. Provide proper storage and disposal facilities for hazardous wastes. 2. For islands without appropriate hazardous wastes disposal facilities, ship the wastes off-island to appropriately licensed disposal sites. 3. Store sharps in secure containers and dispose off them in accordance with protocols for medical wastes. 4. Remove asbestos from buildings where it currently exists. 5. Educate the public on the dangers of adding bleach and other chemicals to seawater.
Air Pollution/ Quality	<ol style="list-style-type: none"> 1. Prohibit the burning of garbage at dumpsites. 2. Service vehicles more regularly and use unleaded gasoline. 3. Educate the public on the adverse environmental effects of slash and burn farming.
Water Pollution/ Marine and Groundwater	<ol style="list-style-type: none"> 1. Stringent enforcement of laws to ensure that marine-generated sewage is not dumped into the ocean. 2. Restrictions should be placed on septic systems close to coastlines. 3. Restrictions should be placed on the construction of septic systems in close proximity to well fields. 4. Establish marine national parks/“no take zones” to protect certain species.
Drinking/ Potable Water	<ol style="list-style-type: none"> 1. Restrictions should be placed on the construction of septic systems in close proximity to well fields.

5.4 NCSA WORKSHOP

The “Workshop for Development of a National Environmental Management and Action Plan (NEMAP)” was held at the SuperClub Breezes hotel in Cable Beach on New Providence Island on April 5-6, 2005. The purpose of the workshop was to review and confirm the findings of the agency interviews, the results of the Family Island consultations and NCSA training workshops on thematic assessment, development of thematic profiles and synergies and cross-cutting issues; and to discuss actions for moving forward. The workshop consisted of formal presentations, plenary sessions and break-out groups with facilitators and rapporteurs.



5.4.1 Workshop Agenda and Participants

The workshop agenda is included here as Appendix C. Invitations to the workshop were sent to all agencies represented on the NCB. The workshop attendees and their affiliations are shown in Appendix D. Most, if not all, of the workshop attendees were familiar with the NCSA project, and several served on thematic committees.

The first day of the workshop included presentations by BEST and SENES on:

- the background to the NCSA project- presented by BEST;
- findings of the public consultations- presented by BEST;
- findings of the NCB interviews - presented by SENES; and
- review of a draft NEMAP for The Bahamas incorporating a “Blueprint”, National Environmental Policy (NEP) and NEMAP - presented by SENES.

Also, on the first day, three break-out groups (named Cocoplum, Seagrape and Mahogany) were convened to discuss a Program Activity Architecture for a new Environment portfolio for The Bahamas.

The second day of the workshop consisted of two additional break-out sessions to build on the discussions of the previous day. The first break-out session discussed the key findings of the NCB interviews and public consultations using the results of the previous day’s presentations. The

second break-out session was designed to discuss the NEMAP and to confirm key action items and assign time frames for their implementation.

5.4.2 Workshop Results

The workshop presentations are presented in Appendix E. The details of the workshop discussions and results, as made available by BEST, are included in Appendix F. The appendix summarizes all of the key comments made in response to the individual presentations, issues raised by each breakout group and comments made during the plenary sessions. In general, the workshop confirmed the findings of the public consultations and NCB interviews, but also in some instances provided dissenting opinions from the results of interviews with the NCB members. A key outcome of the workshop was the development of consensus on priority issues, especially relating to the NEP and NEMAP, and the establishment of timelines for taking action and procedures for moving forward. The following sections highlight the key results.

5.4.2.1 Key Action Items

The workshop participants reached consensus on the following key action items:

NEP

- There is a need for the GOB to articulate an over-arching national policy on the environment.
- That the NEP as presented in the workshop be revised to incorporate the comments of the workshop participants (see revised NEP in Appendix G).
- That the NEP be circulated for broad public consultations. The document should be made available for public comment through a variety of means including the BEST web site, civic organizations, presentations at the College of The Bahamas, newspaper advertisement or supplement.
- That a strict timeline, preferably 45 days, be set for public comment on the NEP.
- After incorporating public comments, the draft NEP should be forwarded to the GOB for approval within six months from the conclusion of the workshop.

Program Activity Architecture (Blueprint)

- While some participants expressed difficulty with the term Program Activity Architecture (PPA), it was agreed that there is a need for the GOB to adopt a blueprint for The Bahamas to plan, evaluate and report on the results throughout the life-cycle of the Government's environmental management programme.

- That the PAA as presented in the workshop be renamed and revised to incorporate the comments of the workshop participants (see revised PAA, renamed Blueprint, in Appendix H).
- The Blueprint be circulated for targeted public consultation with government agencies and technical officers. Consultations should be limited by a strict timeline, preferably 45 days.
- After incorporating public comments, the draft Blueprint should be forwarded to the GOB for approval within the next 1-3 years.

NEMAP

- The NCSA study provides a solid foundation to proceed with developing a NEMAP for The Bahamas.
- That the draft NEMAP presented at the workshop be revised to include the comments from the workshop participants.
- The NEMAP should include, among other things:
 - the immediate establishment of a Department of the Environment for The Bahamas with a long term goal of establishing a Ministry of the Environment;
 - a Cabinet Committee on the environment.
 - a National Environmental Council made up of Cabinet Ministers, using the existing National Economic Council as a model.
 - a national multi-stakeholder committee, possibly made up of Permanent Secretary level employees; and
 - the technical thematic subcommittees should be maintained. Technical subcommittees could recommend priorities and send these onward to Cabinet through the relevant Permanent Secretary.
- The draft NEMAP should be made available for public review through a process that gives wide public access including use of the Web, libraries, Island administrators and public service announcements. The review process should have a specified timeline.
- Following the public consultation process, the NEMAP should be submitted to the GOB for approval. This should be accomplished within the next 1-3 years.

5.4.2.2 Comments on Family Islands Consultations

Overall, the workshop participants were in agreement with the results of the public consultations. It was felt that the issues raised in the consultations confirmed the priorities for developing the capacity of The Bahamas in implementing the international environmental Conventions and addressing other key environmental issues. The workshop participants highlighted the following additional comments to the list of issues discussed earlier in section 5.3 of this report.

- Centralization has resulted in a brain drain from the Family Islands. Many students have no plans to remain in the Family Islands.
- There is a need for the establishment of an environmental hotline to direct concerns to the relevant agencies instead of the current situation where an individual reporting a concern must often endure the frustration of calling several different agencies before locating the appropriate contact.
- Information including phone numbers and contact names should be listed at the front of The Bahamas telephone directory.
- The Water and Sewerage Corporation should undertake a land retention programme to preserve water resources in the Family Islands. Current lands will be under threat once the Corporation moves to reverse osmosis.

5.4.2.3 Comments on NCB Interviews

Workshop participants were asked to comment on the results of the NCB interviews discussed earlier in section 5.2 of this report. While participants were in agreement with most of the results of the interviews with NCB members, they were not in full agreement with some of these as noted below:

Systemic Level

- **Management Accountability:** Participants disagreed with the NCB assertion that institutions were generally held publicly accountable. The consensus of the workshop participants was that public accountability is seriously lacking.
- **Public Consultation:** participants noted that there is a need for more emphasis on education and awareness. It was recommended that GOB undertake more frequent updates of government information posted electronically, and that more user-friendly formats be utilized for electronic postings.

Institutional Level

- **Institutions Purpose and Reporting Structure:** Participants disagreed with the NCB opinion that for the most part institutions had a clear well defined and understood missions and mandates, and reporting structure. Participants maintained that while this was probably true at the Director level, that this was not the case at the technical staff level.
- **Institutions Structure and Management:** Participants felt that the governance structure is in place, but the management techniques vary significantly-ranging from good to poor.
- **Staff:** Participants agreed with the NCB that there was a shortage of staff, but that staff were generally sufficiently skilled for their jobs. However, unlike the NCB, they maintained that staffing resources were not effectively utilized.

- Budget: In addition to budgets being inadequate, it was noted that the budgetary process is outdated and inflexible.
- Information: Participants agreed with NCB on the difficulties associated with information management and distribution. They also highlighted the results of recent work such as the report titled *An Integrated Biodiversity Data Management System For The Bahamas* (May 2004), which highlighted the need for improved library services and information technology.

Individual Level

- Work Description: Unlike the NCB, workshop participants felt that jobs are often not defined. The general consensus was that many technical staff had no proper job descriptions.
- Competency: It was emphasized that many of the senior technical staff who are promoted to the management level are not effective managers, and their replacements at the technical level are often less experienced. This has the double effect of poor management and a weakening of technical capabilities. It was recommended that a more collaborative working relationship be established between the civil service and institutions, such as the College of The Bahamas, to develop basic training programmes on environmental management in which all agencies can participate. Through these programs, individuals would receive certification.
- Staff Retention: The participants agreed with the NCB that staff retention within the civil service was high, but pointed out that the prestige of working in the civil service is beginning to “fade”, as problems such as understaffing become more chronic.

5.4.2.4 Other General Comments

Following are some general comments from workshop participants that were not previously noted in the report.

- The GOB should pursue the protection of a variety of different ecosystems within a national parks and protected areas system which not only protects species’ habitat but provides outdoor classrooms to educate people about the value of the natural environment.
- There is a lack of political will in The Bahamas for addressing environmental issues.
- There is a need for the GOB, through the Water and Sewerage Corporation, to pursue a programme of land retention for the purpose of protecting water resources. This is especially critical in areas where such lands are under threat of private/commercial development.
- There is a need for designated green spaces and “Windows to the Sea” as areas where the public can enjoy nature and the environment.

- While the major industries in The Bahamas are tourism and finance, it is not always made clear how these important industries are dependent on environmental protection and sustainability.
- There is a need for more emphasis on science/research. The need for more research should be given a high priority, since scientific knowledge gained through research and monitoring is essential to establishing environmental laws, regulations, policies, guidelines and to sound environmental decision-making.
- There is a need for the development of a National Energy Policy to guide the conservation of non-renewable resources.
- More emphasis should be placed on recycling and reducing solid waste.
- GOB should develop more central sewage treatment facilities in an effort to move away from the use of septic systems.
- There is a problem with enforcement which involves interference from politicians, thus compromising the integrity of enforcement officials.
- Environmental enforcement officers are shown little respect by individuals being investigated and are often subjected to intimidation tactics.
- The police need to be more involved in environmental management as they act to uphold all laws.
- There is a lack of human and financial resources for environmental management. The Bahamas is moving forward slowly but people should not lose hope as these things will take time.

REFERENCES

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APPENDIX A

LIST OF INDIVIDUALS INTERVIEWED

APPENDIX A: LIST OF INDIVIDUALS INTERVIEWED

Name	Agency	Telephone Contact	Fax #	E-mail Address
Ambassador Keod Smith	<i>Ambassador to the Environment,</i> BEST Commission	322-4546	326-3509	Keod_smith@yahoo.com
Dr. Donald Cooper	Under Secretary BEST Commission	322-4546	326-3509	dcooper@best.bs
Mrs. Nakira Wilchcombe	<i>Supervisor of Computer Operations</i> BEST Commission	322-4546	326-3509	nwilchcombe@best.bs
Mrs. Stacey Moultrie	<i>Assistant Geologist</i> BEST Commission	322-4546	326-3509	smoultrie@best.bs
Allens, Anthony (Captain)	<i>Port Comptroller,</i> Port Department	356-5639	322-5545	ajallens@batelnet.bs
Bowleg, John (Mr.) (Chair of Wetlands Committee)	<i>Manager,</i> Water Resource Unit Water and Sewerage Corporation	302-5607	322-7812	wcjbowleg@wsc.com.bs
Braynen, Michael (Mr.)	<i>Director,</i> Ministry of Agriculture and Fisheries	393-1777	393-0238	mbraynen@batelnet.bs
Higgs, Leon (Dr.)	<i>President,</i> College of the Bahamas	302-4301	322-2054	prescob@cob.edu.bs
Isaacs, Maurice (Dr.)	<i>Veterinarian,</i> Department of Agriculture Chairman, Committee for Biodiversity	325-7502	325-3960	maurice@batelnet.bs
Zonicle, Marilyn (Mrs.)	<i>Ministry of Foreign Affairs</i>	322-7624	328-8212	alane@mfabahamas.org
Larson, Susan (Mrs.)	<i>Executive Director,</i> <i>Bahamas National Trust</i>	393-1317	393-4978	slarson@bahamas.net.bs

APPENDIX A: LIST OF INDIVIDUALS INTERVIEWED (Cont'd)

Name	Agency	Telephone Contact	Fax #	E-mail Address
Major, Michael (Mr.)	<i>Director,</i> Department of Physical Planning	322-7550/1	328-3206	mlmreds@hotmail.com
Marche, Athena (Ms.)	<i>Senior Budget Analysis Officer</i> Ministry of Finance	327-1530	327-1618	amarche@bahamas.gov.bs
Marshall, Livingston (Dr.)	<i>Consultant and Science Advisor</i> Cabinet Office	322-3220/9	328-2526 328-8294	livingstonmarshall@bahamas.gov.bs
McKenzie, Melony (Ms.)	<i>Director,</i> Environment Health Services	322-8037 322-8048/9	322-8118	Melonymckenzie@hotmail.com
McPhee, Earlston (Mr.)	<i>General Manager,</i> <i>(Sustainable Tourism Development)</i> Ministry of Tourism	356-6965 356-6964	356-6956	emcphee@bahamas.com
Outten, Valerie (Mrs.)	<i>Director,</i> Ministry of Agriculture	325-7502	322-1767 325-3960	valericoutten@bahamas.gov.bs
Rolle, Arthur (Mr.)	<i>Director,</i> Department of Meteorology Chairman, Committee for Climate Change	356-3734/8	356-3739	awr.met@batelnet.bs
Hardy, Richard (Mr.)	Land and Surveys	322-2328	322-5830	
Simmons, Jeffrey (Mr.)	Department of Meteorology	356-3734	356-3739	jws.met@batelnet.bs
Taylor, Beverly J.T. (Ms.)	<i>Asst. Director of Education (Science and Technology Section)</i> Ministry of Education Chairperson, Committee for Science and Technology	356-5109 356-0876(H)	328-7329	bjtt@hotmail.com
Turner, Mike (Mr.)	<i>Undersecretary</i> Ministry of Health	502-4738	323-3535	michaelturner@bahamas.gov.bs

APPENDIX B

INTERVIEW QUESTIONS

APPENDIX B: INTERVIEW QUESTIONS

Introduction:

1. Are you familiar with the NCSA Project?
2. What is the mandate/responsibilities of your agency with respect to: biodiversity (Convention on Biological Diversity), climate change (UNFCCC), land degradation (convention to Combat Desertification), and wetlands (Ramsar Convention on Wetlands)?

Assessing Capacity Constraints at the Systemic Level:

3. *Legal and Regulatory Framework* - Is there appropriate legislation in place and are these laws effectively enforced?
4. *Policies and Guidelines* – Are there policies and guidelines in place?
5. *Management Accountability Framework* – Are institutional responsibilities clearly defined; are performance measures defined; and are responsible institutions held publicly accountable? Is there a requirement to report to Parliament and public on performance?
6. *System Level Resources* – Are the required human, financial and information resources available?
7. *Processes and Relationship* – Do the different institutions and processes interact and work together effectively? (Including national government, private sector, and civil society)

Assessing Capacity Constraints at the Institutional Level:

8. *Mission/Strategic Management* – Do the institutions have clearly defined and understood missions and mandates? To which Minister does your agency report? What level of independence does your agency have in terms of decision-making? What mechanisms are used for interactions with other departments, and the Family Islands?
9. *Cultures/Structures/Competencies* – Are the institutions effectively structured and managed?
10. *Processes* –Are institutional processes such as planning, quality management, monitoring and evaluation in place and if so do they work effectively?
11. *Human Resources* – Are the human resources adequate, sufficiently skilled, and appropriately deployed?
12. *Financial Resources* – Are financial resources adequate and managed effectively and allocated appropriately to enable effective operation?
13. *Information Resources* – Is required information available and effectively distributed and managed?

14. *Infrastructure* – Are material requirements such as buildings, offices, vehicles, computers available and allocated appropriately and managed effectively?

Assessing Capacity Constraints at the Individual Level:

15. *Job Requirements and skill levels* – Are jobs correctly defined; and are the required skills available? How many employees do you have? What are the positions and how many people in each? What is the rate of employee turn-over and how easy is it to fill vacancies? If there is a staffing problem, is due to a lack of qualified personnel, or is it due to a lack of budget?
16. *Training/Retraining* – Are learning/training plans developed for staff and is appropriate learning taking place?
17. *Career Progression* – Are individuals able to advance and develop professionally?
18. *Accountability/Ethics* – Is responsibility effectively delegated and are individuals held accountable?
19. *Access to Information* – Is there adequate access to needed information?
20. *Personal/Professional Networking* – Are individuals in contact and exchanging knowledge with appropriate peers?
21. *Performance/Conduct* – Is performance effectively measured?
22. *Additional Comment* – Do you have any additional comments, views and perspectives on capacity with regard to other environmental issues?

APPENDIX C

WORKSHOP AGENDA

APPENDIX C: WORKSHOP AGENDA



The Bahamas Environment, Science and Technology (BEST) Commission

AGENDA OF THE WORKSHOP ON THE NATIONAL CAPACITY SELF-ASSESSMENT (NCSA) PROJECT FOR THE BAHAMAS
5th-6th April 2005
Nassau, The Bahamas

DAY 1

9:00-9:15	Welcome and Opening Remarks	Ms Nakira Wilchcombe and Dr. Donald Cooper Ministry of Health and Environment, BEST Commission
9:15-9:20	Participants' Introduction	BEST (Nakira Wilchcombe)
9:20-9:30	Review of Agenda (purpose, objectives, rules and structure of workshop) and Qs& As	SENE (Patrice LeBlanc and Fred Bernard)
9:30-9:40	Overview of NCSA Project for The Bahamas	BEST (Stacey Moultrie)
9:40-10:00	Coffee Break	
10:00-10:15	Review of Key Findings from Public Consultation Process	BEST (Stacey Moultrie)
10:15- 10:30	Qs and As	All
10:30-10:45	Review of Key Findings from NCB Interview Process	SENE (Fred Bernard)
10:45-11:00	Qs and As	All
11:00-11:15	Review of Draft National Environmental Management Action Plan (NEMAP) for The Bahamas	SENE (Patrice LeBlanc)
11:15-11:30	Qs and As	All
11:30-13:00	Break-out Session I: National Environmental Policy and Program Activity Architecture	Break-Out Groups
13:00-14:00	Lunch	All
14:00-15:00	Break-out Session I: (Continued): National Environmental Policy and Program Activity Architecture	Break-Out Groups
15:00-16:00	Presentation on Results of Break-out Session I: National Environmental Policy and Program Activity Architecture	Rapporteurs from Break-Out Groups

The National Capacity Needs Self-Assessment Project

16:00-16:45	Qs and As	All
16:45-17:00	Summary of Day 1	SENES (Patrice LeBlanc and Fred Bernard)

DAY 2

9:00-9:15	Review of Day 1 and Agenda for Day 2	SENES (Patrice LeBlanc and Fred Bernard)
9:15-10:30	Break-out Session II: Issues and Priorities for Capacity Development	Break-Out Groups
10:30-10:45	Coffee Break	All
10:45-11:45	Presentation on Results of Break-out Session II: Issues and Priorities for Capacity Development	Rapporteurs from Break-Out Groups
11:45-12:00	Qs and As	All
12:00-13:00	Lunch	All
13:00-14:00	Break-out Session III: Recommendations and Next Steps for NEMAP	Break-Out Groups
14:00-14:45	Presentation on Results of Break-out Session III: Recommendations and Next Steps for NEMAP	Rapporteurs from Break-Out Groups
14:45-15:00	Qs and As	All
15:00-15:15	Closing and Next Steps	BEST (Nakira Wilchcombe) SENES (Patrice LeBlanc and Fred Bernard)

APPENDIX D

LIST OF WORKSHOP ATTENDEES

APPENDIX D: LIST OF WORKSHOP ATTENDEES

**NEMAP Workshop
Bahamas NCSA Project
April 5th and 6th, 2005-08-03 Superclub Breezes**

Name	Affiliation
Beverly Taylor	Ministry of Education
Carlton Watson	College of The Bahamas
Eleanor Phillips	Nature Conservancy
Eric Carey	Bahamas National Trust
Fred Bernard	SENES Consultants
Joan Vanderpool	College of The Bahamas
John Bowleg	Water and Sewerage Corporation
John Hammerton	Private Citizen
Kenneth Richardson	Ministry of Agriculture
Lewelyn Curling	College of The Bahamas
Lynn Gape	Bahamas National Trust
Maurice Isaacs	Ministry of Agriculture
Nakira Wilchcombe	BEST Commission
Patrice LeBlanc	SENES Consultants
Patrick Hanna	Bahamas Electric Commission
Rochelle Newbold	BEST Commission
Sheila Cox	Ministry of Tourism
Stacey Moultrie	BEST Commission

APPENDIX E

WORKSHOP PRESENTATIONS



National Capacity Needs Self Assessment (NCSA) Project
The Bahamas

5 April 2005



NCSA Project - Background

- Bahamas awarded GEF funding in February 2003
- Funding administered through UNEP
- Key players – NEA, NPC, NCB, Subcommittees, consultants, the public



NCSA Project - Background

Project involves four main environmental conventions:

- Convention on Biological Diversity (CBD)
- United Nations Framework Convention on Climate Change (UNFCCC)
- Ramsar Convention on Wetlands
- United Nations Convention to Combat Desertification and Drought (UNCCD)



NCSA Project - Goals

- To identify, through a country-driven consultative process, priorities and needs for capacity-building to protect the global environment.
- To develop a National Environmental Management and Action Plan (NEMAP)
- To develop thematic programmes for the areas of biodiversity (inclusive of wetlands), climate change and land degradation



NCSA Project - Objectives

- Identification, confirmation and review of priority issues within the thematic areas of biodiversity, climate change, land degradation and wetlands;
- Identification of synergies across these thematic areas;
- Development of a framework/mechanism for targeted and coordinated action, including requests for external funding assistance;



NCSA Project - Objectives

- Linkage of country action with respect to capacity-building to a broader national environmental management and action plan
- Build on work completed under NBSAP, BDM, FNC, CPACC, NCWRI and Agenda 21 Report;
- Complement work under other environmental projects, e.g. BEA, Small Islands Voice

Why do we need a NCSA Framework?



A National Capacity Needs Self Assessment Framework enables the identification of systemic, institutional and individual level needs and the steps that can be taken to meet these needs.

Why do we need a NEMAP?



- Provides guidance to development
- Ensures a healthy environment
- Gives a voice to all stakeholders
- Builds capacity
- Assures sustainability

Components of the NCSA



- Thematic assessments
- Thematic programmes
- Identification of synergies and cross-cutting issues
- Systemic, institutional and individual assessments
- Training and planning workshops

Components of the NCSA



- Public consultation
- School visits
- NCSA Framework development
- NEMAP development



Public Consultations
under (NCSA) Project
The Bahamas

5th April 2005



Consultations

Public consultations involved:

- Week-long visits to 13 Family Islands between January-April 2004
- More than 60 meetings with students, Local Councils and the public
- School visits in New Providence



Consultations

- Technical meetings and workshops in New Providence



Family Islands visited

■ Abaco	■ Eleuthera
■ Acklins	■ Exuma
■ Andros	■ Grand Bahama
■ Berry Islands	■ Inagua
■ Bimini	■ Mayaguana
■ Cat Island	■ San Salvador
■ Crooked Island & Long Cay	



Results of consultations

- Identification of issues and concerns under the four thematic areas
- Identification of other key environmental issues and concerns
- Suggestions for possible solutions to some of the problems identified



Key findings

Major concerns raised:

- Biodiversity – habitat damage, overfishing, deforestation, species destruction
- Land degradation – coastal and beach erosion, impacts of sand mining
- Wetlands – filling in, discharge of contaminants into wetlands
- Climate change – emissions from burning garbage



Key findings



Other environmental issues raised:

- Vector control
- Wastes – solid, sewage, chemical, medical
- Pollution – air, groundwater, marine
- Poor quality of potable water



Key findings



Concerns raised about:

- Laws and regulations
- Responsibility and accountability among government agencies for environmental management
- Public's exclusion from important decisions affecting the environment
- Lack of adequate infrastructure and basic facilities for waste management



Suggested solutions



- More and better laws and regulations;
- Better enforcement of existing laws and regulations;
- Improved public awareness and education programmes;
- More public consultations and involvement in decision-making related to development projects;
- Enhanced training for government staff; and
- Greater allocation of resources for dealing with environmental issues.



Points to note



- Link between environmental issues and social issues, e.g. illegal immigrants, lack of employment opportunities
- High level of frustration with Central Government among Family Islanders
- Continuing “brain-drain”
- Lack of hope amongst young Bahamians



Questions?

NATIONAL CAPACITY SELF ASSESSMENT (NCSA) WORKSHOP:



APRIL 5-6, 2005

RESULTS OF WORK CONDUCTED BY
SENES CONSULTANTS LIMITED (SENES)

Presented By:

Fred Bernard and Patrice Leblanc



CONTEXT

◆ The Bahamas NCSA Project is to identify country-level priorities and assess capacity development needs for implementing key international environmental Conventions related to:

- Biodiversity;
- Climate change;
- Land degradation;
- Wetlands.



◆ BEST coordinates NCSA Project with assistance of National Capacity Body (NCB) and SENES.



CONTEXT (Cont'd)

◆ Capacity assessment includes four components:

- Summary of Environmental Management in The Bahamas (SENES)
- Interviews with NCB (SENES).
- Public consultations (BEST).
- National Workshop (BEST and SENES).



SUMMARY OF ENVIRONMENTAL MANAGEMENT IN THE BAHAMAS

◆ Based on government publications, reports and documents and information from government officials.

◆ Overview of:

- State of environment.
- Governance structure.
- Institutions involved in environmental management.
- Environmental laws, regulations, policies and guidelines.



INTERVIEWS WITH NCB MEMBERS

◆ NCB members represent a broad cross-section of government agencies with responsibilities for international environmental Conventions.

◆ The interviews were designed to assess capacity needs at systemic, institutional and individual levels.



AGENCIES REPRESENTED ON NCB

- ◆ Bahamas National Trust
- ◆ BEST Commission
- ◆ Cabinet Office – Science Advisor
- ◆ College of The Bahamas
- ◆ Department of Meteorology
- ◆ Department of Physical Planning
- ◆ Environment Health Services



AGENCIES REPRESENTED ON NCB

- ◆ Ministry of Agriculture and Fisheries
- ◆ Ministry of Education
- ◆ Ministry of Finance
- ◆ Ministry of Foreign Affairs
- ◆ Ministry of Health
- ◆ Ministry of Tourism
- ◆ Port Department



KEY FINDINGS FROM NCB INTERVIEWS: SYSTEMIC LEVEL

- **Legislation:** Lack of appropriate legislation and policies to implement the requirements under the international environmental Conventions.
- **Responsibilities:** Institutional responsibilities are not always clearly defined.
- **Management Accountability Framework:** Institutions are generally held publicly accountable. There are requirements for reporting to the relevant Minister or Cabinet on performance.



KEY FINDINGS FROM NCB INTERVIEWS: SYSTEMIC LEVEL (Cont'd)

- **Resources:** Human and financial resources are often lacking, but information resources are generally available.
- **Communications:** For the most part, institutions interact and work effectively together. There is, however, room for improvement in expediting responses to information requests.



KEY FINDINGS FROM NCB INTERVIEWS: SYSTEMIC LEVEL (Cont'd)

- **Public Awareness:** Institutions make broad use of the media, including newspapers, television and radio to inform the public of programmes, projects, policies, etc.
- **Public Consultation:** Existing environmental regulations do not mandate public consultation.



