

2010

BARBADOS NATIONAL ASSESSMENT REPORT

of Progress made in addressing Vulnerabilities of SIDS through
Implementation of the Mauritius Strategy for Further
Implementation(MSI) of the Barbados Programme of Action



The Ministry of the Environment, Water
Resources and Drainage
Government of Barbados

2010

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Acronyms

ACCC	Adaptation to Climate Change in the Caribbean Project
APTO	Association of Private Transport Operators
BADMC	Barbados Agricultural Development Management Corporation
BNSI	Barbados National Standards Institute
BPOA	Barbados Programme of Action for the Sustainable Development of Small Island Developing States
BSDP	Barbados Sustainable Development Policy
BSS	Barbados Statistical Service
CAIPO	Corporate Affairs and Intellectual Property Office
CANARI	Caribbean Natural Resources Institute
CARDI	Caribbean Agriculture Research and Development Institute
CARICOM	Caribbean Community
CBOs	Community Based Organisations
CCCCC	Caribbean Community Climate Change Centre
CDEMA	Caribbean Disaster Emergency Management Agency
CDM	Comprehensive Disaster Management Strategy
CEHI	Caribbean Environmental Health Institute
CERMES	Centre for Resource Management and Environmental Studies
CIP	Coastal Infrastructure Programme
CFRAMP	CARICOM Fisheries Resource Assessment & Management Program CFCs Chlorofluorocarbons
CHM	Clearing House Mechanism
CIMH	Caribbean Institute for Meteorology and Hydrology
CITES	Convention on International Trade of endangered Species of Flora and Fauna
COTED	Council for Trade and Economic Development
CPACC	Caribbean Planning for Adaptation to climate Change Project
CPD	Central Purchasing Department
CPDC	Caribbean Policy Development Centre
CRFM	Caribbean Regional fisheries Mechanism
CSME	Caribbean Single Market and Economy
CXC	Caribbean Examination Council
CZMU	Coastal Zone Management Unit
DEMA	Department of Emergency Management
DHUB®	De Heart uh Barbados®
EEC	Environmental Education Committee
EEP	Environmental Education Programme
EEZ	Exclusive Economic Zone
EGS	environmental Goods and Services
EMA	Environmental Management Act
EMLUP	Environmental Management and Land –use Planning for Sustainable Development Project
EPA	Economic Partnership Agreement
EPD	Environmental Protection Department
FMP	Fisheries Management Plan

GEF	Global Environmental Facility
GHG	Greenhouse gas
GIS	Government Information Service
GNP	Gross National Product
GOB	Government of Barbados
GPS	Global Positioning System
ICCAT	International Commission for the Conservation of Atlantic Tunas and Tuna-like Species
ICT	Information and Telecommunications Technology
IADB	Inter American Development Bank
IICA	Inter-American Institute for cooperation on Agriculture
IMO	International Maritime Organisation
ISP	Internet Service Provider
ISWMP	Integrated Solid Waste Management Programme
LBS	Land-based Sources of Marine Pollution
MACC	Mainstreaming Adaptation to Climate Change Project
MARPOL	International Convention for Prevention of Pollution from Ships
MDGs	Millennium Development Goals
MEAs	Multilateral Environmental Agreements
METIC	Ministry of Economic Affairs, Empowerment, Innovation, Trade, Industry and Commerce
MEWD	Ministry of the Environment, Water Resources and Drainage
MH	Ministry of Health
MMA	Marine Management Authority
MPCA	Marine Pollution control Act 1998
MSDS	Material Safety Data Sheet
MSI	Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States
MTW	Ministry of Transport and Works
NBF	National Biosafety Framework
NCC	National Conservation Commission
NCF	National Cultural Foundation
NCSD	National Commission on Sustainable Development
NHD	Natural Heritage Department
NGOs	Non-Governmental Organisations
NIFCA	National Independence Festival for the Creative Arts
NIP	National Implementation Plan
NOAA	National Oceanic and Atmospheric Administration
NOSCP	National Oil Spill contingency Plan
NSCTE	National Sub-Committee on Trade and Environment
OAS	Organisation of American States
ODA	Overseas Development Assistance
ODS	Ozone Depleting Substances
OSR	Oil spill Response
PCB	Pesticide Control Board
PDP	Physical Development Plan
PIF	Project Identification Form

POPs	Persistent Organic Pollutants
PTAs	Parents Teachers Associations
PSV	Public Service Vehicles
RAF	Resource Allocation Fund
RAMCID	Risk Analysis and Monitoring Committee on Industrial Development
RFMO	Regional Fishery Management Organisations
SAICM	Strategic Approach to International Chemicals Management
SCP	Sustainable Consumption and Production
SIDS	Small Island Developing State
SIDS/NET	An information-sharing network for Small Island Developing State
SIDS/TAP	A technical assistance programme for Small Island Developing State in order to promote inter- and intraregional cooperation
SLM	Sustainable Land Management
SSA	Sanitation Services Authority
SWPU	Solid Waste Project Unit
TCDPO	Town and Country Development Planning Office
TOR	Terms of Reference
TVET	Technical and Vocational Education and Training
UNCSD	United Nations Commission on Sustainable Development
UNDESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistical Department
UWI	University of the West Indies
VCA	Vulnerability Country Assessment and Tourism Strategy
WIPO	World Intellectual Property Organisation
WHO	World Health Organisation
ZSEC	Zone of Special Environmental Control

Preamble

In 1994 the Government of Barbados hosted the Global Conference on the Sustainable Development of Small Island Developing States, which gave birth to the Barbados Programme of Action-the internationally recognized blueprint for the Sustainable Development of Small Island Developing States. As we commence preparations for the review of progress made with implementing this Programme it is useful to look back and re-focus on some of the reasons for seeking a special voice for Small Island Developing States (SIDS) in the international negotiating arena.

It is a well known fact that islands and their surrounding waters cover one-sixth of the world's surface and provide habitat for more than half of the Earth's diversity of marine plants and animals. Islands support a high ratio of endemic species which are plants and animals found no place else on Earth. Islands and their coastal areas are also the critical source of food, jobs and income for more than 500 million people who live on more than 100,000 islands around the globe. Many traditional and unique island cultures have flourished in much the same way as the endemic species. Protecting islands' natural resources and culture is therefore as vital as is finding economic stability. For an island, conservation goes hand-in hand with sustainable economic development, a delicate balance where both humans and habitats can prosper.

Islands though small in size have had a tremendous impact on the world's development- be it economically, scientifically, artistically, and culturally and their role in development should be acknowledged and lauded.

For centuries islands have been associated with heroic journeys and sojourns resulting in renewal and transformation, if one thinks of Daniel Defoe's Robinson Crusoe, the journey of Odysseus and Shakespeare's Tempest as examples. Islands have been viewed as sites of rites of passage-a role they continue to play today which many islands in this region capitalize on in the form of tourism.

If we examine our history, many islands and associated mainlands form interdependent parts of a larger world. Historically, mainlands have shaped islands while islands have affected the course of continental history as is evidenced by the region's history with Europe and current evolving relationship with North America. Gillis in 2004 remarked that Islands and islanders rarely had the power or the influence of continents, but they have had a considerable, and generally underappreciated, impact on the destiny of larger landmasses.

With respect to the evolution of modern conservation biology, arguably, the main history of western conservationist responses to environmental degradation developed much further "south", in the complex and destructive relationship between colonial expansion and tropical environments. This relationship brought together European imagination and indigenous environmental knowledge to form the institutional basis of environmentalism during the late eighteenth century. The components of this budding environmentalism took the form of:

- Professionalization of science and particularly natural history;
- Emergence of global networks of botanical and other specialist information flow; and
- The development of detailed perceptions and experiences of the environmental degradation of oceanic islands.

By the beginning of the 1790s a theory referred to as "**desiccationism**" emerged connecting forest destruction to rainfall change and regional aridification and to a very specific kind of interest in tree-planting and afforestation. Some historians argue however that in 1483, Columbus, who had witnessed the desiccation that had resulted from deforestation on the Canary Islands, feared that the same might take place in the Caribbean

In the eighteenth century it was strongly felt by colonial powers that if the immediate environmental problems caused by "**desiccationism**" were not addressed; social and economic disaster might ensue. Therefore by the end of the eighteenth century in St. Vincent, Tobago, St. Helena and Mauritius environmental conservation measures in the form of limited forest reservation, timber licensing and tree planting programmes were in place. In the four island colonies environmental regulation was based on systematically-formulated and theory-based fears of climate or precipitational change.

Added to this, between 1600 and 1800 soil erosion became particularly acute on the Caribbean plantation islands. These phenomena were so serious that local conservationist responses soon developed in the form of limited legislative attempts to irrigate land, prevent deforestation and carry out planting programmes. The body of knowledge around soil erosion was not as extensive as it was for "desiccationism" and until the end of the seventeenth century the colonies were considered to possess limitless resources. Today the region is still dealing with the legacy of the environmental effects of plantation agriculture.

Finally it is fitting to mention Charles Darwin whose theory of evolution by natural selection, now the unifying theory of the life sciences, was formulated from his observations of natural history of the Cape de Verde and other islands of the Atlantic, the South American coasts and adjacent islands (including the Galapagos), as well as Tahiti, New Zealand, Australia, Tasmania and Azores.

Given the role islands play in the physical and economic arena, it is critical that the special vulnerabilities of islands whether economic, environmental or social continue to be highlighted at the international level. It is therefore appropriate at this time to recall the following key points made by His Excellency Sir Lloyd Erskine Sandiford former Prime Minister of Barbados at the opening of the SIDS Conference in 1994 which remain relevant today, sixteen years after the hosting of that historic summit.

"As we prepare to embark on our substantive discussions, I would urge all of us to be guided by the following simple but fundamental guidelines:

- 1. Sustainable development will best be achieved under conditions of peace, not war.*

2. *Sustainable development connotes change: change from the way we abuse renewable and non-renewable resources, but above all change in our attitudes to people, who must be at the centre of our concerns. Where is the conscience of the world? Where is the centre of justice? How can a caring world permit the wide disparities among States that would not be permitted within States?*
3. *We will not even begin to solve the problems of sustainable development in small developing States or other developing states unless there is a greater flow of resources in the form of foreign-direct investment, official development assistance, flows from the international institutions and other flows from the industrialized to the developing world. It is a worrying fact that the gap between rich and poor countries is growing, but should rather be closing.*
4. *There is a need for a new partnership and new efforts at genuine cooperation between small developing States and industrialized countries to effect sustainable development. Now that the resource wasteful East-West ideological conflicts are at an end, a more economically beneficial encounter and a more morally uplifting one between North and South should be seriously embarked upon. The conclusions and decisions arrived at during the dialogue should not be left to languish, but there should be discrete and dedicated mechanisms for implementation.*
5. *Small Island Developing States should collaborate in a deeper manner with one another in a spirit of self-reliance and for mutual support and assistance in dealing with problems of sustainable development.*
6. *Sustainable development in small countries should aim at the full participation in the socio-economic thrust of all social elements, including the poor, disabled and the disadvantaged, as well as women, youth and indigenous people. This is advanced on the grounds not only of social equity but also of the need for small island States to utilize their human resources to the fullest possible extent.*
7. *There can be no sustainable development without sound and healthy lifestyles, good education, poverty alleviation, the creation of wealth leading to greater employment opportunities and good governance.*
8. *Further reforms should be carried out within the United Nations system in order to strengthen its capacity to take speedy decisions, to have ready access to resources and to allocate those resources speedily in areas of sustainable development.”*

Executive Summary

The United Nations General Assembly (GA) Resolution 63/213 (February 2009) reaffirmed the GA decision 62/191 to review the progress made in addressing the vulnerabilities of small island developing states through the implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (MSI). The Resolution stressed ‘that the review should provide the international community with an opportunity to conduct an assessment of the progress made, lessons learnt and constraints encountered in the implementation of the MSI and agree on what needs to be done to further address the vulnerabilities of SIDS’.

The Governments of SIDS recognize that the primary responsibility for the implementation of the MSI lies with themselves and their national and local stakeholders. Barbados’ progress has to be characterized as fair given the prevailing conditions and ongoing global crises. There have been many successes but significant challenges still remain and some work remains to be done in some critical areas.

Sixteen years after the Global conference for SIDS in Barbados the Jury may still be out. However, Barbados has met and even exceeded many of the targets set by the Millennium Development Goals (MDGs). Barbados has also been able to highlight some of its successes in its annual Commission for Sustainable Development (CSD) reports. Barbados still remains one of the few countries in the Western Hemisphere to develop and implement a national policy for sustainable development. The Barbados Sustainable Development Policy (BSDP) is our National Sustainable Development Strategy (NSDS) which provides a national framework, guidelines and principles that we can employ in our everyday activities. The policy promotes a motto of “Doing the right thing by doing things right!”

Achieving sustainable development entails paying particular attention to reaching that delicate balance between the economic and ecological pillars that delivers social benefits. It also requires that proper natural resource management, including preservation, and practicing a culture of maintenance on our built environment. We have to be careful that the development of sectoral policies, even though they may build that sector, do not erode the gains, potential or real, in other sectors. Proper integrated planning is a prerequisite for sustainable development.

OVERVIEW

Economic Pillar

As was expected in a country that is highly dependent on tourism, the performance of the Barbadian economy was worse in 2009 when compared to 2008, by most indicators. The impact of the economic and financial crisis in industrialized countries showed up in a contraction of real output, a reduction of foreign exchange inflows and an increase in

unemployment. However, the deficit on the current account of the balance of payments narrowed as a result of the fall in oil prices, which reduced import payments substantially. The key to economic stability in Barbados is the maintenance of an adequate level of foreign reserves, and the net international reserves of the Central Bank remained comfortably above the international norm for fixed exchange rate countries.

The projections for the Barbadian economy in 2010 are clouded by uncertainty about the pace and robustness of the recovery in the North American and European markets on which Barbados' tourism and international financial and business sectors depend. However, Government will need to achieve a reduction in the fiscal deficit in order to avoid excessive pressure on the Net International Reserves (NIR), though a reduction will most likely be modest because tax revenues will remain depressed¹.

Trade

Issues regarding access to market and signed economic partnership agreements will have to be assessed. Barbados as well as the SIDS remain active in the World Trade Organization (WTO) Committees and Working Groups and are constantly lobbying for special and differential treatment for small economies.

Access to Development Aid

The flow of both bilateral and multi-lateral aid has to be sped up. Financial instruments need to be more user-friendly and less cumbersome. Government needs to invest in building the capacity to attract and draw down more available finance for development from the international donor community. However we note that Overseas Development Assistance (ODA) went up from a global average of 0.33% of Gross National Product (GNP) in 2002 to nearly 0.6% in 2008. The global minimum target for ODA has been set at 0.7% GNP.

Social Pillar

The quality of life remains relatively high for Barbadians in general however tax payers are under pressure in supporting the economic base and social fabric that delivers these social safety nets. The social partnership dynamics between government, the private sector and labour may also have to be examined and if necessary be reformed.

Education

The Ministry of Education and Human Resource Development (MEHRD) continued to place emphasis on the development of education through curriculum reform initiatives. These included: the Education Sector Enhancement Programme (ESEP); increased access to early childhood education; the national Reading Plan; as well as the domestic programme and other ongoing initiatives in formal education.

In the last year, the number of Barbadians students enrolled in undergraduate, postgraduate and diploma courses increased by 656 or 12.2 per cent over the last year.

¹ Central Bank Report, 2009.

Youth

The Youth Entrepreneurial Scheme (YES) provided development support to young people through the provision of finance and job creation to stimulate the micro and small business sector. YES also planned, organized procured resources coordinated, and accounted for the business solutions which are designed to meet specific needs of the existing and potential entrepreneurs.

Health

During 2008, the Ministry of Health pursued a number of critical reform initiatives contained in the Barbados National Strategic Plan for Health with technical assistance provided by the Pan American Health Organisation (PAHO) and the 9th European Development Fund. These initiatives addressed the management of chronic non-communicable diseases: family health services and strengthening health systems. Additionally, support was secured through a second World Bank Project to strengthen the HIV/AIDS programme. Barbados also continues to demonstrate good indicators for: infant mortality; maternal mortality and life expectancy at birth; access to clean drinking water; immunization coverage; and maintaining a low incidence of communicable diseases.

HIV/AIDS

A new National Strategic Plan for HIV prevention and control for the period 2008 – 2013 was approved in Parliament in May 2008. During 2008, discussions on a second HIV/AIDS World Bank Project were concluded. The project supports the implementation of the National Strategic Plan and the approved behavioural change communication strategy.

Environmental Health Services

In 2008, under the food and Safety Programme, six hundred food handlers were trained in the safe handling and preparation of food and 14 Environmental Health Officers were trained in Hazard Analysis Critical Control (H.A.C.C.P) auditing.

Environment Pillar

The Caribbean region has been categorized as a “Global Hot spot”. Climate change will have a profound impact on the region and creates significant implications for living and lifestyles. The Government of Barbados continued to recognize that in order to fulfil the Millennium Development Goals pertaining to environment, certain global environmental sustainability challenges needed to be overcome. The BPOA, the MSI and Agenda 21 provide an overarching framework and template for achieving environmental sustainability.

Sustainable Consumption and Production

Sustainable consumption and production (SCP) is a cross cutting thematic issues that has severe implications for the country in its efforts to achieve sustainable development. This issue impacts on our way of doing business, our lifestyles and our health. The Secretary General report for the World Summit on Sustainable Development (WSSD), 2002, stated that changing unsustainable patterns of consumption and production was key to achieving sustainable development. This view was reaffirmed by member states at the CSD 17 policy

session in May, 2009. Barbados has to develop and implement a specific national SCP framework that will allow for the monitoring and review of its SCP initiatives.

Water Resource Management

Barbados is the 15th most water scarce country and the water delivery infrastructure is an aging one; however when compared to domestic water producers in the western hemisphere, the Barbados Water Authority (BWA) has done fairly well especially when we recognize that it has been under capitalized for many years. The water authority is pumping at near maximum capacity which puts our ground water aquifers under significant pressure. At present the BWA is being restructured and resources will be made available to execute its programme of work.

Coastal and Marine Resources Protection

The Government of Barbados continues to place high priority on the protection of its vulnerable coastal resources. To this effect the development of a Barbados Beach Management Plan was completed during 2008, funded by the National Conservation Committee (NCC) and the Organisation of American States (OAS), creating clear guidelines for the sustainable management of beach resources to the benefit of stakeholders. The work of the Coastal Zone Management Unit continues to be a best practice in the region employing cutting edge engineering solutions to safeguard against coastal erosion, ensure continuous data collection as it relates to the health of coral reef systems, and ensure sustainable development practices on the coastline through the work of its coastal planning department.

Pollution Management

The Environmental Protection Department (EPD) has executed a number of projects and initiatives over the last two year which covered policy development, monitoring and evaluation. The activities ranged from the revision of the ambient air quality policy to the review of the Standard Operating Procedures for the Department. The department's programme changed from amending the national oil spill contingency plan to the development of guidelines on fuel and waste oil handling, storage and disposal practices. The department also liaised with other government departments regarding the management of solid waste.

Parks, Protected Areas and Green Spaces

The Natural Heritage Department has facilitated and encourages work to commence the establishment of the National Park and a system of protected areas for the island. This will safeguard the biodiversity of the area including terrestrial and marine ecosystems, habitats and species. It will also protect the distinctive character and appearance of each of the Park's five terrestrial landscape zones, create and support opportunities for sustainable local economic development through rural tourism and promote recreation and tourism within the Park. It is also proposed that the system will respect the special environmental qualities of the areas and where possible provide social and economic benefits for local communities.

1. INTRODUCTION

1.1 PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Location: Barbados is the most easterly of the islands of the Caribbean, located at 13⁰ north, 59⁰ west, approximately 160 kilometres from the nearest landmass, against prevailing winds and currents. The island is 34 km long and 23 km wide with a total land area of approximately 432km², 92km of coastline and an Exclusive Economic Zone (EEZ) of 167, 000km².



Source: Adapted from mediamaps.com

Climate: The Barbadian climate is classified as dry sub-humid with temperatures between 20⁰ and 30⁰ C. There is a distinct dry season from December to May and a wet season from June to November. The average annual rainfall is about 50 inches (1254 mm) in the lower elevations and about 66 inches (1650 mm) in higher elevations. Most locations receive between 56 (1405mm) and 60 (1505mm) inches of rainfall annually. The total annual water resources of Barbados are estimated at 59.0 million cubic metres per year in an average year and approximately 45 million per year in a 1:15 year drought². There is little surface water on the island, with small surface streams found primarily in the Scotland District region of the island. The island is therefore almost completely dependent on groundwater abstracted from the aquifer underlying the island.

² Klohn Crippen, 1997.

Geography: The island is divided into two distinct geologic regions. Eighty-six percent of the island is made up of a karst landscape of deeply fractured and gullied limestone laid down in a series of terraces, deeply incised by numerous gullies and underlain by a complex underground cave system. These gullies and caves constitute the remaining bastions of the island's terrestrial biodiversity. The remaining land area consists of the sedimentary deposits of the Scotland Series. These layers are highly folded and faulted and are very susceptible to erosion. Large-scale land slippage is common in the Scotland District. In spite of the above, the island is relatively flat, with the highest point being Mount Hillaby at 336m (1,104 ft).

The 92 km long Barbados coastline has an interesting diversity of land and seascapes and is a unique and irreplaceable asset. The Atlantic coast faces the trade winds. It is continually exposed to high wave energy and holds the most rugged elements of the coastal landscape. Reef development is minimal offshore but there are extensive areas of limestone pavement dominated by sea fans. In contrast the Caribbean coastline, whilst backed by limestone cliffs, has a very different aspect. The protected bays and shorelines were the preferred sites for trade, commerce and early settlement. Within recent history the sandy beaches, fringing reefs and relatively calm waters have been the focal points for Barbados' important tourism industry. Industrial facilities are also located along or near to parts of this shoreline.

1.2. SOCIO-ECONOMIC CHARACTERISTICS

Population and Population Growth: Barbados has been able to control its rate of population growth through the successful implementation of an island-wide family planning programme for the past five decades. This, coupled with economic development, has also contributed to the attainment of an average rate of growth of 0.3 percent between 1980 and 2008 which has led to a unique situation where the country has a population growth rate comparable with that of most developed countries. Between 1990 and 1999, the average birth rate was 13.03 per thousand, with the average being 13.5 for the period 2000 to 2008. Infant mortality rates average 12.1 per thousand for 1990-1999 and 14 per thousand during the period 2000 to 2008. The overall death rate during the period 1990-1999 averaged 8.04 per thousand and 8.63 per thousand for the period 2000 to 2008.

Barbados' resident population in 2008 was estimated at 275,300³ making it one of the most densely populated countries in the world, with a density of 637 persons per square kilometre.

Economy: The World Bank classifies Barbados as a high-income country, given its Gross National Income (GNI) per capita of US\$12,178 in the year 2007⁴.

In 2008, the Gross Domestic (GDP) for Barbados at factor prices was \$5,675.9 million with the finance, insurance and business sectors, the highest contributors, accounting for 19

³ Barbados Economic and Social Report, 2008.

⁴ UNDATA, 2007.

percent⁵. In 2000, the per capita income was US\$8,050 and has risen to US\$10,400 in 2008 (US\$1=BD\$2.00), while the rate of inflation was 8.6 percent. Total unemployment rate for 2008 was estimated at 8.1 percent with the proportion of unemployed males at 6.9 percent and unemployed females at 9.5 percent. The Central Bank reported that in 2009 inflation fell to 3.1 % while unemployment was estimated at 10%.

Education and Health: The Government of Barbados has consistently placed heavy emphasis on the development of its human capital. The school-age population (5-18) has been on the decline for the past three decades, falling from 97,100 in 1970 to 66,800 by 1990 to approximately 59,800 by 2008 which is characteristic of an aging population and the impact of earlier migration trends. Expenditure in this area is significant - BDS \$485.8 million for 2008/2009 - and is characterized by a very high level of educational attainment. The literacy rate is 97 percent among the over 15 age group of the population.

Barbados continues to place emphasis on primary health care, which is reflected in life expectancy at birth which according to the World Health Organisation (WHO) stands at 72 years for males and 79 years for females.

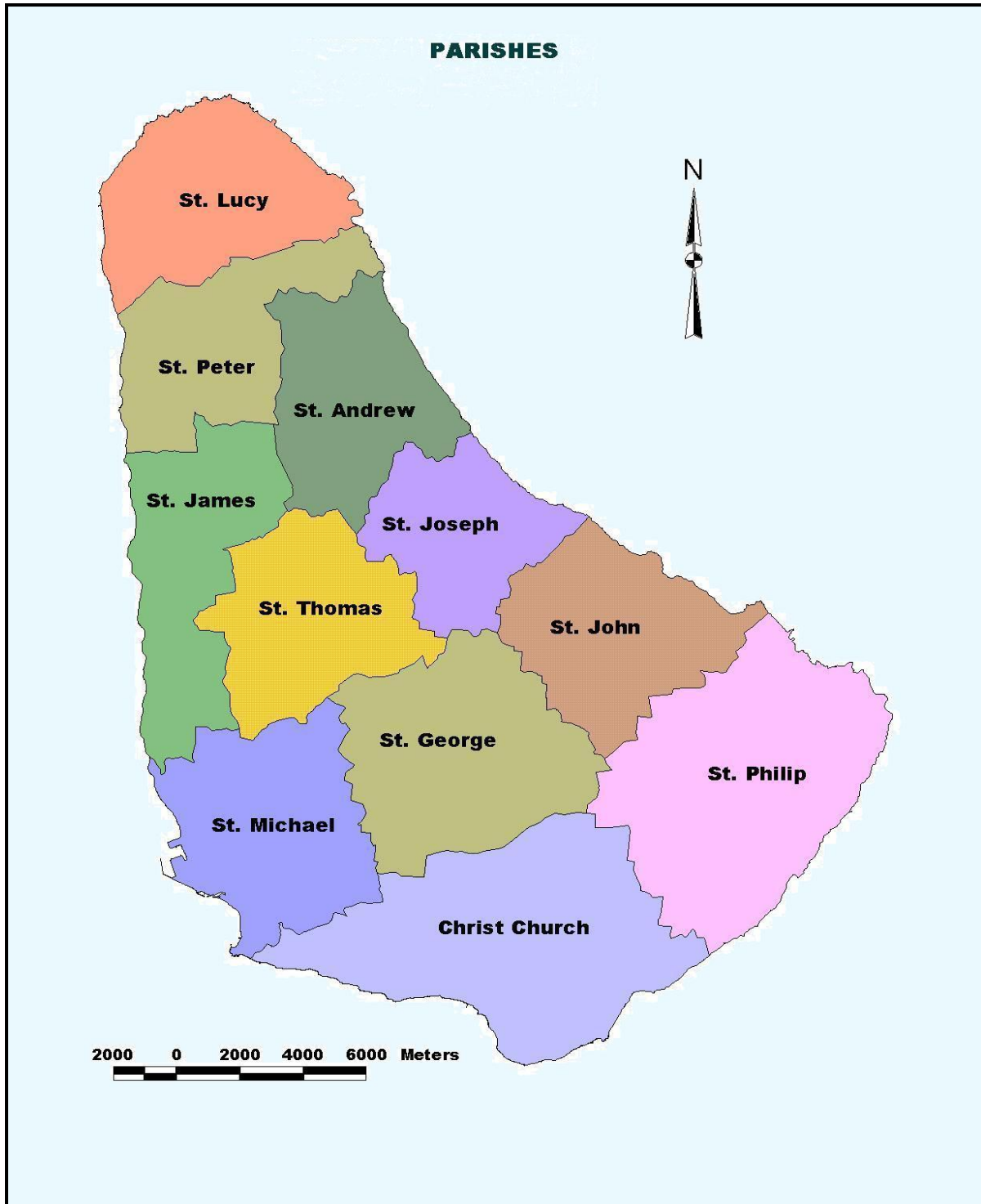
Distribution and Settlement: The majority of the population is settled along the south-east, south and west coasts of the island, predominantly in the coastal areas of the parishes of St. Philip, Christ Church, St. Michael, St. James, and the southern reaches of St. Peter. It is believed that the 'suburbanization' from the Bridgetown area will continue, leading to the gradual increase in densities to the northwest, north and east of Bridgetown, while most other areas will remain relatively constant.

Barbados' socio-economic development has been marked by increased demand for land for urban and suburban development, and declining area under agriculture. The Barbados National Report to Habitat II (1997) presented data suggesting that the percentage of land for residential and business development increased over the period 1966 to 1996, and noted that land previously identified for agricultural purposes had been subdivided for residential and business uses.

The most recent estimate indicates that the total number of dwelling units was 91,406⁶. More than 90 percent of the houses in Barbados have piped water and electricity. Barbados has an extensive and well developed road system of about 1,475 km of paved roads. The main ABC highway, which links the north and south of the island, has recently undergone a multi-million dollar expansion, to cope with the ever-increasing road traffic. It is estimated that there is approximately 116,675 vehicles on the road, 94,496 of which are private cars. The island receives up-to-date telecommunications coverage, with 134,261 fixed lines, 257,596 mobile phones, six major Internet Service Providers (ISPs) and 47,133 internet users.

⁵ *Supra*, fn 3.

⁶ Barbados Statistical Service, 2000 Population and Housing Census Report



Source: The National Natural Resource Data Base

Governance: Barbados has been an independent state since 1966 and practices the parliamentary form of democracy based on the Westminster model. This democratic system is well established and Barbados is generally regarded as one of the most politically stable countries in the world. Legislative power is vested in Parliament, which consists of the House of Assembly, the Senate and the Governor General. Executive power is vested in the Cabinet, which consists of the Prime Minister and the other Ministers of Government.

2. NATIONAL SUSTAINABLE DEVELOPMENT STRATEGY

The task of spearheading progress toward sustainable development in the period immediately following the Global Conference on the Sustainable Development of Small Island Developing States was entrusted to a Cabinet appointed National Commission on Sustainable Development (NCSD). The major task of the NCSD was the production of the Barbados Sustainable Development Policy.

2.1 THE NATIONAL COMMISSION ON SUSTAINABLE DEVELOPMENT

The Cabinet-appointed NCSD was the most visible and successful structure put in place for the co-ordination of national sustainable development. This original Commission, appointed in 1994, comprised 30 members representing Government and all major groups including Non-Governmental Organisations (NGOs), Community-Based Organisations (CBOs), Trade Unions, Women Organisations, the Academic Community and Private Sector entities.

The role of the Commission was to:

1. Advise Government on measures required to integrate environmental and economic considerations into the decision-making process and on global issues of sustainable development;
2. Facilitate national level co-ordination mechanisms on sustainable development;
3. Promote greater understanding and public awareness of cultural, social, economic and policy opportunities to attaining sustainable development in Barbados; and
4. Receive and review the annual report of actions in pursuit of sustainable development, prior to its submission to Cabinet and to the UN Commission on Sustainable Development (UNCSD).

The NCSD became fully formalized in 1996 and established 8 Steering Committees to consult on and provide recommendations on the following cross-sectoral themes of sustainable development:

1. indicators of sustainable development;
2. implementation mechanism, assessing progress made and steps required to go forward;
3. science and technology, assessing research and development of alternative renewable energy sources;
4. natural resources;
5. man-made resources and the built environment;

6. waste management and pollution control;
7. human resource development; and
8. public awareness and education.

The work of these Steering Committees combined with the results of 5 national dialogues held in 1997 on Sustainable Water Management, Energy, Youth and Community, Solid Waste Management and Agriculture were used to draft a Barbados Sustainable Development Policy (BSDP) which identifies strategies for achieving sustainability in various sectors.

The Ministry responsible for the Environment, the Government's policy-making arm for environment and sustainable development issues, facilitated the work of the NCSA by acting as the Secretariat. At present, the next three years of the lifespan of the NCSA is being charted. One of the primary tasks being proposed is the continued education of members of the public and decision-makers alike on the Barbados Sustainable Development Policy, as well as the encouragement of individuals and groups to inculcate the recommendations of the policy into their practices as applicable.

2.2 THE BARBADOS SUSTAINABLE DEVELOPMENT POLICY (BSDP)

The BSDP was approved and made one of the documents of Parliament in 2004 and is used by both decision-makers and citizens to adapt current attitudes and behaviours to reflect the principles of sustainability.

The overarching goal of the Policy is ***“to ensure the optimization of the quality of life for every person by ensuring that economic growth and development does not occur to the detriment of our ecological capital.”*** The major objectives of the Policy were:

1. to formulate a national definition of sustainable development;
2. to provide a national framework for decision-making based on our principles of sustainable development;
3. to promote principles of sustainable development and encourage all persons to adopt and apply these principles in every aspect of decision-making; and
4. to sensitize and educate all persons in Barbados about key issues and conflicts between development and environment and the need to make wise consumption and production choices.

The BSDP is divided into two main parts. The first section of the document centers on the policy aims and objectives, in addition to placing the principles of sustainable development within a Barbadian context.

The second part of the BSDP focuses on presenting an Action Plan. It articulates detailed sector focused policy recommendations supporting sustainable development. These sectors include:

- Fresh Water Resources;
- Transportation;
- Agriculture;
- Terrestrial Biodiversity Including Forestry;
- Fisheries;
- Energy;
- Biotechnology;
- Research and Development;
- The Built Environment;
- Land Resources;
- Natural Resources;
- Education and Training;
- Waste Management;
- Regional Cooperation;
- Concessions and Incentives;
- Human Health, Well Being and Poverty;
- Gender;
- Population;
- Disaster Management;
- Coastal and Marine Preservation;
- Consumption Patterns;
- Implementation and Legislation;
- Indicators for Sustainable Development; and
- Sustainable Tourism Development.

Barbados Sustainable Development Policy website - <http://www.un.org/esa/sustdev/natlinfo/nsds>

2.3 CONSTRAINTS TO IMPLEMENTATION

The constraints experienced with implementing the Barbados Sustainable Development Policy can be summarized as follows:

1. **Capacity:** There is inadequate human, financial and technical resources dedicated to sustained implementation and evaluation activities associated with the BSDP. Particular attention is required in areas such as research, public education, further policy development, lobbying and advocacy and demonstration projects. Additionally, a dedicated staff, comprising administrative and technical personnel, is needed to facilitate the work of the NCSO which is envisaged would have 'ownership' for monitoring implementation of the policy. During its tenure, the NCSO operated as a voluntary entity and without an allocated budget or independent secretariat (this may change in the future), the creation of which would enhance the ability of the NCSO to fully implement and institutionalize the BSDP.

2. **Information for Decision-making:** Sustainable Development and environment data are not readily available. Barbados is working assiduously to develop a coordinated approach to statistics and data collection. Where data is available it exists in differing formats and in different locations, which makes it problematic for decision-makers to get information on a sustained basis and at opportune moments. This scenario also has an added impact on the effectiveness of regulation and enforcement practices.
3. In terms of **enforcement**, there is a lack of legal authority and institutional capacity needed for the implementation and enforcement associated with the BSDP. While a significant amount of legislation exists for the management of natural resources, some of it needs to be updated to reflect current national goals and circumstances. A number of agencies including the Town and Country Development Planning Office, the Environmental Health Inspectorate, the Environmental Protection Department and the Ministry of Agriculture (including the Fisheries Division), play an important regulatory role but there is still room for improvement especially with respect to coordination . Current resource constraints mean that environmental enforcement is not a priority for the Barbados Police Force or other relevant legal entities.
4. The need to **sensitise policy makers** many who still operate on the premise that economic development can only be achieved through increases in economic growth which results in significant funding being allocated primarily to economic development sometimes to the detriment of the proper management of finite natural resources.
5. Although Barbados is a developing country, it has a high standard of living which means its primary economic and social indicators follow those exhibited by developed countries. This brings with it waste management, health and conservation problems which tax the limited resources of finance and physical space needed for adequate management of associated issues.
6. Communicating sustainable development to the general population is a challenge. For effective education, a variety of messages have to be transmitted to a number of different publics in differing formats. The resources required to adequately provide the volume of information required in the appropriate format have been *ad hoc* and information is usually provided in response to various situations. The approach to public education and information require streamlining and coordination and will be bolstered by the requisite information for decision-making.
7. There is inadequate opportunity for timely reviews and evaluation of the planning process.

2.4 BEST PRACTICES ON INTEGRATION

A major advantage of this Policy lies in the fact that it was developed through a highly participatory process and all major sectors and groups were consulted. This ensured that there was a sense of ownership of the Policy outside of the traditional sphere of the environmental practitioners. The reports of eight multi-sectoral and multi-disciplinary

steering committees fed in to the process and the structures which were established and individuals who were involved in the process still work together. Therefore, it could be argued, that a major strength of the BSDP is that the highly participatory process encouraged the formation and maintenance of informal relationships among committee members that enables collaboration and integrated activities to this day.

Additionally the BSDP informed the development of subsequent national policies including the National policy on Science and Technology and ongoing development of a White Paper on Sustainable Tourism. The BSDP is also considered a supporting document of the National Strategic Plan 2006-2025.

Finally, the development of National Indicators of Sustainable Development which accompanied the Policy Development has had the added benefit of building both national and governmental awareness of Sustainable Development issues and the importance of tracking policies and goals. The formation of Indicators networks has helped to integrate all relevant institution and ministries in the process and provided an excellent platform for both administrative and substantive discussions. This platform is currently being utilised to articulate Indicators of the Green Economy for Barbados which will be used to monitor Goal 4 of the National Strategic Plan: “These Fields and Hills’: Building a Green Economy- Strengthening the Physical Infrastructure and Preserving the Environment. A synopsis of the National Strategic Plan can be found at **Appendix 2**.

3. CONCRETE ACTIONS TAKEN AND SPECIFIC PROGRESS MADE IN IMPLEMENTATION

This Chapter focuses on advancements concentrated within the last seven years, demonstrating Barbados' progress in the pursuit of sustainable development. It is recalled that the Barbados Programme of Action (BPOA) was adopted upon the conclusion of the United Nations Global Conference on the Sustainable Development of Small Island Developing States, held in Barbados from April 25th to May 6th 1994. The BPOA called for national, regional and international action in 14 priority areas. These areas were scrutinized in 2005 at the International Meeting to Review the Programme of Action for the Sustainable Development of Small Island Developing States where the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (MSI) was articulated.

This chapter focuses on progress made under specific areas of the MSI where national action was called for. Wherever appropriate, regional and international initiatives are also highlighted.

3.1 CLIMATE CHANGE AND SEA LEVEL RISE

Paragraph 17 of the Mauritius Strategy of Implementation of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States (MSI) calls for ***“Ratification of the Kyoto Protocol”***.

Barbados acceded to the Kyoto Protocol in August 2000

It should also be mentioned at this stage that Barbados has been a party to the Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on the Phasing out of Ozone Depleting Substances (ODS) since October 1992. Refrigerant gases are the main ODS of significance in the national phase out effort with trade in the other ODS being marginal or non-existent. Barbados has met all phase out targets established under the Protocol with a ban on CFC imports for 2010 being effected with an amendment to the Customs (Prohibited and Restricted Imports and Exports) Order, 2010. This Order also provides coverage for all other ODS for which international trade is banned, and establishes the framework for the sequential reduction in Hydro-chloro-fluorocarbon (HCFC) import and export.

Paragraph 19 of the MSI states that ***“As a part of the national sustainable development strategy, develop and implement national adaptation strategies and facilitate regional and interregional cooperation, including within the UNFCCC.”***

While it is recognized that the scope of this report captures the period since the articulation of the MSI, the Government of Barbados (GOB) has realised that the issue of climate change can be a crucial challenge to the nation’s development. This challenge has been met ‘head-on’ via a number of ongoing and targeted investments over a number of years to adapt to and mitigate against, the impacts of climate change.

With respect to mitigation, there are several projects in early inception stage or already on-stream, to increase our carbon storage capacity as well as reduce greenhouse gas emissions. A snapshot of the initiatives is shown in the following two tables. **Table 1** looks at Adaptation projects and programmes while **Table 2** looks at mitigation projects and programmes. For the programmatic areas the figures shown are what was budgeted for the individual departments but does not reflect the final amounts approved by the Ministry of Finance. For the completed projects, the figures shown are estimated final totals.

Table 1: Adaptation Measures to address climate

ACTIVITY	ADAPTATION	
	Value (\$BDS)	Justification
Barbados Water Authority	Proposed \$108 million project approved	Issues of drought and water scarcity are a national issue because of the size of the island, the nature of our underground freshwater reserves, the size of the population (275,300) and economic factors (the tourism industry which is the main foreign exchange earner brings in over 500,000 stay over visitors and 1.2 million cruise ship visitors annually, so it impacts and is impacted by water availability). As such, Government is aiming to improve water resources management via sustainable water and wastewater service provision by the Barbados Water Authority (BWA). Specifically, the BWA will strive to modernize the institutional setting of the water and sanitation sector; improve water production infrastructure and the efficiency of the operations of the BWA by reducing unaccounted-for-water and implementing adequate cost recovery mechanisms. This will advance our efforts with respect to drought preparation and mitigation
Coastal Infrastructure Programme (CIP)	\$40 million to date	One of the major objectives of the CIP is shoreline stabilization and erosion control. This is essential for maintaining the quality of the coastal environment which provides the basis for tourism which drives the country’s economic development. Increased sea level rise and extreme weather events as a result of climate change can have severe impacts on the coasts via increased erosion and/or increased incidences of coastal inundation.
Coastal Zone Management	This is programmatic	The role of the CZMU includes <i>inter alia</i> the development of standards for water quality in coastal and marine areas to effect the maintenance,

<p>Unit</p>	<p>and budgeted for every year Budgeted \$ 3 million for the 2009-2010 financial year</p>	<p>rehabilitation and enhancement of coastal and marine habitats; determination of temporal changes in coral reef communities, and developing necessary measures to protect, rehabilitate, and enhance coastal and marine habitats. The work of the CZMU monitors the important coastal resources and habitats ensuring that targeted policy, legislative and infrastructural interventions can be made to combat the impacts associated with global climate change including –shoreline erosion, coastal inundation, species loss, warming ocean temperatures, among others.</p> <p>On a programmatic level, the CZMU also carries out Coastal planning and management activities which provide professional technical evaluations of all coastal related applications received from the Town and Country Development Planning Office, use Geographic Information Systems to better assess user conflict and development pressure points along the coastline and use the policies developed in the Integrated Coastal Zone Management Plan for the implementation of sound coastal management practices for Barbados</p>
<p>Drainage Unit</p>	<p>This is programmatic and budgeted for every year. Budgeted \$ 6.4 million for the 2009-2010 financial year</p>	<p>The Drainage Unit is mandated to provide a sustainable drainage management and flood prevention system aimed at remediating the perennial flooding around the island, using appropriate personnel, equipment and technology to mitigate disaster flood risk. The unit maintains the island’s storm drainage system. This is a critical role vis a vis climate change since it is predicted that changing global climatic patterns will see increased instances of severe weather in the region.</p>
<p>Harrisons Cave Redevelopment project</p>	<p>\$51 million</p>	<p>This project demonstrates the development of tourism products in an environmentally sustainable way. The project involves strong elements of disaster and risk management and is a demonstration of decentralizing tourism from the fragile coastal environment. The bed and breakfast programme designed for the project also demonstrates that other forms of accommodation are viable rather than concentrating solely on the coastal zone which remains vulnerable to the impacts of adverse weather.</p>
<p>Ministry of Agriculture Incentive Programme</p>	<p>Programmatic and budgeted for annually</p>	<p>The Barbados Agricultural Development and Marketing Corporation (BADMC) under the Ministry of Agriculture has established an irrigation scheme for both urban and rural farmers, with many progressive features, and also offering free technical advice to farmers. There is a 40 % rebate on irrigation systems and the cost of the water from the irrigation scheme is also subsidized.</p> <p>The irrigation scheme ensures that water conservation measures are employed by farmers which is critical in a water scarce country like Barbados and an important measure to have in place should drought conditions prevail.</p>
<p>Meteorological Office</p>	<p>This is programmatic and budgeted for every year</p>	<p>This office plays a critical role in data collection and monitoring as it pertains to climatic factors and observing changing weather patterns over time. The Meteorological Office is currently investigating the potential impacts of the ongoing negotiations on climate services.</p>
<p>Soil Conservation Unit of the Ministry of Agriculture</p>	<p>Programmatic and budgeted for annually</p>	<p>Due to the size of Barbados -166 square miles -the impacts of land degradation and drought while occurring locally, are experienced and addressed nationally. The area of land most prone to land degradation and slippage is confined to the Scotland District which comprises one- seventh of the total land mass and hence the Soil Conservation Unit of the Ministry of Agriculture is based in this area and employs a number of soil</p>