KEY FINDINGS FROM NCB INTERVIEWS: INSTITUTIONAL LEVEL

- **Institutions Purpose and Reporting Structures:** For the most part, institutions have clearly defined and understood missions and mandates, and their reporting structure is well understood.
- **Institutions Structures and Management:** Institutions were often not seen to be effectively structured and managed.



KEY FINDINGS FROM NCB INTERVIEWS: INSTITUTIONAL LEVEL (Cont'd)

- **Staff:** Most institutions are lacking in human resources, but the available staff are generally sufficiently skilled and appropriately deployed.
- **Budget:** Financial resources are inadequate to enable effective operation.



**KEY FINDINGS
FROM NCB INTERVIEWS:
INDIVIDUAL LEVEL**

- **Work Description:** Jobs are most often well defined and some institutions provide written job descriptions to all staff.
- **Competency:** Individuals generally have the required skill to perform their jobs.
- **Staff Retention:** The rate of staff retention is high.



**KEY FINDINGS
FROM NCB INTERVIEWS:
INDIVIDUAL LEVEL (Cont'd)**

- **Responsibility and Accountability:** Responsibilities are effectively delegated but individuals are not always held accountable.
- **Access to Information:** For the most part, individuals have adequate access to information maintained within the institution and from international sources via the internet.



**KEY FINDINGS
FROM NCB INTERVIEWS:
INDIVIDUAL LEVEL (Cont'd)**

- **Communications/Networking:** Personal/ professional networking is not given high priority. Most networking occurs outside of the workplace on the employee's own time.
- **Performance Measurement and Evaluation:** Performance evaluation criteria have been developed for the civil service and are widely used.



KEY GAPS AND DEFICIENCIES

- ◆ Based on the interview conducted, the following key gaps and deficiencies identified:
 - **Legislation (Laws and Regulations):**
 - For the most part, The Bahamas lack the types of laws and regulations necessary to implement the international environmental Conventions to which it is a Signatory.
 - **Policies and Guidelines:**
 - Existing guidelines are not officially approved by government and are mainly procedural in nature e.g., EIA guidelines for wetlands.



KEY GAPS AND DEFICIENCIES (Cont'd)

- **Institutions:**
 - The Bahamas does not have an environment ministry or department with a clear mandate and responsibilities for all aspects of environmental planning and protection.
 - In the absence of a central coordinating agency, there appears to be a degree of jurisdictional conflict and misunderstanding between the various agencies with responsibilities for the environment.
 - The disaggregation of responsibilities is confusing to both Bahamians and outsiders.



KEY GAPS AND DEFICIENCIES (Cont'd)

- **Financial Resources:** The lack of financial resources is reflected in the inability of institutions to:
 - provide ongoing training to staff to improve their knowledge, abilities and skills;
 - hire the full complement of staff required;
 - purchase the necessary material requirements such as buildings, offices, vehicles and up-to-date computers; and
 - Undertake long-term planning.



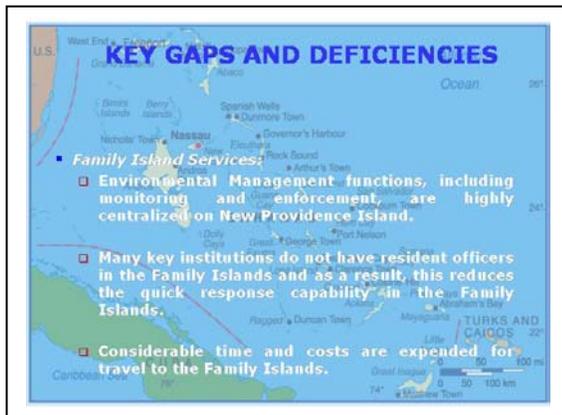
KEY GAPS AND DEFICIENCIES (Cont'd)

- ❑ **Human Resources:** Institutions are hampered by a shortfall in staffing. The shortfall in staffing has resulted in:
 - ❑ many institutions utilizing staff in multiple areas, including areas in which they have no formal training; and
 - ❑ hindrance in the execution of many important functions, including policy development, monitoring and enforcement.



KEY GAPS AND DEFICIENCIES (Cont'd)

- **Family Island Services:**
 - ❑ Environmental Management functions, including monitoring and enforcement, are highly centralized on New Providence Island.
 - ❑ Many key institutions do not have resident officers in the Family Islands and as a result, this reduces the quick response capability in the Family Islands.
 - ❑ Considerable time and costs are expended for travel to the Family Islands.



KEY GAPS AND DEFICIENCIES (Cont'd)

- **Training:**
 - ❑ a lack of financial resources at the systemic and institutional levels;
 - ❑ permission for involvement in training, in particular international workshops, is most often granted at the ministerial level, and not at the institutional level, where training needs are best assessed;



KEY GAPS AND DEFICIENCIES (Cont'd)

- **Training (Cont'd):**
 - ❑ due to understaffing, managers are reluctant to "lose" staff time through training; and
 - ❑ a lack of learning plans and a specific environmental management training program.



KEY GAPS AND DEFICIENCIES (Cont'd)

- **Training (Cont'd):** The inability to effectively participate in training results in lost opportunities:
 - ❑ to improve skills through exposure to new technologies, procedures, research, etc.;
 - ❑ for networking with professional peers; and
 - ❑ for gaining recognition by sharing expertise through presentation of and participation in training activities both locally and internationally.



KEY GAPS AND DEFICIENCIES (Cont'd)

▪ **Information Management:**

- There appears to be no mechanism or procedures in place for ensuring that when requested, legitimate information is expeditiously transferred to the institution requesting it.
- Many institutions do not have libraries, or even a system for documenting and filing important information.
- Seems easier for staff with internet access to obtain information from international institutions, than from local institutions.
- Significant volumes of important information, including reports, datasets, etc. reside in the offices of individuals.



KEY GAPS AND DEFICIENCIES (Cont'd)

▪ **Compliance and Enforcement:** The following issues were identified:

- a lack of new and/or updated regulations with "teeth" specifically geared to implement the requirements of the international environmental Conventions;
- insufficient trained field officers in the areas of investigations and enforcement;



KEY GAPS AND DEFICIENCIES (Cont'd)

▪ **Compliance and Enforcement (Cont'd):**

- insufficient material hardware including vehicles, watercraft, etc. dedicated to compliance and enforcement activities;
- lack of coordination between agencies with shared jurisdiction in areas such as fisheries protection; and
- due to the jurisdictional misunderstandings, the general public often fails to establish contact with the appropriate authority in the crucial first minutes or hours after an offence is deemed to occur.

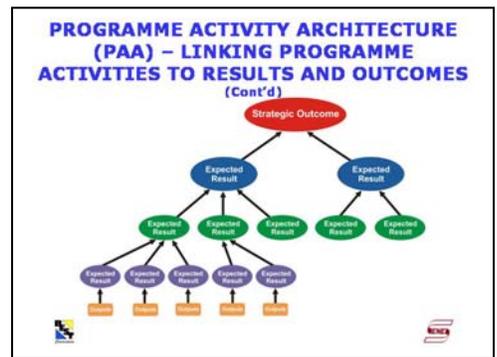
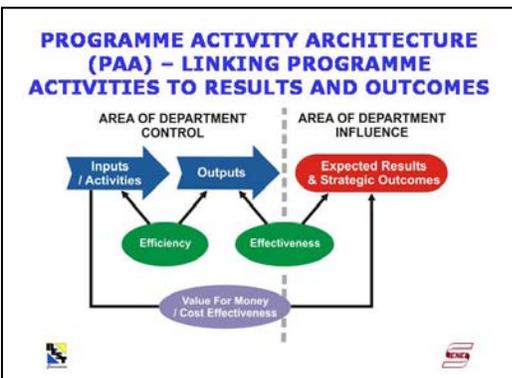


PROPOSED NATIONAL ENVIRONMENTAL MANAGEMENT ACTION PLAN (NEMAP)

- ### NEMAP
- ◆ National Environmental Policy (NEP).
 - ◆ Programme Activity Architecture (PAA).
 - ◆ Performance Indicators.
 - ◆ Action Plan: Recommendations and Next Steps.

- ### NATIONAL ENVIRONMENTAL POLICY
- ◆ Articulates the vision, goals and objectives (or strategic outcomes) and basic principles of the Government with respect to its commitment for the conservation, protection and enhancement of the environment of The Bahamas.
 - ◆ Sets the context and guidance for establishing environmental laws, operating policies and programmes.

- ### PROGRAMME ACTIVITY ARCHITECTURE (PAA)-PERFORMANCE MEASUREMENTS
- Programme Activity Architecture
- ◆ A road map of the programme that ties resources and activities to expected results and strategic outcomes.
 - ◆ PAA:
 - Ensures clear and logical design of the programme.
 - Clarifies roles and responsibilities for the main parties involved in delivering the programme.



PERFORMANCE MEASUREMENT

- ◆ A systematic collection and reporting of information that track resources used, work produced and intended results achieved.
- ◆ Allows managers to monitor, evaluate and report on the results throughout the life-cycle of the programme.
- ◆ Demonstrates accountability and benefits to the public and stakeholders.
- ◆ Helps assess and improve the performance of an organization and its programme.
- ◆ Provides opportunity to celebrate good performance and motivate staff and stakeholders to perform.



PERFORMANCE MEASUREMENT AND THE LIFE-CYCLE APPROACH TO MANAGING PROGRAMME FOR RESULTS



FEATURES OF GOOD PERFORMANCE MEASURES/INDICATORS

Reliable and Valid

- Measures the same thing across time, groups and areas.
- Measure must be strongly connected to the outcome.

Comparable

- Measure can be compared at different points in time e.g. percentage (not number) of adult Bahamians with university education.



FEATURES OF GOOD PERFORMANCE MEASURES/INDICATORS (Cont'd)

Cost Effective

- Must be relatively easy to collect the data.

Clear to Bahamians

- Make them citizen focused-easily read and understood.
- Each should be a complete thought, (example: not an opinion of stakeholders but percentage of key stakeholders who feel they are being adequately consulted.)



DESCRIPTION OF DATA FIELDS

Strategic Outcome	Indicators	Data Source(s)	Frequency	Actual	Effective Date for Actual Value	Target/ Benchmark
Long-term enduring benefits to Bahamians that stems from a department's mandate, vision and efforts.	A performance indicator (qualitative or quantitative), e.g. a percentage of Bahamians owning their homes.	The source from which data for a performance indicator will be available on a regular basis.	The frequency with which the data for a performance indicator will be available, e.g. annually.	This refers to the last performance indicator data that is available, e.g. 65% of Bahamians own their homes to use the example above.	The date at which the last actual data was collected (i.e. 65% above).	Performance levels achieved by any other organization or jurisdiction that allows a department to compare with its achievements. Usually seen as best practices.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS

- ◆ The recommendations and next steps are organized by the following key categories to respond to the deficiencies identified earlier:

- **Legislation (Laws and Regulations);**
- **Policies and Guidelines;**
- **Institutions;**
- **Financial Resources;**
- **Human Resources;**
- **Family Island Services;**
- **Training;**
- **Information Management; and**
- **Compliance and Enforcement.**



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: LEGISLATION

- The GOB should pass an Act and Regulations to establish a Department of Environmental Planning and Protection.
- Develop a comprehensive package of other regulations to support the Implementation of the Act.
- Given the large number of regulations to be drafted, a phased approach is proposed for their development using a prioritized list of high, medium and low.



RECOMMENDATIONS AND NEXT STEPS: LEGISLATION



- The GOB should pass an Act and Regulations to establish a Department of Environmental Planning and Protection.
- Develop a comprehensive package of other regulations to support the implementation of the Act.
- Given the large number of regulations to be drafted, a phased approach is proposed for their development using a prioritized list of high, medium and low.

PRIORITY LISTING OF REGULATIONS FOR THE BAHAMAS

Regulations	High Priority	Medium Priority	Low Priority
Chemical management and safety	X		
Occupational health and safety		X	
Biosecurity		X	
Land use and development		X	
Coastal zone management	X		
Wetlands	X		
Water resources management	X		
Research			X
Use of natural and genetic resources			X
Habitat/Resource Conservation and recovery	X		
Energy industry			X
Site remediation	X		
Noise		X	
Coral reefs	X		
Endangered species			X
Climate change	X		



COST ESTIMATE FOR DRAFTING EACH REGULATION

	Cost Per Regulation (US\$ (0000))	
High Priority	Chemicals Management and Safety	25
	Coastal Zone Management	20
	Wetlands	20
	Water Resources	25
	Habitat/Resource Conservation and Recovery	15
	Site Remediation (hwd)	20
Medium Priority	Coral Reefs	20
	Climate Change	51
	Occupational Health and Safety	20
	Biosecurity	20
	Land Use and Development	30
Low Priority	Noise	15
	Research	15
	Use of Natural and Genetic Resources	15
	Energy Industry	15
Endangered Species	20	



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: POLICIES

- The GOB needs to approve a National Environmental Policy for The Bahamas to guide the implementation of Conventions.
- Finalize policies for biodiversity, climate change and wetlands.
- Develop a national policy on land degradation building on the results of the November 23-24, 2004 workshop to raise awareness to the Convention to Combat Desertification.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: GUIDELINES

- Interim and draft EIA Guidelines to aid proponents in the preparation of EIAs should be finalized and formalized as part of the EIA process.
- Additional EIA guidelines should be drafted covering extractive processing, energy industries, industrial operations and manufacturing.
- Additional guidelines are necessary to address issues related to the four thematic areas.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: GUIDELINES (Cont'd)

Guidelines (Cont'd):

- The guidelines should be drafted according to a priority classification.
- Similar to the new regulations, the new guidelines can be drafted by a three member team.



PRIORITY LISTING OF EIA GUIDELINES FOR THE BAHAMAS

EIA Guidelines	High Priority	Medium Priority	Low Priority
Extractive processing	X		
Energy industries		X	
Industrial Operations			X
Manufacturing			X



COST ESTIMATE FOR DRAFTING GUIDELINES

	High Priority	Cost Per Guideline US\$
1	Extractive Processing	\$15,000
2	Energy Industries	\$19,000
3	Industrial Operations	\$13,000
4	Manufacturing	\$17,000



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: INSTITUTIONS

- The GOB should take necessary steps to approve the draft Bill to create a Department of Environmental Planning and Protection.
- This new Department should have a clear mandate and be the designated lead agency for all aspects of environmental management, including the implementation of international environmental Conventions.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: INSTITUTIONS (Cont'd)

- A Governance structure on environmental management should be established:
 - A Cabinet Committee on the Environment.
 - A Committee of Senior Government Officials on Environmental Management supported by Thematic Working Groups.
 - A national multi-stakeholder Advisory Committee on Environmental management.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: FINANCIAL RESOURCES

- Stable funding is an essential component of environmental management.
- Ongoing need to obtain additional funding under the various Conventions for specific projects.
- Funding commitments are needed from the GOB to support projects in the long-term, particularly after international funds have been exhausted.
- Estimated staffing of some 230 new positions and operating budget of approximately 5.5 million.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: FINANCIAL RESOURCES (Cont'd)

- An initial staffing level of 230 should enable the new Department of Environmental Planning and Protection to meet its obligations.
- Additional staff would be required within other agencies that carry out environmental activities and functions supporting the implementation of the Conventions.
- Any staffing increase or redeployment programme should include a strategy to locate permanent staff in all of the major islands, and to deploy other staff geographically such that they can best serve groups of neighbouring islands



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: FAMILY ISLAND SERVICES

- Increase the number of permanent staff, in particular environmental, fisheries and wildlife protection officers.
- Strategic deployment of permanent staff designed to locate permanent staff on all major islands and other staff to serve groups of islands based on geography.
- Decentralization could avert alienation of the Family Islands from the environmental management process, and prevent a loss of their invaluable knowledge and input on local ecosystems.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: FAMILY ISLAND SERVICES (Cont'd)

- The increased visibility of enforcement officers will help to:

- deter polluters;
- enable more rapid responses to environmental infractions such as poaching and dumping; and



- enable the local populations to develop a sense of attachment to the regulatory agencies and their decision-making processes.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: TRAINING

- Establish a national mandatory Environmental Management Training Programme with financial resources to develop and implement
- The assessment of need and approval for training should be completed at the institutional level and not at the ministerial level.
- Learning plans be developed and a competency-based environmental management training programme be developed and implemented over about a two-year period.
- E-learning could be utilized to reduce cost.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: INFORMATION MANAGEMENT

- establish formalized mechanisms and procedures for ensuring the expeditious transfer of inter-departmental information;
- establish a library, managed by a trained librarian, for cataloguing, storing, loaning and managing all data, documents, etc. relevant to all of the agencies under the jurisdiction of the new Department;
- develop a relational environmental database and develop capability to use interactive maps based on GIS; and
- outline a well defined programme, including timeline, for a phased upgrade of computer hardware and software for staff within the new Department.



ACTION PLAN: RECOMMENDATIONS AND NEXT STEPS: COMPLIANCE AND ENFORCEMENT

- Establish an environmental compliance and enforcement programme focusing on promoting compliance through education and training and voluntary programmes; and with capacity for conducting compliance and effectiveness monitoring, investigations, issuing warnings, enforcement actions and fines and penalties (including restitution for damage).
- Sufficient well-trained and properly equipped compliance and enforcement staff with adequate operating budget.



APPENDIX F

WORKSHOP DISCUSSIONS AND RESULTS

Bahamas NCSA Project
Report of NCSA Workshop on National Environmental Management and Action Plan
(NEMAP)
5th – 6th April 2005
Superclubs Breezes

This workshop was conducted by the BEST Commission in conjunction with SENES Consultants Limited. It continued work completed under the training workshops on thematic assessment, development of thematic profiles and synergies and cross-cutting issues. The agenda for workshop is in Annex I.

Presentations were given on the following topics:

- Overview of the NCSA Project for The Bahamas – Stacey Moultrie, BEST
- Review of Key Findings from Public Consultation Process – Stacey Moultrie, BEST
- Review of Key Findings from NCB Interview Process – Fred Bernard, SENES
- Review of draft NEMAP for The Bahamas – Patrice LeBlanc, SENES

The full text of the presentations is attached in Annex II to this report.

Following the presentations, participants were divided into three break-out groups. The composition of each group is outlined in Annex III. There were three break-out sessions over the two-day period covering the following areas:

1. National Environmental Policy and Program Activity Architecture;
2. Issues and Priorities for Capacity Development; and
3. Recommendations and Next Steps for NEMAP.

Each group was asked to respond to the same questions as outlined in Annex IV and then the groups merged to have a general discussion on their group responses. Below are the group responses as well as notes on the general discussions

General discussion following presentations highlighted the following points:

- There is a lack of political will in addressing environmental issues.
- There is a need for more emphasis on science/research. The listing of research as “low priority” on the legislation table is disturbing, since research is essential to establishing all environmental legislation.
- There is a problem with enforcement which involves interference from politicians, thus compromising the integrity of enforcement officials.
- Environmental enforcement officers are shown little respect by individuals being investigated and are often subjected to intimidation tactics.
- The police need to be more involved in environmental management as they act to uphold all laws.
- There is a lack of human and financial resources for environmental management. The Bahamas is moving forward slowly so we should not lose hope as all these things will take time.

- Information on which agency is responsible for what could be placed online or in the front of the phone book so persons know who to call when a particular issue or problem arises.
- There is a need for the establishment of an environmental hotline to direct concerns to the relevant agencies instead of persons having to call around and becoming frustrated because they cannot find the right agency.
- Centralization has resulted in a brain drain from the Family Islands. Many students have no plans to remain in the Family Islands.

Some participants did not agree with the points put forward from the NCB interviews that information resources are available and that job descriptions are adequate.

It was raised that the NEMAP needs to include awareness, education and research as an important component of environmental management.

I. National Environmental Policy (NEP) and Program Activity Architecture (PAA)

Cocoplum - NEP

1. There is a need for the Government of The Bahamas (GOB) to articulate an overarching national policy on the environment.
2. Specific changes to NEP:
 - a. Need to reference the total environment so as to include altered environments found in urban areas, not just natural environments; altered environments would include housing subdivisions
 - b. Omit the word “unique” in the Introduction as it would have to be validated if utilized
 - c. In Introduction, para. 2, line 5, add “supply” after “water”.
 - d. Under Vision, add “and appreciation” after “respect in last line on this page. The end of this line does not flow properly into the line at the top of the next page as if there is some text missing.
 - e. Under Objectives, need to add a point on “developing a respect or understanding of the environment”; possibly “environmental stewardship”
 - f. Under Basic Principles, include a point on “creating greater awareness and an appreciation for the environment” under paragraph 2 on improve the quality of human life
 - g. Include “religious freedom” or eliminate all references to freedom
 - h. Sentence needs to be included qualifying that having all these things is dependent on a healthy environment
 - i. Under “conserve the diversity...” include a point (e) on exploring alternative, less harmful technologies
 - j. Noted the importance of extension services for other areas using current agricultural extension services as a model
 - k. Under section on carrying capacity, the language needs to be clarified for “finite limits to the carrying capacity”. Some felt the term carrying capacity implied limits but others felt that not everyone is familiar with this terminology and may

not understand that there are limits to carrying capacity. Perhaps the phrase needs to be reworded.

- l. Under the same section, 3rd sentence, omit “women and” as women are empowered in The Bahamas.
 - m. Under the same section in the first bullet replace “villages” with “settlements”, and omit the third bullet as it does not seem relevant.
 - n. Under personal attitudes and practices, replace “forest workers” with “contractors/builders” or some appropriate term to refer to this group and replace “poor” with “populations” in referencing rural groups as the rich are some of the worst offenders.
 - o. Under Empower Communities, top of page 1-5 include “and its agents” after “Government of The Bahamas” to cover agencies such as The Bahamas National Trust, corporations and consultants the Government may employ for a particular task
3. Next steps would include some broad consultations with strict timelines; this would include consultations with relevant Government Ministries. The NEP should incorporate the group’s comments.

Mahogany – NEP

Changes to NEP suggested were:

Conserve the biological diversity of the country and the stability, integrity, resilience and productivity of the ecosystems.

National parks and protected areas as the most effective way that the country can preserve its biological resources.

The protection of a variety of different ecosystems within a national parks and protected areas system which not only protects species’ habitat but provides outdoor classrooms to educate people about the value of the natural environment.

In the introduction of the NEP include line about the lack of open green space.

The major industries in The Bahamas are tourism and finance. It is not always clear how these important industries are dependent on environmental protection and sustainability.

Make reference to parks, protected areas and in situ conservation where we reference biodiversity conservation.

There is a need for the development of a National Energy Policy where reference is made to the conservation of non-renewable resources.

Place more emphasis on recycling and reducing solid waste and develop more central sewage treatment facilities in an effort to move away from the use of septic systems.

There is a need for designated green spaces and “Windows to the Sea” as areas where the public can enjoy nature and the environment.

Sustainable tourism should be specifically mentioned as well as carrying capacities.

This document should receive public consultation. There should be multi-media involvement as well as other means of exposure. It is strongly recommended that there be one-on-one consultations and input for key stakeholders.

Seagrass – NEP

1. The issue of carrying capacity is very important and should be expanded to include social impacts.

2. New Providence is nearing its carrying capacity.
3. Women in The Bahamas do not lack empowerment. In fact, under current trends, men are being marginalized.
4. The document should specify the need for more research/scientific studies.
5. The document needs to go beyond public awareness to address changes in personal attitudes and practices.
6. The NEP should be made available for public comment, but with a specific deadline for the comment period. Means for public consultation could include the BEST web site, civic organizations, presentations at the College of The Bahamas, newspaper advertisement or supplement.

Cocoplum – PAA

1. There is a need for the GOB to adopt a PAA as the road map to plan, evaluate and report on the results throughout the life-cycle of the Government's environmental management program.
2. Specific changes to PAA:
 - a. The 3rd paragraph under the section 1.0 needs to be reworded as it sounds like jargon and is hard to follow.
 - b. Point 2.1.2 – Needs to be stronger on the point that capacity will be built through training
 - c. Point 2.1.6 – “baseline” suggested as alternative wording for “quality” as environmental quality cannot be established without baseline data.
 - d. Point 2.2.2 – include “for all sectors” after “materials”, and under (iv) add “other forms of mass media”
 - e. Point 2.3.1.2 – under point (ii) add “inclusive of enforcement agencies” after “staff” and add a point (iii) Executive and legislative branches that understand environmental management laws, policies, strategies and tools.
 - f. The document needs to factor in how scientific studies and environmental information will be integrated into decision-making as an activity
 - g. Point 2.5 – some reference needs to be made to the population with respect to improved stewardship
3. Next steps would include broad consultations with strict timelines including with Government Ministries. Group comments should be incorporated into the PAA.

Mahogany – PAA

Seagrape – PAA

1. *The term is somewhat confusing.*
2. *“Road map” should be replaced by another term.*
3. *Instead of prioritizing issues as low, medium and high, a time-based model is suggested- immediate (within six months), short term(1-3 years), medium term (3-5 years) and long term (5+ years)*
4. *The group agreed that public consultation was necessary on the PAA, but it should be geared to technical review and not the general public.*

General discussion

The option was raised to promote the NEP through funding available under the Media Capacity Development project of the Department of Education.

II. Issues and Priorities for Capacity Development

Cocoplum

1. Results of interviews and consultations identified basically all the environmental issues and priorities. The following recommendations were made after reviewing the documents on these:
 - a. Conservation and Protection of the Physical Landscape Act's Schedule on protected trees needs to be reevaluated as many of these trees are commercially viable but not necessarily endangered.
 - b. Recommendation made to reference all legislation and possibly draft legislation; these would include Animal and Contagious Diseases Act, Agriculture and Fisheries Act and Bahamas National Trust Act.
 - c. The document seems to be lacking in responses from the Department of Agriculture and the NCB representative was sure that he responded to all interview questions including estimates for needed staff.
 - d. In 5.2.1.3, all institutions need to be listed.
 - e. The suggestions was made to do further analysis of the list of Family Island issues to put them under broad areas, such as biodiversity and wetlands, to make it easier to determine if any issues were in fact left out.
2. Additional environmental issues and priorities to add:
 - a. More emphasis on education and awareness.
 - b. Suggestion to work with some institution, such as the College of The Bahamas, to develop basic training programs on environmental management that all agencies can participate in. Through these programs, individuals would receive certification.
 - c. Retention of lands by the Water and Sewerage Corporation for water resources. These will be under threat once the Corporation moves to reverse osmosis. It is estimated that the lands should be retained as follows:
 - i. 65-75% of Corporation lands in New Providence including Prospect East, Windsor, and Perpall's
 - ii. 50% of lands in mainland Exuma
 - iii. North Eleuthera wellfields of Bogue and Spanish Wells
 - iv. In North Andros, retention of barging scheme wellfields (presently utilized to supply 4-5 million GPD of water to New Providence) as well as wellfields throughout Andros
 - v. Wellfields in the north of Abaco and Grand Bahama
 - vi. Cockburn Town wellfield in San Salvador for blending water

There is no process to procure these lands and there will basically be a land grab for them. These lands are already becoming a part of development deals and are being designated for housing. All these activities are slated to happen within this calendar year. The easiest way to keep the lands is to force the Corporation to keep them as back-up for water resources. It was

recommended that a letter be written to the Corporation and carbon-copied to the Minister responsible for this agency.