		<p>engineering techniques to ensure soil integrity and stability. Incidences of erosion and land degradation outside of the Scotland District together with instances of beach erosion are addressed by Government entities such as the Ministry of Transport and Works and the Ministry of the Environment, Water Resources and Drainage (Drainage Unit and Coastal Zone Management Unit).</p> <p>Prevention of erosion of land has the dual benefit of ensuring carbon capture by securing the vegetative cover as well as preventing the run-off of soil into the marine environment thereby ensuring overall reef health.</p>
<p>South and West Coasts Sewerage Projects</p>	<p>\$149 million to date.</p>	<p>This system was designed to improve environmental conditions for residents and tourists but also to protect coastal and marine ecosystems especially the coral reef system thereby sustaining their role in beach sand production, reducing beach erosion, and ensuring the overall health of the reef which protects the coast line from the direct impacts of storm waves. It should be noted that the South Coast Sewage Project is already in place and the West Coast Project will commence in the near future. In the context of climate change, this project also has the added benefit of offering options for wastewater re-use in a water scarce country.</p>
<p>Town and Country Development Planning Office</p>	<p>Programmatic and budgeted for annually</p>	<p>The TCDPO through its development planning control ensures that development occurs in a manner to avert risk e.g. ensuring that buildings are disaster and drought proof via various planning approval requirements. Additionally via zoning, the TCDPO will minimize the construction of commercial buildings and housing in vulnerable areas.</p>

Table 2: Mitigation Measures to address climate change

ACTIVITY	MITIGATION	
	Value (\$BDS)	Justification
<p>Energy Division</p>	<p>Programmatic and budgeted for annually</p>	<p>The energy supply sector is a major contributor to carbon dioxide emissions. The Government of Barbados has put a number of measures in place to encourage energy conservation. Examples include:</p> <ul style="list-style-type: none"> ➤ The cost of a 'household energy audit and recommended conservation systems/materials' of up to \$2000.00 are allowed as a deduction from assessable income under the Income Tax Home Allowance Scheme. ➤ The import duty on fluorescent light bulbs and fittings were reduced to 5%. ➤ Hybrid vehicles as well as those powered by solar energy, LPG and Compressed Natural Gas have an excise tax at a fixed rate of 20% as compared to the rate of 46.9% on regular cars.
<p>National Botanic Gardens</p>	<p>Budgeted \$0.8 million (approximation for the 2009-2010 financial year)</p>	<p>This entity was designed to support the development and maintenance of a comprehensive open 'green' space management plan. Open green spaces once established and properly managed, present an opportunity for both social and economic development in that they can be used for recreational, educational and cultural events, as well as being marketed as a natural ecotourism destination. This is an important measure since such an area can act as a carbon 'sink' removing excess CO₂ from the atmosphere.</p>
<p>National</p>	<p>Budgeted</p>	<p>The cultivation of 80,000 trees by the National Conservation Commission will</p>

<p>Conservation Commission</p>	<p>\$50,000.00 in 2009-2010 financial year for project to plant over 80000 trees over three years.</p>	<p>offset the combined impacts of climate change and land degradation resulting in biodiversity loss.</p>
<p>Natural Heritage Department</p>	<p>Budgeted \$155,285 in 2009-2010 financial year</p>	<p>The department has the mandate to promote the conservation of special and unique biomes of Barbados through effective management of a network of terrestrial and marine protected areas for the recreation and enjoyment of Barbadians, and by the creation of innovative ideas and initiatives, facilitate sustainable development of persons living in these areas. This will ensure a network of green spaces that can offset the impacts of climate change and land degradation resulting in biodiversity loss. The NHD has the mandate for the establishment of a National Park System in Barbados.</p>
<p>Waste to Energy Project</p>	<p>Value to be determined</p>	<p>The SWPU and Sanitation Service Authority (SSA) are currently in discussions with the Canadian Firm BIODÉV Inc. on the conclusion of a Landfill Gas (LFG) Agreement. The successful conclusion of the Agreement would allow for the flaring of the landfill gas at the Mangrove pond landfill and if the amounts of gas are sufficient would allow for utilizing the landfill gas in the Mangrove Pond Landfill for the generation of energy.</p> <p>What such a project could mean is that LFG can be captured, converted, and used as an energy source. This will help to reduce odors and prevent methane, a major greenhouse gas, from migrating into the atmosphere and contributing to global climate change.</p>

It should be noted that the Government of Barbados has secured financing for the preparation of its Second National Communications report to the UNFCCC, and is actively engaged in the execution of the necessary activities. This report will identify the Greenhouse gas (GHG) emissions over the years 2000, 2002 and 2004 and report on progress since the First National Communication Report. Additionally, a Cabinet Paper has been prepared to re-establish the National Climate Change Committee as the major mechanism to spearhead the implementation of climate change policies on the island.

The Government of Barbados participates as part of the AOSIS grouping and has been very active in the discussions of the international climate change agenda. Additionally, Barbados has been involved in a number of climate change activities regionally and internationally to aid in adapting to, and mitigating against, the effects of climate change. These include:

- Climate Observation Systems;
- Tourism Vulnerability Country Assessment (VCA) and Tourism Strategy;
- The Mainstreaming Adaptation to Climate Change Project;
- The Caribbean Community Climate Change Centre (CCCCC);
- The Council for Trade and Economic Development (COTED);
- The Department for International Development (DFID), United Kingdom of Great Britain and Northern Ireland and ECLAC Sub Regional HQs in Port of Spain and Mexico Review of the Economics of Climate Change in the Caribbean; and
- Barbados Drought Precipitation Monitor.

Climate Observation Systems

A Review of Observation Systems relevant to climate change was completed by the Caribbean Institute for Meteorology and Hydrology (CIMH). The review examined the types and locations of existing climate observation equipment, and the agencies responsible for maintenance, data collection and storage. The final report of the Review identified the need to ensure continuous, accurate and reliable data, and recommended that:

- a systematic programme of quality control be introduced by the Coastal Zone Management Unit to ensure instrumentation or other errors and biases are detected at an early stage;
- that the Barbados Water Authority acquire at least four (4) automatic rainfall measuring instruments capable of measuring amounts and intensities, and that at least one (1) should be a full automatic weather station capable of measuring other weather elements. To date the BWA has purchased one total and one automatic station and are currently awaiting the results of the CIMH assessment for optimum location for the placement of these stations;
- the non-meteorological government agencies using automatic weather stations should approach the Caribbean Institute for Meteorology and Hydrology (CIMH) to organise a course that would provide appropriate training in basic observations and storage of data; and
- Government agencies should implement a programme of systematic maintenance and calibration of automatic weather stations. Non-meteorological agencies could engage in discussions with the Barbados Meteorological Services or the Caribbean Institute for Meteorology and Hydrology to provide this service.

Tourism Vulnerability Country Assessment (VCA) and Tourism Strategy

Barbados was chosen as a pilot site for a Tourism Vulnerability Country Assessment under the Mainstreaming Adaptation to Climate Change (MACC) project.

The VCA study was part of a broader regional initiative conducted as a part of the Mainstreaming Adaptation to Climate Change (MACC) project implemented through the Caribbean Community Climate Change Centre (CCCC) in Belize. The Study was expected to contribute to the further development of a National Multi-Hazard Disaster Management Plan for the tourism sector that is being developed by the Ministry of Tourism, the Department for Emergency Management (DEMA) and other relevant partners.

The VCA was designed to generate information on the physical, environmental, social and economic vulnerability issues related to the Tourism sector as well as inform the development of a regional strategy for the tourism sector under the MACC. Given the importance of Tourism to the Barbadian economy, this study was considered important.

Paragraph 20 of the MSI calls on countries to ***“Coordinate on a regional basis to establish or strengthen national and regional climate-change co-ordination mechanisms”***

A number of activities can be listed in accordance with Paragraph 20. These include:

The Mainstreaming Adaptation to Climate Change Project (MACC)

The Mainstreaming Adaptation to Climate Change (MACC) project was implemented by the World Bank, with funding of USD \$5 million from Global Environmental Facility (GEF). The executing agency is the CARICOM Secretariat located in Georgetown, Guyana. In-kind participants include the Government of Canada and the Government of the United States of America through the National Oceanic and Atmospheric Administration (NOAA).

The project's main objective is to mainstream climate change adaptation strategies into the sustainable development agendas of the Small Island and low-lying states of CARICOM. MACC adopted a learning-by-doing approach to capacity building, consolidating the achievements of its predecessors the Caribbean Planning for Adaptation to Climate Change Project (CPACC) and Adaptation to Climate Change in the Caribbean Project (ACCC).

The participating countries include: Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Saint Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, and Trinidad and Tobago.

The Caribbean Community Climate Change Centre (CCCCC)

Started under the ACCC project, the Caribbean Community Climate Change Centre coordinates the region's response to climate change. Officially opened in August 2005, the Centre is the key node for information on climate change issues and on the region's response to managing and adapting to climate change in the Caribbean. The Centre is located in Belmopan, Belize.

The Council for Trade and Economic Development (COTED)

The Council for Trade and Economic Development consists of Ministers of CARICOM Member States. The role of COTED is itemised in Article 15 of the Revised Treaty of Chaguaramas. Of particular significance is Paragraph 2 (h) of Article 15 which states that the COTED shall

“promote and develop policies for the protection of and preservation of the environment and for sustainable development”.

Coordination of regional agendas on environment and sustainable development issues for CARICOM takes place at the level of the COTED where Ministerial oversight is provided for programmes and projects of regional importance. COTED decisions are forwarded for the Conference of Heads of Government (grouping of Prime Ministers and Executive Presidents) which has overall oversight for the policy direction of the Caribbean Community and is the authority for conclusions of treaties on behalf of the Community and for entering relationships between the community and international organisations and States. Therefore in advance of the 15th Conference of the Parties of the UNFCCC, a special declaration on the issue of climate change was issued by Heads of Government to signal the importance the region places on the issue of climate change.

The Department for International Development (DFID), United Kingdom of Great Britain and Northern Ireland and ECLAC Sub Regional HQs in Port of Spain and Mexico Review of the Economics of Climate Change in the Caribbean

This project was designed to assess the likely economic impacts of climate change on key sectors of the Caribbean economies, to stimulate governments, regional institutions and private sector actions to develop and implement policies to mitigate and adapt to climate change

Barbados Drought Precipitation Monitor

The CIMH is coordinating a project focused on development of a drought forecasting model using recorded rainfall data. This project can be considered as a climate change adaptation management tool.

3.2 NATURAL AND ENVIRONMENTAL DISASTERS

Paragraph 21 (a) of the MSI called for “ *....national disaster preparedness and early warning capacity, increase public awareness about disaster reduction, stimulate interdisciplinary and intersectoral partnerships and support the mainstreaming of risk management into the national planning process*”

The lead agency for Disaster Management on the island is the Department of Emergency Management. Through their intervention, in a 2003 Cabinet decision, the Barbados Government embraced the Comprehensive Disaster Management (CDM) Strategy. This strategy represents a deliberate attempt by the Caribbean Disaster Emergency Management Agency(CDEMA) participating states to holistically incorporate all phases of the disaster management cycle (prevention, mitigation, preparedness and response, recovery and rehabilitation) while focusing on promoting and accelerating disaster risk reduction initiatives. Subsequently, in 2006, the Emergency Management Act 2006 was proclaimed providing legislative authority for the mainstreaming of Comprehensive Disaster Management.

The structure of national disaster management mechanism has facilitated the stimulation of interdisciplinary and inter-sectoral partnerships and supported the mainstreaming of risk management into the national planning process. This mechanism includes the Emergency Management Advisory Council which has responsibility for recommending policies, programmes and activities to enhance the emergency management programme, fifteen (15) standing committees which are responsible for advancing detailed sectoral disaster management planning, and 30 voluntary district emergency organizations through which the community disaster management programme is facilitated.

With respect to the enhancement of national disaster preparedness and early warning, the Government of Barbados and the United States Geological Survey signed a memorandum of understanding concerning scientific and technical cooperation in the earth sciences which

provided seismology training for members of staff, the establishment of an Earthquake and Tsunami Early Warning Station at Gun Hill, St. George and the placement of dart buoys in the Caribbean Sea to provide real time data on seismic activity in the region.

A number of additional noteworthy initiatives include:

- The capacity of the Meteorological Department is being enhanced to disseminate public warnings regarding tropical weather systems under a European Union Radar Project, including the deployment of a Doppler Radar.
- As part of a Coastal Zone Management Unit (CZMU) initiative, one tide gauge was installed and others deployed to various locations on a temporary basis as required by specific projects being executed by the CZMU, around the island. These other locations can be considered for future long term gauge installations.
- There is a Draft Coastal Evacuation Plan being developed with oversight by the Department of Emergency Management Technical Standing Committee on Coastal Hazards.
- A Coastal Vulnerability Assessment of the St. Peter coastline has been conducted under an Inter-America Development Bank/CDEMA “Adaptation for Climate Change and Disaster Mitigation: Township Planning Strategies for Storm Surge in the Caribbean Project”. Under this same project there has also been the development of a draft toolkit which provides guidance on the replication of the project in other coastal areas in country.
- There is a Japan International Cooperation Agency (JICA) funded/CDEMA implemented “Telephonic Community Flood Warning System Project” which has identified Speightstown St. Peter Barbados as the project pilot site. The objective of the project is the integration of rainfall early warning systems into the flood hazard mapping systems. This project was impacted however by equipment loss after a significant rainfall event and has not been re-established yet.
- The Public Education and Information Standing Committee of the Department of Emergency Management has spearheaded the development of public education initiatives for floods and hurricanes. The committee will be mounting a similar campaign for the tsunami hazard under a CDEMA implemented “Tsunamis and Coastal Hazards Project”.
- The Tourism Emergency Management Standing Committee was established in 2005 to facilitate the mainstreaming of disaster management in the tourism sector. This committee has been successful in establishing a fully functional Tourism Emergency Operations Centre which provides centralized coordination and control of disaster response within the tourism industry.

Paragraph 21 (b) of the MSI spoke to “*...issues relating to insurance and reinsurance arrangements for SIDS.*”

Under Section 153 (1) of the Insurance Act Cap 310” the Minister may require companies to establish an insurance pool for the purpose of covering risk for a particular class of persons if the Minister determines that:

- (a) it is in the national interest to do so, and
- (b) a particular insurance cover is not readily available. Section 153 (3) states “in this section “insurance pool” means an arrangement entered into by insurance companies to form a facility for the purpose of underwriting insurance business of a specific nature”. Attempts to arrange a pool thus far have been unsuccessful.

A Catastrophe Fund was established by Statutory Instrument 1998 No. 74, the Insurance (Catastrophe Reserve Fund) Regulations 1998, and allowed insurers carrying on property insurance business to deduct up to 25% of net premium income from this class of insurance business to establish the fund; the Regulations were not mandatory at first but a recent amendment to Statutory Instrument 1998 No.74 has now made the establishment of the Fund mandatory and it is expected that the fund will grow over time to a level where adequate funds would be available to meet catastrophic events.

The Fund is administered by the Office of the Supervisor of Insurance to provide relief or assistance to persons receiving income of less than the income tax limit of \$22,500.00 per annum in respect of damage to owner-occupied chattel dwellings or dwelling units of wood/concrete block construction. The programme was to be funded by Government making an annual contribution of \$2.5 million for five years in the first instance and contributions from the working force taking the form of a deduction of 0.1 % of earnings up to the national insurance limit

In addition, the Barbados Light and Power Co. Ltd. established a self-insurance mechanism to provide insurance coverage on its distribution lines, generation plant, equipment, buildings and other contents; the fund established by this mechanism has now grown to a sizeable sum adequate to meet the replacement cost of its equipment which may be damaged in a catastrophic event. This type of arrangement may arise from time to time especially in those situations of a catastrophic nature when funds are required to rebuild the economy.

Traditionally local insurance companies have turned to the international markets for re-insurance and this has worked well over the years, however the international markets for re-insurers regard this region as a catastrophe zone and accordingly have applied rates commensurate with the risk involved, for those insurers seeking coverage. The higher rates have been passed onto the consuming public with the result that premiums have remained very high.

To address the issue of the tourism sector, the Government has proposed that in order to obtain a license to operate in Barbados (effective January 2006) all hotels and places of accommodation must be adequately insured for property damage and public liability

3.3 MANAGEMENT OF WASTES

Paragraph 23 (b) of the MSI called for countries to ***“....strengthen control of the transboundary movement of hazardous wastes especially through the enhancement of activities under the Basel convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal”***

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was signed by Barbados in 1994 and ratified in 1995. The Government is undertaking the establishment of a temporary storage facility for hazardous wastes prior to export for offshore treatment in accordance with the requirements of the Basel Convention however the constraint of the lack of space has to be considered when addressing the most appropriate method of hazardous waste disposal.

Chemical waste is treated and disposed of locally where possible. For other cases arrangements have been established with external agencies to ship hazardous wastes abroad. Each shipment of hazardous materials overseas is individually assessed pursuant to the Basel Convention.

Hazardous waste production covers the medical, electronic manufacturers, food manufacturers, oil producers and agrochemical sector. The education sector is also included in hazardous waste production. Written confirmation is sought by the receiving Government from the Environmental Protection Department (EPD) for shipment of the hazardous waste listed by the companies in Barbados. A chain of command, which gives every stage of the journey of the hazardous waste, must be given in advance (i.e. Carriers on land and sea, number of border crossings). Within Barbados, the EPD mandates that a protocol be followed well before shipping of hazardous waste; there are 3 stages in this protocol; Initial Notification; Pre-Shipment Notification and Post Shipment Notification. All information must be recorded on a Basel Convention-Transboundary Movement of Waste Notification Form. It is the responsibility of the generator to identify a shipper with the necessary capabilities to ensure that the proposed shipper will be able to meet the requirements of the Basel convention. The EPD makes checks to ensure that the country where the waste will be disposed is signatory to Basel Convention.

An Environmental Management Act (EMA) and associated regulations have been drafted which makes provisions for the management of hazardous wastes for individuals and commercial entities. The Draft EMA has a section addressing toxic substances from import to disposal. At present the EPD reviews any hazardous waste disposal on a case-by-case basis in accordance with the material safety data sheet (MSDS). If the waste can be neutralized the disposer is given the relevant information, but otherwise the waste is exported under the stipulations of the Basel Convention, usually to Canada. The main issue

with this system is that it is dependent upon the waste producer realizing and reporting the waste as hazardous. The absence of this legislation is the primary constraint on the operations of EPD in most areas.

The EPD has responsibility for reporting the number of shipments to the Basel Secretariat. A challenge in reporting is the accuracy of the figures since legislation is not in place for monitoring of emissions and other waste streams, other than that which is exported. While the inaccuracy of figures impacts on local regulation of hazardous waste generation and disposal, this does not hinder Basel Reporting on the known number of shipments out of the country. The challenge is that without legislation mandating that generators notify the EPD, there is the possibility that there are shipments which leave the country without the knowledge of the EPD and are therefore not included in the national reports.

The Environmental Protection Department with technical assistance from the United Nations Institute for Training and Research (UNITAR) has developed a proposal for funding by the SAICM Quick Start Programme Trust Fund for the project "Development of a National Implementation Strategy for Globally Harmonised System (GHS) for Classification and Labelling of Chemicals in Barbados". This project aims to strengthen national capacities to implement SAICM and the GHS as well as make a contribution to the implementation of the BASEL, Rotterdam and Stockholm Conventions by focusing on labelling of chemicals as a building block for sound chemicals management. Funding for the project has been approved pending receipt of letters of support and participation from the Ministries of Health, Industry and Labour.

Additionally, in 2008-2009, Barbados participated in a project entitled "Updating a National Chemicals Management Profile, Development of a National SAICM Priority Setting Workshop". This particular project facilitated by the EPD was also developed with technical assistance of UNITAR and the financial support of the Strategic Approach to International Chemicals Management (SAICM) Quick Start Programme Trust Fund.

The Updated National Chemicals Management Profile has been prepared as a key component of the enabling phase for Barbados towards implementation of the Strategic Approach to International Chemicals Management (SAICM). Additionally, it is hoped that this Profile will facilitate greater understanding of the functioning, strengths and weaknesses of the Barbados chemicals management framework. The capacity assessment and priority setting workshop has also advanced the work on chemicals management.

Ideally the EPD should be in constant contact with companies using and generating hazardous wastes. However Government is of the view that by employing appropriate regulatory mechanisms which complement the current efforts of the EPD, more significant gains will be realized. One such recognized mechanism is effective legislation; as a result the Marine Pollution Control Act (1998) (MPCA) is based on the polluter pays principle.

Barbados is involved at the regional level in the development of measures to address the Environmentally Sound Management of Hazardous Wastes as governed by the Basel Convention. As identified in the Regional Programme of Action for the Environmentally Sound Management of Chemicals, Barbados will benefit from the establishment of the sub-

regional Technology Transfer Centre at Caribbean Industrial Research Institute (CARIRI), Trinidad & Tobago. This will serve to build capacity of existing institutions and agencies in the different islands.

Paragraph 23 (c) of the MSI called for countries to “*...Promote sustainable waste management.....*”

The management of waste in Barbados is the primary responsibility of three major agencies: The Environmental Protection Department (EPD), the Sanitation Service Authority (SSA) and the Solid Waste Project Unit (SWPU).

The EPD has traditionally conducted monitoring and regulation of the solid waste management and government operated solid waste disposal sites. The Solid Waste and Hazardous Substances Section was established within the EPD in 2005 with the aim of improving the regulation of solid waste management.

The EPD is mandated to:

1. Regulate and monitor solid waste disposal facilities; and
2. Develop policies for the regulation of solid waste management.

The Sanitation Service Authority (SSA) is responsible for the collection and disposal of non-hazardous solid waste from homes and government agencies around the island. The SSA also has a commercial arm which offers services to the private sector. The SSA also operates the four (4) Government solid waste disposal sites:

- Mangrove Pond Landfill;
- Bagatelle Bulky Waste Disposal Site;
- Rock Hall Asbestos Disposal Site; and
- Lonesome Hill Blood and Grease Disposal Site.

The Solid Waste Project Unit (SWPU) is responsible for the implementation of the Integrated Solid Waste Management Programme (ISWMP). The ISWMP is an infrastructural project which commenced in 1993 with a feasibility study. It is a major component of the general policy of the Health Sector Development Plan 1993-2000, encompassing the whole island of Barbados, and providing for the preparation of a long term (20 year) vision of managing solid waste in Barbados.

These policies are further clearly reinforced by the Barbados Sustainable Development Policy which specifically highlights the issue of waste management. Under this wider umbrella of waste management, the Policy draws attention to the need to ensure that a focus is retained on solid and liquid waste, as well as the challenges associated with air emissions. It also encourages that these concerns be addressed within the context of a comprehensive framework of environmental quality guidelines.

While at present there is no single comprehensive solid waste management legislation, waste disposal is governed by the following legislation:

- The Health Services Act (Cap. 44), 1969 - “An Act relating to the promotion and preservation of the health of the inhabitants of Barbados”.
- Health Services (Nuisances) Regulations, 1969 – These Regulations prohibit nuisances which may include solid waste that is left or placed in a manner that may be injurious or dangerous to health.
- Health Services (Disposal of Offensive Matter) Regulations, 1969 – These Regulations restrict the disposal of offensive matter to approved disposal sites only.

POLICIES AIMED AT WASTE PREVENTION AND MINIMIZATION, REUSE AND RECYCLING

Recycling is a private sector led activity. Generators of household waste benefit from a free national collection service by the Sanitation Service Authority (SSA) which is scheduled for at least once a week. In densely populated areas on the island, this service is offered for two days a week. In Bridgetown there are collections 13 times a week because of the commercial activity there. Generators of commercial and bulky waste can call the SSA to remove this waste at a cost. Alternatively, they have the option of utilising a private commercial service to remove their waste.

The SSA works in collaboration with the Solid Waste Project Unit (SWPU) at the SWPU’s home-composting workshops and encourages recycling where it is available. While members of the public are not encouraged to enter the Bulky Waste landfill to recycle materials, this occasionally occurs and is permitted. The practice is not actively encouraged however, since the authorities wish to regulate this activity to ensure that it is conducted appropriately. Several approaches to facilitate the regularization of this type of activity are being considered, including the use of fees, permits and licenses.

The Mangrove landfill receives approximately 90% of used tires on the island and there is currently research underway into recycling of these tires the options including their conversion to rubberized asphalt or to use them as a fuel source.

The level of infrastructure needed to facilitate curb-side recycling is currently not available in Barbados. A separate complement of equipment, including specialized trucks and color coded containers would be required. The private sector is therefore currently the main driver of this activity, while Government regulates their operations. Recyclable materials are either returned to a depot or collected by the recycler.

Another area of concern is illegal dumping and littering. Bins have been placed throughout the country by the SSA and other entities, especially in problematic places like Bridgetown as well as other locations heavily traversed by tourists. This is in an effort to decrease the amount of littering. Dumping normally takes place in gullies and remote areas of the island. Nevertheless, reduction in dumping has been realized as a result of monetary compensation

as a part of the recycling effort of the private sector for white goods like, refrigerators, washing machines and stoves.

The SSA has also established a committee for the prevention of illegal dumping in Barbados. This committee comprises representatives from the SSA, SWPU and the Ministry of Health. The aim is to educate communities across the island about the problems associated with illegal dumping, and in effect, discourage such practices. The committee goes into communities and hosts town hall meetings to promote clean-up events, as well as to educate persons on the benefits of sustainable waste management practices. The identification of the communities to be targeted is usually led by the Environmental Health Officers of the Ministry of Health, and in some cases, by the District Emergency Organisation (DEO).

An emerging area of interest is the establishment of biogas digesters. An example of this is the initiative at Barnwell, Rock Hall, St. Thomas. The immediate benefits of these projects are multiple since in addition to reducing the amount of waste entering the waste stream there would also be a reduction in the amount of nitrates entering the groundwater system as well as the production of energy to reduce operation costs for some farmers.

Paragraph 23 (d) of the MSI called on countries to “ *.....reduce the quantity of waste disposed of at sea....*”

In accordance with the relevant IMO Conventions persons are required to apply for a license from the Environmental Protection Department of the Ministry of the Environment, Water Resources and Drainage as well as the Ministry of International Transport for permission to dump approved waste at sea. However there have been no applications for such permission in recent history and dumping of waste at sea is not an option exercised locally. Barbados’s beaches are periodically affected by marine garbage dumped from passing vessels washing up on its shores, however these incidences have been drastically reduced because of Maritime agreements and greater coast guard surveillance.

Paragraph 23 (e) called for countries to “*Promote the broad participation in and early implementation of the new IMO Convention on Ballast Water*”

Barbados has ratified the “International Convention for the control and Management of Ship’s Ballast Water and Sediments 2004” in March 2007.

While Paragraph 24 spoke of “*....concern that potential oil leaks from sunken vessels have environmental implications.*”

With respect to accidental oil spills-Barbados has had a National Oil Spill Contingency Plan in operation since 1980. The plan is revised on a periodic basis to ensure compatibility with emerging issues and technologies. The Plan is effective for the territorial waters of Barbados, the adjoining shoreline and in the high seas where a threat to Barbados’ waters exists as well as for incidents which may occur on-shore in Barbados. The Plan brings

together expertise and capability of several Government agencies as a National Response Team (BNRT) which serves as Government's body for planning and preparedness action prior to an oil pollution incident and for coordination and advice during an oil pollution incident. Among the members of the BNRT are:

1. Environmental Protection Department;
2. Barbados Defence Force/Barbados Coast Guard;
3. Barbados Fire Service;
4. Barbados National Oil Company Ltd.;
5. Barbados National Terminal Company Ltd.;
6. Barbados Port Inc.;
7. Coastal Zone Management Unit;
8. Department of Emergency Management;
9. Energy Division;
10. International Transport Division;
11. Local Petroleum Industry Representative;
12. Ministry of Public Works;
13. National Conservation Commission; and
14. Royal Barbados Police Force.

The Director of the Environmental Protection Department is the Chair of the National Oil Spill Response Committee.

The efficacy and efficiency of the Plan has been tested via a National Oil Spill Simulation Exercise in 2004. The Plan has been revised with input from the Response Team and industry stakeholders and a revised version was drafted in 2008 for resubmission to Cabinet. The revised plan includes an Appendix detailing the National Dispersant Policy. The National Response Team is also planning to develop a number of Appendices which would give full effect to the plan e.g. pre-agreed response strategies; a list of pre-determined response centre locations; a manual of operational procedures for oil spill response(OSR); and a national inventory of OSR equipment to name a few. The Plan remains under constant review especially with respect to its training, resource and equipment maintenance components. Members of the BNRT receive ongoing training both at the national and international level for example the IMO Level 3 Model Course in Oil Spill Preparedness and Response.

Paragraph 25 of the MSI indicated that “ ***States should maintain dialogue and consultation, in particular under the aegis of the International Atomic Agency and the International Maritime Organization, with the aim of improving mutual understanding, confidence building and enhance communications in relation to safe maritime transport of radioactive materials.***”

The Government of Barbados has, since 1992, issued statements at various regional and international *fora* calling for the immediate ban of Transboundary movement of nuclear materials through the Caribbean Sea and that the Caribbean Sea should be declared a nuclear-free zone. It is noted that in the event of an accident that would result in release of the nuclear materials, that there is limited capacity within the region to adequately deal

with the consequences. CARICOM, which represents 14 English-speaking nations of the region, has issued a supporting statement in 1992 and again in 1995. It has been proposed that a compensatory and liability fund established in the event of such a catastrophe so that there will possibly be some measures, which can be taken. The Government of Barbados is presently pursuing along with CARICOM members and partners how this issue can best be addressed through a multilateral instrument.

Barbados has no nuclear reactors and does not utilize large amounts of radioactive materials. The Ministry of Economic Affairs, Empowerment, Innovation, Trade, Industry and Commerce (METIC) has responsibility for importation of radioactive materials; however the only sectors that utilize this material are health and research institutions in laboratories. Not only is the disposal of this radioactive material the concern of the EPD but also the Ministry of Health (MH). The METIC is responsible for the regulatory framework while the EPD and MH are responsible for monitoring, enforcement and standards.

Of special concern to Barbados and the region as a whole is the issue of the Transboundary movement of radioactive wastes from one developed country to another through the ecologically sensitive Caribbean basin. With the increased threat of terrorism throughout the world the work of the EPD and MH has become extremely important with respect to monitoring the unregulated movement of this radioactive material through the Caribbean.

On 20 December 2006 the United Nations General Assembly (UNGA) adopted Resolution 61/197, *'Towards the sustainable development of the Caribbean Sea for present and future generations.'* This resolution broadened the scope of previous resolutions adopted by the Assembly in 1999, 2000, 2002 and 2004, which largely referred to *'Promoting an integrated management approach to the Caribbean Sea in the context of sustainable development,'* and in addition made specific references to the Caribbean Sea as a *special area* within the context of sustainable development. Resolution 61/197 also provided a solid platform for international collaboration regarding protection of the Caribbean Sea including through the financial support of the international community.

Two years later on 19 December 2008 the UNGA again considering the matter of the Caribbean Sea adopted Resolution 63/214 *'Towards the sustainable development of the Caribbean Sea for present and future generations,'* which although not reflecting the international community's full recognition of the *'special area,'* did outline a process to resolve the long-standing legal concerns raised by those in opposition to the definition. It is expected that the Secretary General in his report on the matter to the Sixty-Fifth Session of the UNGA will *inter alia* report on the work done by the Caribbean Sea Commission in terms of seeking to address such legal concerns and in general, the CSC's efforts to institutionalize itself as proposed in 2008. The Caribbean Sea Commission was established at the behest of Barbados in 2006 as a structured mechanism through which work regarding the Caribbean Sea Initiative could be pursued

3.4 COASTAL AND MARINE RESOURCES

Paragraph 27 (a) of the MSI calls for countries to ***“Complete the delimitation of maritime boundaries”***, while paragraph 27 (b) calls for ***“..submission of claims to the Continental Shelf Commission by 13 May 2009”***.

The Government of Barbados has completed the delimitation of its maritime boundary with the Republic of Trinidad and Tobago.

On the 8th May 2008 Barbados made a submission to the Commission on the Limits of the Continental Shelf (CLCS) for the recognition of its continental shelf, a process that required Barbados to satisfy geological, geophysical, geomorphological and legal criteria. The Government considers this to be the essential next step in establishing the appropriate jurisdiction and sovereign rights over the maritime space to which Barbados is entitled under international law. In that period a number of bilateral meetings were held with countries with neighbouring territorial waters including France (on behalf of Martinique and Guadeloupe) to satisfy condition of Article 76 of UNCLOS which requires that there must be no disputes between neighbouring states in order for a submission to be considered. On October 15th 2009 Barbados signed into law a maritime Treaty between France and Barbados, within and beyond 200M which was the result of successful negotiations between the two states. Negotiations were also held with the governments of Suriname and Guyana.

The Government of Barbados made its first appearance before a Sub-Commission of the CLCS from August 10th - 14th 2009 at the 23rd Session of the CLCS in defense of its extended Continental Shelf (ECS) claim. Three additional appearances were required between August 10th, 12th and 14th, 2009 to address questions and concerns pertaining to the submission including:

1. Test of appurtenance and natural prolongation,
2. Foot of Continental Slope (FOS),
3. The 200 M and the 350 M limits, the FOS + 60 M formula line and the 2500 m isobath +100 M constraint line, and
4. Gardiner points.

There is one outstanding concern regarding the extrapolation of the velocity model to calculate sediment thicknesses north of the Barracuda Ridge.

A second round of meetings and presentations for Barbados to appear before the Subcommission were scheduled for the 24th Inter-sessional meeting of CLCS November 2nd - 6th, 2009, at which time the presentations were made on the requested data. Additional information was requested by the Sub-Commission which the Government of Barbados proposes to present ahead of the 25th session of the CLCS in March 2010. A successful conclusion is expected which sets Barbados on course to become the first small island developing state to be issued with recommendations from CLCS.

It should be noted that the Government of Barbados pursued and benefitted from technological and legal advice and exchanges with the Governments of Australia and France who have expertise in through the ECS process, with Australia receiving recommendations from the CLCS in April 2008.

Paragraph 27 (c) of the MSI calls for ***“Further the work on the assessment of living and non-living seabed resources within national jurisdiction”***

The CZMU is the primary government entity with the mandate for undertaking research and assessments of marine resources in Barbados. In addition the Fisheries Department is responsible for the assessment of fish stocks.

During the summer 2005 the CZMU initiated a joint coral bleaching and temperature monitoring project with CERMES, UWI. This project was intended to establish long term monitoring at several coral reefs along the west and south coasts. This project will assist in establishing a long term coastal water temperature profile for the island’s coast and provide the Unit with better information on the health of the reefs. Based on ongoing national development initiatives, the CZMU performed coral transplantation from the new Coast Guard site to Batts Rock and instituted a monitoring programme on the new site. A total of four hundred coral heads were transplanted and numerically tagged for monitoring purposes. Recent assessments have shown that the transplanted corals are indeed in good health

The Bellairs Research Institute based on the west coast of Barbados plays an active role in conducting assessment of living marine resources in the coastal waters of Barbados.

Paragraph 28 (a) of the MSI calls for ***“...monitoring, reporting and enforcement and control of fishing vessels, to further implement international plans of action to prevent, deter and eliminate illegal, unreported and unregulated fishing to manage fishing capacity”***

The Fisheries Division, Coast Guard and Police Service are among the agencies empowered to undertake enforcement in fisheries related matters. Under the Fisheries Act, local commercial vessels are required to be registered and licensed following inspection. Sport fishing vessels and fishers must be licensed. There are requirements for notification of vessel construction, alteration and conversion as well as for change of ownership.

The Fisheries Division of the Ministry of Agriculture is required by law under the Fisheries Act (1993-6) to prepare a Fisheries Management Plan (FMP). The FMP contain fishery specific plans for the major fisheries in the island. These specific plans must be related to the existing and expected biological, economic and social conditions in the fishing industry and the country. The changes that occur in these conditions require that the entire plan be periodically reviewed and updated. Each specific plan contains a description of the ecology of the target species and the fishery (including economic importance, vessel type, fishing gear and methods etc), classification of the management unit (physical environment), resource status, catch effort and trends, regulatory history, management policies and

objectives, prescribed selected management approaches, development constraints and opportunities.

Paragraph 28 (c) of the MSI calls for countries to ***“Fully implement surveillance and monitoring systems”***.

The CZMU conducts a regular Coastal Structures Inventory Programme to assess the number and condition of all coastal structures. A routine beach profiling programme is in place to monitor the condition of selected beaches. Additionally, the CZMU is in the process of bringing on stream a coastal water quality monitoring programme. The Environmental Protection Department (EPD) also conducts near-shore beach water quality assessments on a routine basis.

The Ministry of the Environment, Water Resources and Drainage as part of the GEF Integrated Watershed and Coastal Area Management Project has developed a project to strengthen the area of information management in partnership with the Food and Agricultural Organisation. The project is designed to accomplish the following:

- To assist the government of Barbados to improve the monitoring system of its land and water resources available for agriculture and the environment, by providing them with an optimised water resources monitoring network and an easy accessible land and water resources database.
- To develop the functional strategic linkages between the departments found in the Ministries of Agriculture and Environment (Coastal Zone Management Unit - CZMU, Environmental Protection Department - EPD, Barbados Water Authority - BWA, Environmental Unit - EU, Drainage Unit - DU) and other influential partners that have specific responsibility for water resources management on the island.
- To strengthen the capacity of the technical staff of the Ministry of Agriculture (Water Resources Management Unit) and the Ministry of Environment Water Resources and Drainage (CZMU, EPD, BWA, EU, DU), in data collection and management.
- To strengthen the capability for data sharing inter-ministerially between the Ministries of Agriculture and Environment.
- To strengthen the link between management of land and water resources.

It is envisaged that this project will go a long way towards formalizing analysis, sharing and publication of data as well as ensuring real –time information is provided to decision-makers in a timely and sustained manner.

Paragraph 28 (d) of the MSI requires that countries ***“Analyse and assess the status of fish stocks”***

A significant amount of Fisheries and fisheries –related research is carried out by the Fisheries Division and the University of the West Indies. Some of the areas studies include:

- Biological and fishery aspects such as species diversity and distribution, size or age composition of the catch, fecundity, potential yield or maximum sustainable yield, life history and ecology, migration, stock structure catch and landings, fishing effort, catch per unit effort, fishing gear selectivity and efficiency.
- Social aspects such as the age and education distribution, family and social unit composition, quality of life, social networks and organizations, participation in fisheries management, effects of changes in fishing technology, recruitment into the fishing industry, occupational alternatives.
- Economic aspects such as contribution to GDP, fishery enterprise profitability, average fisherfolk income and expenses, input cost analysis, fish price analysis, cost-benefit and cost- effectiveness analysis of management measures, employment and trade trends.

Paragraph 28 (e) of the MSI calls for countries to adhere to ***“UNCLOS provisions relating to the Conservation of Straddling Fish Stocks and Highly Migratory Fish Stocks and FAO Agreement to promote compliance with the international Conservation and Management Measures by Fishing Vessels on the High Seas”*** while paragraph 28 (f) calls for countries to ***“Establish or enhance the necessary infrastructure and legislative and enforcement capabilities to ensure effective compliance with, and the implementation and enforcement of, their responsibilities under international law”***.

Barbados is a member of the International Commission for the Conservation of Atlantic Tunas and Tuna-like Species (ICCAT) and fulfills its mandate under this initiative through submission of data for use in stock assessment. The Government of Barbados is also an active member of the Western Central Atlantic Fishery Commission of the FAO participating in among other things, an assessment of the flying fish stock in 2001 and 2008.

At the regional level, there is a significant amount of collaboration among the Regional Fishery Management Organisations (RFMOs) that forms part of the Caribbean Regional Fisheries Mechanism (CRFM) with respect to actively conducting stock assessments of major pelagic based fisheries- a shared resource in the region.

There is currently legislation pertaining to the high seas being drafted.

Paragraph 30 of the MSI calls for countries to ***“...put in place integrated policies and sound management approaches, such as marine protected areas...and develop national capacity to monitor, conserve and sustainably manage coral reefs and associated ecosystems.”***

The establishment of a Marine Management Authority (MMA) is considered important, given the integrated role the MMA will play in the management of coastal related activities and the use of coastal space for recreational purposes. Currently, the Folkestone Park and Marine Reserve is the only official national Marine Protected Area (MPA); however, Carlisle Bay is recognised as an unofficial protected area where fishing not permitted. The Natural Heritage Department in the past was tasked with the establishment and implementation of a Marine Management Agency. To date the following has been undertaken:

1. Review of the Institutional Setting, Organisational Framework and Legislative Changes;
2. Development of the Business Module for the MM Agency and MM Areas (including stakeholder consultation); and
3. Development of an Implementation Plan.

Four demonstration projects were completed as part of Phase II of the process, which were intended to serve as a focus for public attention to coastal areas. The four demonstration projects are:

1. *Design of Public Changing Facilities at Carlisle Bay*: to enable the Government of Barbados to implement visible site improvements, completion of a detailed design for the proposed public changing facilities at Carlisle Bay.
2. *Mobile Educational Display*: to promote the concept of Marine Management Areas and a Marine Management Agency in Barbados, development of a mobile display on marine areas, marine area management and zoning that could be taken to the various public events.
3. *User Surveys*: conduct observational surveys of marine areas users in several areas within Carlisle Bay and the Folkestone Marine Management Area (FMMA).
4. *Planning a Visitor Facility for the FMMA*: consideration of concept plans for some type of visitor facility with interpretative features.

A comprehensive stakeholder process, which was carried out as part of the study produced interesting results, which informed the study.

Future work for the NHD, as it relates to MMAs, will focus on the following:

1. A co-management study structure is proposed to manage and operate marine management areas in Barbados. The distinct roles and responsibilities in the four management areas identified are enforcement and people management, revenue generation and use, education/interpretive programming and resource protection and management.
2. A Business Plan proposed potential costs and revenue for operation of MM Areas.
3. In respect of the legislative and regulatory frame work proposed, it was recommended that a MM Board manage the MM Areas. New legislation would be required to establish the enforcement agency.
4. An implementation plan which constitutes finalisation of zonation for Folkestone and Carlisle Bay MM Areas, public education programme, new legislation and regulations for MM areas and establishment of regulatory bodies.

While paragraph 31 calls for countries to ***“.....work together to develop and implement regional initiatives to promote the sustainable conservation and management of coastal and marine resources.....”***

There are a number of regional initiatives in which the government of Barbados participates as it relates to conservation of coastal and marine resources. These include:

- As mentioned previously the GOB is heavily involved in the initiative being coordinated by the Association of Caribbean States to have the Caribbean Sea designated a Special Area in the context of sustainable development, by the UN General Assembly.
- Caribbean Regional Fisheries Mechanism (CRFM)
- The GEF funded Integrated Watershed and Coastal Area Management Programme in conjunction with the Caribbean Environmental Health Institute (CEHI)
- Barbados has been heavily engaged in the projects and programmes of the Intergovernmental Oceanographic Commission since the inception of the Coastal Conservation Project Unit in the 1980s and was represented on the Board of the Regional IOC UNESCO Sub-Commission for 14 years. Projects under the IOC include:
 - The Caribbean Large Marine Ecosystem Project (CLME), a US\$7.08 million programme funded by the Global Environment Facility, to develop a plan for sustainable management of the shared living marine resources of the Caribbean and adjacent regions. The Project is heavily geared towards the reversal of trends in declining fish stocks and resulting potential interstate conflicts.
 - The IOC officially began the formulation of a project in Integrated Coastal Area Management (ICAM) for Latin America and the Caribbean. It is expected that because of our strong ties to the IOC system, the successful Barbados CZMU programme will be used as a best practice, and the staff of the Unit as resource persons.
 - In 2006, the IOC approved the Tsunamis and Coastal Hazards Warning System for the Caribbean and Adjacent Regions. Barbados was elected the Chair of the Tsunamis and Coastal Hazards Warning.
 - The Harmful Algal Blooms Programme, Integrated Coastal Area Management, and the Tsunamis and Coastal Hazards Warning System for the Caribbean and Adjacent Regions.

Paragraph 32 calls for countries to ***“.....fully implement the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities.....by undertaking initiatives specifically addressing the vulnerability of SIDS”***

Barbados is currently conducting the background preparations to sign on to the Land-Based Sources of Pollution (LBS) Protocol; however, several initiatives are currently active and are

consistent with the LBS Protocol. These initiatives are set up in such a manner as to pave the way for a smooth transition to the LBS Protocol once the decision is made by Government to sign on. These include:

- The Marine Pollution Control Act (MPCA) 1998;
- Development of the Draft Marine Pollution Control (discharge) Regulations and the associated Table of Prohibited Concentrations which propose effluent discharge and marine water quality standards;
- The nearshore water quality monitoring programme where 34 sites at 18 south and west coast beaches are routinely monitored for *Enterococci*, *Faecal coliform* and other parameters
- The National Programme of Action for Lands-Based Sources of Marine Pollution, which is currently being drafted.

3.5 FRESHWATER RESOURCES

Paragraph 35 calls for countries to ***“...meet the Millennium Development Goals and World Summit on Sustainable Development 2015 targets on sustainable access to safe drinking water and sanitation and hygiene and the production of integrated water resources management and efficiency plans by 2005”***

With respect to water quality, 96-98% of households in Barbados are connected to the public water supply system with the remaining 2-4% having easy access to the public water supply. Good groundwater quality and a relatively effective disinfection system have ensured that Barbados has a biologically safe water supply. Specific water management measures are implemented to achieve specific targets or standards.