- d. Need to explore sustainable and renewable sources of energy.
3. Resources currently being expended on environmental management activities including number of staff and amount of operating budget:
 - a. BNT – 100% of resources and staff (staff is currently 19)
 - b. DOA – 20% of budget and 15% of staff
 - c. WSC – less than 2% of budget and 3 staff members
 - d. Dept of Education – 20% of budget and numerous teachers and staff involved in environmental education. There is a Bahamas Environmental Education Programme (BEEP)
 - e. BEST – 100% of resource and staff (staff is currently 7)
4. Next steps would include:
 - a. Talking with the Ragged Island Association based in New Providence as it will not be feasible to visit Ragged Island.
 - b. Public meeting in New Providence, possibly through community associations, civic groups and church groups.
5. Other water related issues for the Family Islands including:
 - a. Excessive development of areas without adequate water and/or other natural resource supplies.
 - b. Limited groundwater supplies may be threatened by increased development of all islands.
 - c. Retention of water resource areas for future groundwater use is urgently required as Water and Sewerage Corporation commences reverse osmosis as primary source of water.
 - d. Integration of wetlands with stormwater management requirements and flood prevention for all islands.
 - e. Abaco – Spring City sewer, sewerage sludge disposal and limited or no water supply on the cays.
 - f. Cat Island – no water distribution system
 - g. Crooked Island and Long Cay – limited water distribution systems
 - h. Eleuthera – limited water resources in central and south; RO service in south, but with limited distribution system; limited water resources in the north during peak tourist season for Spanish Wells and Harbour Island.
 - i. Exuma – limited distribution system (mainland RO service stops in Rolletown and Steventon).
 - j. Grand Bahama – limited distribution outside the Port area.
 - k. San Salvador – RO installation underway, but limited distribution; service required to United States and other areas.

Mahogany
Seagrape

Results of interviews and consultations identified basically all the environmental issues and priorities.

The following additional observations were made after reviewing the documents:

1. Some of the comments provided by NCB members are too “rosy”, especially relating to the management of the agencies and the transfer of information.
2. Many agencies are poorly managed. There may be some agencies that are well managed but this is not widespread, and good management techniques are generally not shared between agencies.
3. Senior technical staff are generally promoted to managers, but often lack the managerial skills to do their jobs.
4. Appropriate replacements are often not found for senior technical staff who have retired or are promoted.
5. Inter-agency communications are poor and significant improvements are needed.
6. Many staff do not have internet access.
7. Many staff need training in modern technology

There is no easy way to determine the resources currently being expended on environmental management activities

Recommend that issues and priorities identified at the workshop be integrated with those obtained from the interviews and consultations before being accepted as those to consider in a capacity building action plan. The following steps are proposed:

- 1 identify priorities.
2. Set a strict timeline for consultation (45 days).
4. Put a structure in place for monitoring success.
5. Assess new priorities.

General discussion

Political interference was raised as a priority issue that needed to be addressed as it impeded proper environmental management.

It was suggested that municipalities or townships that could be established under Local Government would make management of these issues easier to deal with. It was also noted that there could be problems associated with too much decentralization.

III. Recommendations and Next Steps for NEMAP

Cocoplum

1. The NCSA study does provide a solid foundation to proceed with developing a NEMAP.
2. Recommendations for inclusion in the NEMAP:
 - a. The structure of the Cabinet Committee should be suggested in the document. It should include the Ministers of Health, Public Works, Education, Agriculture and Fisheries, Trade and Industry, Finance, National Security as well as Ministers responsible for Lands and Surveys, and investments. The Committee should be chaired by the Minister responsible for the environment.
 - b. Alternatively, a National Environmental Council made up of Cabinet Ministers could be established using existing National Economic Council as a model. The

- document should outline the Terms of Reference for this group or the Cabinet Committee.
- c. The senior-level priority-setting Committee on Environmental Management should be eliminated. Technical subcommittees could recommend priorities and send these onward to Cabinet through the relevant Permanent Secretary.
 - d. There should be suggested mechanisms for interaction and integration of issues, such as water management and agriculture, which currently are managed in isolation.
 - e. It was suggested that each workshop participant submit their own job descriptions as examples to be included in the NEMAP.
 - f. The importance of persons being able to identify successors was also raised so that these persons can be appropriately trained.
3. Next steps would include writing of the document, which would then need to be circulated to a wide audience for comments with strict timelines. The audience would include the usual suspect. Once consultations were complete with appropriate revisions made, the document would go to Cabinet for approval.
 4. The time frames suggested for addressing critical needs are as follows:
 - a. Systemic level
 - i. 1-3 years to start and will continue
 - ii. 1-3 years
 - iii. 1-3 years; manual/SOPs given as alternative to guides
 - iv. Start now but will take 5+ years to implement; inclusive of awareness building program for decision-makers
 - b. Institutional level
 - i. 1-3 years; brackets should include monitoring and enforcement as well
 - ii. 3-5 years
 - iii. 3-5 years
 - iv. 3-5 years
 - v. 1-3 years and continuing
 - vi. Developing communication systems, 1-3 years
 - vii. Identification and recruitment of staff, 1-3 years and continuing
 - c. Individual level
 - i. Immediate; suggested changing “generic work descriptions for” to “job descriptions for technical”
 - ii. 3-5 years and should include upgrading of staff

Mahogany

1. There was much discussion on the proposed governance structure for the Cabinet Committee. There was concern about lack of political commitment and that once things are sent to the Cabinet level, they would just sit and not be addressed. There is a need for Cabinet to be better informed and educated so that once environmental issues are brought before them they can be given priority.
2. The group recommended immediate establishment of a Department of the Environment with a long term goal of establishing a Ministry of the Environment as a one stop for all environmental issues. It was agreed that there needs to be a formal/proper governance structure but the legal ramifications of establishing a Ministry will take longer because of

all the current scattered facets of the environment being the responsibility of several agencies.

3. It was agreed that there should be a national multi-stakeholder committee, possibly made up of Permanent Secretary level employees.
4. The technical thematic subcommittees should be maintained. There is already a mechanism in place to make policy recommendations to Cabinet through the committees established at BEST.
5. There needs to be a public education campaign on international environmental conventions incorporated into the national education system.
6. Next steps in approval of the NEMAP would include documents being made available for public review through a process that gives wide public access including use of the Web, libraries, Island administrators and public service announcements.
7. Timeframes suggested for addressing critical needs are as follows:
 - a. Systemic level
 - i. Immediate, 1-3 years
 - ii. Immediate
 - iii. Immediate
 - iv. Immediate
 - b. Institutional level
 - i. Immediate
 - ii. Medium term
 - iii. Immediate
 - iv. Immediate
 - v. Immediate
 - c. Individual level
 - i. Immediate
 - ii. Immediate
 - iii. Align remuneration with qualification and experience, medium term

Seagrape

General discussion

Staff learning plans include mentoring, agency exchange programs as well as training.

Public consultation on the NEMAP could involve public service announcements to inform the public that the document is available for comment. The document should be made available on the Web as well as in libraries and through island administrators for Family Island consultation.

APPENDIX G

REVISED NEP

**DRAFT
NATIONAL ENVIRONMENTAL POLICY
FOR THE
COMMONWEALTH OF THE BAHAMAS**

Prepared for:

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INTRODUCTION

The Bahamas comprises an archipelago of over 700 low-lying islands plus more than 200 cays, islets and rocks, covering approximately 100,000 mi² (260, 000 km²) mostly comprised of the country's Exclusive Economic Zone (EEZ) in the Atlantic Ocean. The total land area is small, approximately 5,380 mi² (13, 934 km²), and only a very small number, approximately 30, of the islands are inhabited. Coastal areas, holding the vast majority of the population and economic activity, are vital to the prosperity of these islands.

The archipelagic nature of The Bahamas creates a unique natural environment. However, The Bahamas natural resources are limited and its size, complexity and ecological isolation have important implications for biodiversity, and human development. With some 80% of The Bahamas landmass within 5 ft (1.5 m) of mean sea level, its fragile coastal ecosystems are extremely vulnerable to the effects of global climate change and sea level rise. In addition, water pollution, land degradation, destruction of wetlands and introduction of invasive species are all issues of growing concern for The Bahamas. Addressing these environmental issues together with growing developmental pressures on the limited land base, declining populations on several of the inhabited islands and the need for a more diversified economy, requires a comprehensive integrated long-term planning and management strategy that is consistent with the goal of sustainable development.

The Government of the Commonwealth of The Bahamas (GOB) recognizes that a healthy and safe environment - reflected in biological diversity and functioning ecosystems, clean water, clean air and productive soils - is essential to the economic and social well-being and health of its citizens and that its citizens influence and are influenced by their environment. It also recognizes that its citizens must live in an environment of a quality that permits a life of dignity and allows the attainment of the highest possible level of health and well-being; and that this can only be achieved if economic and social development is in harmony with ecological principles.

Chapter V of The Bahamas 1973 Constitution grants the Parliament of The Bahamas the authority to make laws and policies with a view to maintaining a safe, productive and healthy environment that will enhance the health and well-being of its citizens and sustain a high quality of life.

Vision

The Government envisions a Bahamas in which all people and institutions treasure its unique natural environment and voluntarily choose to act in a manner that contributes to its conservation, protection and enhancement. We foresee a time when all our people, rich and

poor, young and old, show respect and appreciation for their natural environment, and share in the benefits that maintenance of a healthy, safe and productive environment provides to present and future generations.

Policy Goal and Objectives

The Government of The Bahamas recognizes the fundamental rights of its people to a healthy and safe environment that is essential to sustaining the quality of life to which all its citizens are entitled. The GOB is committed to the sustainable use of the environment and consequently the promotion of economic and social development that fully integrates the environment in a manner consistent with the goal of sustainable development. However, the fundamental rights of the people are accompanied by certain responsibilities –a solemn duty of all who reside in The Bahamas to share in the stewardship of its unique natural environment and resources so that these are sustained and available for the benefits of future generations.

The goal of the GOB is the sustainable use of the environment of The Bahamas to meet the needs of present and future generations.

Government's approach to attaining this goal is to pursue a strategy of sustainable development, meaning improving the quality of human life while living within the carrying capacity of supporting ecosystems. Its specific objectives are to:

- prevent, reduce or eliminate various forms of pollution to ensure adequate protection of the environment and the health of its citizens;
- conserve the biological diversity of the country and the stability, integrity, resilience and productivity of ecosystems; and
- provide for environment to be fully integrated in policies, plans, programs and development project decisions that might be detrimental to the continued health, safety and productivity of the country's environment.

BASIC PRINCIPLES

The Government of The Bahamas' environmental policy will be guided by the following basic principles:

Respect and Care for the Community of Life

An ethic based on respect and care for each other and for nature is the foundation of sustainable development. Development ought not to be at the expense of other groups or future generations, nor significantly threaten the survival of other species. The benefits and costs of resource use

and environmental protection, conservation and enhancement should be shared fairly among different communities, among men, women and children, among people who are poor and those who are affluent and between our generation and those who will come after us.

All life, with soil, water and air, constitutes a great, interdependent system - the ecosystem. Disturbing one component can affect the whole. Our survival depends on the use of other species, but it is a matter of ethics, as well as practicality, that we act as stewards to ensure their survival and safeguard their habitats. Implementation of this principle requires that:

- all sector of society (industry, citizens' groups, non-governmental organizations) incorporate the ethic of stewardship and sustainability into their own policies and practices; and
- people in all walks of life incorporate the ethic of stewardship and sustainability into their personal behaviour and conduct.

Improve the Quality of Human Life

The aim of development is to improve the quality of human life. It should enable people to realize their potential and lead lives of dignity and fulfillment. Economic growth is an essential part of development, but it cannot be a goal in itself.

Development should result in long and healthy human lives, improved education, access to decent housing, adequate nutrition and safe water, political freedom, guaranteed human rights, cultural and religious freedoms, and freedom from violence. Development is only real if it makes our lives better in all these respects.

Conserve the Diversity, Integrity and Productivity of Natural Resources

Development must strive to:

- a) Conserve life-support systems, i.e. the ecological systems that cleanse air and water, regulate water flow, recycle essential elements, create and regenerate soil and enable ecosystems to renew themselves.
- b) Conserve Biodiversity. This includes not only species of plants, animals and other organisms but also the range of genetic stocks within each species, and the variety of different ecosystems, including those in protected areas. This may also include national parks and conservation areas.
- c) Use renewable resources sustainably. These resources include soil, wild and domesticated organisms, forests, agricultural land, and the marine and freshwater ecosystems.

- d) Conserve non-renewable resources. The use of these resources will be optimized to obtain the best possible benefit for all citizens and without impairing the value of other resources.
- e) Utilize alternative technologies. The use of alternative, less harmful technologies for exploiting natural resources.

Keep within the Country's Carrying Capacity

There are finite limits to the carrying capacity of The Bahamas' ecosystems so its renewable resources must be used sustainably. This must be linked to a humane, proactive population policy, which seeks to stabilize the population. We must also recognize the special role of Bahamian youth and that the need for their empowerment is integral to success in attaining sustainable development. In order to keep growth within the nation's carrying capacity, the following are required:

- National physical development and planning policies must address in a realistic way the need to stabilize population growth, reduce poverty, promote equal access to all national services and engender sustainable tourism. An ecological approach to human settlements planning must be implemented in order to make our settlements, towns and cities clean and safe. Strategies and plans must also be introduced to use land and water optimally.
- Resource conservation, waste minimization and recycling must be promoted as a way of life. Economic incentives, environmental taxes and use of environmentally-preferred products and services must become an accepted part of our environmental management strategy.
- Family planning services must be strengthened and linked to improved care and education for mothers and children.

Change Personal Attitudes and Practices

If the ethic for sustainable development is to be widely adopted, people must re-examine their values and alter their behaviour. Information must be widely disseminated through formal and informal education campaigns so that stewardship of the environment and the required actions are widely understood.

Environmental education for children and adults must be integrated in education at all levels. Extension services must also be available to help farmers, fishermen, contractors/builders, artisans, the urban and rural populations and other groups to use natural resources more productively and sustainably.

Empower Communities to care for their own Environments

Local communities, non-governmental organizations and community-based organizations provide the easiest channels for people to express their concerns and take action to create sustainable societies. However, such groups need the power to act. Communities should be given an opportunity to share in managing their local resources and the right to participate in decisions. Local government bodies, communities, businesses, non-governmental and community-based organizations and other interest groups should become partners with the Government of The Bahamas and its agents in decisions about policies, plans, programs and projects that affect them, their environment, and the resources on which they depend.

A national forum for Government, business and the environmental movement to have ongoing dialogue in achieving environmental sustainability will help build confidence by discussion of objectives, processes and practices and the open disclosure of the results of monitoring. It will be adaptive, continually re-directing its course in response to experience and to new needs.

APPENDIX H

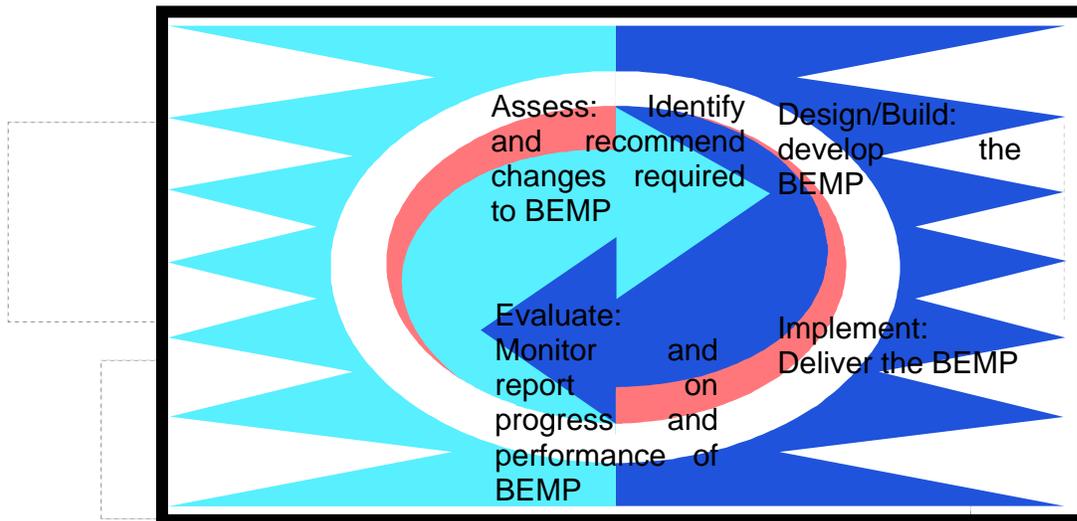
REVISED BLUEPRINT

PROPOSED BLUEPRINT FOR THE BAHAMAS' ENVIRONMENTAL MANAGEMENT PROGRAM

1.0 BACKGROUND

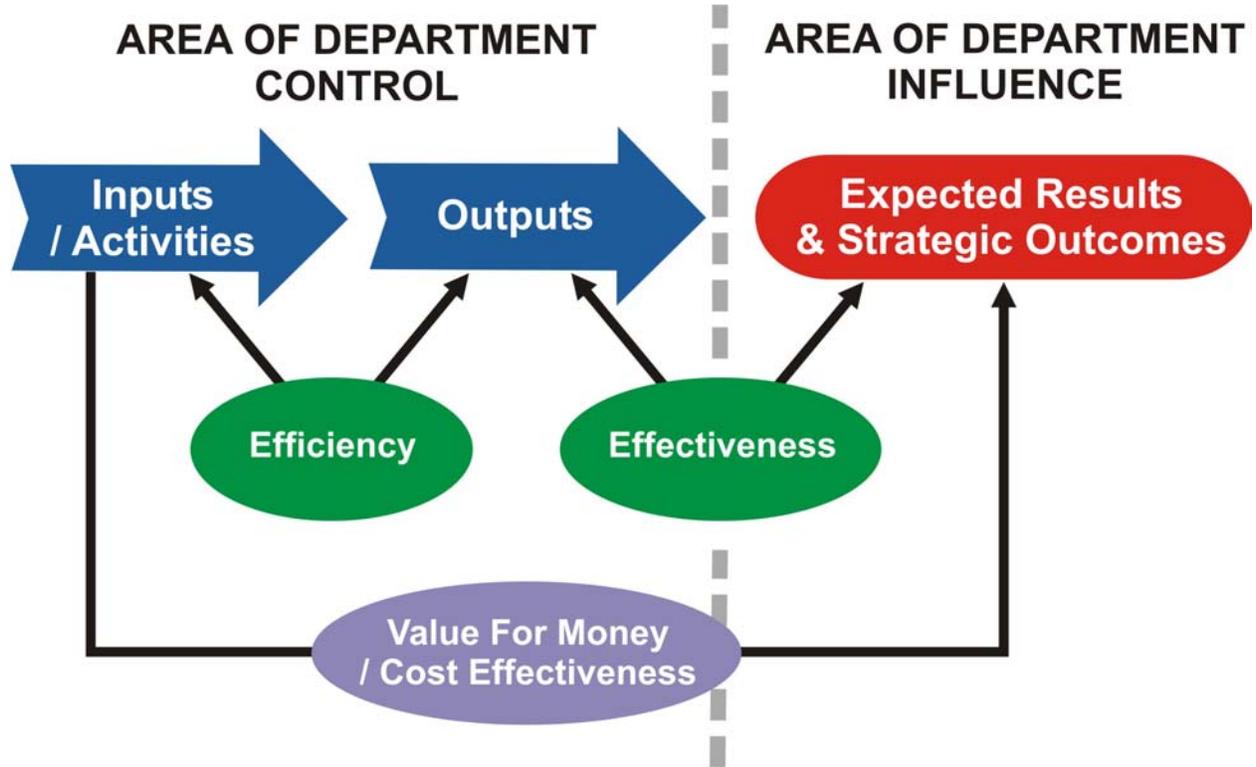
The proposed Blueprint for The Bahamas Environmental Management Program (BEMP) is intended to provide a map to plan, monitor, evaluate and report on the results throughout its lifecycle (design/build/develop, implement, evaluate and assess) as shown in the figure below. The Blueprint includes three core components: (i) Program Profile; (ii) Expected Results; and (iii) Monitoring and Evaluation.

Life Cycle Approach



The Program Profile provides a description of the program's origin, beneficiaries and regulated parties, delivery approaches and strategies, resources, governance structure and planned results

The Expected Results component represents the focal point of the Blueprint providing a graphic representation of the causal or logical relationships (i.e. Logic Model) between activities and the outputs and results that the BEMP is intended to produce as shown below. A good logic model validates the theory behind the BEMP and represents the first step in developing realistic and relevant performance measurement and evaluation plans.



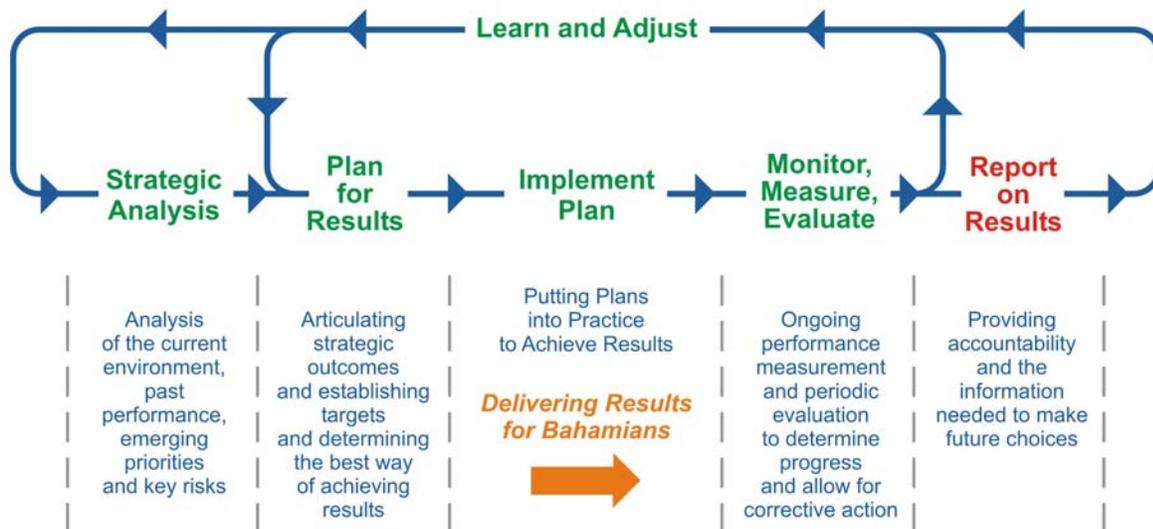
The monitoring and evaluation plan represents the government’s strategy to monitor performance and demonstrate results of the BEMP. The monitoring or performance measurement plan enables managers to establish the necessary systems and processes to collect and analyze data and information so that the BEMP’s performance can be optimized. Evaluations generate accurate, objective and evidence-based information to help government managers to make sound management decisions, demonstrate success, show ongoing relevance and develop more effective and cost-efficient alternatives to service delivery that provide ongoing benefits to Bahamians.

The following presents the logic model (activities; outputs; and results (immediate, intermediate and ultimate or final) for the BEMP; and a table of draft performance indicators to monitor and evaluate the BEMP’s performance in achieving its desired results and contributing to the strategic outcomes outlined in the National Environmental Policy (NEP).

2.0 LOGIC MODEL FOR BEMP

2.1 ACTIVITIES OF THE BEMP

The following proposes key activities of the BEMP where resources should be expended to produce outputs (products and services) that contribute to immediate, intermediate and ultimate results.



2.1.1 Establishing the “Rules of the Game”: Developing the regulatory (regulations) and policy (operational policies, guides, guidelines, codes of practice) basis for environmental management in The Bahamas.

- 2.1.2 Communicating the rules of the game: Communicating information about the rules of the game (educational and training materials) to raise awareness and understanding and to build capacity about the environmental management in the Bahamas.
- 2.1.3 Conducting Regulatory Reviews: Conducting reviews of existing and proposed development projects to assess their impacts on the environment and establish mitigation and compensation measures to reduce, eliminate and offset their adverse effects in accordance with the rules of the game.
- 2.1.4 Compliance and Effectiveness Monitoring and Auditing: Conducting monitoring of existing activities, projects and plans to establish compliance with and effectiveness of regulations, policies and guidelines.
- 2.1.5 Responding to cases of non-compliance: Establishing cases of non-compliance with the rules of the game and taking appropriate actions to enforce the requirements.
- 2.1.6 Conducting scientific studies to establish baseline environmental conditions and improve understanding of the environment and impacts of human activities on its productivity.
- 2.1.7 Reporting on the state of the environment, emerging issues and government priorities.
- 2.1.8 Evaluating the results achieved by the BEMP and developing and implementing strategies and plans to continuously improve its performance.

2.2 OUTPUTS OF THE BEMP

The outputs resulting from the activities of the BEMP in the form of products and services are identified below.

- 2.2.1 Developing regulatory and policy tools for environmental management:
 - (i) Regulations;
 - (ii) National and Operating Policies;
 - (iii) Guides;
 - (iv) Guidelines, Codes of Practice.
- 2.2.2 Communicating information, educational and training materials for all **SECTORS TO** raise awareness and understanding about environmental management:
 - (i) Fact sheets, brochures, slide presentations, training modules,

- (ii) Publications;
 - (iii) Workshops, conferences, seminars
 - (iv) Training courses;
 - (v) Web sites and other forms of mass media.
- 2.2.3 Conducting reviews of existing and proposed development projects to assess their impacts on the environment and establish mitigation and compensation measures to reduce, eliminate and offset their adverse effects
- (i) Reviews of Environmental Impact Assessment Reports (i.e. EIS);
 - (ii) Public consultation meetings;
 - (iii) Follow-up studies;
 - (iv) Environmental Management/Protection Plans.
- 2.2.4 Monitoring and auditing existing activities, projects and plans to establish compliance with environmental requirements and the effectiveness of mitigation and compensation measures:
- (i) Site inspections and audits;
 - (ii) Monitoring and auditing reports.
- 2.2.5 Responding to cases of non-compliance:
- (i) Warnings;
 - (ii) Stop Orders;
 - (iii) Investigations;
 - (iv) Charges;
 - (v) Convictions and orders for remedial measures.
- 2.2.6 Conducting scientific studies to establish environmental quality and improve understanding of the environment and impacts of human activities on its productivity and to guide decision-making:
- (i) Research studies;
 - (ii) Baseline Monitoring studies.
- 2.2.7 Reporting on the state of the environment and emerging issues and priorities:
- (i) Reports on the State of the Environment

2.2.8 Evaluating and reporting on the results achieved by the BEMP and developing and implementing strategies and plans to continuously improve its performance.

- (i) Evaluation reports;
- (ii) Process modernization plans and initiatives.

2.3 RESULTS

The results achieved through the activities of the BEMP are described in three time frames:

- (i) immediate (short-term, i.e. 1-3 years);
- (ii) intermediate (medium-term, i.e. 3-5 years);
- (iii) final (long-term, i.e. beyond 5 years). These results are intended to contribute to Strategic Outcome outlined in The Bahamas National Environmental Policy.

2.3.1 Immediate Results of BEMP

2.3.1.1 Developing regulatory and policy base for environmental management:

- (i) Standards for environmental management established.

2.3.1.2 Communicating information, educational and training materials to raise awareness and understanding about environmental management:

- (i) A public and partners that are aware of the environment, understand the requirements to comply with the environmental laws and policies and support the conservation, protection and enhancement of the environment;
- (ii) Government staff that understand environmental management laws, policies, strategies and tools, inclusive of enforcement agencies;
- (iii) Executive and legislative branches that understand environmental laws, policies, strategies and tools.

2.3.1.3 Conducting reviews of existing and proposed development projects to assess their impacts on the environment and establish mitigation and compensation measures to reduce, eliminate and offset their adverse effects:

- (i) Environmental requirements are integrated in the design of new development proposals and existing developments.

2.3.1.4 Monitoring and auditing existing activities, projects and plans to establish compliance with environmental requirements and the effectiveness of mitigation and compensation measures:

- (i) Compliance with and effectiveness of mitigation and compensation measures are confirmed.

2.3.1.5 Responding to cases of non-compliance:

- (i) Non-compliance is dealt with.

2.3.1.6 Conducting scientific studies to establish environmental quality and improve understanding of the environment and impacts of human activities on its productivity:

- (i) Environmental quality is established and environmental knowledge is improved.

2.3.1.7 Reporting on the state of the environment, emerging issues and government priorities:

- (i) The public is aware of the state of the environment and emerging issues and priorities.

2.3.1.8 Evaluating the results achieved by the BEMP and developing and implementing strategies and plans to continuously improve its performance.

- (i) Environmental processes are improved.

2.4 INTERMEDIATE RESULTS OF BEMP

- (i) Environmental impacts of activities, projects and plans are eliminated or reduced; and
- (ii) Losses to environmental assets are offset.

2.5 Ultimate Results of BEMP

- (i) Healthy and productive ecosystems that sustain social and economic benefits for existing and future generations.

3.0 PERFORMANCE INDICATORS FOR BEMP

Performance indicators represent a particular value or characteristic (quantitative or qualitative) designed to measure input, output (services and products), result, etc. of the Program's activities. The indicators should measure all important aspects of outputs/results and should allow for assessing progress in the short and/or long term. They should be easily read and understood; and

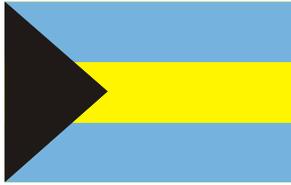
they must be valid, reliable over time. For example these should not be “quality of life of X” but “% of X deemed to have a ‘good’ quality life”.

In developing performance indicators consideration should be given to how they are going to be reported. This should include:

- (i) **Data Source:** The source from which the data for performance indicator will be available on a regular basis.
- (ii) **Frequency:** The frequency with which the data for performance indicators will be available e.g. annually.
- (iii) **Actual:** This refers to the last performance indicators data that is available e.g. 50% of Bahamians own their home.
- (iv) **Effective date for Actual:** The date at which the last actual data was collected.
- (v) **Target:** refers to any targets (performance levels) that have been set for outcomes and outputs. Performance information tends to be more robust if actual performance can be compared to targets that have been set earlier in the process. It should be based on some objective or systematic approach, such as benchmarks, studies, analyses of historical data and resources, etc.
- (vi) **Benchmark:** Performance levels achieved by any other organization or jurisdiction that allows a department or ministry to compare its own achievements. Usually considered as best practices.
- (vii) **Date to Achieve Target:** The date that has been set for the achievement of a target (performance level).

The following is an example of a table of potential performance indicators:

Indicators	Sources of Data	Collection Method	Frequency	Responsibility
% of Environmental Impact Assessments (EIAs) completed for development projects	EIA tracking system	Data entry	Ongoing	Government agency
% of EIAs subjected to public review	EIA tracking system	Data entry	Ongoing	Government agency
% of companies with voluntary environmental programmes	Companies	survey	annually	companies
% of government staff that completed mandatory training programme	Government agencies	survey	annually	Government agencies
% of public that are aware of environmental laws and regulations and policies and guidelines	Government agencies	survey	annually	Government agencies



Final Report:

NATIONAL ENVIRONMENTAL MANAGEMENT ACTION PLAN (NEMAP) FOR THE BAHAMAS



Prepared For:

Bahamas Environment Science and Technology (BEST) Commission

Prepared By:

SENES Consultants Limited

August 2005

**NATIONAL ENVIRONMENTAL MANAGEMENT
ACTION PLAN (NEMAP)
FOR THE BAHAMAS**

Prepared for:

**Bahamas Environment Science and Technology (BEST) Commission
P.O. Box N-3730
Nassau, Bahamas**

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EXECUTIVE SUMMARY

The Government of The Bahamas (GOB) in its effort to meet its commitments under various international environmental Conventions has undertaken a National Capacity Needs Self-Assessment (NCSA) Project. The over-riding goal of each NCSA is to identify and analyze country level priorities and capacity development needs within the context of implementing the key international environmental Conventions.

The Bahamas NCSA Project is intended to review its global environmental responsibilities; assess its existing capacity to meet its commitments to international environmental Conventions, related to biodiversity, climate change, land degradation and wetlands; identify and prioritize their most critical needs; and determine how best to build its capacity to meet its commitments to these Conventions. This is being accomplished through the use of a comprehensive self-assessment methodology and broad consultations with stakeholders and the public. The end result of this process will be the development of a National Environmental Management Action Plan (NEMAP) for The Bahamas that can serve as a tool for the GOB to identify gaps and deficiencies in meeting its international environmental commitments and in addressing other environmental management issues in the country. It will also define appropriate actions as well as provide a baseline to evaluate the effectiveness and efficiency of its capacity development efforts to address these gaps and deficiencies.

The Bahamas Environment, Science and Technology (BEST) Commission, the primary advisor to the GOB on environmental matters and the national focal point for international environmental Conventions, has the responsibility for coordinating the NCSA Project.

The BEST Commission also retained the services of SENES Consultants Limited (SENES) to assist in completing its NCSA Project. SENES' key deliverables include:

- 1 – A report on the NCSA Study focusing on gaps and deficiencies in capacity that need to be filled for implementation of international environmental Conventions dealing with four thematic areas (biodiversity, climate change, land degradation and wetlands) to which the Bahamas is a Signatory.

- 2 – A framework for a NEP highlighting:
 - the uniqueness of The Bahamas;
 - the constitutional basis for environmental management in The Bahamas;
 - NEP policy, goals and objectives;
 - the priority issues of national concern relating to environmental protection and sustainable resource management; and
 - strategies and actions.

- 3 – A NEMAP that:
 - reviews the current state of the environment in The Bahamas;
 - reviews the current governance structure for environmental management in The Bahamas;
 - incorporates the NEP;
 - identifies key programme activities for a Bahamas Environmental Management Programme (BEMP);
 - presents an Action Plan that identifies activities for the immediate (within six months), short (1-3 years), medium (3-5 years) and long (5+ years) term; and
 - outlines sources of funding for carrying out the Action Plan.

Deliverable 1 and 2 have been completed by SENES and submitted to BEST under separate cover. This current report presents the results of the Deliverable 3 and draws on the results of both deliverable 1 and 2.

A NEMAP was drafted by SENES based on information obtained from interviews with several government agencies, local experts, and the review of existing Bahamian regulations, guidelines, policies, etc. The draft NEMAP identified deficiencies with the existing environmental management structure, including legislation, policies and guidelines, institutions, financial resources, human resources, information management and compliance and enforcement. It also recommended specific actions for moving forward. The draft NEMAP was presented at a national NCSA workshop held on April 5-6, 2005 in Nassau. The key conclusions specific to the NEMAP were as follows:

- The NCSA study provides a solid foundation to proceed with developing a NEMAP for The Bahamas.
- That the draft NEMAP presented at the workshop should be revised to include the comments from the workshop participants.
- The NEMAP should include, among other things:
 - the immediate establishment of a Department of the Environment for The Bahamas with a long-term goal of establishing a Ministry of the Environment;
 - a Cabinet Committee on the environment;
 - a National Environmental Council made up of Cabinet Ministers, using the existing National Economic Council as a model;
 - a national multi-stakeholder committee, possibly made up of Permanent Secretary level employees; and
 - the technical thematic subcommittees should be maintained. Technical subcommittees could recommend priorities and send these onward to Cabinet through the relevant Permanent Secretary.

- The draft NEMAP should be made available for public review through a process that gives wide public access including use of the Web, libraries, Island administrators and public service announcements. The review process should have a specified timeline.
- Following the public consultation process, the NEMAP should be submitted to the GOB for approval. This should be accomplished within the next 1-3 years.

Incorporating the input from the workshop participants, along with the information previously compiled from the agency interviews and document reviews, the following key actions are put forth as comprising a NEMAP for The Bahamas:

- adoption of a National Environmental Policy;
- the enacting of new environmental legislation;
- the instituting of a new environment Department and Ministry;
- implementation of a new governance structure;
- adoption of a blueprint for environmental management, including new regulations, guidelines and policies;
- options for securing stable and reliable funding for environmental management; and
- improvements to human resources, Family Island services, training, information management and compliance and enforcement.

LIST OF ACRONYMS

BEST	The Bahamas Environment, Science and Technology
BNT	Bahamas National Trust
DEHS	Department of Environmental Health Services
EEZ	Exclusive Economic Zone
GHGs	Greenhouse Gases
GIS	Geographic Information Systems
GOB	Government of The Bahamas
EIA	Environmental Impact Assessment
MOPW&U	Ministry of Public Works and Utilities
NCB	National Coordinating Body
NEMAP	National Environmental Management Action Plan
NGOs	Non-Governmental Organizations
SIDS	Small Island Developing States
WRMU	Water Resources Management Unit
WSC	Water and Sewage Corporation

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1.0 INTRODUCTION

Over the past decades, the international community has reached unprecedented international agreements on global environmental issues such as climate change, biodiversity, desertification/land degradation and wetlands mainly in the form of binding Conventions. While these international Conventions are viewed as crucial to achieving the goal of sustainable development and resource conservation, their effective implementation places significant demands on the capacity of participating countries and in particular developing countries and small island developing states (SIDS).

The Bahamas is a small island developing state which is Signatory to a number of international environmental Conventions. The Bahamas has identified a lack of capacity as a key obstacle to its effective implementation of these Conventions, representing a major impediment to the country's aspiration of sustainable development. While its size and available resources represent a major factor contributing to its limited capacity to implement the international environmental Conventions to which it is a Signatory, this is further compounded by the vast number and archipelagic nature of its islands and their differing ecosystems, the scarcity of freshwater reserves, the limited options for and high cost of waste disposal and the rate and pace of economic development.

Recognizing the importance of building its capacity to effectively implement these Conventions so it can achieve its goal of sustainable development, the Government of The Bahamas (GOB) has initiated a National Capacity Needs Self Assessment (NCSA) Project. The over-riding goal of each NCSA is to identify and analyze country level priorities and capacity development needs within the context of implementing the key international environmental Conventions.

The Bahamas NCSA Project is intended to review its global environmental responsibilities; assess its existing capacity to meet its commitments to international environmental Conventions, in particular those related to biodiversity, climate change, land degradation and wetlands; identify and prioritize their most critical needs; and determine how best to build its capacity to meet its commitments to these Conventions. This is being accomplished through the use of a comprehensive self-assessment methodology and broad consultations with stakeholders and the public. The end result of this process will be the development of a National Environmental Management Action Plan (NEMAP) for The Bahamas that can serve as a tool for the GOB to identify gaps and deficiencies in meeting its environmental international commitments and in addressing other environmental management issues in the country. It will also define appropriate actions as well as provide a baseline to evaluate the effectiveness and efficiency of its capacity development efforts to address these gaps and deficiencies.

The Bahamas Environment, Science and Technology (BEST) Commission, the primary advisor to the GOB on environmental matters and the national focal point for international environmental Conventions, has the responsibility for coordinating the NCSA Project. The BEST Commission has set out the following as the major goals of the NCSA Project for The Bahamas:

- identification, review and confirmation of priority issues within the four thematic areas of (1) biodiversity, (2) climate change, (3) land degradation and (4) wetlands;
- identification of the needs and priorities required for building the country's capacity to meet its international commitments under the Conventions dealing with (1) biodiversity, (2) climate change, (3) land degradation and (4) wetlands;
- definition of synergies across the four thematic areas;
- development of programmes for the four thematic areas;
- development of a framework/mechanism for targeted and coordinated action, including requests for external funding assistance;
- linkage of the country's framework National Environmental Policy (NEP) with respect to a broader national environmental strategy for The Bahamas; and
- development of a NEMAP.

As part of the process for the NCSA Project, the BEST Commission undertook comprehensive public consultations with the residents within the chain of inhabited islands of The Bahamas. These were facilitated through a number of public outreach activities involving churches, civic organizations, schools and local governments. Through these public consultations, information on environmental concerns, needs and priorities was obtained from all sectors of the population.

The BEST Commission also retained the services of SENES Consultants Limited (SENES) to assist in completing its NCSA Project. SENES' key deliverables include:

- 1 – A report on the NCSA Study focusing on gaps and deficiencies in capacity that need to be filled for implementation of international environmental Conventions dealing with four thematic areas (biodiversity, climate change, land degradation and wetlands) to which the Bahamas is a Signatory.
- 2 – A framework for a NEP highlighting:
 - the uniqueness of The Bahamas;
 - the constitutional basis for environmental management in The Bahamas;
 - NEP policy, goals and objectives;
 - the priority issues of national concern relating to environmental protection and sustainable resource management;
 - strategies and actions.

- 3 – A NEMAP that:
 - reviews the current state of the environment in The Bahamas;
 - reviews the current governance structure for environmental management in The Bahamas;
 - incorporates the NEP;
 - identifies key programme activities for a Bahamas Environmental Management Programme (BEMP);
 - presents an Action Plan that identifies activities for the immediate (within six months), short (1-3 years), medium (3-5 years) and long (5+ years) term; and
 - outlines sources of funding for carrying out the Action Plan.

Deliverable 1 and 2 have been completed by SENES and submitted to BEST under separate cover. This current report presents the results of the Deliverable 3 and draws on the results of both deliverable 1 and 2. In general information for this report was obtained from:

- 1) results of deliverables 1 and 2;
- 2) use of existing documents;
- 3) review of results of BEST public consultations;
- 4) interviews with government officials/experts; and
- 5) national workshops.

In addition to this introductory chapter, the rest of the report includes:

- Chapter 2 – An overview of the state of The Bahamas' environment.
- Chapter 3 – A summary of the legal and institutional framework for environmental management in The Bahamas.
- Chapter 4 – Gaps and deficiencies in the capacity of The Bahamas to effectively implement the international environmental Conventions addressing the four thematic areas and to address other environmental issues and concerns.
- Chapter 5 – An outline of an Action Plan for The Bahamas.

**TABLE 1.1
NCSA ACTIVITY SUMMARY**

Task	Output	Responsibility	Date	Preparatory Activities
1. Initiating the planning process			August 2003	
2. Establishing high level co-ordination and supervision				
Appointment of Project Coordinator (PC)	TORs and appointment	NCB and BEST	August 15	TORs
Formal establishment of NCSA National Coordinating Body (NCB)	Meeting minutes	BEST	August 19	Letters of invitation
Stakeholder identification	Analysis matrix	BEST and PC	August 19	Circulate to SBC members for completion by August 25
First planning session of NCB, Project Coordinator and Subcommittees	Meeting minutes	BEST and PC	August 27	Develop information documents and presentation
3. Stock-taking and gap identification				
NCSA/NEMAP National Consultation Workshop	Workshop report	BEST and PC	Sept. 15-18	Liaison with LG Development of agenda, presentations, discussion material, surveys/questionnaires
1 st Report to UNEP on project status and finances	Project Report 1	BEST	Sept. 30	Use formats provided
Training workshop in capacity building and assessment	Workshop report and training evaluation	BEST and PC	October	Organize workshop (venue, agenda, letters, pr, etc.)
4. Thematic assessments				
Thematic assessments for biodiversity, climate change, land degradation and wetlands	Draft assessments	NCB, PC and Subcommittees	Oct. – Nov.	Develop formats for completion by subcommittees
Consultation and development of thematic profiles/ programmes	Thematic profiles/ programmes	Subcommittees	Nov. – Dec.	Programmes developed in time to be formatted for inclusion in NEMAP document
5. Synergies and Cross-cutting				
Identification of synergies and cross-cutting analyses	Draft report on synergies	NCB, PC, BEST and Subcommittees	Jun. 15	One-day workshop (organization associated with formats to be filled)
2 nd Report to UNEP on project status and finances	Project Report 2	BEST	Dec. 31	Use formats provided

**TABLE 1.1 (Cont'd)
NCSA ACTIVITY SUMMARY**

Task	Output	Responsibility	Date *	Preparatory Activities
6. Framework for domestic action				
Systemic, institutional and individual level assessments	Needs assessment	BEST and PC	Jun. – Nov.	Contract a consultant with specific TORs
Second planning session of NCB, Project Coordinator and Chairs of Subcommittees	Meeting minutes	BEST and PC	May 25	
Development of NCSA Framework	Draft Framework	NCB, PC, Subcommittees and BEST	Jun. – Nov.	Drafting to be formatted by publisher as a single document/inclusion in NEMAP document
7. Developing thematic programmes				
Respective subcommittees to develop programmes with long term goals	Draft Programmes	Subcommittees	Nov. – Dec.	
8. Developing a NEMAP				
Third planning session of NCB, Project Coordinator and Chairs of Subcommittees	Meeting minutes	BEST and PC	Oct.	
NCSA/NEMAP National Planning Workshop	Workshop report	BEST and PC	Nov.	
Development of NEMAP	Draft Action Plan	NCB, PC, Subcommittees and BEST	Oct. – Jan.	
National workshop to present project outputs	Revised Framework and Action Plan	BEST and PC	Jan 2005	
9. Monitoring mechanisms				
Development of mechanisms to monitor progress	Final Framework and Action Plan	NCB, PC, Subcommittees and BEST	Dec.	
Final report to UNEP with accompanying documents produced during the project (including workshop reports)	Project Report 3	BEST	Feb.	

Note * - Many of the tasks listed were completed at dates later than as shown in this table.

2.0 THE STATE OF THE BAHAMAS ENVIRONMENT

The purpose of this chapter is to provide an overview of the current state of the environment focusing on the valued environmental components (VECs) in The Bahamas and to identify the key related concerns and issues. The chapter is organized as follows:

- 2.1 Geography
- 2.2 Population
- 2.3 Climate
- 2.4 Economy
- 2.5 Valued Environmental Components
 - 2.5.1 Air Quality
 - 2.5.2 Soils
 - 2.5.3 Freshwater Resources
 - 2.5.4 Marine Resources
 - 2.5.5 Biological Resources (Terrestrial and Aquatic)

The chapter draws mainly on information from The Bahamas Environmental Handbook and the First National Communication on Climate Change.

2.1 GEOGRAPHY

Geographically considered part of the Caribbean, The Bahamas comprises an archipelago of over 700 low-lying islands plus more than 200 cays, islets and rocks, covering approximately 100,000 mi² (260, 000 km²) that include the area of the country's Exclusive Economic Zone (EEZ) in the Atlantic Ocean. The total land area is approximately 5,380 mi² (13, 934 km²). The islands extend 50 miles (km) east of Florida to 50 miles (km) northeast of Cuba. In addition to the United States and Cuba, neighbours include Haiti and the Turks and Caicos Islands, located to the southeast of The Bahamas, as shown on Figure 2.1 (*First National Communication on Climate Change, p.5; Bahamas Environmental Handbook, pp.2-4*).

**FIGURE 2.1
THE BAHAMAS AND SURROUNDING COUNTRIES**



As noted, the islands have low relief. The highest point in The Bahamas is 206 ft (63 m), above mean sea level, at Mt. Alvernia on Cat Island. There are no rivers, but several islands have large brackish lakes, and many others are deeply penetrated by tidal creeks, notably Andros and Grand Bahama. These creeks are generally navigable by small boats. The potable freshwater resources of The Bahamas overlay brackish and saline waters and mostly occur within five feet of the land surface (*Bahamas Environmental Handbook*, pp.2-3).

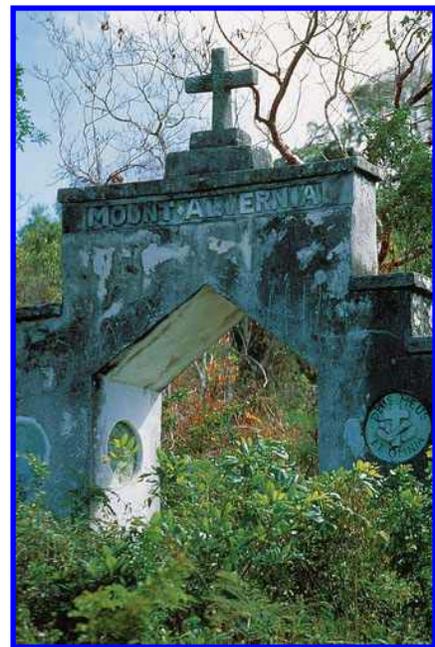


Photo taken by BEST

Around the islands, especially on their windward sides, are extensive fringing of coral reefs. There are also areas of patch reefs on the interiors of the banks, as well as extensive sea grass beds. Collectively, the Bahamian shallow seas provide the largest body of coral reef and other marine organisms in the Atlantic/Caribbean region. The estimated reef area is 3,800 mi² (10,000 km²) (*National Biodiversity Strategy Action Plan p.10*).

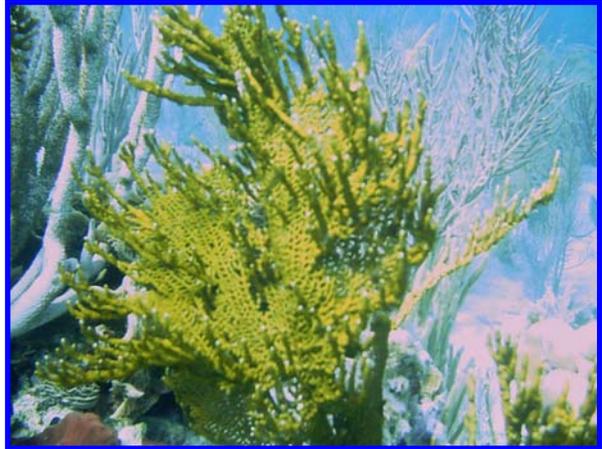


Photo taken by Sharrah Moss



Photo taken by Fred Bernard

The landscape of the islands consists of a mixture of rolling hills and ridges, flat rockland, and extensive wetlands. Vegetation provides a superficial cover where it has not been cleared for settlement or agriculture. The natural vegetation consists of forests of Caribbean pine in the four northern islands and various levels of broadleaf hardwood forests and coppice vegetation elsewhere, although this becomes less diverse and more stunted in the drier southern islands (*Bahamas Environmental Handbook, pp.2-4*).

2.2 POPULATION

Approximately 30 of the over 700 islands are inhabited. The population of The Bahamas was estimated to be about 295,000 in 2000, growing at a rate of just over 1%. Thirty percent of the population is under 15 years old, and about 94% is less than 65 years old. [BEST will provide more recent statistics from most recent census]. The two major population centres are the capital, Nassau which is located on New Providence Island and Freeport, located on Grand Bahama Island. Over 80% of the population reside in these two centres ([wysiwyg://5/http://geography.about.com/library/cia/blcbahamas.htm](http://5/http://geography.about.com/library/cia/blcbahamas.htm)).

2.3 CLIMATE

The climate of the Bahamas is described as sub-tropical, moderated by the warm north-flowing Gulf Stream. The Bahamas has two distinct seasons: a hot wet summer season (May to October)

and a warm drier winter season (November to April). Mean annual rainfall varies from about 34 in (865 mm) to 58 in (1470 mm). Mean daily temperature varies between 63°F and 90°F (17°C to 32°C).

The climate of The Bahamas poses some environmental problems. Hurricanes and tropical storms are a regular occurrence during the Atlantic hurricane season that extends from June to November. The high winds, rains, storm surges and associated flooding caused by this severe weather conditions can result in significant damage. High evaporation rates and low rainfall, makes the southern half of The Bahamas semi-arid and water deficient. Even in wetter areas such as New Providence which receives on average 50 in (127 mm) of rainfall annually, potable water has to be barged from nearby Andros, and is also supplemented by desalination plants.

2.3.1 Vulnerability to Climate Change/Climate Variation

Trends in climate extremes for the Caribbean show that climate change is manifested in the Caribbean by an increase of about 1C° in average temperature in most countries over the last century, with most of the change occurring in the last 30 to 40 years (Peterson, Taylor, 2002). Averaged over the Caribbean, the percentage of hot days when maximum and minimum temperatures were higher than the 90% percentile (1977-1997) has risen from 4% to 8% since 1960. The percentage of annual rainfall that comes from very high intensity one-day rains has increased from 24% to 28%. These trends of increasing frequency of extreme events are projected to continue with further increases in greenhouse gas concentrations in the atmosphere (*Adapting to Climate Change in the Caribbean, May 2004*).

Bahamian data show that the mean daily maximum temperature for July have increased at a rate of 3.6 F° (2 C°) per 100 years, and more recently at the rate of 4.8 F° (2.6 C°) per 100 years. Climate models also predict increased heavy rain events, and drought in some areas. The data show that over the past 95 years rainfall in Nassau has decreased at a rate of 4.2 in (107 mm) per 100 years, but since 1959, has been increasing at a rate of 21.8 in (554 mm) per 100 years (*First National Communication on Climate Change, April 2001*).

Like many other SIDS, The Bahamas with its fragile coastal ecosystems is extremely vulnerable to the effects of global climate change and sea level rise, as some 80% of the landmass is within 5 ft (1.5 m) of mean sea level. Coastal areas, holding the vast majority of the population and economic activity, are vital to the prosperity of these islands. Coastal areas are also the most productive areas, supporting a wealth of living marine resources



Photo taken by Fred Bernard

and high biological diversity.

The vulnerability of coastal resources, human settlements and infrastructure to sea level rise, increases in sea surface temperature, and changes in wind and ocean currents, etc., is a significant concern to The Bahamas (*CPACC brochure*).

2.4 ECONOMY

The Bahamas is a developing nation with an economy heavily dependent on tourism and offshore banking. Tourism alone accounts for more than 50% of the Gross Domestic Product (GDP) and directly or indirectly employs about 40% of the labour force. About 60% of the visitors arrive by sea and the rest by air, contributing about \$1.5 billion to the Bahamian economy annually.



Photo taken by Fred Bernard

The banking and financial sector accounts for approximately 15 % of GDP, which is about \$300 million annually (*wysiwyg://5/http://geography.about.com/library/cia/blcbahamas.htm, First National Communication on Climate Change, and p.6, Bahamas Environmental Handbook*).



Photo taken by Fred Bernard

Other sectors of economic importance to The Bahamas include agriculture, fishing and manufacturing. In 2002, the value of agricultural production in The Bahamas was approximately \$50 million, with large-scale crop production concentrated on Abaco, Andros, and Grand Bahama. Commercial fishing generates about \$70 million to the economy annually. Recreational fishing is also an important aspect of the local tourism industry. The Bahamas manufacturing sector is small, accounting for only 4% of GDP.

Most of the industrial operations are located in and around Freeport Harbour on Grand Bahama Island and include cement bagging, oil bunkering, ship dry-dock and repair and pharmaceuticals manufacture (*Bahamas Environmental Handbook*).

2.5 VALUED ECOSYSTEM COMPONENTS

The following subsections briefly describes the valued ecosystem components of The Bahamas and discusses the key issues and concerns related to the maintenance of these components as summarized mainly from The Bahamas Environmental Handbook.

2.5.1 Air Quality

Ambient air quality in most of The Bahamas is relatively good for the following reasons:

- The local meteorology is dominated by strong easterly trade winds for the majority of the year, and multi-directional but still windy conditions in the remainder of the year. The strong winds will tend to transport emissions from sources located on the Islands out over water, rather than allowing them to accumulate and concentrate in ambient air over areas of population. This same effect will also preclude the chance for sufficient accumulations of ozone precursors that could lead to elevated levels of ambient ozone.
- The density of industrial activity (and emission) on the islands is low. Areas of relatively low industrial activity tend to have acceptable concentrations of air contaminants.
- The population density is relatively low.

Table 2.1 shows carbon dioxide emissions from fossil fuel sources in The Bahamas for 1990 and 1994, and Table 2.2 shows estimated emissions from other GHGs in The Bahamas for the same years.