Sewage disposal in Barbados varies depending on locality, type of structure and in which water protection zone the property is situated. A government operated sewage treatment plant caters to the central Bridgetown area while most hotels have privately operated sewage treatment plants. Domestic and commercial properties vary in disposal methods from water borne facilities or environmental sanitary pits. Final disposal from homes is underground via septic tank, well or earth pit while effluent from the treatment plants are usually to the sea or underground via a well after primary treatment.

Paragraph 37 calls for ***“...integrated water resources management (including using the Hydrological Cycle Observing System); water demand management; water quality capacity building, water governance, regional water partnerships; and water partnerships among SIDS”***

A Draft Policy Framework for Water Resources Development and Management in Barbados laid out the policy for integrated land and water management and development was articulated under the Environmental Management and Land Use Planning for Sustainable Development Project (EMLUP) carried out in 1998. As part of a regional project the Government of France is supporting a project to deliver eight total stations to the Caribbean

region (CARIHCOS Project). The project involves Barbados, Martinique and some of the Northern Caribbean islands.

Water management measures are implemented to achieve specific targets or standards. The management of water resources in Barbados can be summarized as:

Water Quality Management: The Barbados Water Authority currently has the legal responsibility of ensuring water quality under the Barbados Water Authority Act. The water quality of Barbados is protected and ensured at 3 levels. First, the National Groundwater Protection Zoning Policy, 1963 (updated 2010), protects the groundwater resource. Second, the water at the pumping station is disinfected to ensure biological safety. Third, The Minister of Health under the Health Services Act has legal responsibility for protecting the health of all residents inclusive of ensuring a safe drinking water supply. This is accomplished through sources monitoring by the Environmental Protection Department and the Barbados Water Authority and is re-enforced by distribution system monitoring by the Environmental Health Department and the Barbados Water Authority. The EPD and EHD both act as regulators of the BWA. The Barbados Agricultural Development and Marketing Corporation (BADMC) monitors water quality for agricultural purposes. At present the drinking water supply meets all international standards for drinking water quality and is safe for consumption.

Land Use and Zoning: Resource protection in Barbados is achieved using the "Revised Policy of Private Sewerage and Waste Water Disposal Systems." The BWA, EPD and Town and Country Planning department holds primary responsibility for its enforcement. However, an inter-ministerial policy has been adopted to administer and enforce the policy. The major players in water resources management in Barbados are the Barbados Water Authority (BWA), the Environmental Protection Department (EPD) and the Ministry of Agriculture (MA) through its irrigation schemes, the Town and Country Development Planning Office (TCDPO) through its zoning policies. The Revised Policy seeks to control any development or liquid waste disposal system that could be injurious to the national water resources.

The Groundwater Protection Zoning Policy divides the island into five zones and its primary concern is to protect groundwater from bacterial contamination. Zone 1 has the most land use restrictions while Zone 5 has the least. The prohibition of new development in Zone 1 has been incorporated into the Development Order under the Town and Country Planning Act (Amended 2003). The Barbados Physical Development Plan, as mandated by the Town and Country Planning Act addresses the issues of water and sewage and lists the requirements guiding the groundwater zoning policy. The BWA and EPD have the joint task of policing the zoning policy; however the TCDPO has sole responsibility for its enforcement.

Pollution Prevention and Control: Since the zoning policy was over 30 years old it did not provide adequate protection from modern industrial pollutants (oil, cleaning detergents, etc.) and agricultural chemicals. A review of the zoning policy was completed in 2010 which included elements to ensure protection of the groundwater reserves from modern chemicals as well as biological contaminants. Recognition was given to the need for continual review, which will determine whether policies remain relevant. However, water quality continues to meet the WHO guidelines for drinking water quality. The Marine

Pollution Control Act will establish discharge standards for all waste water into the groundwater as well as the marine environment which will be listed in a table of prohibited concentrations.

Protection from Degradation and Depletion: The present regime of groundwater development in Barbados is based on the principle that the limit of the national water reserves is equal to the recharge of the aquifer. The estimation of groundwater reserves is cognisant of degradation, which can take place in the freshwater-saline zone and the response of this zone to pumping as well as to pollution from point and non-point sources. To this end the BWA institutes a system of managed pumping based on monitoring the chloride content of its wells where this concentration is not allowed to exceed 250 ppm chlorides. Full implementation of the Marine Pollution Control Act, 1998 will address degradation of groundwater outside of zone one areas.

National Water Conservation Plan: This plan has been accepted by the Board of the Barbados Water Authority and is currently in the implementation phase. The Barbados Water Authority is the agency responsible for the management of water resources. The National Conservation Plan comprises two parts, long-term ongoing measures such as leakage reduction and universal metering and short-term measures such as temporary shutdown of parts of the system on a rotational basis or temporary license restrictions on private abstractions.

The Emergency Drought Management Plan: A drought and emergency Plan was approved by the Planning and Priorities Committee in 1997. This is a plan of action with respect to drought. It identifies parameters that would be used to monitor, forecast and predict the impact of drought. Such parameters include - rainfall measurements, groundwater measurements, and salinity and weather data from the Meteorological Office as well as reservoir levels. As a result of this, the BWA has now started looking at establishing a rainfall-gauging network to supplement the existing network so that estimation could be made on the impact and variation of rainfall.

Resourcing (Financial mechanisms)

Barbados is one of the world's fifteen most water scarce country with limited available water resources. Thus, there is potential for the water resource issues to adversely limit economic and social development of the country. Therefore, enough support exists to facilitate financing/loans for the above-mentioned management initiatives. The main source for financing to date is the Government of Barbados, however in 2009/2010 negotiations with the IADB were completed in order to undertake major infrastructural improvement.

Legislation

There are several pieces of legislation that can directly and indirectly influence the management of fresh water resources in Barbados:

- i. Three-Houses Spring Act, 1713;
- ii. Porey's Spring Act, 1864;
- iii. The Underground Water Authority Act 1953 [Cap. 283] ;
- iv. The Soil Conservation (Scotland District)Act, 1959;
- v. The Health Services Act and Regulations (1969);
- vi. The Barbados Water Authority Act, 1980 [Cap.274A];
- vii. The Town and Country Planning Development Order, 1972; and
- viii. The Marine Pollution Control Act, 1998.

3.6 LAND RESOURCES

Paragraph 39 a. of the MSI calls for countries to ***“Develop capacity to implement the multilateral environmental agreements in relation to land resources”***

Recognizing the possible threat that land degradation and drought poses to Barbados' social and economic development, government continues to strengthen some of its key agencies, and these include the Soil Conservation Unit (SCU), National Conservation Commission (NCC), Ministry of Agriculture (MA), Drainage Unit (DU), Environmental Protection Department (EPD), Coastal Zone Management Unit (CZMU) and the Town and Country Development Planning Office (TCDPO). Both the SCU and the DU have terrestrial mandates, in the case of the former, its role is confined to addressing issues relating to land degradation within the Scotland District only, while the latter focuses on flood related matters. The CZMU was established to deal with all coastal related matters, including the evident increase in beach erosion which is now a major threat to coastal plant communities around the island's coastline. Drought concerns are addressed collaboratively via the Meteorological Department, Barbados Water Authority (BWA), Ministry of Transport and Works (MTW) and TCDPO. Finally, the TCDPO is government's key regulatory agency and its mandate encompasses all issues associated with land-use in Barbados.

In addition to strengthening existing departments, when the need arises, new land management agencies are also created. For example, the Natural Heritage Department (NHD) was established in 2005, and part of its mandate is to ensure that land-use practices occurring within the proposed National Park are consistent with sustainable land management. Similarly, a National Botanical Gardens Unit was established primarily to promote and showcase best land-use practices on environmentally sensitive landscapes. Government's support and commitment to the implementation of the provisions of the UNCCD is reiterated via a collection of actions including:

- ongoing capacity building;
- a plethora of structured and coherent reviews, participatory planning and implementation of governance-based systems;

- continual allocation of financial resources via national budgetary processes;
- continual amendments to existing legislation and the creation of new laws and regulations;
- participation in regional and international functional and technical cooperation arrangements on degradation and drought issues;
- establishment of national data collection, indicator, and information dissemination systems; and
- increased efforts in public consultation, engagement, education and outreach programmes.

These actions are essential elements of the country's national action programmes to combat land degradation and drought.

Paragraph 39 b calls for countries to ***“Develop capacity for sustainable land management and self-generating agro-ecosystems by building on communal tenure systems and traditional land-use planning and practices for crop, livestock and aquaculture production, taking into account increasing competition for land resources resulting from tourism, urbanization and other activities”***

The University of the West Indies under their CERMES programmes addresses environmental education relating the mitigation against land degradation via the Coastal and Marine Management Stream, Climate Change and Applied Meteorology streams. The Samuel Jackman Prescod Polytechnic and the Barbados Community College both have a portfolio of science and agricultural programmes focused on educating youth and other interest groups. Specifically:

- Samuel Jackman Prescod Polytechnic: Offers a Diploma in Agriculture (2 years), Certificates in Animal husbandry, crop husbandry and landscaping and horticulture (all 1 year) , short courses in crop protection, gardening and plant care
- The Barbados Community College offers a Major in Applied Sciences (Agriculture)
- The University of the West Indies offers B. Sc. in Biology and Meteorology and an MSc in Natural Resource Management

Paragraph 39 c calls for countries to ***“Strengthen land tenure and management systems, move from primary to tertiary agricultural and diversify agricultural production in a sustainable manner”***

Over the years government has embarked upon a number of sustainable land management initiatives that have impacted significantly on the quality of life in several rural communities. Such initiatives include:

- Leasing of arable agricultural lands to landless rural farmers for the purpose of promoting sustainable agriculture.

- Providing free extension services to farmers in an effort to ensure best cropping practices on these lands.
- Providing free technical advice in the area of land cultivation.
- Offering rebates on agricultural machinery and other equipment.
- Offering rebates on fruit and forest trees being used in various reforestation programmes.
- Offering tax benefits to land owners who are involved in sustainable land management programmes.
- Funding of sustainable projects and programmes by various government agencies, e.g. Urban Development Commission (UDC) and Rural Development Commission (RDC).
- Construction of terraces and other access roads in an effort to give rural farmers entry to their farm lands.
- Construction and maintenance of dams and other water bodies being used in national irrigation programmes.
- Sinking and maintenance of wells for the purpose of collecting domestic water and other run-off that would otherwise accelerate soil erosion.

Paragraph 40 states that ***“...SIDS should fully utilize available GEF resources to develop and implement projects to address land degradation through sustainable land management.”***

Funding from the Global Environmental Facility (GEF) has been provided to assist in the development of National Action Programmes called for under the United Nations Convention to Combat Desertification and Drought (UNCCD). Additionally Barbados is participating in six regional projects that will enable it to meet some of the objectives under the UNCCD. These include:

- UNDP/GEF – Least Developed Countries (LDC) /SIDS Targeted Portfolio Project for Capacity Building and Mainstreaming of Sustainable Land Management. This project is expected to promote the mainstreaming of Sustainable Land Management (SLM) in Barbados, through institutional, individual and systematic capacity building;
- The Partnership Initiative on Land Degradation and Sustainable Land Management in Caribbean SIDS;
- CEHI/OAS – Preventing Land Degradation in Eco-systems through SLM;
- UNDP/CEHI/UNEP Integrated Watershed and Coastal Area Management Project;
- The FAO/CANARI project entitled ‘Participatory Forestry Management’ which addresses aspects of land degradation in managing forest resources. The project supports the improvement of the socio-economic and environmental benefits that can be derived from forest management by analysing, promoting and building capacity for participatory planning and management of forest resources at the regional, national and local levels. Barbados is one of seven countries participating in this initiative; and
- Caribbean Youth Programme for Environmental Rehabilitation. The main aim of the project is to promote SLM by reforestation of degraded lands while creating

a sense of ownership and appreciation for the natural environment through the empowerment of youth.

Paragraph 41 a of the MSI required SIDS to ***“Create an enabling environment for sustainably enhancing agricultural productivity and promoting agricultural diversification and food security”***

The Government of Barbados has outlined the medium term goals to achieving a vibrant and dynamic agricultural sector comprised of agribusiness enterprises operating on the basis of modern management principles and practices and engaged in scientifically based, technology driven, commercial production, processing and marketing of quality products. These include:

- Land use policy that protects agricultural lands;
- Maximizing reforms through value added production and increased competitiveness;
- Reducing costs on inputs, enhancing cultivation services and encouraging youth participation in agricultural;
- Improving marketing-infrastructure and food security;
- Diversifying the production base of agriculture through the development of a sugar cane industry and an integrated cotton industry;
- Providing support for private sector investment in those industries with greatest potential for growth;
- Achieving greater levels of self-sufficiency, particularly in those products identified as being critical for food security;
- Enhancing the productivity of agricultural production through the promotion of technology, new varieties and other measures that contribute towards improved yields, lower costs and improved quality;
- Enhancing the competitiveness of agricultural production, from primary production to processing and through to marketing;
- Strengthening agricultural sector institutions, such as the Government laboratories and the Plant Protection Department and to better equip the sector to safeguard the health of the nation and to facilitate trade in Barbadian agricultural products;
- Formulate a comprehensive food security plan; and
- Quantify the production targets necessary for food security, as well as the percentage of the product that should ideally be sourced from domestic production.

Paragraph 41 b of the MSI calls for SIDS to ***“Remove production constraints and build programmes in such areas as seed production and integrated pest management systems.”***

Sectoral linkages are utilized such as agro-tourism projects; plant propagation programmes e.g. joint projects in tissue culture programmes between Government of Barbados, Caribbean Agriculture Research and Development Institute (CARDI) and University of the

West Indies (UWI); and incentives for private sector involvement are the core of the technology aspects of agricultural production.

Paragraph 41 c of the MSI requires SIDS to ***“Enhance food processing, marketing and product development and quality control.”***

The Ministry of Agriculture (MA) is a key partner with respect to land management in Barbados, as this Ministry provides a number of incentives not only to promote sustainable farming, but also, to improve the quality of life in rural communities. The MA is a part of a very structured and coordinated national mechanism. In addition, the Barbados Investment Development Corporation (BIDC) also administers incentives to promote businesses based on applying sustainable and clean technologies to agricultural production and agro-processing industries.

Paragraph 41 d of the MSI requires that countries ***“Promote relevant research and development and use of appropriate modern technologies.”***

The Government of Barbados has committed to:

1. Provide the requisite regulatory and infrastructural framework to facilitate storage and preservation of food security products;
2. Develop a National Agricultural Health and Food Safety Authority which will ensure that the country upholds national and international food safety requirements for the production, export and import of agricultural commodities;
3. Upgrade all laboratories to improve agricultural health and food safety. The animal and plant quarantine services will be amalgamated and strengthened in accordance with international requirements;
4. Place greater emphasis on achieving laboratory accreditation in order to facilitate international recognition and acceptance of results; and
5. Promote new technologies through the use of adaptive research, field days, on-farm demonstrative activities and collaborative programmes with various farmer organizations, commodity associations and agricultural cooperatives will be undertaken.

Activities 2 to 4 are now the underway as components of an IADB funded project.

Paragraph 41 e of the MSI calls for countries to ***“Promote sustainable aquaculture.”***

Aquaculture initiatives can benefit from concessionary support once they comply with guidelines for responsible environmental practices. Aquaculture enterprises will also be carefully monitored by the relevant regulatory agencies. Currently there are a few private sector initiatives involved in aquaculture and the major species being farmed is tilapia. A best case example of this can be found in Pilgrim Road, Christ Church where a combined aquaculture and aquaponics project is being undertaken.

Paragraph 45 a of the MSI calls for ***“Policy and legislation formulation”*** [With respect to mining].

In Barbados, mining activity primarily relates to the quarrying of deposits to meet the needs of the construction sector, including limestone, coral, clays and shale, sand and gravel, and carbonaceous deposits. There are also onshore reserves of oil and gas.

Monitoring of mining activity is carried out by all the relevant stakeholder agencies, such as the Natural Resources Department (NRD) of the Energy Division, the Town and Country Development Planning Office, the Barbados Water Authority (BWA), and the Ministry of Labour and Immigration.

There legislation governing mining includes the Quarries Act (Cap 353), the Petroleum Winning Operation Act. (Cap. 281) and the Health Services Act (1963). The legislation on quarrying is currently being updated which will incorporate strengthened natural resource management provisions.

The current process for opening a quarry requires the submission of an application to the Natural Resources Department. A certificate of registration is issued on approval. Potential operators are then allowed to apply for a license to operate the quarry.

Currently quarry operators must also submit an Environmental Impact Assessment (EIA) to the Town and Country Development Planning Office (TCDPO). An EIA committee is such instances comprise representatives of the Natural Resources Department as well as Barbados Water Authority, Environmental Protection Department, Ministry of Agriculture, Town and Country Development Planning Office and the Ministry of Transport and Works. Terms of Reference (TOR) guidelines for the preparation of an EIA are provided by the TCDPO. Quarry operators must prepare their TOR for submission to the EIA committee for review. The EIA committee reviews and provides recommendations to the Chief Town Planner (CTP) as to whether the EIA itself is adequate or inadequate. The CTP has the responsibility to grant or deny the license.

Paragraph 45 b of the MSI speaks to ***“The development of databases and assessment of mineral and aggregate resources.”***

The Natural Resource Department of the Ministry of Finance, Investment, Telecommunications and Energy is in the process of completing mineral resource reserve calculations with respect to limestone, sand and shale. The Quarries Act and associated Subsidiary legislation (1963) which is being revised will enable the Unit to accurately keep track of how much is mined annually.

A significant achievement in the past year was that in December 2008 the Energy Division approached Latin American Energy Organization (OLADE) to obtain assistance with the compilation, organization and registration of energy information. The system would be used in a cross-sectoral manner with both the private and public sector involvement. The Energy information system for Barbados is spearheaded by a technical team which includes government representation from Energy- which includes Natural Resources, Research and

Renewable Energy Departments; The Ministry of Economic Affairs; and Barbados Statistical Service. There is also a Statistical Committee with broader membership including the major oil companies - SOL, ESSO and Texaco; national oil companies – Barbados National Oil Company Ltd. (BNOC), Barbados National Terminal Company Ltd. (BNTCL), National Petroleum Corporation (NPC), as well as the University of the West Indies (UWI), Barbados Manufacturing Association (BMA), Barbados Coalition of Service Industries (BCSI) and the Central Bank of Barbados.

The major elements of the indicator development will be economic, social and environmental with the main themes being equity, health, production, use, security and atmosphere. Data will be uploaded via the internet or through an intranet.

Paragraph 45 c of the MSI calls for ***“Negotiations with transnational corporations, including measures to enhance the transparency of revenue flows.”***

Barbados has recently entered a phase of offshore petroleum exploration. New legislation was drafted to govern the off- shore exploration process and the issues of transparency factored heavily in the development of the legislation.

Paragraph 45 d of the MSI speaks to ***“The evaluation of transnational corporations including measures to enhance the transparency of revenue flows.”***

The evaluation of transnational corporations including measures to enhance the transparency of revenue plans is critical to Barbados in particular in light of its potential contributions of FDI to our fiscal revenues. This has been addressed in recently drafted offshore drilling legislation.

3.7 ENERGY RESOURCES

Paragraph 47 of the MSI states that ***“SIDS are committed with the necessary support of the international community, to develop and implement integrated energy programmes.....include inter alia, comprehensive assessments of energy resources, current and projected patterns of energy use and ways to enhance energy efficiency.....promote the development and use of renewable energy technologies as well as advance clean energy technologies that are affordable and readily adaptable to the circumstances of small island developing states”***

Government’s target for renewable energy contribution to the island’s primary energy to be in excess of 30% by 2012. Currently the main renewable energy sources are bagasse and solar water heaters. These contribute approximately 15% to the island’s primary energy

supply. Other forms of renewable energy will be developed as well as measures put in place to improve the contribution from current sources.

In the Financial Statement and Budgetary Proposals of 2008 presented by the Hon. David Thompson Prime Minister and Minister of Finance on Monday 7th July, 2008, a number of policy interventions in support of renewable energy were proposed. Some of these interventions included:

1. Government will take the lead using its properties in generation of electricity from solar, wind and waste for its own facilities and for sale into the national electricity grid. This initiative will also be accompanied by any necessary fiscal incentives to encourage the efficient generation of energy from these alternative sources.
2. Government will also lead the way in retrofitting its buildings and facilities, and in revamping its fleet of vehicles in as feasible and economical a manner as possible in order to conserve its own use of energy, particularly of fossil fuel energy.
3. Building standards and incentives will also be put in place to encourage major conservation of energy.
4. The Income Tax Act provision for the cost of energy audits is currently up to \$2,000.00 to be deducted as part of the general Income Tax Allowance for Home Improvement of \$10,000 in any one year. A separate allowance called the Energy Conservation and Renewable Energy Deduction of a maximum of \$5,000.00 per year over each of five (5) years to cover the costs of an energy audit and fifty per cent of the cost of retrofitting a residence or installing a system to produce electricity from a source other than fossil fuels was proposed. This applies also to businesses whether incorporated or unincorporated.
5. Under Part II B item 87 of the Customs Tariff, various items of wind turbines, photovoltaic components and systems, biofuel systems, hydropower systems, solar thermal systems, wave or tidal power systems, fuel cell systems and geothermal heat pump systems are exempted from import duty (20%) and environmental levy, on the basis of ministerial approval. The need for ministerial approval in each and every instance will no longer apply and these items will automatically enjoy the concession from the Customs.

Paragraph 48 of the MSI states that ***“SIDS are committedto strengthening ongoing and supporting new efforts in the area of energy supply and services, including the promotion of demonstration projects.....”***

There are a number of solar photovoltaic installations in the country but these are generally for demonstration purposes and not connected to the national grid.

- The Government of Barbados has invested in a 17.5KW installation at Harrison’s Cave, the major tourist attraction. This installation is connected to the recharging system for the electric trams that transport visitors through the cave system.
- The BL&P has two 2 MW solar photovoltaic installations which are connected to the national grid but their contribution to the total power supply is minimal.
- Other projects include:

- i. The ice machine at Skeetes' Bay, a rural fishing community,
- ii. The computer laboratory at Combermere School, one of the island's secondary schools, and
- iii. The lighting of a statue of National Hero Sir Grantley Adams, located at Government Headquarters.

The Government of Barbados continues to demonstrate commitment to alternative energy as demonstrated via the Greening of Government Project under the Ministry of the Environment, Water Resources and Drainage. One of the line departments of the Ministry has commenced the conversion from conventional sources of electricity to photovoltaic sources.

Paragraph 49 of the MSI requires SIDS to ***“.....work to promote wider dissemination and application of technology that is appropriate to SIDS and to strengthening existing mechanisms such as UN renewable energy fund..... Cooperation among SIDS should be further pursued in areas where success has been achieved.....”***

Barbados boasts the second largest concentration of solar water heaters, preceded globally only by Israel. Solar water heaters were introduced in the 1970s and there are now approximately 40 000 units in use in the country with more than 30 000 for domestic use. All solar heaters are manufactured locally by three indigenous companies, employing local staff. Government support in the form of fiscal incentives to both manufacturers and consumers and in purchasing units has contributed to the industry's growth.

The solar water heating industry has led to significant savings in fuel import costs, direct energy savings, energy security benefits and savings in greenhouse gas emissions. The savings outweigh the costs of tax incentives to the industry and to consumers. It is estimated that there has been a 30% increase in demand for solar water heaters locally.

The success of the solar water heaters in the local industry is just the first step. The synergistic combination of government fiscal incentives and policies along with private sector innovation and entrepreneurial spirit has been coined 'The Barbados Model of solar water heater development' and is now exported

Barbados now has technology transfers in St. Lucia (10 year old joint venture) and in Trinidad (a 5 year franchise agreement). Barbados has been approached by over 10 developing countries from throughout the world and in particular, is seeking to be part of the US \$12 million dollar GEF solar water heater project.

There is also an IADB funded project aimed at facilitating independence power producers that could produce their own electricity as well as sell additional power to the Barbados Light and Power Company Ltd. This will involve the installation of solar panels on private homes, commercial entities and government buildings. This IADB funded project will also pursue small wind projects and small biofuel projects.

3.8 TOURISM RESOURCES

Paragraph 51 states that ***“SIDS.....should monitor the impacts of tourism development to ensure tourism development and social and environmental priorities are mutually supportive at all levels. They must also facilitate the design or refinement of guidelines and best practices appropriate for assessing the carrying capacity of SIDS including the provision of technical and financial support to conduct these assessments..... SIDS should also implement the guidelines on biodiversity and tourism development adopted by the Conference of Parties to the Convention on Biological Diversity at its seventh meeting.”***

The tourism industry in Barbados has recognized that conservation and preservation of resources is crucial to having a sustainable tourism market. There have been several partnerships between government and the tourism sector in the area of environmental conservation. The Tourism sector has lobbied government to invest more in environmental preservation. There are of course the negative impacts of tourism which have to be mitigated against and addressed through the incorporation of environmental management systems and standards. The solution lies in continued dialogue, partnerships between the tourism industry and those responsible for environmental management, and education in matters pertaining to environmental conservation, for all citizens.

With respect the guidelines on biodiversity and tourism development, the National Biodiversity Strategy Action Plan has as its Objective 12: “To promote the conservation and sustainable use of biodiversity in various sectors (agriculture, health, fisheries and tourism). A detailed list of strategies and actions are provided for the tourism sector, for example:

- Promote only small- scale, fully-trained guided tourism in important biodiversity areas.
- Prevent high impact tourism development in currently undeveloped areas of significant biodiversity importance.

Paragraph 52 of the MSI states that ***“SIDS should also find effective ways and means to develop and implement sustainable tourism development plans, in partnership with all relevant stakeholders, in particular the private sector, and should integrate these plans into their national strategies for sustainable development. In addition they should develop and implement community-based initiatives on sustainable tourism, and build necessary capacity of civil society and local stakeholders, while protecting culture and traditions and effectively conserving and managing natural resources”.***

In 2001 the Ministry of Tourism submitted a Green Paper on the “Sustainable Development of Tourism in Barbados-A Policy Framework” which was used to guide the sustainable development of the tourism industry in Barbados in the short to medium term. The elements of participation, collaboration and conservation were encapsulated in the Policy which has as its broad policy objective:

“To pursue sustainable tourism development through improvement and optimal use of our land, human resources and services, and through the conservation and managed use of our cultural, built and natural heritage, in order to ensure a product of the highest quality whilst improving the life and economic development of the people of Barbados”.

In 2008, the multi-sectoral Tourism Advisory Council which provides advice to the Minister of Tourism on critical issues impacting the industry-reviewed the Policy Framework in light of the current international climate. With respect to conservation a number of observations and recommendations were made including the need to:

- a) Establish Tourism as the “Green Leader” in Barbados championing the cause of Greening Barbados in the following areas:
 - Energy Conservation
 - Water Conservation
 - Solid Waste Management
 - Hazardous Waste Management
 - Indoor/Outdoor Air Quality
 - Community Outreach
 - Building Infrastructure
 - Land Use
 - Environmental management

- b) Prioritise greening for local private and public sector organisations since ‘going green’ is currently one of the most feasible solutions to reducing the high operating costs that have become characteristic of the Barbados tourism industry. Specific recommendations included:
 - Encouragement of hotels to utilise the Energy Audit Efficiency and Retrofit Fund – (request that equipment be brought in duty free)
 - Encouraging tourism stakeholders to take advantage of incentives being offered for companies that use eco-friendly products and equipment. (Compact fluorescent lighting (consumption is reduced by up to 70 percent and bulbs last 10 times longer than standard incandescent light bulbs); alternative fuels and energy – (biodiesel, renewable solar and wind powered electricity), dual-flush toilets (saving 67% more water than a standard toilet), composting etc.
 - Conducting the relevant research and facilitating workshops to educate and inform industry constituents about eco-trends and the benefits of greening the industry
 - Facilitating education and awareness community outreach programmes to highlight the benefits of Going Green to tourism stakeholders, the local population and visitors and involving them in the process.
 - Targeting consumers who are looking for greener travel options by encouraging stakeholders to list their accommodation in the Natural Green Pages or on various other green oriented sites.
 - Barbados should lobby for a lead role on the international Marrakech

Task Force on Sustainable Tourism which is currently led by the Bahamas. This would lend support to its “care for the environment” approach.

3.9 BIODIVERSITY RESOURCES

Paragraph 54 a of the MSI speaks to ***“Integrating biodiversity protection into national sustainable development strategies”***

There is legislation for the protection of biological resources including:

- a. The Cultivation of Trees Act which provided tax refunds to any landowner growing trees not considered to be fruit trees as defined by the act, on 0.02 ha or more;
- b. The Trees (Preservation Act) which prohibits any person from felling any tree having a girth larger than one metre at breast height, unless prior permission is granted by the appropriate authority;
- c. The Town and Country Planning Act which permits the Chief Town Planner to prohibit any willful destruction of trees and to direct the necessary replanting should trees be indiscriminately felled with or without his permission;
- d. The Soil Conservation Act, which while restricted to the boundaries of the Scotland District, is of significance since it gives the Chief Agricultural officer the power to forbid any kind of action that may contribute to soil erosion within the district, including removal of trees, shrubs, grasses etc. from fragile areas, overgrazing on erosion-prone land, and physical development in critical areas;
- e. The Fisheries Act 1998 and associated Fisheries Management Regulations has provisions for the protection of among other things, turtle and turtle eggs, lobster carrying eggs, white sea urchin, ornamental fish or aquatic flora, yellowfin tuna under a certain size

Additionally, Barbados has developed its National Biodiversity Strategy and Action Plan which identifies national priorities for the management, conservation and sustainable use of local biodiversity. Recommendations for preservation of national biodiversity have also been included in the Barbados Sustainable Development Policy.

More recently, Barbados’ National Strategic Plan 2006-2025 has addresses natural resource conservation in Goal 4, Objective 4.1 namely, “To promote and facilitate the Sustainable Use of our renewable resources and the wise management of our non- renewable natural resources.” Also of note is the Physical Development Plan (amended 2003) which has as one of its main environmental goals “to conserve and manage natural resources for valued ecological functions and to provide an improved quality of life for the residents and future generations of Barbados”.

Paragraph 54 b of the MSI speaks to ***“Building effective partnerships between all relevant stakeholders essential to the conservation and sustainable use of biological resources.”***

For more than ten years the Natural Heritage Department (NHD) has pursued an integrated development programme which included Harrison's Cave (the island's premier tourist attraction), Welchman Hall, Jack-in-the-Box Gully, Folkestone Marine Reserve, Carlisle Bay Marine Reserve. The NHD during this period has, therefore, developed some skills and experience with respect to the challenge of implementing the sustainable development concept. Among the most important aspects of this has been the approach to community participation and awareness. This time-consuming component which is at the heart of sustainability can only be achieved through the conversion of technical information into tangible workable prospects for members of the community.

With the case of the background work carried out for the establishment of Barbados' Marine Management Agency (MMA) which will be designed to manage marine protected areas, extensive use has been made of the round table approach, to ensure that all the stakeholders who use the same economic space are aware of each other's needs while recognising short term issues and processes which are necessary to ensure sustainability.

An example of effective coordination is the convening of the Graeme Hall Ecosystem Management Committee by the Director of the Natural Heritage Department. This committee comprises representatives of the Ministry of Environment, Water Resources and Drainage, the Coastal Zone Management Unit, Environmental Protection Department, Drainage Department and the Barbados Water Authority who are assembled to address the issues related to the effective management of the ecosystem.

Multi-disciplinary steering committees are also utilized for example the Working Group on Biodiversity and CITES Scientific Authority, in addition to developing national positions for various negotiating fora develop and implement programmes of work to facilitate biodiversity management on the ground.

Paragraph 54 c of the MSI calls for ***“Addressing island biodiversity ...in a manner that responds to the unique characteristics of SIDS and to the threats related to climate change, land degradation and their particular vulnerabilities”***

Barbados has already developed its National Biodiversity Strategy and Action Plan which identifies national priorities for the management, conservation and sustainable use of local biodiversity. In addition there is the Physical Development Plan under the aegis of the Town and Country Development Planning Office which is a tool used to ensure the allocation of adequate land to support economic development, social development and environmental conservation. In recognition of the vulnerability of our natural resources more and more Government Sectors are incorporating environmental factors into their programming for example the Ministry of Housing and Lands has adopted a policy of planting small trees into new developments.

In summary the major agencies responsible for the management of biodiversity in Barbados has the following as part of their mandates:

- **The Natural Heritage Department, MEWD**
 - i. Protect the quality and integrity of ecosystems including air, water, land and animal components.
 - ii. Focus on the linkages and relationships among the ecosystems, with special attention to human activities, and consider these components beyond their immediate environs to the broader National Park system, and to the Island system as a whole.
 - iii. Promote the protection, conservation and wise use of Barbadian flora.

- **The National Conservation Commission, MEWD**
 - i. Conservation of the natural beauty, topographic features, historic buildings, sites and monuments of Barbados.
 - ii. Development of a network of protected areas, both marine and terrestrial.

- **The National Botanic Garden, MEWD**
 - i. Conducting silvicultural and dendrological research on indigenous, naturalized, endangered, rare and endemic plant species existing on open spaces across Barbados
 - ii. Develop the nature tourism potential of green spaces for integration into the national tourism product

- **The Coastal Zone Management Unit (CZMU), , MEWD**
 - i. To develop standards for water quality in coastal and marine areas to effect the maintenance, rehabilitation and enhancement of coastal and marine habitats.
 - ii. To determine temporal changes in coral reef communities, and to develop necessary measures to protect, rehabilitate and enhance coastal and marine habitats.

- **The Fisheries Division, Ministry of Agriculture**
 - i. The *Fisheries Division* is responsible by law for fisheries management including conservation of resources and development of the fisheries.

Paragraph 54 d of the MSI speaks to ***“Implementing the guidelines of the Convention on biodiversity and tourism development”***

The Sustainable Development of Tourism in Barbados Policy Framework has been developed by the Government and addresses the natural environment. The specific objective is to promote sustainable tourism development through the protection, conservation and development of the natural environment within its carrying capacity and through education and awareness of, and respect for, the country’s unique natural heritage. In addition a multi-sectoral Tourism Advisory Council comprising the major public, private and non-governmental entities impacting the tourism industry, advises the Minister of Tourism on

major issue impacting the industry. The Ministry of the Environment, Water Resources and Drainage is a member of the Council.

Paragraph 54 e of the MSI addresses ***“Enhancing the national efforts, by both Governments and other stakeholders in the implementation of the programme of work on protected areas, including the establishment of protected areas consistent with international law and based on scientific information”***

The Government of Barbados recognizes the importance of the establishment of Protected Areas for the conservation and management of biological diversity and by designating and establishing these sites there will be protection of species habitats and by extension the species themselves. Protected areas have been delineated in the National Park Plan and the National Physical Development Plan of Barbados.

Significant action has been taken through the development and implementation of the Coastal Zone Management Act, the Integrated Coastal Zone Management Plan and the Physical Development Plan and the Integrated Gully Ecosystem Management Plan.

The Environmental Management and Land use planning for Sustainable Development Study, (EMLUP) completed in March 1999 had, as one of its outputs, the National Park Plan which contained the following components:

- Section A -An Ecosystem Approach to the Barbados National Park
- Section B - Opportunities for Rural Economical Development and National Tourism, and
- Section C - Education Awareness opportunities.

The Physical Development Plan 1999 states that the National Park and the Natural Heritage Conservation Areas (NHCAs) encompass the most important areas of natural and cultural interest in Barbados (1999:3-1). The Natural Heritage Department (NHD) has the mandate for establishing Barbados' first system of Protected Areas, specifically the above mentioned National Park (NP), located in the northern part of Barbados. The boundaries proposed, will stretch from Archer's Bay, St. Lucy to Consett Bay, St. John incorporating inland areas such as the Flower Forest, St. Joseph; Jack-in-the-Box Gully and Harrison's Cave, St. Thomas, to Consett Bay, St. John. While establishment of the National Park is an awesome responsibility, it nonetheless will be a remarkable achievement, as significant opportunities will be created for the people of Barbados through a system of Protected Areas, and "green spaces" in the Scotland escarpment, and other Natural Heritage Conservation Areas (NHCA), island wide.

Preliminary work in designation of Barbados' first National Park commenced in 2009 through methodologies encompassing the following: a) visual assessment work via field investigation and photographs of the Barbados National Park; b) review of all documentation generated from previous work (studies) carried out of the proposed National Park; c) production of booklet and CD of National Park related information; and d) Establishment of the National Park Advisory Committee

Another major undertaking is the National Botanic Garden Project was designed to protect and preserve Barbados' biological resources and the habitats and ecosystems in which they exist via novel, appropriate silvicultural management practices. The specific objectives of the project include:

- i. Supporting the development and maintenance of a comprehensive open space management plan that employs green (organic) landscape treatment programmes and novel silvicultural practices.
- ii. Conducting silvicultural and dendrological research on indigenous, naturalized, endangered, rare and endemic plant species existing on open spaces across Barbados.
- iii. Developing the nature tourism potential of green spaces for integration into the national tourism product.
- iv. Promoting the 'Green Deficit' management approach among stakeholders not only at Waterford, but across the entire island

Paragraph 54 f of the MSI calls for ***“Controlling major pathways for potential alien invasive species in SIDS.”***

There are laws in Barbados such as the Animals (Disease and Importation) Act and the Plant, Pest and Disease (Import Control) Act which have to be satisfied before any plant or animal specimens, or parts are allowed to enter the country. There are Plant and Animal quarantine and inspection offices located at both the air and seaports.

There is room however for laws to be amended to capture the issue of regional integration which brings with it increased ease of travel for persons moving between islands. This becomes problematic when persons seek to smuggle plant materials from island to island.

There is also room for increased training for quarantine officials and expanding examinations for pests from strictly living biological materials to non-living biological material such as wood and wood products.

The Working Group on Biodiversity under the Natural Heritage Department also provides guidance on non-CITES listed alien and exotic species.

Paragraph 54 g of the MSI speaks to ***“Developing local capabilities for protecting and developing traditional knowledge of indigenous groups for the fair and equitable sharing of benefits arising from the use of genetic resources, taking into account the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising out of their utilization.....”***

Objective 10 of the National Biodiversity Strategy and Action Plan specifically seeks to “Ensure equitable biodiversity access and benefits sharing’. The Director of the Natural Heritage Department is the national focal point to the convention on biological Diversity on Access and Benefits Sharing.

Barbados has a Corporate Affairs and Intellectual Property Office (CAIPO) which is the local lead agency as it related to the protection of traditional knowledge, legislative instruments which support the work of CAIPO include patents, copyright and related rights, trademarks and geographic indications.

With specific reference to Barbados' biodiversity use, and management there is an ongoing issue of foreign researchers visiting the island and extracting valuable information for example with respect to the use of biodiversity for medicinal purposes. The cost of creating databases of intellectual property coupled with the inability to adequately value intangible issues such as traditional knowledge may be prohibitive on SIDS.

There is need for the development of capacity by the relevant regulatory authority to address bio-prospecting and bio-extraction initiatives which appear to be increasing in Barbados. The CZMU grants permission for marine research of any form, if it has a potential impact on coral reefs and coastal habitats. This is done through a research permit process. With respect to external research as it relates to terrestrial biodiversity, a similar process is being put in place under the aegis of the Natural Heritage Department.

Paragraph 54 h of the MSI speaks to ***“Developing capacity for cooperation among SIDS for biodiversity resources, shared ecosystem management and exchange of experience”***

The various Government entities involved in biodiversity conservation communicate with other regional focal points, Barbados participates in workshops and meetings held regionally and subregionally. CARICOM has several sub-regional entities that provide critical services for its member states. Examples include the Climate Change Centre in Belize, CARDI in both Trinidad and Tobago and Barbados, CARICOM Fisheries Resource Assessment & Management Program (CFRAMP) and of course the campuses of the University of the West Indies. With respect to terrestrial biodiversity there are annual meetings of Caribbean Foresters. As a matter of interest, the Natural Heritage Department is engaged in a partnership with the Woodbourne Refinery site and Birdlife International to provide sanctuary for migratory shore birds.

Paragraph 54 i of the MSI calls for ***“Participation in the Ad Hoc Open-ended Group of the Convention on an international regime on access and benefit-sharing to elaborate and negotiate the nature, scope and elements of an international regime on access and benefit-sharingthe issue of unauthorized access to an misappropriation of genetic resources and traditional knowledge which is of particular concern to SIDS.”***

Barbados through its Ministry of the Environment, Water Resources and Drainage has developed and has had approved by the Global Environment Facility a project which speaks to these issues. The Biodiversity Enabling Activities project will shortly be started as a tool to contribute to the achievement of the 2010 targets and when completed should provide

policy guidance leading to legislation development for the conservation and sustainable use of biodiversity in Barbados.

The project specifically addresses:

- i. An assessment of the capacity required to implement an efficient access and benefit sharing system (Bonn Guidelines) to assist the conservation and sustainable utilization of biological diversity (including traditional knowledge as it relates to biological diversity use).
- ii. A national Clearing House Mechanism (CHM) to better participate in the overall CBD process and to raise public awareness of biodiversity in Barbados.
- iii. Assessment of national capacity building needs in taxonomy.
- iv. Protected areas and
- v. Assessment of national capacity to implement an efficient system to manage invasive alien species and their impacts on biological diversity

Paragraph 55 j of the MSI speaks to ***“Developing human and institutional capacity at the national and regional levels in SIDS for research in the area of biodiversity, including taxonomy.”***

The University of the West Indies Cave Hill Campus offers Undergraduate and Postgraduate Degrees in Biology. Programmes are also offered at the Barbados Community college and to some extent at the Samuel Jackman Prescod Polytechnic.

At the National Botanic Garden, staff development continued to focus on technical cooperation programmes with countries that are already advance in areas relevant to the National Silvicultural Management Support Programme (NSMSP) and who are willing to give support at minimum cost. The NSMSP requires local technical expertise at various levels and hence partnerships with the Barbados Community College, the Samuel Jackman Prescod Polytechnic and the National Training Board with respect to specialized training for future recruitment were initiated. The Ministry of Education was also approached regarding the possibility of providing scholarships in fields related to silvicultural management.

Paragraph 55 k of the MSI speaks to ***“Supporting, through the convention and its Cartagena Protocol, the development and implementation of national biosafety frameworks.”***

In September 2002, Barbados became a Party to the Cartagena Protocol on Biosafety (CPB) and, by extension the ongoing global biosafety programme. Since signing the Protocol, the country has undertaken several initiatives intended to establish compliance with international obligations and generally to develop national capacity to manage biosafety issues.

Barbados participated in the Global Biosafety Project entitled *“Development of National Biosafety Frameworks”* which was funded by the Global Environmental Facility (GEF) and implemented by the United Nations Environmental Programme (UNEP) to assist countries in

putting in place the structures needed to effectively achieve the objectives of the Protocol. The National Project component commenced in July 2003 and facilitated the definition of a Draft National Biosafety Framework (NBF) for Barbados. The Draft NBF Report was finalized in September 2005 and endorsed by Cabinet in August 2006, thus paving the way for the commencement of work preparatory to the establishment of the national administrative and regulatory regimes.

The Draft National Biosafety Framework Report contains the following as its key components:-

- i. A National Biosafety Policy;
- ii. A Regulatory Regime;
- iii. An Administrative System;
- iv. A Monitoring and Enforcement System; and
- v. A Mechanism for Promoting and Facilitating Public Awareness, Education and Participation.

The long-term vision against which the National Biosafety Policy is developed is one in which Barbados is recognized as:

“A society that safeguards human, plant and animal health and the environment, while optimizing the benefits of modern biotechnology”.

Work is still ongoing to establish the National Biosafety Framework.

Paragraph 55 l of the MSI calls for ***“.....building community capacity to conserve important species, sites and habitats”***

The Natural Heritage Department (NHD) has developed some skills and experience with respect to the challenge of implementing the sustainable development concept. Among the most important aspects of this has been the approach to community participation and awareness. This time consuming component which is at the heart of sustainability can only be achieved through the conversion of technical information into tangible workable prospects for members of the community.

The programmes developed for the execution of the unit's work have been in keeping with the approach complementary to the recommended Natural Heritage Department. The Unit has carried out a study visit and research in national parks and protected areas abroad, and should provide the technical staff where possible with opportunities, for familiarisation with National Park planning concepts.

The NHD has therefore focused its efforts in being the focal point for residents surrounding Harrison's Cave to air their concerns in respect of the Harrison's Cave Redevelopment Project and the Zone of Special Environmental Control (ZSEC).

The NHD recognises that there is need to establish conservation projects in the Harrison's Cave communities; conceptualise a comprehensive management plan for the Zone of

Special Environmental Control, and increase pilot projects which give rise to social and economic benefits for residents.

The National Botanic Garden over the past two years has been undertaking an initiative focused on silvicultural management of trees, shrubs and grasses growing in mini parks, in and around government buildings, along highways, around coastal areas, etc. This programme was carried out in collaboration with the Natural Heritage Department, the National Conservation Commission, the Town and Country Development Planning Office, the Ministry of Agriculture and the Coastal Zone Management Unit. In addition to managing trees on these landscapes, the programme targeted various plant nurseries to ensure that the best genetic materials are being propagated and species, cultivars, varieties and strains are planted at locations compatible with their natural requirements.