**TABLE 2.1
CARBON DIOXIDE EMISSIONS FROM FOSSIL FUEL ENERGY SOURCES IN THE
BAHAMAS FOR 1990 AND 1994 (Gigagrams of CO₂)**

Fuel Type	1990	1994	% Total
Gasoline	470.7	476.5	25.2
Jet Kerosene	55.0	43.6	2.6
Gas/Diesel Oil	802.4	593.5	37.1
Residual Fuel Oil	424.8	696.9	29.8
LPG	39.7	40.8	2.1
Other Oils	101.5	14.9	3.1
Total (Gg CO ₂)	1894.1	1866.2	

Note: 1 A Gigagram (abbreviated to Gg) is 1,000,000,000 grams or 1,000 metric tonnes.

Source: First National Communication on Climate Change.

TABLE 2.2
ESTIMATED EMISSIONS OF OTHER GREENHOUSE GASES IN THE BAHAMAS
FOR THE YEARS 1990 AND 1994 (Gg)

Year	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Carbon Monoxide (CO)	NMVOCs
1990	2	0	4	3
1994	1	1	4	3

Source: *First National Communication on Climate Change*.

Due to its small industrial base and low population density, the Bahamas is not a major contributor to greenhouse gases (GHGs). Electricity generation and the transportation sector (through the burning of petroleum products) were determined to be the two most significant sources of GHG emissions in The Bahamas. Carbon dioxide emissions produced by the consumption of gas/diesel oil and residual fuel oil for electricity generation, account for some 65% of total CO₂ emissions in The Bahamas. Heavy use of air conditioning and refrigeration also releases CFCs into the atmosphere when equipment is damaged, poorly maintained, or discarded.



Photo taken by Fred Bernard

With its extensive vegetation cover and marine production of calcium carbonate, The Bahamas can be considered a major absorber, or ‘sink’ for carbon dioxide. Forests sequester CO₂ by photosynthesis, and Bahamian forests include pine, coppice (or hardwood), and mangrove forests. The extensive shallow marine areas sequester carbon dioxide through chemical, mechanical and biological processes. An estimated 370 to 739 kg CO₂ per year is sequestered over a 277 km² area of shallow marine banks around Abaco. This equates to a carbon sequestration of some 121,968 to 243,930 Gigagrams (Gg) of CO₂ over the entire shallow water banks of The Bahamas (*First National Communication on Climate Change*).

2.5.2 Soils

Very little of the total area of The Bahamas is land (some 5.4%) therefore, there are competing demands for the limited land resources, including urban use, agriculture, forestry, tourism and conservation.

Bahamian soils are thin, coarse-textured and fragile, and quickly become exhausted. Various attempts at commercial agriculture have been tried, and some have had some success. Land use has changed dramatically on New Providence over the past thirty (30) years with the building of several large resort hotels, and large tracts of land have been cleared for housing, business complexes and roads. A great deal of land clearing and construction has also taken place on Grand Bahama Island. The forest



Photo taken by Fred Bernard

resources of The Bahamas comprise pine forest, coppice forests and mangrove forests, with approximately 80% of forest resources on state land (Crown land). Pine forests are considered the most productive of the three forest types, and pine is now a protected species. Coppice (hardwood) forests are found in the central and southern Bahamas [*First National Communication on Climate Change*].

The key issues and concerns related to soil in The Bahamas include:

- the use of arable land for infrastructure development including roads, resorts, housing, etc.;
- pollution associated with chemical spills from industrial facilities;
- indiscriminate dumping of solid wastes, including derelict vehicles, on undeveloped lands; and
- leachate contamination from improperly designed landfills/waste dumps and septic systems.



Photo taken by BEST

2.5.3 Freshwater Resources

Rainfall is the only source of freshwater in The Bahamas. Throughout the islands, the average annual rainfall varies from about 34 inches (in)/865 millimetres (mm) to about 58 in (1470 mm). There is a distinct northwest to southeast gradient to decreasing rainfall (*First National Communication on Climate Change*). There are no rivers or major freshwater lakes in the country. As rainwater seeps through the soluble limestone rock, it comes to rest on top of the

denser seawater, where it forms lenses of freshwater throughout the islands. There is generally an intervening brackish layer between the two, and freshwater can be discharged along the shoreline during periods of heavy rain.

Wetlands

The amount of rainfall received and the size of each island ultimately determines the volume of its freshwater resources. Andros accumulates the largest quantities of freshwater, but Grand Bahama Island and Abaco also have large reserves. Thousands of gallons of water are pumped from the lenses on these islands and shipped to New Providence daily. In many places, this freshwater forms wetlands and small pools at the surface, and seasonal ponds exist on all islands. Freshwater wetlands in The Bahamas tend to be small, seasonal and widely scattered.



Photo taken by The Bahamas Ministry of Tourism

Wetlands are components of larger biophysical systems that include bordering (and sometimes more distant) terrestrial and aquatic systems underlying groundwater systems, diverse biotic systems, and complex nutrient cycling and sequestration systems. The functions provided by wetlands often affect or benefit an area beyond the confines of the wetland itself. They help to regulate water levels within watersheds; improve water quality; reduce flood and storm damages; provide important fish and wildlife habitat; and support hunting, fishing and other recreational activities (BEST, www.best.bs/wetlands.htm).

There are several concerns regarding the management of wetlands in The Bahamas. These include:

- There is no recent national inventory of wetlands in The Bahamas. As a result, the necessary information for designation and conservation/protection is unavailable to guide effective decision-making.



Photo taken by BEST

- There is insufficient legislation to protect wetlands, which poses a significant threat to their conservation.
- Many wetlands are in locations that are attractive to development and are thus under threat by activities such as illegal excavation and reclamation.
- There is a general decline in the number of healthy wetland ecosystems in The Bahamas.

Potable Water

Water is also obtained from shallow wells, trenches, pits, freshwater marshes, and rainwater catchments in lesser-developed areas. Distillation and reverse osmosis have become common methods of obtaining freshwater in The Bahamas. Reverse osmosis is cheaper and faster than distillation and is currently used in many industrial sectors. In addition, some Bahamian companies use reverse osmosis to produce thousands of gallons of drinking water a day for the commercial market [*Bahamas Environmental Handbook, p. 27*].

Ninety percent of The Bahamas' freshwater lenses are within five feet of the land surface. The fresh groundwater resource is therefore, fragile and highly vulnerable to contamination and overexploitation. Some of the major natural and anthropogenic related issues and concerns on fresh water resources are described below:

Salt Water Intrusion

Intrusion of salt into fresh water sources due to over-pumping and inundation from storm surges arising from tropical storms and hurricanes.



Photo taken by Philip Welch

Uncontrolled Extraction

The lack of controls on water extraction methods, sites of extraction, and the rates of extraction are endangering the water supply in some areas and hence its availability for domestic and other important uses.

Groundwater Contamination

The close proximity of The Bahamas' groundwater resources to the ground surface makes these ground waters particularly vulnerable to contamination by pollutants released or spilled onto the ground surface or released by underground storage tanks, pipes, lagoons, or other structures. Some of the key threats include:

- sewage (if not properly handled, sewage can contaminate groundwater with dangerous pathogens and/or nitrates);
- leachates leaking from landfill sites;
- industrial wastes such as dry cleaning wastes and photo processing solvents;
- agriculture products (pesticides, fertilizers, fungicides, and herbicides);
- spills or leaks from underground fuel storage tanks;
- hazardous wastes from dumps and spills, and releases of toxic chemicals and oils;
- waste handling from automobile service and repairs (in the past, activities such as the dumping of lead-acid automobile batteries, antifreeze, lubricants, hydraulic fluids, and solvents have caused serious contamination); and
- zinc from the normal wear of automobile tires on the road.

Public Health Concerns

Chemical contamination of freshwater poses a major health risk for humans and the surrounding ecosystems. Microbial contamination of the freshwater also presents risk of disease, including serious and potentially deadly disease outbreaks.



Photo taken by Fred Bernard

Tourism

Tourists use substantially more water than resident Bahamians. With an expanding tourism industry, the availability and distribution of freshwater may present difficulties in the future.

2.5.4 Marine Resources

Marine environments cover the greatest area of The Bahamas and are linked in both the flow of energy and matter through biological and ecological cycles. The marine environment can be classified into four main categories: sea grass beds, coral reefs, pelagic ecosystems and deepwater ecosystems.

Sea Grass Beds

Sea grasses beds, the most common tropical shallow-water environment worldwide, grow in a few inches of water or up to depths of 100 ft (33 m) and more and cover thousands of acres of the Bahama Banks. The grass blades trap sediment by forming a small forest of leaves and

provide food and a refuge for fish, crabs, and other marine life that are critical to sustaining the benefits derived from all aspects of the commercial and recreational fisheries.

Sea grass also stabilizes sediment and traps small particles, helping to maintain the clear waters of The Bahamas. When sea grass beds are destroyed, the water can become more turbid, making the area an unsuitable habitat for many animals and less attractive for use by tourists. Threats to sea grass beds include:



Photo taken by Page Gill

- careless boating practices which cause sea grass beds to be scarred by propellers and allow the sea grasses to be severely eroded in storms;
- long-term anchoring of boats in grass beds can cause erosion and damage to the root system of sea grasses and should be avoided except in emergencies;
- the widespread use of jet skis can result in the destruction of sea grass beds, causing murky water and excessive seaweed on the beach;
- dredging areas of sea grass for channels, marinas and sand, destroys the sea grass and the suspended fine sediments suffocate adjacent sea grass beds and reefs;
- pollution run-off, especially sewage or excess nutrients, can also kill sea grasses, nutrients in sewage can cause algae to overgrow the grass, and smother the grass blades;
- silt from works and undertakings on land;
- direct discharge of contaminants/pollutants from industrial and other human activities; and
- discharges from boats; etc.

Coral Reefs

Coral reefs are the most spectacular of the marine environments of The Bahamas. Every year, thousands of people come to The Bahamas to dive on the reefs, fish on the reefs, or cruise the islands to appreciate the reefs and surrounding environment. Coral reefs are valuable for the protection of ecosystems including:



Photo taken by Sharrah Moss

Production of sand: The sand on beaches consists of pieces of coral, shell and algae that make up the sand grains. Much of this sediment production comes from reefs and their associated fauna.

Tourism: Coral reefs have proven to be important economically as tourist attractions. Visitors enjoy scuba diving and snorkelling amongst colourful fish, marine organisms, and intricate coral structures.

Educational and scientific opportunities: The coral reefs offer humans an opportunity to learn about complex biological processes and serve as a laboratory for scientist.

The coral reefs of The Bahamas are threatened by the following:

- the ‘physical destruction’ of reefs from dredging and development, the creation of navigation channels through reefs, and destructive fishing methods such as bleaching or dynamiting reefs;
- chronic destruction of reef environments occurs from anchor damage that breaks corals, or damage coral heads to the point that the coral is more susceptible to disease or predation;
- over-harvesting marine animals from the reef environment has a primary impact on the population of that animal itself and secondary impact on the reef ecology; and
- changes in water quality as a result of discharges of chemicals, nutrients, sediment can adversely affect coral reefs.

Pelagic Ecosystems

The pelagic zone discussed here is the top 3000 ft (938 m) of water – the epipelagic and midwater zones of the ocean – that support a vast oceanic food. The proximity of this deep water offshore creates exciting sport fishing opportunities and convenient shipping lanes for cargo and cruise ships alike.

The clear, warm pelagic environment of The Bahamas is also attractive to species seeking winter protection such as the great whales and dolphins. Marine pollution, overharvesting by local fishermen and poaching by foreign vessels are some of the major threats to these ecosystems.

Deep Water Ecosystems

The deep sea environments of The Bahamas include the waters at depths greater than 3000 ft (938 m), the deep ocean floors of submarine canyons, and the adjacent deep Atlantic. These deep sea environments hold a variety of fishes and marine life. Even areas as remote as the deep sea environment are threatened by human activity such as deep water disposal of cars, trash and other unwanted material.

2.5.5 Biological Resources (Terrestrial and Aquatic)

Within The Bahamas archipelago a mosaic of natural systems exists, representative of the tropical Americas: coral reefs, mangroves, sea-grass meadows, lagoons and beaches. The coral reefs are rich with fish and marine life. Biologically, The Bahamas can be described as an oligotrophic system because its waters and land are low in nutrients. This tightly associated group of organisms recycle and reuse organic material to produce forests, wetlands, and reefs from near-desert conditions (*Bahamas Environmental Handbook, p.22*).

The natural resources of The Bahamas are limited. More than 80% of the land surface is only a meter or less above mean sea level. The economy is built on tourism and services. Bahamians, like other island peoples, have historically had a close relationship with the land and sea. Until the advent of modern tourism and banking industries, most Bahamians relied on the resources of both land and sea for survival. This is still true in most of the Family Islands, where many of the inhabitants are either fishermen, or farmers, or both. Tourism, the main economic activity in The Bahamas, is largely fueled by the lure of tourists to the natural beauty of the country. Marine biodiversity, in particular, has been an attraction to visitors seeking scenic beauty, recreational fishing, scuba diving, other water sports and fresh seafood (*First National Communication on Climate Change, p.4, Bahamas Environmental Handbook, p.5*).

2.5.5.1 Terrestrial Environment

Very little of the total area of The Bahamas is land. About 40% is shallow water bank easily accessible to man, and the remainder is deep oceanic water and the seabed. Further, more than 80% of the land surface is only about 1.5 m or less above mean sea level. (*Bahamas Environmental Handbook and First National Communication on Climate Change*). As was stated earlier in Section 2.3, high evaporation rates and low rainfall, makes the southern half of The Bahamas semi-arid and water deficient. Even wetter areas such as New Providence, depend on potable water barged in from nearby Adros, and is also supplemented by desalination plants.

There are three major terrestrial vegetation environments in The Bahamas based on vegetation classification: Northern Bahamas pine forests found on Abaco, Andros, and Grand Bahama; Central Bahamas broadleaf hardwood forests, commonly known as coppice, including mahogany and brasiletto found on islands such as Cat Island; and Southern Bahamas drought-resistant woodlands. To a large degree, The Bahamas supports a flora and fauna that are distinct from the rest of the Caribbean.



Photo taken by Fred Bernard

The unique biodiversity of the pine forest includes the ground-nesting Bahama Parrot and the rare Kirtland's Warbler which winters in the Bahamian pine forests. Other wildlife found in pine forests include the quail, Wood dove, White-crowned pigeon, and several hummingbird and duck species.



Photo taken by Fred Bernard

In the Central Bahamas broadleaf hardwood forest, animals are limited to a relatively few small species, including snakes, crabs, lizards, bats and the hutia, a brown, rabbit-sized member of the rodent family. The bird life, both resident and migratory, is abundant (*Bahamas Environmental Handbook p.25*).

The forest ecosystem of The Bahamas provides these important ecological benefits:

- habitat for many animals, including rare and endangered species;
- protection of soil and freshwater resources;
- recreational opportunities like bird-watching, camping and hunting;
- scenic landscapes; and
- a variety of plants used in horticulture and traditional bush medicine.



Photo taken by Fred Bernard

The primary threats to the forest ecosystems of The Bahamas are:

- fires which may be started carelessly or deliberately by humans;

- indiscriminate tree clearing for development destroys natural habitat;
- overexploitation in the past has caused the near-extinction of some tree species; and
- competition from exotic or introduced species like the Casuarina and the Brazilian pepper reduces the abundance of native vegetation and alters important native habitats. (*Bahamas Environment Handbook*)

2.5.5.2 Coastal Environment

Due to its island nature, The Bahamas has an extensive coastline, and few places are far from the sea. Most of the country can be considered coastal, and because of the pattern of settlement and nature of the economy, this is undoubtedly the most important of all Bahamian environments. Coastal environments are best considered according to the two processes usually acting on them, namely erosion and deposition.

Many features of eroding coastlines can be attractive and useful to humans. High cliffs, for example, erode slowly and protect the interior land from flooding. The cliff elevation provides attractive vistas and cooling breezes for residential and tourist development. Within the cliffs, there are caves found at, above, or below sea level. Other scenically attractive landforms, such as stacks, arches, finely sculpted headlands, and other features make the eroding coasts classic tourist attractions.

Deposition along the coast is an ongoing process. The material is mainly sand but can include finer particles such as silt and mud, and larger material such as stones and boulders. The most common areas of deposition are beaches, which may have great length and width. Smaller depositional areas, such as spits, tombolos and sand dunes, are not uncommon. Indeed, sand dunes are universal along the windward coasts of most islands.

The coastal zone includes many diverse and interconnected ecosystems and communities. If one is harmed, it directly affects the other ecosystems to which it is connected. Far ranging species such as seabirds, sea turtle, and marine mammals connect coastal zone ecosystems of The Bahamas with those of other islands in the greater Caribbean and even larger areas. Some of the more important services that coastal zone areas provide to the people of The Bahamas include:

- hurricane resistance/buffer zone;
- tourist attraction;
- educational opportunities; and
- living resources.

Potential threat to the coastal environment include:

- Sand Mining

If sand is removed from either the beach or dunes, its protective value is reduced. Even driving a vehicle over the sand dunes to park destroys the vegetation, which holds the dune together.



Photo taken by Philip Welch

- Infrastructure Development

Building roads, houses, or other structures on the beach or immediately next to it prevent sand dunes from recovering from storm damage, which most beaches can do naturally if left alone. Improper construction near sand dunes causes erosion of the dunes and loss of that protective buffer between the ocean and the inland areas of the islands. Loss of sand dunes can also result in significant changes in the location and extent of beaches that are maintained in part by the presence of the dunes.

- Construction of Penetrating Structures

Beaches are quite vulnerable to onshore and offshore activities, and structures that actually penetrate beaches are even more destructive than structures along the edge of beaches. Such penetrating structures include docks, marinas, groynes and canals, and any structure that interferes with the lateral movement of sand along a beach. Even seawalls intended to protect beaches can actually lead to increased sand loss and enhanced erosion.

The size, complexity and ecological isolation of The Bahamas has important implications for biodiversity. Each specie and life-form in an ecosystem plays a unique but significant role, which contributes to the robustness of the ecosystem. In small island states, such as The Bahamas, maintaining these ecosystem characteristics is a challenge (*BEST – The Commonwealth of The Bahamas National Biodiversity Strategy and Action Plan, June 30, 1999*).

Small islands are much more prone to loss and extinction of species than are large land masses. Removal of one or more components, invariably leads to ecosystem change or even loss. Ecologically diverse environments are more stable and better able to withstand the disturbances of adverse weather, and ultimately climate change. As was stated earlier, the archipelagic nature of The Bahamas makes it especially vulnerable to such environmental stresses (*Bahamas Environmental Handbook, p.11*) and for this reason, maintaining biological diversity is of

paramount importance. In marine ecosystems for example, destruction of coral reefs and sea-grass beds removes food and shelter for many life-forms, and leads to declines in commercial fish populations. Coral reefs and swamps also protect coastal areas from ocean storms and surges, and, swamps also reduce flooding. Mangrove swamps provide nurseries for many fish of commercial importance, as well as for crabs, and provide nesting sites for birds. In terrestrial ecosystems for example, development pressures are a continuing threat to the protected species like the Caribbean Pine, which is unique to The Bahamas.

3.0 LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

This chapter reviews the governance system of the GOB and the existing laws, policies and guidelines, international Conventions and institutions for environmental management in The Bahamas.

3.1 LEGAL FRAMEWORK

3.1.1 System of Governance

The Commonwealth of The Bahamas has over 270 years of uninterrupted Parliamentary Democracy. Prior to its independence in 1973, The Commonwealth of The Bahamas was a British Colony. To this date, The Bahamas remains a member of the Commonwealth and retains the British monarch as its chief of state, represented in the Bahamas by an appointed Governor General. The Bahamas also holds membership in the United Nations and Organization of American States. <http://www.bahamaweb.com/offshore/government.htm>

The 1973 Constitution proclaims The Bahamas a sovereign democratic state; sets requirements for citizenship; guarantees fundamental human rights; establishes the executive, legislative, and judicial branches of government; and creates three civil commissions: the Public Service Commission, the Judicial and Legal Commission, and the Police Service Commission.

<http://countrystudies.us/caribbean-islands/123.htm>



Photo taken by Fred Bernard

The political system is based on the British Westminster parliamentary system. The Parliament comprises the House of Assembly and the Senate. Members of the House are elected directly every five years. The members of the Senate are appointed by the Governor General. The Prime Minister is the head of the Executive Branch of Government and heads a Cabinet of minimum 8 other Ministers, one being the Attorney General.

The Bahamian Judiciary is fully independent from the rest of the government. English Common Law forms the basis of the judiciary system although many Bahamian statutory elements have been added over the years. The Supreme Court is the main court in The Bahamas. Its decisions may be appealed before The Bahamas Court of Appeal. Final appeals may be presented to the Privy Council in London.

Local government in the Family Islands falls administratively under the Department of Local Government of the Ministry of Agriculture and Fisheries, and Local Government. The Family Islands are divided into nineteen districts administered by twenty-three commissioners appointed by the government and supervised from Nassau. Several of the larger islands with relatively greater populations are split up into several districts. In addition to the commissioners, elected House of Assembly members often deal with local matters, thereby filling the void created by the absence of an elected local government.

<http://countrystudies.us/caribbean-islands/123.htm>.

Under the Constitution, Parliament may make laws for the peace and good government of The Bahamas. Laws are generally enacted by Parliament in the following manner. A Bill is introduced in the House of Assembly, read three times, debated, and, if passed, becomes an Act. The Act is read three times in the Senate and then sent to the Governor General. The Governor General signs the Act, which upon being published in the official journal of the government becomes a law. Bills may officially be introduced in either house of Parliament, except for money bills, which may only be introduced in the House of Assembly, and may be passed with or without amendment, subject to the agreement of both houses.

<http://countrystudies.us/caribbean-islands/123.htm>

3.1.2 Existing Environmental Laws, Regulations, Policies and Guidelines

There are only a few existing environmental laws and regulations in The Bahamas relevant to the implementation of its requirements under the international environmental Conventions. The key laws and regulations and their applicability to the international environmental Conventions covering the thematic areas of the NCSA Project are identified in Table 3.1 and summarized below.

3.1.2.1 Environmental Health Act

The *Environmental Health Act* (1987) provides a general framework for developing environmental regulations in The Bahamas. The *Act* authorizes the DEHS to develop regulations that prevent and control air pollution, soil contamination, and preserve water quality.

i) Wastewater (Effluent) Discharges

Water quality laws and regulations are enforced by the DEHS and the WSC. The draft Environmental Protection (Effluent Limitations) Regulations, 1995 address primarily effluent discharges from sewage and industrial sources. The regulations state that no person shall cause or permit the discharge of any effluent, solid waste or sludge generated from any production or manufacturing process in or on any soil or surface of land without prior written permission of the

DEHS. Effluent discharges include sewage or industrial effluent and exclude storm-water. The limits also apply to discharges to inland waters, including any part of the sea that is within the most seaward (5.5 m or 18 ft) depth contour line offshore from the island. Discharges into coastal waters up to the 5.5 m depth contour are subject to specific effluent discharge limits established by DEHS. The Effluent Limitations Regulations strictly forbid the discharge of any flammable liquids, tar or other related liquids into inland areas or into the marine environment.

Permits must be obtained from the WSC for the installation of groundwater wells, extraction of water for domestic or commercial use, and disposal of sewage. The application process may require a developer to conduct hydrogeological investigations as well as to provide estimates of water requirements for construction, domestic, commercial, and emergency demands. The developer may also be required to include estimates of future water supply needs.

ii) *Air Quality/Atmospheric Emissions*

The draft Environmental Health Air Emissions Regulations are enforced under Section 31 of the *Environmental Health Act*. The Air Emissions Regulations require all projects/developments with associated emissions, depositions, or discharges of any regulated air contaminant to obtain permit approval by the Director of the DEHS prior to initiating discharges to ambient air.

iii) *Soil Contamination*

Soil contaminant levels are governed by regulations promulgated under the *Environmental Health Act*. The DEHS regulates and controls contamination of land and controls the methods for disposal of contaminated soil, and sets acceptable soil contaminant levels. These levels are determined by DEHS on a case-by-case basis, in conjunction with ERMA.

3.1.2.2 *Conservation and Protection of the Physical Landscape of The Bahamas Act*

Eleven tree species in The Bahamas are protected under the *Conservation and Protection of the Physical Landscape of The Bahamas Act* Number 12 of 1997. Harvest or removal of these species associated with any disturbance of landscape and vegetation requires a permit from the Department of Physical Planning. This Act also administers and regulates excavation and mining in coastal areas.

3.1.2.3 *Wild Animals Protection Act and Wild Birds Protection Act*

All wild animals and wild birds (including their eggs) are also protected under the *Wild Animals Protection Act* and *Wild Birds Protection Act* from any taking, capturing, or hunting activities. Written authorization is required for any taking or capturing of any wild animal or bird.

A permit is also required by the Agriculture and Fisheries Department for any potential disturbance of marine resources.

3.1.2.4 Existing Environmental Policies / Guidelines

Interim Environmental Impact Assessment (EIA) Guidelines for Projects Affecting Wetlands

Interim EIA guidelines are intended to be used within the context of the overall EIA process. They provide an approach for assessing the acceptability of a proposed project's impacts on wetland areas. The approach described in these guidelines is largely qualitative and leaves considerable latitude for best engineering practices and ecological judgement. The guidelines recognize that information currently available on the wetland areas of The Bahamas is incomplete. The following basic principles are reflected in the guidelines:

- the conservation of wetlands and their basic ecological functions is essential to the environmental and economic well-being of The Bahamas; and
- wetland management in The Bahamas will embrace the “wise use of wetlands” concept under the Ramsar Convention.

In general terms, the guidelines define wetlands, outline wetland functions and their value, provide criteria for defining acceptable impacts on wetlands, and outline an approach for the assessment of impacts on wetlands.

Acceptability Criteria for Proposed Projects Affecting Natural Areas

Acceptability criteria define the requirements of the GOB for projects located in natural areas. They are interim criteria intended to provide guidance in assessing proposed projects and the proposed siting of projects in areas without land use plans. Proposed projects that fail to meet these criteria are deemed environmentally unacceptable. Criteria are specified for environmental aspects including uniqueness and sensitive natural areas. Sensitive natural areas are defined as mangrove areas, aquifer recharge areas, coral reef areas, freshwater wetlands and steep slope upland areas.

Other Guidelines

The BEST Commission has provided other draft guidelines to assist proponents and other stakeholders in the preparation of environmental impact assessments for aquaculture and mariculture, agriculture and housing developments. While these guidelines are designed to be exhaustive, project proponents are ultimately responsible for ensuring that all environmental issues relevant to their project have been addressed in their EIA.

3.1.3 Existing International Environmental Agreements

Over the past several decades, the GOB has been a Signatory to many international environmental Conventions, Agreements and Protocols. Table 3.2 outlines some of the key Conventions, etc. and provides a brief description of each. The Bahamas signed four Conventions covered by the NCSA and identified in Table 3.2 as follows:

1. Convention on Biodiversity;
2. United Nations Framework Convention on Climate Change;
3. United Nations Convention to Combat Desertification;
4. Convention on Wetlands of International Importance Especially as Waterfowl (Ramsar Convention).