3.10 TRANSPORT AND COMMUNICATION

Paragraph 56 of the MSI states that *“SIDS with the support of the international community, should cooperate and develop viable regional transportation arrangements, including improved air, land and sea transport policies”*

As it relates to land transport there are a number of initiatives being adopted to ensure a modern, sustainable transport system. As can be found with many other areas which are deemed to be important in Barbados’ achievement of sustainable development, the Barbados Sustainable Development Policy speaks to the issue of transport addressing the need to reduce environmental damage associated with various aspects of transport whilst ensuring that its valuable economic and social contributions are not undermined.

The Barbados Transport Board is a Government owned and funded public transport system, established as a result of an Act of Parliament in 1955. The Transport Board has a fleet of approximately 304 buses, which include two buses with wheel-chair access for the disabled.

In addition to Government provided transportation services, there are also privately run minibus and route taxi services which operate on selected routes.

Access- Including the Rural Population and the Poor

The use of Government-run bus services in Barbados is increasing and may continue to increase once the Transport Board can demonstrate to the general public the reliability of services provided through maintenance of the fleet and improved regularity of services. Bus services are heavily subsidized with a fixed bus fare of \$1.50 per trip. School children in uniform and senior citizens over the age of sixty-five (65) travel for free on Transport Board buses.

The Transport Board has conducted research which suggests that there could be room for improvement in the service availability in some rural sections of the island. To address this

issue, it has been proposed to use route taxi vehicles between the main routes and to some of the smaller villages to supplement the Transport Board's main services. There are also challenges regarding the provision of bus services in some areas of the country. These are attributed to poor road surface conditions and residential developments where roads are too narrow for standard-sized buses.

A recent development in service improvement has been the establishment of the *Call a Ride* service through the Transport Board for persons with disabilities. This service provides access to public transportation for children who were previously unable to attend school because of physical challenges. The service is also available for people who need to attend medical appointments; in some cases aid is offered to members of the public who are elderly or disabled who wish to attend religious or church services. This novel initiative is a state funded service and is free to approved users. Given that there is an increasing demand for the service and the limited number of vehicles, a systematic approach needs to be developed which allows an optimal number of persons to be accommodated with the capacity that is currently available.

Establishment of the Transport Authority

The recent establishment of a Transport Authority in November 2008 is expected to formulate the vision of the Transport Board into a clearly articulated policy framework for public transport in Barbados. This entity will also be responsible for strategic planning and goals of the organization and the role it plays with the public transportation sector on the island. The establishment of the Authority was the result of recommendations of a study done in the 1990s aimed at ensuring the right mix of transport options on the island.

Urban Transport Planning and Policies

Given the relatively small size of Barbados and its system of centralized government, urban transport planning is not carried out as a separate activity to transport planning at the national level.

In the late 1970s, the Government of Barbados commissioned the undertaking of the first integrated land-use transport study for the island. In the 1980s there was a Bridgetown traffic management study done that proposed the upgrade of the road corridors that form the inner and outer bypass system that exists today. In 1995, the Government of Barbados commissioned a study to prepare a National Transport Plan.

Vehicle Efficiency and Emissions Policies

A Draft Energy Policy for the country was completed in December 2007. It is described as a series of measures to ensure a secure supply of energy, at competitive prices, with efficient use, in an environmentally sound manner. The Draft Policy promotes the use renewable energy technology and the development of a low carbon economy as key strategies to ensure sustainability.

The Ministry of Transport and Works (MTW) is currently researching the issue of emissions in collaboration with the EPD and the Barbados National Standards Institute (BNSI) in order

to establish a policy. Existing legislation cover emissions in a very subjective way, i.e. it doesn't refer to specific levels/standards.

With regard to efficiency, the Transport Board has acquired diagnostic software for the most recent acquisitions in the fleet of buses.

Additionally there is a policy from the Ministry of Finance via the Central Purchasing Department (CPD) regarding vehicles which can be imported for government use to ensure that they are fuel efficient.

Paragraph 57 speaks to "***...Access limitations to basic telecommunications.***"

Barbados has 100% access to basic telecommunications.

Paragraph 58 sees countries "***...Taking initiatives in such areas as access to and the use of information and communication technology (ICT), the development of community multimedia centres, ICT literacy, skills development, local content and applications in building knowledge-based societies and bridging the digital divide particularly in rural communities. Maintenance of low -technology communication solutions such as high-frequency radio for rural and remote locations.***"

The strategy to develop information and telecommunications technology (ICT) in Barbados will focus on applying ICT to generate economic growth and development. This will be accomplished through using ICT to enhance the competitiveness of the economy of Barbados. Specific activities include:

- Establish the legislative, fiscal and capacity building framework to stimulate the development of the information economy
- Establish a comprehensive intranet system within the public service
- Develop a set of national information technology policies aimed at strengthening the linkages between technology and the rest of the economy
- Promote broadband, wireless and networked ICTs
- Restructure the telecommunications unit such that policy-making regulatory and enforcement missions are separated and more efficiently executed
- Design technology and policy frameworks so as to ensure that the highest standards are met in support of security and privacy protections as well as sensible treatment of intellectual property rights
- Identify and support software developers with specific expertise and/or interest in designing locally produced software for use in the public and private sectors of Barbados or for possible export throughout the region
- Adopt a Freedom of Information Act for Barbados
- Develop better programmes to diffuse new digital communication technologies and networks more widely and evenly throughout the society and economy

- Design educational programmes aimed at sensitizing key decision-makers across Barbados of the significant role and potential benefits of ICTs.

The Government of Barbados has in place the following initiatives to bridge the digital divide:

- The establishment of call centers throughout the island, and plans to have internet-ready computers at all post offices are moving forward.
- Digital TV (technology that allows a TV to function as a computer) and WAP (commonly referred to as Wireless Application Protocol or Wireless Access Point) technology for mobile phones are being considered as other methods of bridging the digital divide.
- The removal of duties on computers, computer equipment and other technologies.

Paragraph 59 calls for “.....***further liberalizing. Telecommunications sector as one of the possible means to address the high costs caused by existing monopoly service providers***”.

The Government of Barbados has completed the liberalization of the telecommunications sector as of February 1st 2005.

3.11 SUSTAINABLE CAPACITY DEVELOPMENT AND EDUCATION FOR SUSTAINABLE DEVELOPMENT

Paragraph 72 b of the MSI speaks to “***Promoting comprehensive and accessible universal primary education and ensuring gender equality in all SIDS with a major emphasis on reducing illiteracy***”

Barbados has a 96% literacy rate and free education for its citizens up to the tertiary level. Since the mid 1980s Barbados has achieved universal primary and secondary education. Barbados is currently engaged in a Nursery expansion Programme to achieve universal pre-primary education. Barbados had achieved gender parity in the provision of primary and secondary education.

Paragraph 72 c of the MSI calls for “***Promoting technical and vocational education in order to enhance skills and facilitate the entrepreneurship necessary for the pursuit of sustainable livelihoods***”

Changes have been made to the curricula of the secondary school to allow children to pursue a pre-vocational programme. Options will therefore be provided on a pilot basis at 6 secondary schools for students to choose careers in carpentry, masonry, painting, tiling, electrical installation, steel-bending and other similar skilled work areas. These skills will be certified by way of an Artisan Certificate from the national Polytechnic institution.

The Ministry of Labour through its agencies the Barbados Vocational Training Board, the TVET council and the National Employment Bureau will develop and implement comprehensive training programmes that will focus on skill sets that are in short supply nationally. These skill sets will be revised according to changing needs of the work force and will include training for retrenched workers and assisting workers generally in becoming multi-skilled.

Plans for the Implementation of the Barbados Certificate of Secondary Education (BCSE) are continuing. To this end, 9 secondary schools are in the Continuous Assessment Pilot Programme. 640 teachers have been trained to facilitate the implementation of the programme, and First Certificates were to be awarded by the end of the 2008-2009 school year. The Ministry of Education is also collaborating with CXC to develop a database for the storage of data.

Paragraph 72 d of the MSI calls for ***“Strengthening distance-learning arrangements”***

The University of the West Indies (UWI) Distance Education Centre (DEC) works with faculties of UWI located on the three campuses in Barbados, Jamaica and Trinidad & Tobago, as well as with other organizations, to develop and deliver quality programmes by distance, to meet the learning needs of the people of the Caribbean. There are Distance Education centres located in all the English-speaking Caribbean countries that support UWI.

Barbados is part of an initiative developed by the Conference of Commonwealth Education Ministers at its 14th meeting in Halifax, Canada and reaffirmed at the 15th meeting in Edinburgh, Scotland for the development of a Virtual Learning University for the Commonwealth. Barbados is playing an active role and is a member of the Advisory Committee for the development of the University.

Additionally the Government of Barbados participates in the Caribbean Knowledge Learning Network (CKLN)-an initiative of the Heads of Government of the Caribbean Community (CARICOM). The initiative will develop a mechanism to facilitate distance learning in countries across the region. The CKLN will make available more post secondary and tertiary education opportunities across the region without having to put more physical infrastructure in place.

Online programmes were introduced through the Open and Flexible Learning (OFL) Centre in 2005 with 5 courses. The provision of online programmes has also been expanded. The OFL now offers over 30 courses through this medium over 175 students have successfully completed courses through the OFL.

Paragraph 72 e of the MSI calls for ***“Integrating national sustainable development strategies and environmental education within the education systems.”***

It is generally accepted that a sound philosophy of education aims to provide students with "... a well-rounded education to develop them to their fullest potential, and nurture them into responsible citizens, conscious of their responsibilities to self, family, society and country." (Ministry of Education and Human Resource Development, 2000) These objectives are in keeping with the goals of education for sustainable development. The Ministry of Education and Human Resource Development views education as key to bolstering national development. As such, since 1992, the Ministry has continued to address needs in the educational system through a number of policy guidance documents including:

- The White Paper on Education Reform 1995; and
- The Master Plan for the Integration of Information Technology in the Barbadian School System (1997).

In addition, a number of major projects and initiatives have been undertaken by the Ministry of Education and Human Resource Development and the Training Administration Division of the Ministry of the Civil Service. These included:

- Edutech 2000;
- Curriculum 2000 – This encapsulates a vision for Barbados on the premise that human resources are critical for success in the new knowledge based economy. Specific Areas of focus include:
 - Revised curricula at the primary and secondary levels to seek to ensure that all students receive quality education which will enable them to be productive citizens capable of creative and critical thinking. Greater focus on the social and emotional learning needs of students in a effort to foster positive self-esteem and greater understanding of self and empathising values, with increasing attention paid to the social sciences; Focus on the integration of technology in an effort to prepare students for the global market and electronic commerce.
 - A greater degree of student-centred learning, where students are taught in increments, to be responsible for their development and learning at varying intervals;
 - Use of more individualised examination processes and other measurement techniques such as oral examinations, performance based tasks and portfolios;
 - Integration of some key sustainable development issues into the curricula and activities at schools.

Techniques used in implementation include:

- Psychological strategies: The fostering of positive self-esteem and greater understanding of key sustainable development issues.
- Training for trainers: Teachers are encouraged to undertake courses through for example, through the Erdiston Training College. In 2001, an 'Education for Sustainable Development' course was offered.
- Student Internships: These are offered at government departments, statutory corporations and private organisations. Internships promote ethical motivation and encourage functioning within a team framework.

- Environmental clubs have been established across secondary schools on the island.

The Informal Education Sector

In Barbados, informal education on sustainable development has mainly taken the form of public awareness. These campaigns are used both as an information delivery mechanism and as a means of encouraging behavioural change. Public awareness campaigns covering various sustainable development topics have been conducted via the relevant Government Departments, the private sector and Non-Governmental Organisations.

Messaging on Sustainable Development as it pertains to the public sector is carried out by a number of entities including but not limited to:

- i) The Ministry of the Environment, Water Resources and Drainage;
- ii) The Ministry of Agriculture;
- iii) The Ministry of Health;
- iv) The Ministry of Transport and Works; and
- v) The Department of Emergency Management whose departments carry out public awareness campaigns on various issues via different media.

A number of different messaging media are employed including:

- i) Documentaries;
- ii) Radio and television spots produced by the Government Information Service;
- iii) Appearances by officials on talk shows on radio and television to highlight pertinent issues;
- iv) Town Hall meetings, consultations and round tables;
- v) Workshops, seminars and symposiums;
- vi) Presentations to PTAs, church groups, community groups and schools;
- vii) Conferences, expositions and exhibitions;
- viii) Production of newsletters, brochures and posters;
- ix) Publications of technical reports;
- x) Hosting of public lectures and lecture series; and
- xi) Production of newspaper supplements.

The Ministry of the Environment, Water Resources and Drainage has a number of high profile events to raise national environmental awareness including:

- i) Celebrating the month of June as Environment Month;
- ii) Hosting of an Annual Minister of Environment Awards; and
- iii) Establishment and disbursement of the Fund for Non-Profit Organisations to assist community, youth and sport groups to assist in their efforts to carry out small scale environmental projects.

With respect to awareness initiatives from the private and NGO communities awareness campaigns and activities have been spearheaded by entities such as the Barbados National Trust, The Future Centre Trust and the Supercentre supermarket chain.

Education remains a key component to the achievement of sustainable development. It is recognised that the integration of sustainable development principles at the national level

begins at the level of the individual. As such, the continued utilisation of formal and informal education techniques are essential to the achievement of this goal.

Paragraph 72 f of the MSI speaks to ***“Assisting with basic infrastructure, curriculum development, where appropriate, and teacher training, working towards an integrated gender perspective.”***

In its Draft Medium Term Strategic Framework, the Government of Barbados has proposed the following strategies for providing lifelong quality education and opportunities for training and continuous development for all citizens according to their aptitude and the needs of the economy:

- Curriculum reform including reform of the Common Entrance Examination, implementation of a modular system of National certification and fully implementing student-centered education programmes
- Human Resource Development, to develop a cadre of trained teachers and other professionals to ensure the best quality of teaching and management at all institutions
- Institutional reform to integrate educational, youth affairs and cultural policies and programmes, to achieve an equitable distribution of available educational resources and to effectively utilize community-based resources in a partnership between school, home and the community
- Legislative reform, to ensure that education, policies and practices remain relevant and incorporate best practice
- Achieve full computerization.

In addition, Caribbean Vocational Qualifications (CVQs) are being piloted in seven (7) secondary schools. Training is being conducted by the TVET Council to facilitate the implementation of the CVQ programme. The Ministry of Education is currently in discussion with Caribbean Examination Council (CXC) with a view to reaching agreement on the issuing of CVQs.

Paragraph 72 g of the MSI speaks to ***“Assisting with the further development of programmes for people with special needs, in particular children and youth, especially training at a regional level.”***

Goal 3 of the National Strategic Plan, specifically objective 3.5 speaks to “Improving the Quality of Life of Persons with disabilities” Specific strategies include:

- providing appropriate teaching aids and support to enhance the skills of children with disabilities as well as the training and support for special education teachers;
- providing the educational infrastructure that will support persons who are physically or intellectually challenged;
- facilitation of enhanced access to public transportation that is built to accommodate the needs of persons with disabilities;

- encouragement and facilitation of the production of all public documents in Braille, large print or audio and provide close captioning on local television; and
- the review and update legislation which will facilitate equality of opportunities.

More specifically, the Ministry of Education and Human Resource Development has provided ICT to the Irving Wilson School to enhance the training/learning process to those students with special needs. Some of the technological equipment include: Braille Notetakers, Braille keyboards, touch screen monitors, voice synthesizers and electronic whiteboards. Other noteworthy initiatives include:

- The Barbados Secondary Schools Entrance Examination was prepared in Braille for one blind student who took the Examination in 2007;
- Staff at the Combermere School received training to adequately prepare them to provide instruction the blind student;
- One student who was physically challenged used computer assisted technology to take the Barbados Secondary Schools entrance Examination in 2007;
- 2630, 5-6 year olds were screened for speech and language difficulties in 2005-2006;
- 2987, 7-8 year olds were screened for speech and language difficulties in 2006-2007;
- 2614 five year olds were screened for hearing difficulties in 2005-2006; and
- 76 primary school students received speech therapy.

Paragraph 72 h of the MSI calls for ***“Further strengthening the training and teaching of the principles and practices of good governance at all levels and protection of human rights”***

The Organisation of American States (OAS) is funding a project on democratic practices and values in the class room. One of the key features of the project is that it will take students’ basic human rights into consideration. Barbados facilitated the hosting of the first project meeting for participating countries in July 2007.

3.12 SUSTAINABLE CONSUMPTION AND PRODUCTION

The MSI call for action in three specific spheres, Paragraph 73 a speaks to ***“Considering all initiatives relating to sustainable consumption and production in the context of the economic, social and environmental dimensions of sustainable development”*** while Paragraph 73 b speaks to ***“Taking appropriate measures to facilitate the implementation of the 10-year framework on sustainable production and consumption in a coherent manner”*** and Paragraph 73 c calls for ***“Assessing the need for programmes on sustainable consumption and production strategies on the basis of national priorities and best practices”***.

There are a number of policies and programme initiatives being implemented by the Government falling within the international approach to adopt a framework of programmes to advance Sustainable Consumption and Production and in accordance with the tenets described in the MSI.

The Barbados Sustainable Development Policy

As mentioned earlier the BSDP was ratified by the Parliament in 2004 and has as its overarching goal, ensuring the optimization of the quality of life for every person by ensuring that economic growth and development does not occur to the detriment of our ecological capital.

The BSDP outlines five principles of sustainable development for Barbados including Quality of Life, Conservation of Resources (specifically mentioning the Polluter Pays Principle), Economic Efficiency, and Equity.

The major objectives of that policy articulation process were to:

- i. formulate a national definition of sustainable development
- ii. provide a national framework for decision-making based on our principles of sustainable development;
- iii. promote principles of sustainable development and encourage all persons to adopt and apply these principles in every aspect of decision-making; and
- iv. sensitise and educate all persons in Barbados about key issues and conflicts between development and environment and the need to make wise consumption and production choices.

The action plan, which forms part of the policy, provides detailed recommendations pertaining to specific sectors and/or issues with a view to fostering and supporting the pursuit of sustainable development, through implementation of the Sustainable Development Policy. The following issues relevant to sustainable consumption and production are detailed:

- Freshwater resources,
- Transportation,
- Energy,
- The Built Environment,
- Waste management,
- Land and Natural Resources,
- Concession and Incentives,
- Consumption Patterns, and
- Indicators for Sustainable Development.

It is noteworthy that although policy recommendations have been articulated by sector, decision makers and stakeholders are encouraged to adopt an integrated approach towards policy implementation and resource management whenever possible.

The National Strategic Plan (NSP) for Barbados 2006-2025

The National Strategic Plan provides the blueprint for the realisation of Barbados' vision of becoming a fully developed society that is prosperous, socially just and globally competitive by the end of the first quarter of the century. The NSP advances six strategic goals in pursuit of the national vision for 2025. Goal four of the NSP speaks specifically to "Building a Green Economy: Strengthening the Physical Infrastructure and Preserving the Environment.

Within the umbrella of Goal Four of the NSP are six objectives that provide specific focus to sectoral issues highlighted within Chapter 3 of the JPOI and that are being addressed within the Marrakech process. Those issues pertain to:

- Natural Resources use and management,
- Energy,
- Water,
- Transport,
- Waste and
- Chemicals management with respect to land and agriculture.

The pursuit of sustainable approaches to encapsulate these issues remains essential elements of national development programming as they constitute core structural pillars required to build the Barbadian Green Economy.

A draft list of Green Economic Indicators, based on previous work undertaken in formulating National Sustainable Development Indicators, have been developed and are in the process of being submitted to the Cabinet for noting, and approval to commence data collection and stakeholder consultations. As the mainstreaming of the Green Economy indicators into national decision making and reporting, the process outputs of this process will feed into the IADB funded Modernisation of the Barbados Statistical Service Project.

As mentioned earlier, a summary of the National Strategic Plan can be seen at **Appendix 2**.

Annual Financial and Economic Policy Statements 2007 -2009

The Minister of Finance, via the annual financial and economic statements in 2007 and recently in 2008 announced several policy measures to give effect to the successful pursuit of a Green Economy. The Green Economy represents a national integrated policy response to address unsustainable consumption and production practices.

Specifically in 2007, the national sustainable development principles of equity and efficiency were adopted as the underlying green economic principles, along with the three crosscutting issues of integrated water resources management, integrated solid waste management, and integrated coastal zone management. The specific programmatic areas to be addressed over the short to medium term included:

1. Establishment of a real-time Green Economic Indicators Programme based on previous work undertaken by the National Commission on Sustainable Development;

2. Establishment of natural carrying capacity limits for planning purposes via the establishment of an integrated environmental information system;
3. Adopting green procurement procedures;
4. Promotion of Sustainable Transportation;
5. Promotion of green approaches within the design and construction fraternities and establishment of green business centres;
6. Establishment of a Green Home Certification Scheme.

In 2008, support was given further to the pursuit of the Green Economy regimen. The Government reinforced its commitment to the Modernisation of the Barbados Statistical Service Project; sustainable tourism development in the context of land use issues, the island's carrying capacity and greater inter-sectoral linkages; the promotion of greater energy efficiency and energy conservation and incentives to facilitate the transition to a greater share of renewable sources in the energy mix; and the promotion of greater corporate social responsibility.

In 2009, the Prime Minister reaffirmed commitment to Barbados becoming the most environmental advanced, green country in Latin America and the Caribbean.

The National Sub-committee on Trade and Environment (NSCTE)

The National Sub-Committee on Trade and Environment was established by Cabinet in 1998 under the Ministry of the Environment, Water Resources and Drainage (MEWD). The major functions of the Sub-Committee are as follows:

1. to monitor the decisions of the World Trade Organization's (WTO) Committee on Trade and Environment (CTE) with a view to determining its impacts for Barbados;
2. to contribute to the formulation of the position of the Government of Barbados on issues of trade and environment discussed within the CTE forum, or in international negotiations;
3. to assist in developing national policies and programmes on trade and environment issues; and
4. to facilitate cooperation among actors in the areas of trade and environment in an effort to promote the common goal of sustainable development.

As part of its robust research mandate the NSCTE has undertaken two relevant studies including:

- Benefiting from trade liberalization in environmental goods and services-identifying the possibilities (ongoing);
- Proposal To conduct Background Research and produce a draft White Paper on the Role and Future Use of Eco-labels in Barbados with Respect to Trade and Economic Development (completed).