**TABLE 3.1
ENVIRONMENTAL LEGISLATION OF THE COMMONWEALTH OF THE BAHAMAS**

Title	Chapter	Act Title	Year Enacted	Applicability to Project
XX	196	<i>Water and Sewerage Corporation Act</i>	1976	Provides regulatory framework for the management of water resources in the Bahamas.
XXVII	232	<i>Environmental Health Act</i>	1987	Provides the framework for environmental regulations that will ensure compliance for the Project. <i>The Act</i> authorizes the DEHS to develop regulations that prevent and control air pollution, soil contamination, and preserve water quality.
XXVIII	242	<i>Agriculture and Fisheries Act</i>	1964	Agriculture and Fisheries Departments provides guidelines for the development of the area. The Minister of Agriculture and Fisheries may declare areas “protected.”
XXVIII	244	<i>Fisheries Resources (Jurisdiction and Conservation) Act</i>	1977	<i>Fisheries Resources Act</i> provides for conservation of fisheries resources of the Bahamas. Establishes exclusive fisheries zones and regulates harvesting of resources. <i>The Act</i> authorizes protected areas within exclusive fisheries zones, including land adjacent to it. Permission to fish within a zone is required; permission may include conditions necessary to conserve the resource.
XXX	248	<i>Wild Animals (Protection) Act</i>	1968	Prohibits the taking, capturing or hunting of any wild animal without a permit.
XXX	249	<i>Wild Birds Protection Act</i>	1952	Prohibits the taking, capturing or hunting of any wild bird without a permit. Protect birds and eggs during closed season.
XXX	250	<i>Plants Protection Act</i>	1916	Relates to plant disease and controls importation of plants to prevent outbreaks of exotic disease and establishment of unwanted species.
XXXI	260	<i>Conservation and Protection of the Physical Landscape of The Bahamas Act</i>	1997	Protects physical landscape from environmental degradation, flooding and removal of hills; regulates filling of wetlands, drainage basins or ponds; prohibits digging or removing sand from beaches and sand dunes; prevents harvesting or removing protected trees. In order to perform activities that may affect the physical landscape of The Bahamas, permits must be obtained for these activities. The Department of Physical Planning issues the permits and enforces the regulations (“Conservation and Protection of the Physical Landscape of the Bahamas Regulations, 1997).
XLVIII	391	<i>The Bahamas National Trust Act</i>	1959	Directs the Bahamas National Trust to promote permanent preservation of lands, buildings, underwater areas of beauty, and areas of natural interest. <i>The Act</i> also allows the Trust to identify sites for protection, and to administer areas declared protected.

**TABLE 3.2
INTERNATIONAL ENVIRONMENTAL CONVENTIONS, AGREEMENTS AND PROTOCOLS
TO WHICH THE BAHAMAS IS A PARTY**

Conventions/Agreements/Protocols	Objective	Concluded	In Force
Kyoto Protocol to the United Nations Framework Convention on Climate Change	To reduce greenhouse gas emissions by enhancing the national programs of developed countries concerned with this goal and by establishing percentage reduction targets for such countries.	16 March, 1998	(Not yet in force) Signed: 9 April, 1999
Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks	To encourage cooperation between States to ensure conservation and promote the objective of optimum utilization of fisheries resources both within and beyond the exclusive economic zone.	4 December, 1995	11 December, 2001
United Nations Convention to Combat Desertification	To fight desertification and minimize the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.	14 October, 1994	26 December, 1996
United Nations Framework Convention on Climate Change	To achieve stabilization of greenhouse gases at a low level in the atmosphere in order to prevent dangerous anthropogenic interference with the climate system.	9 May, 1992	21 March, 1994
Convention on Biological Diversity	To develop national strategies for the conservation and sustainable use of biological diversity.	5 June, 1992	29 December, 1993
Cartagena Protocol on Biosafety	To protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. It establishes an advance informed agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of such organisms into their territory.	29 January 2000	29 January 2000

TABLE 3.2 (Cont'd)
INTERNATIONAL ENVIRONMENTAL CONVENTIONS, AGREEMENTS AND PROTOCOLS
TO WHICH THE BAHAMAS IS A PARTY

Conventions/Agreements/Protocols	Objective	Concluded	In Force
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	To reduce transboundary movements of wastes consistent with the environmentally sound and efficient management of such wastes; to minimize the amount and toxicity of wastes generated; and to assist Lesser Developed Countries (LDCs) in environmentally sound management of the hazardous and other wastes they generate.	22 March, 1989	5 May, 1992
Montreal Protocol on Substances that Deplete the Ozone Layer, as amended	To protect the ozone layer by control of the production and consumption of the most commercially and environmentally significant ozone-depleting substances.	16 September, 1987	1 January, 1989
Vienna Protocol for the Protection of the Ozone Layer	To protect human health and the environment against the adverse effects resulting from human activities which modify or are likely to modify the ozone layer; and to establish protective control measures.	22 March 1985	22 September, 2001
United Nations Convention on the Law of the Sea (LOS)	To establish a comprehensive new legal regime for the sea and the oceans; to include rules governing environmental standards and enforcement provisions concerning pollution of the marine environment.	10 December, 1982	16 November, 1994
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	To protect certain endangered species from over-exploitation via a system of import/export permits.	3 March, 1973	1 July, 1975
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar)	To restrict the progressive encouragement on and loss of wetlands at present and in the future; to recognize the important ecological functions of wetlands and their economic, cultural, scientific and recreational value.	2 February, 1971	21 December, 1975

3.1.4 New Environmental Laws, Regulations,

The GOB, through BEST, drafted in 2000 a new *Environmental Planning and Protection Act* and various guidelines to enhance the conservation and protection of the environment of The Bahamas consistent with the goal of sustainable development.

3.1.4.1 Environmental Planning and Protection Act

As part of an institutional strengthening project in 2000, ICF Consulting recommended the creation of an entirely new Ministry of Environmental Planning and Protection under the portfolio of a Minister of Environmental Planning and Protection, having the responsibility of ensuring the integrated protection of the environment and ensuring the sustainable development of natural resources. The proposed Ministry would amalgamate the responsibilities of BEST, DEHS, the Department of Physical Planning and the Department of Land and Surveys. A draft Bill was presented to the GOB titled “*A Bill for an Act to Establish The Bahamas Ministry of Environmental Planning and Protection to Provide for Environmental Planning and Protection*”.

The Bill proposed to establish departments of Environmental Planning and Environmental Protection, and an Environmental Advisory Council to respond to request from the Ministry.

The Department of Planning would develop plans for the sustainable management of all land resources of The Bahamas, including both uplands and coastal areas. It would work cooperatively with other agencies such as The Bahamas National Trust, the departments of Agriculture and Fisheries, Water and Sewerage Corporation, etc. to develop plans for park management, surface water management, groundwater management and natural resource management. It would have three divisions:

- Land Use Planning Division with Crown Lands, Upland and Coastal Zone Management sections;
- Water and Wetlands Resource Management Division; and
- Parks Planning and Management Division.

The Department of Environmental Protection will be responsible for environmental emergency preparedness and prevention; environmental education, awareness promotion and outreach; the regulation, review and oversight of the environmental assessment program; issuing of environmental permits; the development of environmental objectives, standards, guidelines and regulations; environmental monitoring, etc. It would have the following divisions:

- Environmental Impact Assessment Division;
- Environmental Policy and Standards Division;
- Environmental Monitoring and Enforcement Division;
- Environmental Monitoring and Enforcement Division;
- Information Management Division;
- Division For International Environmental Agreements;
- Environmental Education, Awareness, Publicity, and Outreach Division.

The draft Bill was not accepted by the GOB, largely due to the costs involved in creating a new Ministry. As a result, the Bill has been revised to propose a Department of Environmental Planning and Protection. The Department would be smaller, only amalgamating the functions BEST and DEHS. The GOB Cabinet is currently reviewing the revised draft Bill and a decision is expected within months.

3.1.4.2 Environmental Impact Assessment Regulations

The Environmental Impact Assessment Regulations (Draft May 15, 2000) proposed (these are proposed and not promulgated as the Act has yet to be passed by Parliament and receive royal assent) under the *Environmental Planning and Protection Act* of 2002. The Regulations outline the purpose for the environmental impact assessment process, defines the roles, responsibilities and rights of project proponents, the proposed Ministry of Environmental Planning and Protection, and the public and interested parties. The Regulations also categorize projects subject to the EIA process and specifies the steps in the EIA process.

3.1.4.3 Pollution Control and Waste Management Regulations

The Pollution Control and Waste Management Regulations of 2000 were promulgated under the *Environmental Planning and Protection Act of 2000*. Part 2 of the regulations specify prohibitions on releases of certain hazardous wastes, contaminants and pollutants, including crankcase oil from motor vehicles, or vessels, battery acid, chlorine, ozone depleting substances and hazardous wastes. Part 3 establishes the ambient water quality and air quality criteria for The Bahamas. Permitting requirements for water quality and air quality discharges are specified in Part 4. Part 4 also stipulates that a Hazardous Waste Management Permit and Identification Number are required for the generation, transfer, acceptance, transport, import, export and operation of a hazardous waste storage treatment and disposal facility. Packaging and labelling standards are stipulated in Part 5, and Part 6 specify requirements for movement documents. Part 7 stipulates standards for storage, treatment and disposal facilities for solid and hazardous wastes, including monitoring, operating and closure/post closure care.

3.2 INSTITUTIONS

Responsibilities for environmental management, including resource management, in The Bahamas is shared among a wide range of government ministries, departments, agencies and organizations. These include:

- Office of the Prime Minister;
- Department of Lands and Surveys;
- Ministry of Health:
 - Department of Environmental Health Services (DEHS);
 - Bahamas Environment, Science and Technology Commission (BEST).
- Ministry of Labour and Immigration:
 - Department of Labour.
- Ministry of Public Works and Utilities (MOPW&U):
 - Department of Physical Planning
- Ministry of Agriculture Fisheries, and Local Government (MAF).

- Other Institutions:
 - Water and Sewerage Corporation (WSC);
 - Bahamas Agricultural and Industrial Corporation (BAIC).
- Bahamian Non-Governmental Organizations (NGOs):
 - The Bahamas National Trust.

Further details on the roles and responsibilities of these institutions are outlined in the following sub-sections.

3.2.1 Office of the Prime Minister

The Office of the Prime Minister ensures that the government's economic, environmental and sustainability policies are carried out. A Science Advisor, with responsibilities for environmental matters and an urban planner are also positioned at the Office of the Prime Minister. The Office is responsible for the Constitutional Review Commission and for relations with the BEST Commission, Public Utilities Commission, Bahamas National Trust, and the Department of Lands and Surveys. The Prime Minister also guides GOB's energy policies.

3.2.2 Ministry of Health and the Environment

This Ministry oversees the health care structure of The Bahamas, including environmental conservation in the interest of public health. The Ministry is responsible for regulating, monitoring, and controlling pollution. The Minister of Health administers the DEHS and the BEST Commission.

3.2.2.1 Department of Environmental Health Services (DEHS)

Under the *Environmental Health Act* of 1987, and the Environmental Health Regulations, the DEHS mandate is to promote and protect public health and ensure conservation and maintenance of the environment. From an environmental standpoint, the main role of the DEHS is to regulate, monitor, and control actual and likely contamination and pollution of the environment and establish minimum standards required for a clean, healthy, and pleasing environment. For proposed large projects, the DEHS evaluates the effectiveness of pollution control measures and initiatives to protect the health and safety of workers, and the natural environment. DEHS also issues the necessary effluent discharge and emissions permits. DEHS has created a new entity, the Environment Monitoring and Risk Assessment (ERMA) Division, formerly the Public Analyst, Laboratory attached to the DEHS, which has the responsibility for environmental monitoring.

The DEHS advises the Minister of Health and is advised by the Environmental Health Board, and also enforces environmental laws and regulations.

3.2.2.2 Bahamas Environment, Science and Technology (BEST) Commission

The BEST Commission, formed by a directive from the Chief of State in 1994, has in effect been the country's environmental agency since 1995. BEST has no regulatory powers, but is responsible for developing GOB's environmental and natural resource management policies. As mandated, the BEST Commission is responsible for the administration of the EIA process, overseeing the technical review of EIAs, coordinating the public review of EIAs, and providing advice to Cabinet for consideration in their decision-making process.

BEST is also the lead agency in ensuring that the GOB implements its requirements under the various international Conventions on environmental matters such as biodiversity, climate change, wetlands, land degradation, etc. In this role, BEST establishes committees, drawing on appropriate staff from different government agencies, for promoting actions to implement the specific requirements of the various conventions. To date, committees have been struck on wetlands, climate change and biodiversity. Also, BEST is mandated to secure funding under the Conventions for projects that support their implementation and is the focal point for GEF in The Bahamas.

Working in conjunction with BEST is an Ambassador to the Environment, appointed by the government of the day.

The BEST Commission also collaborates closely with other government agencies with responsibilities for environmental matters such as the Water Resources Unit, Ministry of Agriculture and Fisheries and Department of Meteorology, and The Bahamas National Trust.

3.2.3 Ministry of Labour and Immigration

The Ministry of Labour and Immigration oversees labour relations and occupational health and safety, through the Department of Labour. The Department is the lead agency for regulating occupational health and safety under the *Health and Safety at Work Act* (2002). Through its Inspection Unit, the Department also conducts inspections to insure adequate worker safety and compliance with regulations.

3.2.4 Ministry of Public Works and Utilities (MOPW&U)

The MOPW&U oversees and maintains physical infrastructure and the environment. It is entrusted with the administration of the *Building Control Act (BCA)* and Regulations, sharing responsibility with the Ministry of Health and Environment, and is also entrusted with the preparation of land use plans and physical planning activities. MOPW&U issues water supply franchises to developers in areas where the supply of water is impractical for GOB or its agencies to undertake.

3.2.4.1 Department of Physical Planning

The Department authorizes activities such as dredging, filling, harvesting or removal of protected trees, and any work that will affect coastlines.

3.2.5 Ministry of Agriculture, Fisheries and Local Government

The Ministry of Agriculture (Incorporation) Act, 1993 gives the Minister of Agriculture authority to hold, lease, and dispose of agricultural land. The Department of Agriculture oversees conservation of wild animals, birds, and plants, as well as forest health. The Ministry has the mandate to enforce the *Fisheries Act*, including arrest and seizure powers, authority that is currently shared with the Coast Guard. Under the previous Caribbean Planning for Adaptation to Global Climate Change (CPACC) project, the Department of Fisheries was responsible for coral reef monitoring, and is currently participating in some of the BEST Commission's sub-committees on international environmental Conventions such as wetlands and biodiversity.

3.2.6 Water and Sewerage Corporation (WSC)

The WSC, with its Water Resources Management Unit (WRMU) has responsibility for optimal development of the country's water resources and the control of water quality. It shares (with DEHS) the responsibility for monitoring water quality.

3.2.7 The Bahamas National Trust

The Bahamas National Trust was created by an *Act of Parliament* in 1959. The mandate of the trust is to conserve and protect the natural and historic resources of The Bahamas. The Trust in some ways was the first environmental agency in The Bahamas and continues to work with BEST and others on environmental aspects and is represented on all of the committees struck by BEST to address compliance with international environmental Conventions. The Trust is responsible for establishing and developing the national park system and protected areas, as well as protecting the biodiversity of the country's unique ecosystem.

Table 3.3 lists the key government institutions discussed above and identifies the NCSA thematic area(s) in which they have responsibility. The table shows a fair degree of overlapping responsibilities, an issue discussed later in Chapter 5.

3.2.8 Committees and Working Groups

The BEST Commission has instituted various committees to develop national policies and strategies specific to the various Conventions. At present, committees have been struck on biodiversity, climate change, wetlands and science and technology. The committees comprise representatives from all agencies with mandates affecting these thematic areas, as well as representatives from the public. These committees are completely voluntary and their members generally have full-time jobs while many committee members are very dedicated and contribute significant time and efforts to assigned tasks, others are sometimes unable or unwilling to do so. However much has been accomplished by the committees in spite of this.

Several initiatives have been successfully completed regarding biodiversity including a National Invasive Species Strategy (NISS) and a National Biodiversity Strategy and Action Plan (NBSAP). Activities underway include a National Biosafety Framework (NBF) and National Biosecurity Strategy (NBS). A grant was received under the Ramsar Convention in June 2004 to assist the National Wetlands Committee in preparing a wetlands policy. Thus far, the Committee has held stakeholder consultations throughout most of The Bahamas. The National Climate Change Committee has prepared a draft policy document that is currently in the review stage. A recent workshop on land degradation was convened by BEST.

**TABLE 3.3
INVOLVEMENT OF GOVERNMENT INSTITUTIONS IN THEMATIC AREAS**

Government Institutions	Thematic Areas			
	Biodiversity	Climate Change	Land Degradation	Wetlands
Office of the Prime Minister	✓	✓	✓	✓
Ministry of Health and the Environment	✓	✓	✓	✓
Department of Environmental Health Services	✓	✓	✓	✓
BEST Commission	✓	✓	✓	✓
Ministry of Public Works and Utilities			✓	
Department of Physical Planning	✓		✓	✓
Ministry of Agriculture, Fishing and Local Government	✓	✓		
Water and Sewage Corporation				✓
The Bahamas National Trust	✓		✓	✓

Responsibilities for environmental management, including resource management, in The Bahamas is shared among a wide range of government ministries, departments, agencies and organizations. These include:

- Office of the Prime Minister
 - Department of Lands and Surveys – **B, CC, LD, W**
- Ministry of Health
 - Department of Environmental Health Services (DEHS) –**B,CC, LD, W**
 - Bahamas Environment, Science and Technology Commission (BEST) - **B, CC, LD, W**
- Ministry of Public Works and Utilities (MOPW&U) –
 - Department of Physical Planning - **B, CC, LD, W**
 - Subdivisions – **B, LD, W**
 - Buildings Control – **B, LD, W**
- Ministry of Agriculture, Fisheries, and Local Government (MAF)
 - Department of Agriculture – **B, LD,**
 - Department of Fisheries – **B, CC, W,**
- Water & Sewerage Corporation – **CC, W**
- Bahamian Non-Governmental Organizations (NGOs)
 - The Bahamas National Trust – **B, LD, W**

Thematic Areas:

**B (Biodiversity);
CC (Climate Change);
LD (Land Degradation); and
W (Wetlands).**

4.0 KEY GAPS AND DEFICIENCIES

The NCSA report, prepared under separate cover, details the key capacity deficiencies facing The Bahamas in terms of meeting its requirements under international environmental conventions, and more generally for environment management. These are summarized below for establishing the basis/need for the action plan described later in Chapter 5. The key gaps and deficiencies may be summarized as follows:

- **Legislation (Laws and Regulations):**
 - For the most part, The Bahamas lack the types of laws and regulations necessary to implement the international environmental Conventions to which it is a Signatory.
- **Policies and Guidelines:**
 - Existing guidelines are not officially approved by government and are mainly procedural in nature e.g., EIA guidelines for wetlands.
- **Institutions:**
 - The Bahamas does not have an environment ministry or department with a clear mandate and responsibilities for all aspects of environmental planning and protection;
 - in the absence of a central coordinating agency, there appears to be a degree of jurisdictional conflict and misunderstanding between the various agencies with responsibilities for the environment; and
 - the disaggregation of responsibilities is confusing to both Bahamians and outsiders.
- **Financial Resources:** The lack of financial resources is reflected in the inability of institutions to:
 - provide ongoing training to staff to improve their knowledge, abilities and skills;
 - hire the full complement of staff required;
 - purchase the necessary material requirements such as buildings, offices, vehicles and up-to-date computers; and
 - Undertake long-term planning.
- **Human Resources:** Institutions are hampered by a shortfall in staffing. The shortfall in staffing has resulted in:
 - many institutions utilizing staff in multiple areas, including areas in which they have no formal training; and
 - hindrance in the execution of many important functions, including policy development, monitoring and enforcement.

- ***Family Island Services:***
 - environmental Management functions, including monitoring and enforcement, are highly centralized on New Providence Island;
 - many key institutions do not have resident officers in the Family Islands and as a result, this reduces the quick response capability in the Family Islands; and
 - considerable time and costs are expended for travel to the Family Islands.

- ***Training:***
 - a lack of financial resources at the systemic and institutional levels;
 - permission for involvement in training, in particular international workshops, is most often granted at the ministerial level, and not at the institutional level, where training needs are best assessed;
 - due to understaffing, managers are reluctant to “lose” staff time through training; and
 - a lack of learning plans and a specific environmental management training program.

- The inability to effectively participate in training results in lost opportunities:
 - to improve skills through exposure to new technologies, procedures, research, etc.;
 - for networking with professional peers; and
 - for gaining recognition by sharing expertise through presentation of and participation in training activities both locally and internationally.

- ***Information Management:***
 - there appears to be no mechanism or procedures in place for ensuring that when requested, legitimate information is expeditiously transferred to the institution requesting it;
 - many institutions do not have libraries, or even a system for documenting and filing important information;
 - seems easier for staff with internet access to obtain information from international institutions, than from local institutions; and
 - significant volumes of important information, including reports, datasets, etc. reside in the offices of individuals.

- ***Compliance and Enforcement:*** The following issues were identified:
 - a lack of new and/or updated regulations with “teeth” specifically geared to implement the requirements of the international environmental Conventions;
 - insufficient trained field officers in the areas of investigations and enforcement;
 - insufficient material hardware including vehicles, watercraft, etc. dedicated to compliance and enforcement activities;

- lack of coordination between agencies with shared jurisdiction in areas such as fisheries protection; and
- due to the jurisdictional misunderstandings, the general public often fails to establish contact with the appropriate authority in the crucial first minutes or hours after an offence is deemed to occur.

5.0 ACTION PLAN

This chapter discusses the various components of an action plan that would allow the GOB to address the key capacity difficulties facing The Bahamas and to place the country on the right path towards meeting its commitments under the various international environmental Conventions. The proposed time-frame for implementation of the various actions range from immediate (within six months), short-term (1-3 years), medium-term (3-5 years) and long-term (5+ years) as shown on Table 5.1. Each of these action items are discussed in turn below.

**TABLE 5.1
IMPLEMENTATION TIME-FRAME FOR ACTION ITEMS**

Action Item	Time Frame			
	Immediate	Short-Term (1-3 years)	Medium-Term (3-5 years)	Long-Term (5+ years)
Adopt National Environmental Policy	✓			
New Environmental Legislation	✓			
New Environment Department and Ministry	✓ (for new department)			✓ (for new ministry)
New Governance Structure		✓		
Blueprint for Environmental Management		✓		
Implementation of Blueprint				
- Regulations		✓	✓	✓
- Policies and Guidelines		✓ (thematic areas)	✓	✓
- Institutions	✓ (for new department)			
- Financial Resources		✓	✓	✓
- Human Resources	✓ (for new department)	✓	✓	✓
- Family Island Services		✓	✓	✓
- Training	✓	✓	✓	✓
- Information Management		✓	✓	✓
- Compliance and Enforcement		✓	✓	✓

5.1 ADOPT NATIONAL ENVIRONMENTAL POLICY (NEP)

A draft NEP was prepared by SENES and tabled for discussion as part of the NCSA NEMAP workshop held in Nassau on April 5-6, 2005. A key outcome of the workshop was consensus of the workshop participants that the GOB needed to articulate an over-arching national policy on the environment, in the form of a NEP. The NEP will articulate the vision, goals and objectives (or strategic outcomes) and basic principles of the Government with respect to its commitment for the conservation, protection and enhancement of the environment of The Bahamas. It will also set the context and guidance for establishing environmental laws, policies and programs. The draft NEP was finalized after incorporating the comments of the workshop participants and is appended to this report as Appendix A.

The following key actions were formulated with respect to the NEP that was tabled.

- That the NEP be circulated for broad public consultations. The document should be made available for public comment through a variety of means including the BEST web site, civic organizations, presentations at the College of The Bahamas, newspaper advertisement or supplement.
- That a strict timeline, preferably 45 days, be set for public comment on the NEP.
- After incorporating public comments, the draft NEP should be forwarded to the GOB for approval within six months from the conclusion of the workshop.

5.2 NEW ENVIRONMENTAL LEGISLATION

A high performing environmental regulatory system will enable The Bahamas to ensure that the environment is protected while balancing the interests of business to compete and innovate; meeting the needs of consumers for a wide variety of goods and services; and providing the general public with an opportunity to contribute to a healthy and productive environment. Achieving this balance in our current rapidly changing society and its needs is becoming ever so complex.

It is recommended that the GOB immediately take the necessary steps to approve the draft Bill to create a Department of Environmental Planning and Protection through the passage of a legislative Act. New environmental regulations and policies could then be made pursuant to the Act that focus on the four thematic areas and complement existing regulations and policies.

5.3 NEW ENVIRONMENT DEPARTMENT AND MINISTRY

As part of an institutional strengthening project for BEST, ICF Consulting, in June 2000, submitted a report outlining a preliminary institutional design and budget for a Ministry of Environmental Planning and Protection, amalgamating the responsibilities of DEHS, BEST, the Department of Lands and Surveys and the Department of Physical Planning. The report details the

institutional structure of the Ministry, provides year one and annual workload estimates in terms of person-months for technical and management staff, and preliminary budget including annual salaries, capital acquisitions and allowances.

The initial proposal has been adapted to one that would create a Department of the Environment that is smaller than the Ministry as it does not include the Department of Physical Planning and Land and Surveys. The new proposal has been presented as a Bill to the GOB and is currently awaiting cabinet approval.

It is recommended that the GOB takes the necessary immediate steps to approve the draft Bill to create a Department of Environmental Planning and Protection. This, however, should be considered as a first step toward the ultimate long-term goal of creating a Ministry of the Environmental Planning and Protection. The new Department should have a clear mandate and be the designated lead agency for all aspects of environmental management in The Bahamas, including aspects relating to the implementation of international environmental Conventions. This will eliminate the apparent jurisdictional conflicts that currently exist between BEST, DEHS, etc. An initial step could be to establish agreements (Memoranda of Understanding (MOUs)) among ministries and departments to clarify roles and responsibilities, accountabilities and governance structures.

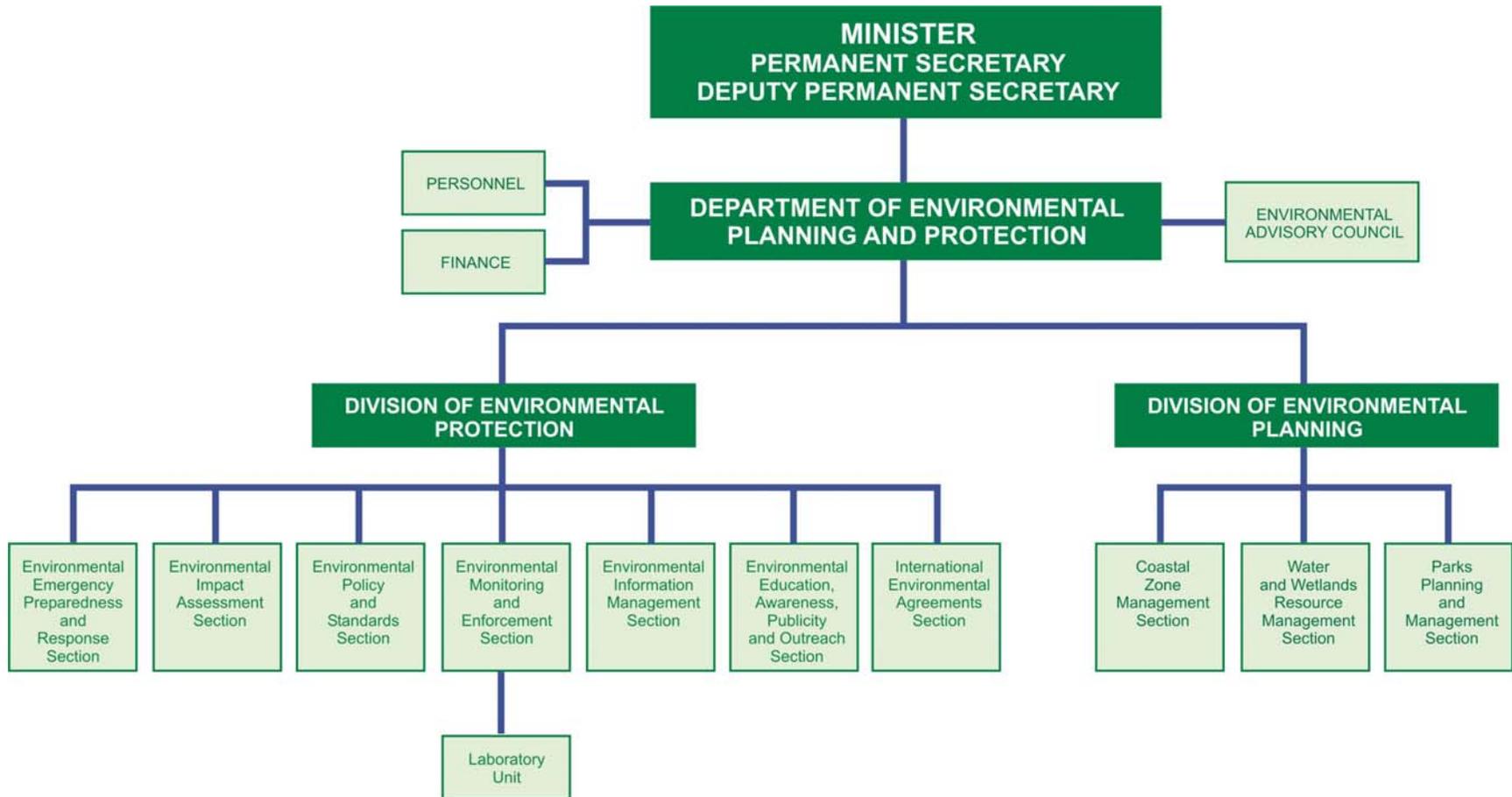
The Department could be structured as shown on Figure 5.1. However, to be effectively functional, the Department needs to be properly funded and staffed as discussed below.

5.4 NEW GOVERNANCE STRUCTURE

It is recommended that a new governance structure for environmental management be established in The Bahamas in the short-term. The new structure would entail the following components:

- A Cabinet Committee on the environment which should include, but not restricted to, the Ministers of Health, Public Works, Education, Agriculture and Fisheries, Trade and Industry, Finance, National Security as well as Ministers responsible for Lands and Surveys, and investments. The Committee should be chaired by the Minister responsible for the environment or a National Environmental Council made up of Cabinet Ministers, using the existing National Economic Council as a model.,
- A national multi-stakeholder committee, possibly made up of Permanent Secretary level employees; and
- Technical thematic subcommittees should be maintained. Technical subcommittees could recommend priorities and send these onward to Cabinet through the relevant Permanent Secretary.

**FIGURE 5.1
DEPARTMENT STRUCTURE**



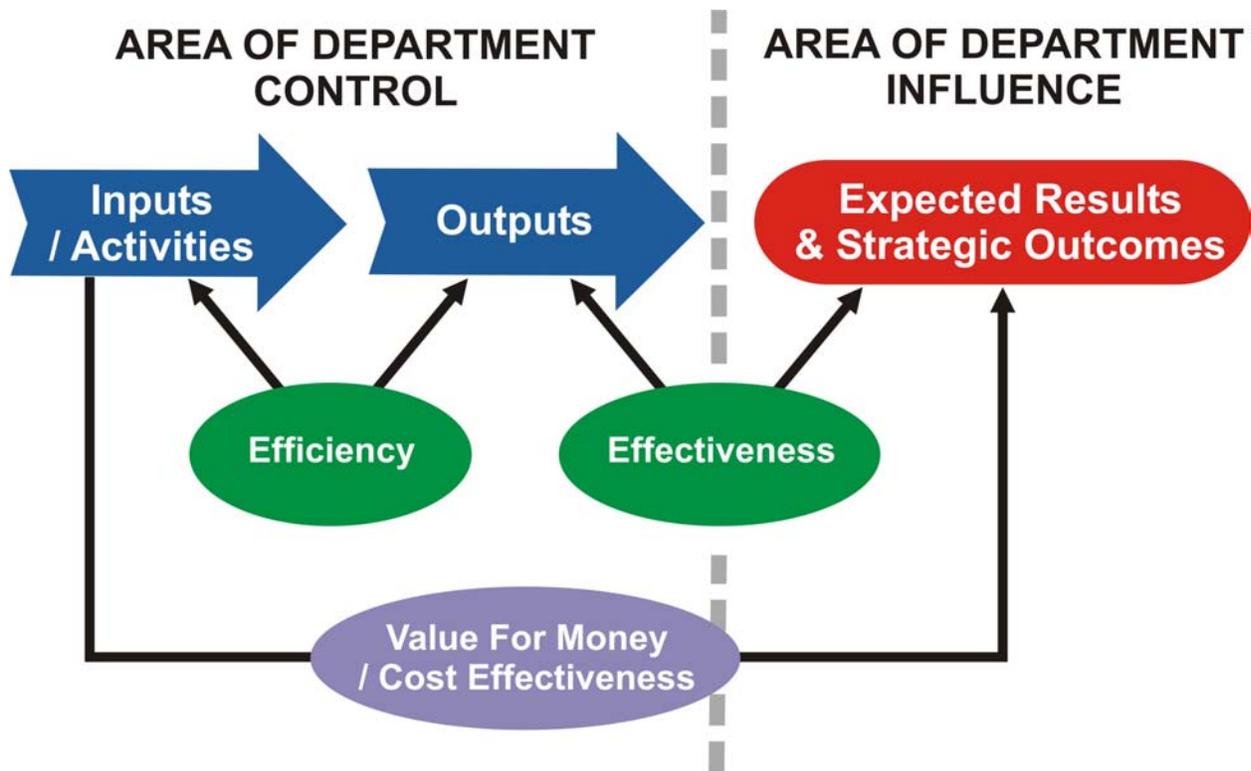
Note that EIA is a planning tool and may best be placed in the division of environmental planning

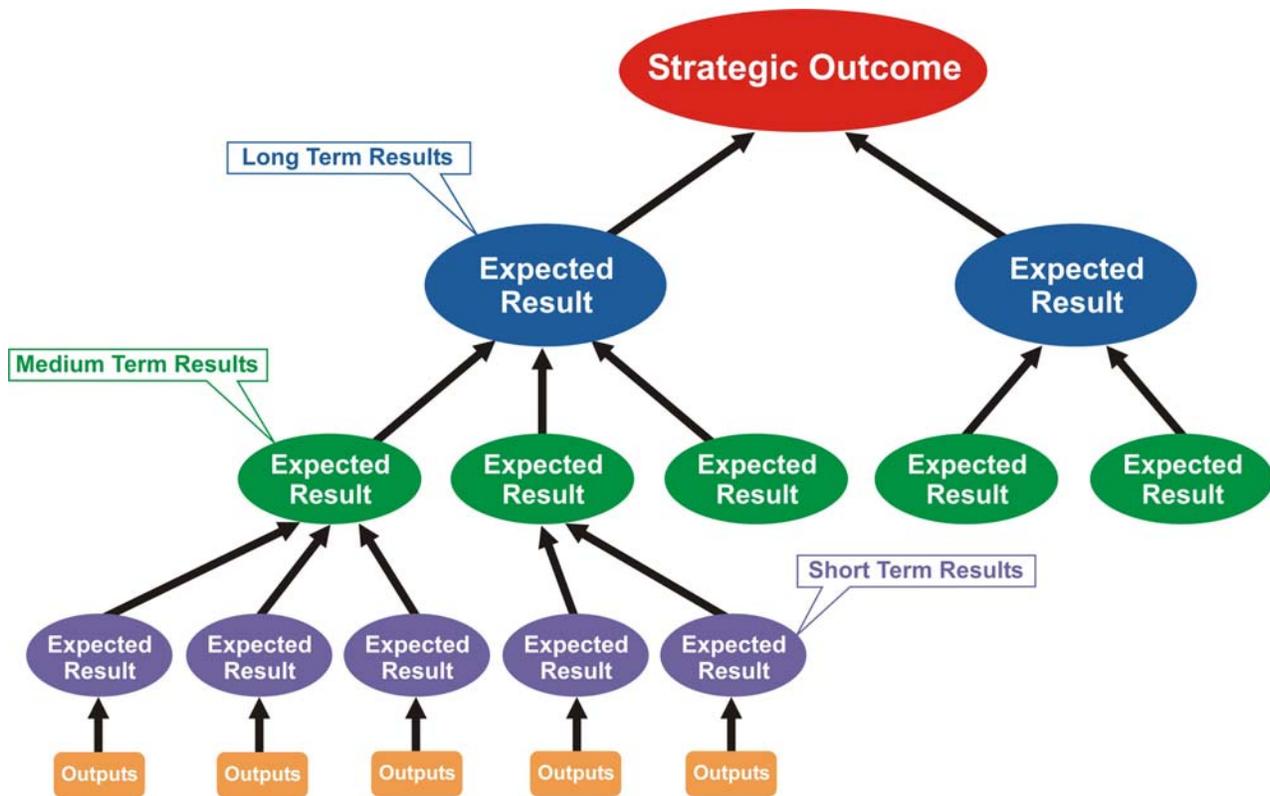
5.5 BLUEPRINT FOR ENVIRONMENTAL MANAGEMENT

A Blueprint for environmental management is proposed for The Bahamas. The proposed blueprint for The Bahamas Environmental Management Programme (BEMP) should provide managers a concise statement or road map to plan, monitor, evaluate and report on the results throughout the lifecycle of the BEMP. The Blueprint includes three core components: (i) Program Profile; (ii) Expected Results; and (iii) Monitoring and Evaluation.

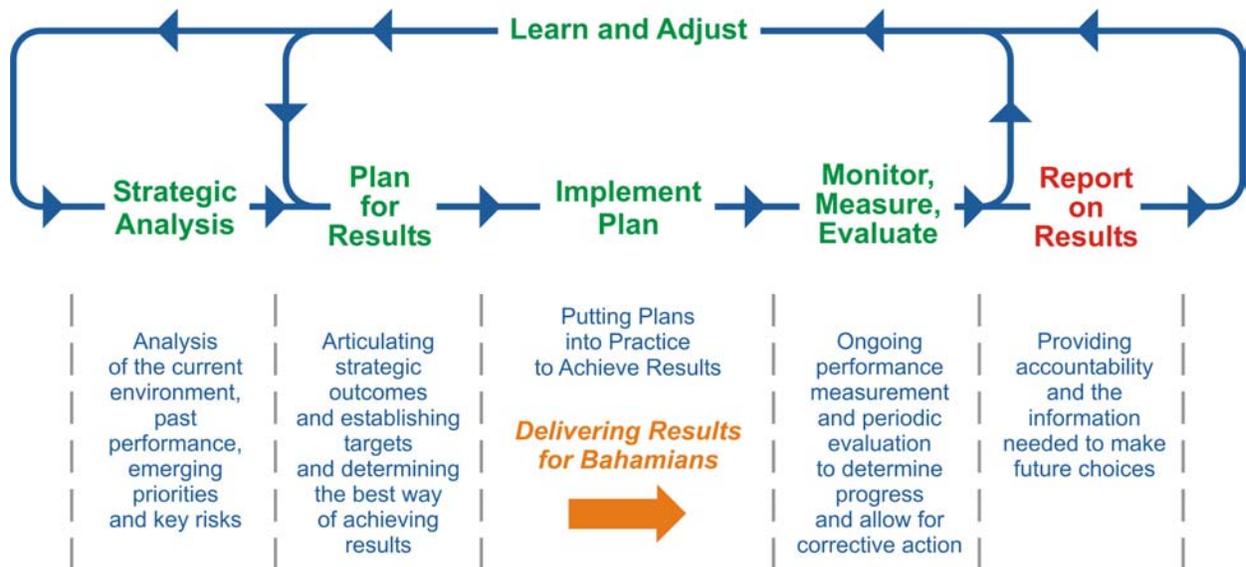
The Program Profile provides a description of the program's origin, beneficiaries and regulated parties, delivery approaches and strategies, resources, governance structure and planned results).

The Expected Results component represents the focal point of the blueprint providing a graphic representation of the causal or logical relationships (i.e. Logic Model) between activities and the outputs and outcomes (i.e. results) that the BEMP is intended to produce, as shown below. A good logic model validates the theory behind the BEMP and represents the first step in developing realistic and relevant performance measurement and evaluation strategies and activities.





The monitoring and evaluation plan represents the government’s strategy to monitor performance and demonstrate results of the BEMP, as shown in the graphic below. The monitoring or performance measurement strategy enables managers to establish the necessary systems and processes to collect and analyze data and information so that the BEMP’s performance can be optimized. Evaluations generate accurate, objective and evidence-based information to help government managers to make sound management decisions, demonstrate success, show ongoing relevance and develop more effective and cost-efficient alternatives to service delivery that provide ongoing benefits to Bahamians.



A draft Blueprint document (formerly called Project Activity Architecture (PAA)) was prepared by SENES and presented at the April 5-6 NEMAP workshop in Nassau. Workshop participants reviewed and provided comments on the document in a break-out session. Based on these comments, the document was revised and is appended to this report as Appendix B. In addition, the following key actions were formulated with respect to the Blueprint:

- The Blueprint be circulated for targeted public consultation with government agencies and technical officers. Consultations should be limited by a strict timeline, preferably 45 days.
- After incorporating public comments, the draft Blueprint should be forwarded to the GOB for approval within the next 1-3 years.

5.6 IMPLEMENTATION OF BLUEPRINT

5.6.1 Regulations

There is a lack of adequate environmental regulations in The Bahamas, and particularly in the four thematic areas of biodiversity, climate change, land degradation and wetlands. Many of the relevant acts are old and require updating. In light of this, some legislation have been updated such as the Wildlife Conservation and Trade Act (2004). Other acts, such as the *Animal Control Welfare and Welfare Act* and the *Plant Protection Act* are undergoing revisions. However, based on the institutional interviews and workshop, and the public consultations, it is determined that regulations are still required in several key areas. Given the large number of regulations to be drafted, a phased approach is proposed for their development using a prioritized list of high, medium and low as shown in Table 5.2.

**TABLE 5.2
PRIORITY LISTING OF REGULATIONS FOR THE BAHAMAS**

Regulations	High Priority	Medium Priority	Low Priority
Chemical management and safety	X		
Occupational health and safety		X	
Biosecurity		X	
Land use and development		X	
Coastal zone management	X		
Wetlands	X		
Water resources management	X		
Use of natural and genetic resources			X
Habitat/Resource conservation and recovery	X		
Energy Industry			X
Site remediation	X		
Noise		X	
Coral reefs	X		
Endangered Species			X
Climate Change	X		

It is recommended that depending on available funding, the high priority regulations be completed first, followed by the medium and then the low priority.

It is proposed that each regulation be drafted primarily by a three-member team consisting of one senior technical expert/specialist, a regulatory expert experienced in drafting regulations and a junior staff member to collect background information and documentation. Table 5.3 estimates the person-days by specialist, and cost for drafting each of the regulations (in \$US).

**TABLE 5.3
COST ESTIMATE FOR DRAFTING EACH REGULATION**

	High Priority	Noise Specialist	Land Use Specialist	Site Remediation Specialist	Hazardous Substances Specialist	Natural Resource Specialist	Water Resources Specialist	Biodiversity Specialist	Occupational Health and Safety Specialist	Mining Specialist	Reg. Specialist	Junior Staff with Various Specializations	Cost Per Regulation \$US (x000)
1	Chemicals Management and Safety				7						8	12	25
2	Coastal Zone Management					6					6	12	20
3	Wetlands					6					5	10	20
4	Water Resources						10				8	8	25
5	Habitat/Resource Conservation and Recovery					6					5	10	15
6	Site Remediation (new)			6							5	12	20
7	Coral Reefs							7			6	12	20
8	Climate Change						5				5	10	15
	Medium Priority												
1	Occupational Health and Safety								8		8	9	20
2	Biosecurity						8				6	12	20
3	Land Use and Development		10			6					8	10	30
4	Noise	7									5	7	15
	Low Priority												
1	Use of Natural and Genetic Resources							6			6	8	15
2	Energy Industry		5								5	8	15
3	Endangered Species							7			8	10	20

5.6.2 New Policies and Guidelines

Policies

To effectively implement its requirements under the international environmental Conventions, The Bahamas needs to formulate national policies and guidelines to guide their implementation.

As was noted earlier, draft policies have been or are being developed for biodiversity, climate change and wetlands. In addition to development of the Bahamas Biodiversity Data Management Plan of 1997, The Bahamas Biodiversity Strategy and Action Plan of 1998, and National Invasive Specific Strategy of 2002, The Bahamas is currently undertaking the development of a National Biosafety Framework (NBF). The objective is to develop a national policy specifically addressing biosafety that will protect the country's environment and biodiversity. Thus, overall, policies on biodiversity are well established.

Similarly, policies on climate change established through the First National Communication on climate change are being further strengthened through the policies currently being developed as part of a National Policy for Adaptation to Climate Change.

The National Wetlands Committee is currently undertaking country-wide consultations to develop a National Wetland Policy under a grant provided by the Ramsar Convention in June 2004.

It is recommended that the National Wetland Policy should at least:

- specify the legal and institutional framework assigning responsibilities for the implementation of the National Wetland Policy;
- identify the wetland resources of The Bahamas;
- outline the GOB commitment to wetland conservation and protection;
- specify a programme for education, public awareness and training;
- specify a management programme for publicly-owned wetlands;
- develop a protected wetlands programme; and
- develop a strategy to encourage research in wetlands conservation.

Of the four thematic areas, policies/programmes on land degradation are the least developed. In fact, The Bahamas does not have a national policy on land degradation. A recent BEST workshop, held November 23-24, 2004, was the first major action taken by The Bahamas to raise awareness to the Convention to Combat Desertification. It is recommended that The Bahamas, through BEST or a new Department of Environmental Planning and Protection, build on the results of the recent workshop to develop an action plan on land degradation. The action plan should at least:

- identify the key local institutions and their responsibilities under the Convention;

- specify a list of activities to be completed by the GOB and government institutions/agencies;
- specify roles for, and avenues for collaboration with non-governmental organizations (NGOs);
- develop a public awareness programme to reach all of inhabited islands of The Bahamas;
- identify and prioritize projects to be undertaken to meet The Bahamas commitments under the Convention;
- identify funding resources both locally and internationally for implementing the projects; and
- develop an appropriate time schedule for completing each of the action items.

Guidelines

As noted earlier, BEST has developed Interim EIA Guidelines for projects Affecting Wetlands, draft guidelines to aid proponents in the preparation of EIAs for agriculture, mariculture, aquaculture and housing development projects, and Acceptability Criteria for Proposed Projects Affecting Natural Areas. It is recommended that all draft guidelines be finalized and formalized as part of the EIA process.

Additional guidelines should be drafted covering extractive processing, energy industries, industrial operations and manufacturing. These additional guidelines are necessary to provide coverage for the full range of activities that are likely to impact on the four thematic areas. It is recommended that the guidelines be drafted according to the priority classification in Table 5.4. The estimated person-days by specialist and costs (in \$US) for preparing each of these guidelines are shown in Table 5.5. Similar to the new regulations, the new guidelines can be drafted by a three member team consisting of one senior technical expert in the area covered by the guideline, an expert experienced in drafting guidelines, and a junior staff member to collect background information and documentation.

**TABLE 5.4
PRIORITY LISTING OF EIA GUIDELINES FOR THE BAHAMAS**

EIA Guidelines	High Priority	Medium Priority	Low Priority
Extractive processing	X		
Energy industries		X	
Industrial Operations			X
Manufacturing			X

**TABLE 5.5
COST ESTIMATE FOR DRAFTING GUIDELINES**

	High Priority	Noise Specialist	Land Use Specialist	Site Remediation Specialist	Hazardous Substances Specialist	Natural Resource Specialist	Water Resources Specialist	Biodiversity Specialist	Occupational Health and Safety Specialist	Mining Specialist	Reg. Specialist	Junior Staff with Various Specializations	Cost Per Regulation \$US
1	Extractive Processing									5	2	15	\$14,650
2	Energy Industries		7		7						2	10	\$18,960
3	Industrial Operations				7						2	10	\$13,010
4	Manufacturing								8	2	2	12	\$16,440

5.6.3 Financial Resources

Stable funding is an essential component of environmental management. Funding for Environmental Management in The Bahamas is currently received from three major sources:

- government;
- outside sources, mainly international institutions such as GEF and UNDP; and
- large development projects.

Government Funding

Government funding for environmental management is dispersed among a wide variety of institutions, departments, agencies including BEST, DEHS, BNT, several ministries etc. The funds are utilized for a broad variety of activities ranging from staffing, purchase of equipment, workshops, environmental monitoring, etc. Due to the fact that the funds are so widely dispersed, it is most difficult to accurately determine the total expenditure on environmental management in The Bahamas. Establishing an environmental Department, with dedicated funding streams, will allow for a more transparent and accurate accounting of financial resources spent on environmental management. It is understood that some other agencies, such as the Ministry of Agriculture, Fisheries and Local Government will have responsibilities for environmental management, and will require funding for that purpose; however, these additional funds can then be more easily added to the majority of the funding that has been consolidated within the single Department.

Based on the costs generated by ICF, it is estimated that the budget for staff remuneration for a fully established Ministry of the Environment will be approximately \$6,231,500, extrapolated to \$5,323,500 for the Department. The recommended staffing for the Ministry was 274. This is extrapolated to about 230 staff for a Department. Additional costs will be incurred for personal emoluments and allowances, rents, communication, utilities, capital acquisitions, etc.

It is recommended that these initial funds be allocated in the short-term to create the new Department of Environment.

Outside Funding Sources

While the funding structure outlined above is designed to cover all aspects of the Department's operations, there will be ongoing opportunities to obtain additional funding under the various international environmental Conventions for specific projects related to their implementation. In the past, funding has been secured through the World Bank, GEF and UNDP. However, funding commitments are needed from the GOB to support these projects in the long-term, particularly

after international funds have been exhausted. Further, as the standard of living in The Bahamas continues to improve, access to such international funding becomes more limited; hence, the need for increased stable funding from the GOB.

Funding from Large Development Projects

In some instances, depending on the complexity of the project, the GOB has negotiated financial agreements with proponents of large industrial projects for the purpose of securing the services of international experts to assist BEST in the review of environmental impact studies and supporting technical documents, Environmental Management Plans (EMPs), and for undertaking public consultation activities, etc. While this type of funding may be significant on a single project basis, these types of agreements are an exception, rather than the rule, and thus does not ensure stable funding.

Taking into consideration the uniqueness of The Bahamas, the fragility of its environment, its limited natural resources and the ever-increasing development pressures, it is recommended that the GOB enact legislation to institute a funding mechanism whereby developers contribute to the costs of environmental management, including review of the EIA documents, environmental monitoring, environmental investigations, etc. The incorporation of a cost-recovery mechanism would provide the GOB, through the Department of Environment, a funding mechanism that is capable of responding to changes in development activity, such as a lengthy public review process. It is recommended that the GOB assess the following models to determine which single model or a combination of models is most suitable to the needs of The Bahamas.

- Model 1 - An environmental levy based on a set percentage, say 1%, of the capital cost of the proposed project. The levy will be applied to all projects requiring an EIA.
- Model 2 - An emission discharge levy on all operating facilities with air and water emissions higher than a stated threshold limit. The levy could be on a per ton basis, beyond the stated threshold.
- Model 3 - An annual environmental charge based on the type and size of commercial and industrial facilities. For example, all hotels with 250 rooms will pay the same annual charge.
- Model 4 - A permit review charge to be applied to all new facilities based on the number of emission sources to be reviewed at the facility as part of the permitting process. For example, there will be a single charge for

reviewing a noise impact study, a separate charge for reviewing studies relating to water discharge sources and separate charges for review of studies on air emissions sources.

5.6.5 Human Resources

As reported earlier, a staffing level of 230 should enable the new Department of Environmental Planning and Protection to meet its obligations. However, additional staff are required within other agencies such as Land and Surveys, BNT, Department of Fisheries that carry out environmental activities and functions supporting the implementation of the Conventions and the NEAP and NEMAP. Any staffing increase or redeployment program should include a strategy to locate permanent staff in all of the major islands, and to deploy other staff geographically such that they can best serve groups of neighbouring islands.

5.6.6 Family Island Services

The major problem affecting Family Island services is the centralization of staffing and other resources in New Providence. While recognizing that the GOB faces special challenges due to the large number of islands to be serviced, and the sparse populations on some of these islands, it is recommended that the number of permanent staff, in particular environmental, fisheries and wildlife protection officers, be increased in the Family Islands. The deployment of staff should be strategic, designed to locate permanent staff on all major islands and other staff to serve groups of islands based on geography. The increased visibility of enforcement officers will help to deter polluters, enable more rapid responses to environmental infractions such as poaching and dumping, and enable the local populations to develop a sense of attachment to the regulatory agencies and their decision-making processes.

Involvement of the Family Island residents is critical for ensuring the conservation and protection of resources. This is especially so with the centralization of functions in New Providence. Over-centralization could result in their alienation from the environmental management process, and a loss of their invaluable knowledge and input on local ecosystems.

5.6.7 Training

It is recommended that stable additional financial resources be made available for training. The assessment of training needs and approval for training should be completed at the institutional level and not at the ministerial level. Immediate managers and supervisors are best placed to assess the training needs of their staff. It is also recommended that learning plans be developed and a competency-based environmental management training program be developed and implemented over about a two-year period. This will include the development of a training module and pilot test. E-learning could be utilized to reduce cost. The estimated cost per

module is between \$US 25,000 – 40,000, thus 6-8 modules will cost about \$US 150,000 – 250,000 per year or \$US 300,000 – 500,000 for two years. An additional \$US 50,000 or so will be required for maintenance and delivery of the training modules.

Targeted training will help staff to:

- improve their skills through exposure to new technologies, procedures research, etc.
- expand networking opportunities with professional peers; and
- gain recognition by sharing expertise through presentations of and participation in training activities both locally and internationally.

5.6.8 Information Management

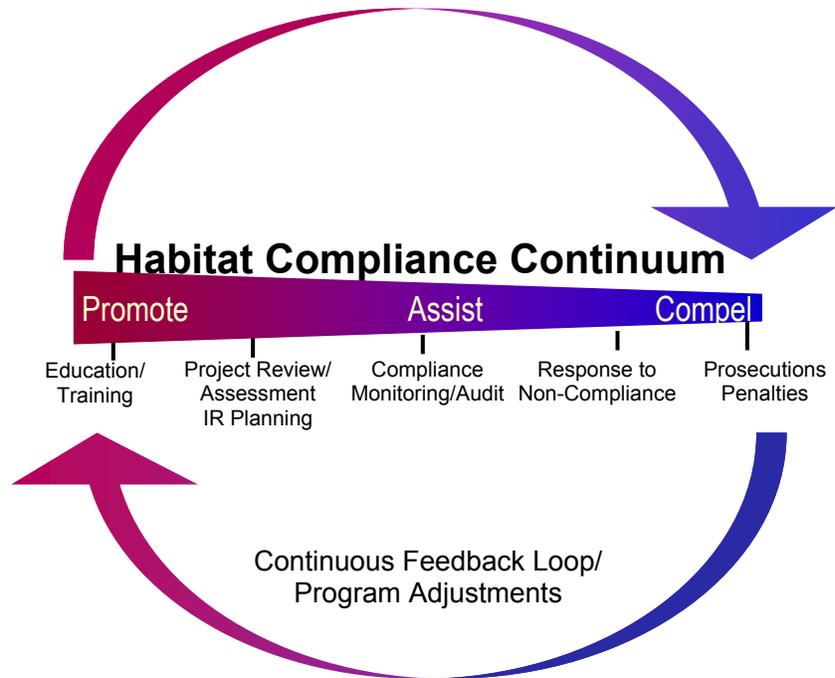
The following recommendations are made to improve information management:

- a formalized mechanism and procedures should be established for ensuring the expeditious transfer of inter-departmental information;
- a library, managed by a trained librarian be established for cataloguing, storing, loaning and managing all data, documents, etc. relevant to all of the agencies under the jurisdiction of the new Department of Environmental Planning and Protection. This library will also be responsible for making relevant information available to the public, researchers and private consultants;
- a relational database should be developed to allow individuals to query data by various attributes such as island name, time period, study type (EAs, scientific research etc.), source, subject types (coral, mangroves, national parks, etc.). Searches can also be designed to use interactive maps based on Geographic Information Systems (GIS); and
- a well defined programme, including timeline, for a phased upgrade of computer hardware and software for staff within the new Department.

5.6.9 Compliance and Enforcement

As discussed earlier, The Bahamas faces several challenges pertaining to environmental compliance and enforcement in general, and specifically, for the four thematic areas. To ensure an effective regime for environmental compliance and enforcement in the four thematic areas, a National Environmental Compliance Model that includes a continuum of tools (education/training, advice, monitoring/auditing, agreements and enforcement) to improve level of compliance should be developed and implemented.

Environmental Compliance Model



The following key elements are recommended:

- **New regulations and guidelines** as per sections 5.5.1 and 5.5.2, covering all aspects relative to the thematic areas with a clear delineation of roles and responsibilities, search and seizure powers, penalties for non-compliance, etc.
- **Incentives for employee and public participation** in enforcement, including instituting “Whistle Blower” legislation with allowances for anonymity.
- **Fines and penalties** should be severe enough to deter potential offenders. Penalties for a first conviction may include a fine not exceeding ten thousand dollars or imprisonment for a term of up to six months, or both. Fines and prison terms should increase with subsequent convictions. In cases involving businesses, liability should extend to both employees and management as was proposed in the draft Bill for *An Act to Establish The Bahamas Ministry of Environmental Planning and Protection and to Provide for Environmental Planning and Protection*.
- **A formal structure for undertaking investigations** of claims and/or charges of non-compliance.
- **Sufficient well trained and properly equipped investigative and enforcement staff** to undertake investigations. Such staff should be strategically located to allow for the most

rapid response throughout the Family Islands. The 2000 draft ICF report recommended a total of 40 staff, 14 of whom would be employed by a Laboratory Section, as part of an Environmental Monitoring and Enforcement Division of a Ministry of Environmental Planning and Protection. This staffing level is still required even with a smaller Department of Environmental Planning and Protection.

- **Adequate funding** to allow investigators to execute their responsibilities expeditiously and effectively including funding for laboratory analyses, travel, computers, vehicles, watercraft, the use of experts, as required. The annual salary for the 40 staff is likely to be in the range of \$977,000 as per the 2000 ICF report. The cost for equipment, travel, supplies, etc. will be additional.
- **Fairness** in the application of the regulations.
- **On-going training** for investigative and enforcement staff in evidentiary matters, including latest techniques in collecting and handling evidence, and presenting evidence in court.

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APPENDIX A

REVISED NEP

**DRAFT
NATIONAL ENVIRONMENTAL POLICY
FOR THE
COMMONWEALTH OF THE BAHAMAS**

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INTRODUCTION

The Bahamas comprises an archipelago of over 700 low-lying islands plus more than 200 cays, islets and rocks, covering approximately 100,000 mi² (260, 000 km²) mostly comprised of the country's Exclusive Economic Zone (EEZ) in the Atlantic Ocean. The total land area is small, approximately 5,380 mi² (13, 934 km²), and only a very small number, approximately 30, of the islands are inhabited. Coastal areas, holding the vast majority of the population and economic activity, are vital to the prosperity of these islands.

The archipelagic nature of The Bahamas creates a unique natural environment. However, The Bahamas natural resources are limited and its size, complexity and ecological isolation have important implications for biodiversity, and human development. With some 80% of The Bahamas landmass within 5 ft (1.5 m) of mean sea level, its fragile coastal ecosystems are extremely vulnerable to the effects of global climate change and sea level rise. In addition, water pollution, land degradation, destruction of wetlands and introduction of invasive species are all issues of growing concern for The Bahamas. Addressing these environmental issues together with growing developmental pressures on the limited land base, declining populations on several of the inhabited islands and the need for a more diversified economy, requires a comprehensive integrated long-term planning and management strategy that is consistent with the goal of sustainable development.

The Government of the Commonwealth of The Bahamas (GOB) recognizes that a healthy and safe environment - reflected in biological diversity and functioning ecosystems, clean water, clean air and productive soils - is essential to the economic and social well-being and health of its citizens and that its citizens influence and are influenced by their environment. It also recognizes that its citizens must live in an environment of a quality that permits a life of dignity and allows the attainment of the highest possible level of health and well-being; and that this can only be achieved if economic and social development is in harmony with ecological principles.

Chapter V of The Bahamas 1973 Constitution grants the Parliament of The Bahamas the authority to make laws and policies with a view to maintaining a safe, productive and healthy environment that will enhance the health and well-being of its citizens and sustain a high quality of life.

Vision

The Government envisions a Bahamas in which all people and institutions treasure its unique natural environment and voluntarily choose to act in a manner that contributes to its conservation, protection and enhancement. We foresee a time when all our people, rich and

poor, young and old, show respect and appreciation for their natural environment, and share in the benefits that maintenance of a healthy, safe and productive environment provides to present and future generations.

Policy Goal and Objectives

The Government of The Bahamas recognizes the fundamental rights of its people to a healthy and safe environment that is essential to sustaining the quality of life to which all its citizens are entitled. The GOB is committed to the sustainable use of the environment and consequently the promotion of economic and social development that fully integrates the environment in a manner consistent with the goal of sustainable development. However, the fundamental rights of the people are accompanied by certain responsibilities –a solemn duty of all who reside in The Bahamas to share in the stewardship of its unique natural environment and resources so that these are sustained and available for the benefits of future generations.

The goal of the GOB is the sustainable use of the environment of The Bahamas to meet the needs of present and future generations.

Government's approach to attaining this goal is to pursue a strategy of sustainable development, meaning improving the quality of human life while living within the carrying capacity of supporting ecosystems. Its specific objectives are to:

- prevent, reduce or eliminate various forms of pollution to ensure adequate protection of the environment and the health of its citizens;
- conserve the biological diversity of the country and the stability, integrity, resilience and productivity of ecosystems; and
- provide for environment to be fully integrated in policies, plans, programs and development project decisions that might be detrimental to the continued health, safety and productivity of the country's environment.

BASIC PRINCIPLES

The Government of The Bahamas' environmental policy will be guided by the following basic principles:

Respect and Care for the Community of Life

An ethic based on respect and care for each other and for nature is the foundation of sustainable development. Development ought not to be at the expense of other groups or future generations, nor significantly threaten the survival of other species. The benefits and costs of resource use

and environmental protection, conservation and enhancement should be shared fairly among different communities, among men, women and children, among people who are poor and those who are affluent and between our generation and those who will come after us.

All life, with soil, water and air, constitutes a great, interdependent system - the ecosystem. Disturbing one component can affect the whole. Our survival depends on the use of other species, but it is a matter of ethics, as well as practicality, that we act as stewards to ensure their survival and safeguard their habitats. Implementation of this principle requires that:

- all sector of society (industry, citizens' groups, non-governmental organizations) incorporate the ethic of stewardship and sustainability into their own policies and practices; and
- people in all walks of life incorporate the ethic of stewardship and sustainability into their personal behaviour and conduct.

Improve the Quality of Human Life

The aim of development is to improve the quality of human life. It should enable people to realize their potential and lead lives of dignity and fulfillment. Economic growth is an essential part of development, but it cannot be a goal in itself.

Development should result in long and healthy human lives, improved education, access to decent housing, adequate nutrition and safe water, political freedom, guaranteed human rights, cultural and religious freedoms, and freedom from violence. Development is only real if it makes our lives better in all these respects.

Conserve the Diversity, Integrity and Productivity of Natural Resources

Development must strive to:

- a) Conserve life-support systems, i.e. the ecological systems that cleanse air and water, regulate water flow, recycle essential elements, create and regenerate soil and enable ecosystems to renew themselves.
- b) Conserve Biodiversity. This includes not only species of plants, animals and other organisms but also the range of genetic stocks within each species, and the variety of different ecosystems, including those in protected areas. This may also include national parks and conservation areas.
- c) Use renewable resources sustainably. These resources include soil, wild and domesticated organisms, forests, agricultural land, and the marine and freshwater ecosystems.

- d) Conserve non-renewable resources. The use of these resources will be optimized to obtain the best possible benefit for all citizens and without impairing the value of other resources.
- e) Utilize alternative technologies. The use of alternative, less harmful technologies for exploiting natural resources.

Keep within the Country's Carrying Capacity

There are finite limits to the carrying capacity of The Bahamas' ecosystems so its renewable resources must be used sustainably. This must be linked to a humane, proactive population policy, which seeks to stabilize the population. We must also recognize the special role of Bahamian youth and that the need for their empowerment is integral to success in attaining sustainable development. In order to keep growth within the nation's carrying capacity, the following are required:

- National physical development and planning policies must address in a realistic way the need to stabilize population growth, reduce poverty, promote equal access to all national services and engender sustainable tourism. An ecological approach to human settlements planning must be implemented in order to make our settlements, towns and cities clean and safe. Strategies and plans must also be introduced to use land and water optimally.
- Resource conservation, waste minimization and recycling must be promoted as a way of life. Economic incentives, environmental taxes and use of environmentally-preferred products and services must become an accepted part of our environmental management strategy.
- Family planning services must be strengthened and linked to improved care and education for mothers and children.

Change Personal Attitudes and Practices

If the ethic for sustainable development is to be widely adopted, people must re-examine their values and alter their behaviour. Information must be widely disseminated through formal and informal education campaigns so that stewardship of the environment and the required actions are widely understood.

Environmental education for children and adults must be integrated in education at all levels. Extension services must also be available to help farmers, fishermen, contractors/builders, artisans, the urban and rural populations and other groups to use natural resources more productively and sustainably.

Empower Communities to care for their own Environments

Local communities, non-governmental organizations and community-based organizations provide the easiest channels for people to express their concerns and take action to create sustainable societies. However, such groups need the power to act. Communities should be given an opportunity to share in managing their local resources and the right to participate in decisions. Local government bodies, communities, businesses, non-governmental and community-based organizations and other interest groups should become partners with the Government of The Bahamas and its agents in decisions about policies, plans, programs and projects that affect them, their environment, and the resources on which they depend.

A national forum for Government, business and the environmental movement to have ongoing dialogue in achieving environmental sustainability will help build confidence by discussion of objectives, processes and practices and the open disclosure of the results of monitoring. It will be adaptive, continually re-directing its course in response to experience and to new needs.

APPENDIX B

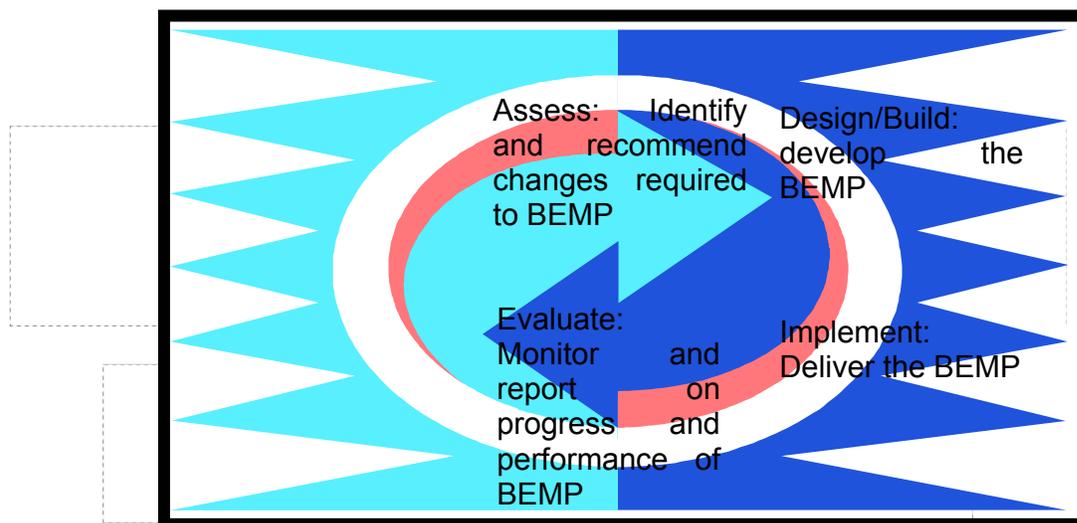
REVISED BLUEPRINT

PROPOSED BLUEPRINT FOR THE BAHAMAS' ENVIRONMENTAL MANAGEMENT PROGRAM

1.0 BACKGROUND

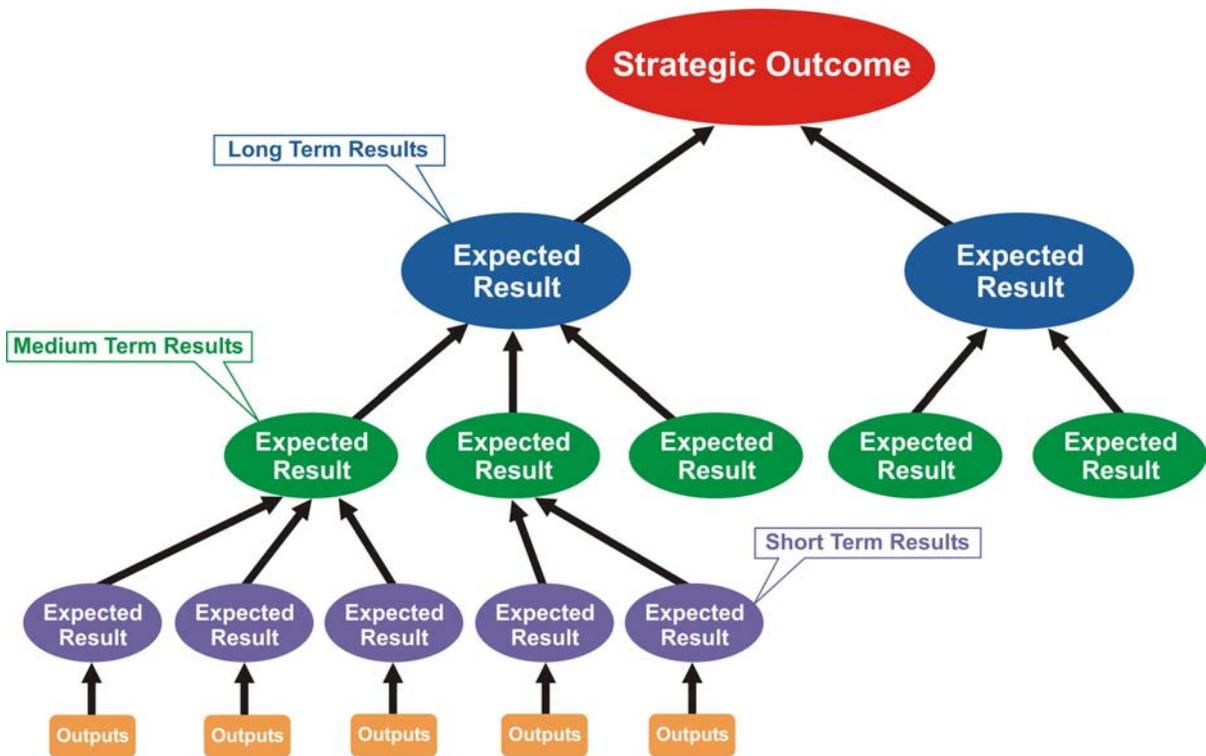
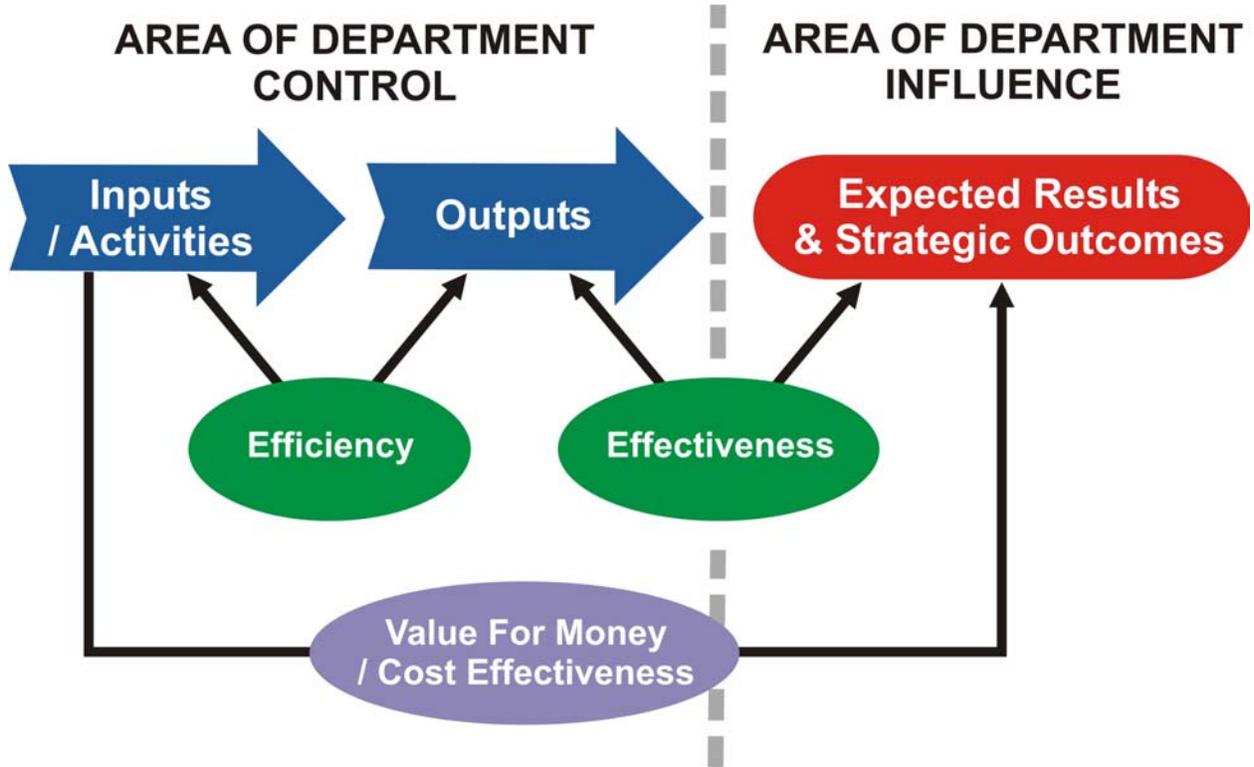
The proposed Blueprint for The Bahamas Environmental Management Program (BEMP) is intended to provide a map to plan, monitor, evaluate and report on the results throughout its lifecycle (design/build/develop, implement, evaluate and assess) as shown in the figure below. The Blueprint includes three core components: (i) Program Profile; (ii) Expected Results; and (iii) Monitoring and Evaluation.

Life Cycle Approach



The Program Profile provides a description of the program's origin, beneficiaries and regulated parties, delivery approaches and strategies, resources, governance structure and planned results

The Expected Results component represents the focal point of the Blueprint providing a graphic representation of the causal or logical relationships (i.e. Logic Model) between activities and the outputs and results that the BEMP is intended to produce as shown below. A good logic model validates the theory behind the BEMP and represents the first step in developing realistic and relevant performance measurement and evaluation plans.



The monitoring and evaluation plan represents the government’s strategy to monitor performance and demonstrate results of the BEMP. The monitoring or performance measurement plan enables managers to establish the necessary systems and processes to collect and analyze data and information so that the BEMP’s performance can be optimized. Evaluations generate accurate, objective and evidence-based information to help government managers to make sound management decisions, demonstrate success, show ongoing relevance and develop more effective and cost-efficient alternatives to service delivery that provide ongoing benefits to Bahamians.

The following presents the logic model (activities; outputs; and results (immediate, intermediate and ultimate or final) for the BEMP; and a table of draft performance indicators to monitor and evaluate the BEMP’s performance in achieving its desired results and contributing to the strategic outcomes outlined in the National Environmental Policy (NEP).

2.0 LOGIC MODEL FOR BEMP

2.1 ACTIVITIES OF THE BEMP

The following proposes key activities of the BEMP where resources should be expended to produce outputs (products and services) that contribute to immediate, intermediate and ultimate results.



2.1.1 Establishing the “Rules of the Game”: Developing the regulatory (regulations) and policy (operational policies, guides, guidelines, codes of practice) basis for environmental management in The Bahamas.

- 2.1.2 Communicating the rules of the game: Communicating information about the rules of the game (educational and training materials) to raise awareness and understanding and to build capacity about the environmental management in the Bahamas.
- 2.1.3 Conducting Regulatory Reviews: Conducting reviews of existing and proposed development projects to assess their impacts on the environment and establish mitigation and compensation measures to reduce, eliminate and offset their adverse effects in accordance with the rules of the game.
- 2.1.4 Compliance and Effectiveness Monitoring and Auditing: Conducting monitoring of existing activities, projects and plans to establish compliance with and effectiveness of regulations, policies and guidelines.
- 2.1.5 Responding to cases of non-compliance: Establishing cases of non-compliance with the rules of the game and taking appropriate actions to enforce the requirements.
- 2.1.6 Conducting scientific studies to establish baseline environmental conditions and improve understanding of the environment and impacts of human activities on its productivity.
- 2.1.7 Reporting on the state of the environment, emerging issues and government priorities.
- 2.1.8 Evaluating the results achieved by the BEMP and developing and implementing strategies and plans to continuously improve its performance.

2.2 OUTPUTS OF THE BEMP

The outputs resulting from the activities of the BEMP in the form of products and services are identified below.

- 2.2.1 Developing regulatory and policy tools for environmental management:
 - (i) Regulations;
 - (ii) National and Operating Policies;
 - (iii) Guides;
 - (iv) Guidelines, Codes of Practice.
- 2.2.2 Communicating information, educational and training materials for all **SECTORS TO** raise awareness and understanding about environmental management:
 - (i) Fact sheets, brochures, slide presentations, training modules,

- (ii) Publications;
 - (iii) Workshops, conferences, seminars
 - (iv) Training courses;
 - (v) Web sites and other forms of mass media.
- 2.2.3 Conducting reviews of existing and proposed development projects to assess their impacts on the environment and establish mitigation and compensation measures to reduce, eliminate and offset their adverse effects
- (i) Reviews of Environmental Impact Assessment Reports (i.e. EIS);
 - (ii) Public consultation meetings;
 - (iii) Follow-up studies;
 - (iv) Environmental Management/Protection Plans.
- 2.2.4 Monitoring and auditing existing activities, projects and plans to establish compliance with environmental requirements and the effectiveness of mitigation and compensation measures:
- (i) Site inspections and audits;
 - (ii) Monitoring and auditing reports.
- 2.2.5 Responding to cases of non-compliance:
- (i) Warnings;
 - (ii) Stop Orders;
 - (iii) Investigations;
 - (iv) Charges;
 - (v) Convictions and orders for remedial measures.
- 2.2.6 Conducting scientific studies to establish environmental quality and improve understanding of the environment and impacts of human activities on its productivity and to guide decision-making:
- (i) Research studies;
 - (ii) Baseline Monitoring studies.
- 2.2.7 Reporting on the state of the environment and emerging issues and priorities:
- (i) Reports on the State of the Environment

2.2.8 Evaluating and reporting on the results achieved by the BEMP and developing and implementing strategies and plans to continuously improve its performance.

- (i) Evaluation reports;
- (ii) Process modernization plans and initiatives.

2.3 RESULTS

The results achieved through the activities of the BEMP are described in three time frames:

- (i) immediate (short-term, i.e. 1-3 years);
- (ii) intermediate (medium-term, i.e. 3-5 years);
- (iii) final (long-term, i.e. beyond 5 years). These results are intended to contribute to Strategic Outcome outlined in The Bahamas National Environmental Policy.

2.3.1 Immediate Results of BEMP

2.3.1.1 Developing regulatory and policy base for environmental management:

- (i) Standards for environmental management established.

2.3.1.2 Communicating information, educational and training materials to raise awareness and understanding about environmental management:

- (i) A public and partners that are aware of the environment, understand the requirements to comply with the environmental laws and policies and support the conservation, protection and enhancement of the environment;
- (ii) Government staff that understand environmental management laws, policies, strategies and tools, inclusive of enforcement agencies;
- (iii) Executive and legislative branches that understand environmental laws, policies, strategies and tools.

2.3.1.3 Conducting reviews of existing and proposed development projects to assess their impacts on the environment and establish mitigation and compensation measures to reduce, eliminate and offset their adverse effects:

- (i) Environmental requirements are integrated in the design of new development proposals and existing developments.

2.3.1.4 Monitoring and auditing existing activities, projects and plans to establish compliance with environmental requirements and the effectiveness of mitigation and compensation measures:

- (i) Compliance with and effectiveness of mitigation and compensation measures are confirmed.

2.3.1.5 Responding to cases of non-compliance:

- (i) Non-compliance is dealt with.

2.3.1.6 Conducting scientific studies to establish environmental quality and improve understanding of the environment and impacts of human activities on its productivity:

- (i) Environmental quality is established and environmental knowledge is improved.

2.3.1.7 Reporting on the state of the environment, emerging issues and government priorities:

- (i) The public is aware of the state of the environment and emerging issues and priorities.

2.3.1.8 Evaluating the results achieved by the BEMP and developing and implementing strategies and plans to continuously improve its performance.

- (i) Environmental processes are improved.

2.4 INTERMEDIATE RESULTS OF BEMP

- (i) Environmental impacts of activities, projects and plans are eliminated or reduced; and
- (ii) Losses to environmental assets are offset.

2.5 Ultimate Results of BEMP

- (i) Healthy and productive ecosystems that sustain social and economic benefits for existing and future generations.

3.0 PERFORMANCE INDICATORS FOR BEMP

Performance indicators represent a particular value or characteristic (quantitative or qualitative) designed to measure input, output (services and products), result, etc. of the Program's activities. The indicators should measure all important aspects of outputs/results and should allow for assessing progress in the short and/or long term. They should be easily read and understood; and

they must be valid, reliable over time. For example these should not be “quality of life of X” but “% of X deemed to have a ‘good’ quality life”.

In developing performance indicators consideration should be given to how they are going to be reported. This should include:

- (i) **Data Source:** The source from which the data for performance indicator will be available on a regular basis.
- (ii) **Frequency:** The frequency with which the data for performance indicators will be available e.g. annually.
- (iii) **Actual:** This refers to the last performance indicators data that is available e.g. 50% of Bahamians own their home.
- (iv) **Effective date for Actual:** The date at which the last actual data was collected.
- (v) **Target:** refers to any targets (performance levels) that have been set for outcomes and outputs. Performance information tends to be more robust if actual performance can be compared to targets that have been set earlier in the process. It should be based on some objective or systematic approach, such as benchmarks, studies, analyses of historical data and resources, etc.
- (vi) **Benchmark:** Performance levels achieved by any other organization or jurisdiction that allows a department or ministry to compare its own achievements. Usually considered as best practices.
- (vii) **Date to Achieve Target:** The date that has been set for the achievement of a target (performance level).

The following is an example of a table of potential performance indicators:

Indicators	Sources of Data	Collection Method	Frequency	Responsibility
% of Environmental Impact Assessments (EIAs) completed for development projects	EIA tracking system	Data entry	Ongoing	Government agency
% of EIAs subjected to public review	EIA tracking system	Data entry	Ongoing	Government agency
% of companies with voluntary environmental programmes	Companies	survey	annually	companies
% of government staff that completed mandatory training programme	Government agencies	survey	annually	Government agencies
% of public that are aware of environmental laws and regulations and policies and guidelines	Government agencies	survey	annually	Government agencies