These policy and programmatic interventions have ensured that a framework is in place for the issue of Sustainable Consumption and Production to be addressed coherently and that they are linked to the national development agenda.

3.13 HEALTH

Paragraph 76 of the MSI speaks to ***“.....Responding effectively to HIV/AIDS is both an urgent health issue and a development imperative”***

A National HIV/AIDS Programme was developed under the aegis of the Prime Minister’s Office and embraces the government sector, the private sector and non-governmental organizations. A National HIV/AIDS Commission was established to provide the Government of Barbados with a mechanism by which to effectively coordinate and manage a multisectoral, expanded national programme for the prevention and control of HIV /AIDS.

Barbados has seen a reduction in mother to child HIV transmission due to Government’s policy to provide Zidovudine(AZT) to all pregnant women who were HIV positive.

Government has also introduced the highly active anti-retroviral therapy (HAART). This will result in HIV/AIDS infected persons living longer and experiencing a better quality of life.

Paragraph 78 a of the MSI calls for ***“Strengthening the health management and financing systems of SIDS to enable them to arrest the HIV/AIDS epidemic, reduce the incidence of malaria, dengue fever and non-communicable diseases and promote mental health”***

Barbados’ dependence on tourism and centrality to Caribbean business has made it a hub for international passenger travel and cargo freight into and out of the region by sea and air making it extremely vulnerable to diseases that can be transferred along with people and cargo

Barbados has an Expanded Programme on Immunisation (EPI) which has achieved high immunization rates in Barbados and significant reduction in the incidence of communicable diseases with respect to morbidity and mortality rates. The Programme targets poliomyelitis, diphtheria, pertussis, tetanus and tuberculosis. The EPI was introduced in 1977 and delivered as part of the Maternal and Child Health programme in all polyclinics.

Approximately 75%of all children under five years old receive their vaccinations in the polyclinics and the remainder from private practitioners. Coverage rates are 97% for DPT, 92% for MMR and 96% for oral polio vaccine. Children are vaccinated with BCG at age 5+. All children must be immunized prior to entering a primary school.

Tuberculosis has re-emerged as a major public health threat particularly due to HIV/AIDS however there is no corresponding increase in incidence rate as compared to HIV/AIDS.

With respect to mental health a proposed strategy for reform of mental health services will focus on mental health promotion rather than mental illness. It will seek to reposition

mental health from institutional to community based care. A public education and sensitization programme is planned as part of the initiative

Dengue fever is endemic to Barbados. The Ministry of Health's strategy to dengue prevention is based on an integrated vector control programme which includes community and individual responsibility for maintaining a healthy environment

Paragraph 78 c of the MSI calls for ***“Enhanced accessibility to effective pharmaceutical drugs at affordable prices”***

The Barbados Drug Service was established in 1980 and is a WHO collaborating Centre. It is governed by the Drug Services Act and the Financial Administration and Audit (Drug Service) Rules 1980. It is responsible for procuring and distributing essential drugs and for promoting rational drug usage in Barbados.

There is a contractual arrangement between the Barbados Drug Service and the private sector pharmacies through which patients who meet one or more of the following criteria, obtain their prescriptions free at the point of service: persons 65 years and over, children over 16 years, persons being treated for hypertension, diabetes, cancer, epilepsy and asthma. Barbadians who seek medical care in the public sector are prescribed formulary drugs, which are provided free of charge at public sector pharmacies.

Paragraph 79 d of the MSI calls for ***“The active implementation of healthy public policy and effective prevention programmes in areas such as immunization, reproductive health, mental health and health education”***

The Government of Barbados has developed the 'Barbados Strategic Plan for Health 2002-2012'. It is grounded in six principles one of which is "Formulating Healthy Public Policy". Additionally there are ten strategic directions which provide the overarching framework for action on health. These strategic directions include: Health systems development; institutional health services; family health; Food, nutrition and physical activity; Chronic Non-communicable diseases; HIV/AIDS; Communicable diseases, mental health and substance abuse; health and environment and human resource management.

Paragraph 79 e of the MSI speaks to ***“The development and implementation of effective surveillance initiatives at the local, national and regional levels”*** while Paragraph 79 f of the MSI calls for the ***“facilitation of early information-sharing on possible emerging outbreaks nationally and internationally...”***

The Ministry of Health has a surveillance system in place that is capable of identifying and analyzing the nature and magnitude of threats to public health. The system is integrated with surveillance systems at the local levels and has formal mechanisms in place for co-ordination and reference between the national public health laboratory and the regional laboratory at the Caribbean Epidemiology Centre (CAREC).

Paragraph 79 g of the MSI calls for the ***“Preparedness of countries and regional organizations to respond rapidly and effectively to outbreaks (whether naturally occurring or intentional), requiring the development and regular testing of response plans, the strengthening of response capacity and the identification of resources which can be accessed quickly.”***

There is a National Emergency and Disaster Health Plan which has built in a component outlining the response protocol and the collaboration mechanisms in place for all stakeholders to be called into action should there be a major outbreak.

Paragraph 79 h of the MSI speaks to ***“The development and implementation of modern, flexible national public health legislation”***

The current existing public health legislation is to be reviewed in 2010. This review process has already been approved and the work will be coordinated by the Senior Medical Officer of the Ministry of Health.

Paragraph 79 i of the MSI calls for ***“Promoting the development of traditional medicines including medicinal plants.”***

There is no official national programme on the development of traditional medicines, however, a survey of local practitioners, capturing information on plants utilised and prescribed remedies, was conducted in 2008, by CERMES, UWI in collaboration with IICA. The UWI is in the process of classifying the plant species and cultivars.

Paragraph 79 j of the MSI calls for ***“The implementation of targeted environmental health programmes that prevent the ill health of SIDS populations, such as waste management, control of air pollution and improved water quality.”***

In Barbados the entire population has access to potable water as well as to sewage and excreta disposal. The main environmental health concerns are management of solid and liquid waste, monitoring of vector borne diseases, monitoring of food safety, leptospirosis and developing strategies to control the threats of new and/or re-emerging diseases.

The importance of occupational health and safety has been underscored by an initiative undertaken by the Barbados Employers Confederation in collaboration with the Government and Trade Unions. The initiative seeks to promote worker’s health through creating awareness of healthy work places, by training employers and workers in practices to maintain health and safety, to improve air quality and reduce noise pollution and well as promoting healthy lifestyle.

The Factories Act, 1982, is currently being reviewed. The government of Barbados has proposed to replace this legislation with the “Safety and Health at Work Act” which will

address some of the current employment practices and issues and will apply to all work places including hotels, schools, banks, retail businesses and offices.

Paragraph 79 k of the MSI calls for ***“Enhanced data collection on demographic and epidemiological trends.”***

The Ministry of Health recognizes the need for a formalized research agenda to build its capacity for making sound decisions. Guidelines for monitoring and evaluating health have been developed. Appropriate data for compiling its health profile are updated annually. The profile will be used for evaluation inequities in health conditions, monitoring changes in the prevalence of risk factors, determining the adequacy and significance of reported data, identifying the population’s priorities and needs in terms of access to services, defining national health objectives and goals, evaluating their compliance and improving the efficiency and quality of the health system.

3.14 CULTURE

Paragraph 82 a of the MSI speaks to ***“Developing and implementing national cultural policies and legislative frameworks to support the development of cultural industries and initiatives in such areas as music, art, the literary and culinary arts, fashion, festivals, theatre and film, sports and cultural tourism”***

In 2002, Barbados became signatory to three critical conventions:

- The convention for the protection of Cultural Property in the event of armed conflict, 1954 (UNESCO),
- The Convention on the Means of Prohibiting and Preventing Illicit Import, Export and Transfer of Ownership of Cultural Property, 1970 (UNESCO), and
- The Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972 (UNESCO),

and has subsequently monitored with interest activities related to these. In addition, Barbados has also prepared draft legislation for the Preservation of Antiquities which signals clearly the intention of government to create a framework for the protection of the cultural heritage.

Barbados is also in the process of reviewing towards eventually signing the Convention on Safeguarding of Intangible Cultural Heritage, 2003 (UNESCO) and 2 related UN Conventions: (The Protection of Underwater Cultural Heritage, 2001(UNESCO); and Stolen or Illegally exported Cultural Objects, 1995(UNIDROIT)).

Barbados was elected to serve on the ICPRCP (Intergovernmental Committee for Promoting the Return of Cultural Property to its Countries of Origin or its Restitution in case of Illicit Appropriation) and chaired its 13th session. As a result of becoming signatory to the World Heritage Convention, Barbados has established a World Heritage Task Force which has been

actively engaged in the preparation of work plans and tentative list of sites for proposal to UNESCO. Barbados has also been actively involved in regional preparatory meets on World Heritage and participated in a critical symposium on the theme “Outstanding Universal Value, Authenticity and Integrity in the Caribbean.”

Paragraph 82 b of the MSI addresses ***“Developing measures to protect the natural, tangible and intangible cultural heritage and increase resources for the development and strengthening of national and regional cultural initiatives”***

Barbados has also invested in the development and/or strengthening of institutions involved in preservation of Cultural Heritage including:

- the major redesign, renovation and reopening of the African Gallery, at the Barbados Museum;
- the donation of governmental funds to the Barbados National Trust to facilitate the further renovation and interpretation of the major heritage projects George Washington House and Tyrol Cot;
- the commencement of the implementation of a National Oral History Programme which will be a major step in the Management of national heritage resources;
- the set up of a National Art Gallery Committee for documentation and management of art in government’s collection;
- the opening of the governmental entity the Commission for Pan African Affairs and its subsequent initiation of a Season of Emancipation in collaboration with the NCF;
- commitment for the implementation of a Cricket Museum following the redevelopment of Kensington Oval for the Cricket World Cup 2007;
- supporting the Opening of the National Armoury display; and
- supporting plans for the establishment of a Museum on Slavery in commemoration of the Bicentennial for the Abolition of Slavery in 2007.

Education and training must be at the core of cultural protection. In this regard:

- Government has been actively engaged in the stimulation of the creativity of Barbadians via the National Cultural Foundation, the governmental agency mandated to continuously invest in training and showcasing of the various artistic expressions of our culture. Its core programme trains approximately 5000 persons annually and exposes Barbadian arts and cultural products to thousands more locally. This entity is also working on the development of a National Living Human Treasures System which embodies an apprenticeship scheme designed to ensure that traditional knowledge and skills are passed on to the next generation.
- The civic studies curriculum has also been reviewed to include Heritage studies for its important role in the building of a national identity.
- At the university level, Barbados has given active support to the University of the West Indies – Cave Hill’s, Masters Degree in Heritage Studies and Cultural

Studies. These 2 programmes offer opportunities for young Caribbean Nationals to research and ultimately pursue careers in these areas.

- Two National Development Scholarships have also been offered in Arts Management, and in addition a Special Award was given in the area of Metal Conservation to encourage studies in these critical areas. The Special Award was in recognition of a young Barbadian's achievement in being identified by the Royal College of Art and the Victoria and Albert Museum as the preferred candidate and sole recipient (worldwide) of this honour.

Government has also recognized the educational and promotional value of exposure of our cultural norms via the mass media. The Government of Barbados has been examining the possibility of the establishment of a Public Broadcasting Service which will broadcast 100% local and Caribbean based programmes. The intention of this is to reaffirm cultural identity. The NCF will be involved in scripting, production and design of programmes. It is proposed that the current national broadcasting station will become a commercial entity.

It is recognized that more work still needs to be done to ensure that this process encourages quality as well as quantity. Investments in making training in these areas more accessible to youth and other marginalized groups is expected to reap many benefits to this sector in the future.

Cultural Diversity

Barbados is cognizant of the need to implement strategies to ensure cultural diversity in all sectors and values the input of its different cultural communities in all national activities. Efforts have been made to attract participation as well as audiences from these communities in all National Festivals, as the value of their diverse artistic expressions has been greatly appreciated. It is recognized that more needs to be done to ensure that all of this island's cultural communities are involved in all aspects of national life.

Barbados is proud of its track record to date in the contributions to global activities that support the principle of Cultural Diversity:

- Barbados has been a part of the group of experts involved in the drafting of the UN Convention on Cultural Diversity. Nationally a local group has been formed to advise government on Barbados' contributions to the review of this draft convention;
- This island has also been invited to be one of three representatives to serve on the drafting committee formed following the first inter-governmental meeting; and
- Barbados has also taken the lead among SIDS in UNESCO in contributions towards the review of the draft convention on the Safeguarding of Cultural Heritage.

Paragraph 82 c of the MSI looks at ***“Improving institutional capacity for the advocacy and marketing of cultural products and the protection of intellectual property”***

Training of artists and entrepreneurs in issues relating to copyright and protection of their intellectual property has also been occurring with greater regularity in recent years:

The access of Barbadians to new technologies is also being facilitated via enhanced specialized programmes designed to address this need:

- The reduction of taxes on computers and the respective components,
- Edutech, a revamping of the infrastructure of Primary and Secondary schools to ensure the full integration of computer technology in the educational environment.
- The Community IT programme, designed to ensure that every Barbadian has access to education in these technologies at community centres around the island.

It is recognized that access to specialized training in the design of software and utilization of technology to further the range of creative expression of Barbadians is the next step needed to be taken and consideration will be given to offering National Scholarships in the field of *Arts and New Technologies* in the near future.

Paragraph 82 d speaks to ***“Seeking venture capital and access to credit for small and medium-sized cultural enterprises and initiatives, including through the establishment of culture support funds in SIDS regions.”***

Government has also invested in the development of Barbados’ cultural industries many of which have grown in connection with our festivals. Many recent initiatives have been launched:

- A survey of Barbados’ cultural industries was commissioned and completed by the Sir Arthur -Lewis Institute of the University of the West Indies. The results of this survey are currently being reviewed with the aim of implementation of its recommendations. A new survey has been initiated to determine the Contribution of the Crop Over 2007 Festival to the island’s economy;
- A private-public sector entity to market and distribute Barbadian products and services locally and abroad was proposed and its consultants have been identified to advise on its establishment. As such “Export Barbados”, a subsidiary of the Investment and Development Corporation Development, has included cultural industries among areas for development;
- The proposed Arts and Design centre that will develop creative new products for the local and export market, is among initiatives planned for the creating of a strong design culture;
- The proposed redevelopment of the Business Development Department of the NCF to equip this institution with the means of creating viable business from the multitude of talent that is developed from the NCF’s various programmes;

- Legislation establishing a Sports and Cultural Endowment Fund has been enacted and disbursements commenced in 2006;
- The capitalization of innovative cultural development projects will be only partly addressed by the Cultural Action Fund, launched in 2005. This fund allows for artists and cultural entrepreneurs to submit for funding, proposals for projects and new product ideas. Barbados recognizes that it also must invest in the training and building of awareness of the financial sector, of the potential for investment in these non-traditional sectors; and
- Many incentives designed to facilitate the formation of Small Business already exists. However to ensure that the cultural industries is adequately capitalized a full regime of fiscal incentives is under consideration aimed at the fullest possible development of this sector.

Additionally, Barbados, represented by the NCF on the Regional Cultural Committee (a sub-committee of CARICOM) shares its best practices and experiences at the regional level.

4. LESSONS LEARNED AND GOOD PRACTICES

As mentioned in the preamble to this report, islands have historically had a large influence on the international community, one that is sometimes overlooked. Nevertheless, there are numerous best practices and lessons learned at the national level which can be extrapolated to larger countries or even be programmed at the regional level.

4.1 MANAGEMENT OF WASTE

Development of Environmentally Sound Disposal Facilities

The main landfill in use, the Mangrove Landfill, is an engineered landfill which receives approximately 1000 tonnes of garbage daily. While the tonnages for domestic waste have not increased significantly in recent years, construction and demolition waste has increased as a result of various large demolitions and the recent construction boom. To accommodate this recent activity, two satellite quarries were opened to receive construction and demolition waste and relieve the pressure on the main sites.

A new waste management facility at Vaucluse, St. Thomas was launched in 2009. It comprises a transfer station, a materials recovery facility, a composting facility and a chemical waste storage facility which government is likely to upgrade to a chemical waste management facility. This new waste management facility receives all the waste previously taken to the Mangrove landfill. As a result approximately 70% of waste including construction and demolition waste, green waste, wood pallets and other recyclables including plastics, glass and metals are diverted from the landfills.

The SSA handles liquid waste including blood and grease. These are managed at a separate disposal site including other non-sewage waste, such as effluent from the paint industry, continued to be disposed of at the Mangrove site.

Recovery, Reuse and Recycling of Wastes and their Transformation into Useful Material

Under the Returnable Containers Act (1987), all beverage containers, both plastic and non-plastic, have a return on deposit. The fees received encourage high rates of collection and return. Given the success of this initiative, Government is looking to apply that principle to other recyclable items. With respect to used oil, it is collected from a number of garages and construction companies and reused as fuel in the boilers at two manufacturing companies.

Transfer of Environmentally Sound Technologies and Know-how on Clean Technologies and Low-waste Production

Under the Marine Pollution Control Act (1998) (MPCA), the EPD is mandated to characterize sources of pollution and to develop initiatives geared towards the prevention, reduction and

control of pollution. The EPD undertakes characterization of the types of waste generated via environmental audits on a sector by sector basis. The audit process includes review of practices and procedures; assessment of waste streams and pollution control equipment; and recommendations are then made for companies to improve their environmental performance.

4.2 COASTAL AND MARINE RESOURCES

The Government of Barbados' Coastal Management Programme has been a best case example for the region for a number of years.

The Coastal Zone Management Unit, the primary entity charged with conservation of the coastline and nearshore resources, performs several routine functions as well as others which change on an annual basis according to the research requirements of the Unit. The Unit's routine functions are Coastal Engineering, Oceanographic Monitoring, Marine Resources Monitoring, Research, Public Education, and Coastal Planning and Management.

Coastal Infrastructure Programme (CIP)

Of particular note is the milestone Coastal Infrastructure Programme (CIP) financed by an IADB loan, was developed to support the sustainable development, improvement, preservation and management of the shoreline of Barbados, and comprises a range of coastal management works and activities designed to achieve shoreline stabilization and erosion control, restoration of coastal habitats, improved public access to coastal areas and institutional strengthening for coastal management. Several detailed supporting studies were also completed as part of the CIP.

The CIP consists of a number of infrastructural projects concentrated on the south and west coasts of Barbados. To date three projects have been successfully completed - the Welches Beach Improvement Project, the Rockley to Coconut Court Waterfront Improvement Project and the Hometown Beach Improvement Project.

Although constructed as a means of shoreline stabilization the Rockley to Coconut Court Waterfront Improvement Project or "The Boardwalk" has realized an added benefit in that it is now used extensively as a meeting place and place of relaxation for both citizens and visitors alike.

Mooring Buoy Programme which addresses the provision of moorings buoys for dive boats and mega-yachts around the South and West Coasts of Barbados

The mooring buoy programme is crucial to the implementation of both the Coastal Zone Management Plan and the Barbados Sustainable Development Policy. Its major objective is to effect the reduction of damage to coral reefs from boat anchors. There are 38 designated mooring buoy locations along the south and west coasts, which are available for

use on a year-round basis. This programme has reaped tremendous success partly due to the participation of state and non-state actors in the surveillance and management aspects of the programme.

4.3 FRESHWATER RESOURCES

Agriculture is still an important sector for Barbados although its contribution to GDP has been severely eroded from approximately 60% in the 1970s to approximately 6% in 2007. Over six thousand persons are still directly employed in the sector and its ancillary services.

The Barbados Agricultural Development and Marketing Corporation (BADMC) under the Ministry of Agriculture has established an irrigation scheme for both urban and rural farmers with many progressive features and also offers free technical advice to farmers.

The Ministry of Agriculture offers a 50% rebate on irrigation systems while the BADMC provides water for irrigation to farmers at a subsidized rate.

The irrigation network system is nearly island wide, it covers nearly all of the southern regions, the eastern and south eastern regions have four systems. Another system is in the central region in Haggatt Hall and services three districts and the Pine Basin.

The project will soon see the implementation of a new pilot project where approximately 30 farmers will demonstrate the use of tensiometers as a mechanism which can assist in the reduction of water wastage.

4.4 LAND RESOURCES

Land Use Policy

As previously stated, Barbados is a SIDS that has approximately 432 km² of land space, with a population of just over 275,300 people. It is the most densely populated country in the western hemisphere. Land is a scarce and extremely valuable commodity that must be carefully managed. As such, several competing sectors have to rationalize and prioritize its use.

A land use policy that allows *ad-hoc* change of use for competing sectors presents difficult and complex development planning challenges. Such policies very often retard sustainable development initiatives. The ideal situation should include balanced development that especially protect peoples aspirations and food security issues.

Since 1970, Barbados has developed a comprehensive Land Use Policy - the Physical Development Plan (PDP). The PDP is a useful planning tool that seeks to create a direct link between national development and land resources by ensuring the allocation of adequate land to support economic development, social development and environmental

conservation. The Policy was recently amended in 2003. A summary of that amendment is shown in **Appendix 3**.

Administration of the Agricultural Incentive Package

Economic Justification: In an effort to stimulate local food production as well as encourage sustainable farming practices, the Government of Barbados has over the years provided a package of incentives to the sector. This support has included the provision of grants, concessions, and rebates, which are made available to registered farmers in an effort to stimulate both food and non-food production as well as promote sustainable development. New areas addressed have included post harvest technology, organic farming, new crop technology and management of resources. These incentives appear to have reaped some success as growth had been experienced for most commodities.

Rationale for Incentives: As a result of incentives which offer financial support to farming and farm related enterprises, there are a number of benefits which accrue to both the recipients of incentives and the Ministry of Agriculture:

- Encourage involvement in new technology and processes which are likely to enhance farm efficiency and productivity;
- Encourage engagement in enterprises which are unfamiliar and in which farmers are hesitant to become involved;
- Encourage practices which are environmentally sound and aesthetically pleasing;
- Encourage practices which enhance animal welfare; and
- Show farmers that government is interested in their welfare and provide a basis for co-operation.

Executive and Administrative Policy: The Government of Barbados has recognised the vulnerability of the agricultural sector especially in relation to new trade arrangements in the face of its contribution to commercial activity and the social and environmental fabric of Barbados. This position has been underscored for the past five years during each presentation of the Economic and Financial Policies of Government. These presentations articulate that agriculture is too vital to our way of life to lose faith in it or allow its eradication, and demand that further that policies:

- enable the sector to upgrade its technology and attract new investment especially in non traditional areas and;
- allow the sector to continue export diversification and reform of the traditional export sectors .

When necessary, recommendations for additions or changes are submitted to the Ministry of Finance for inclusion in the annual Financial and Economic Statement. This forms the executive basis of the incentive scheme. Internal policies are directed by the managers of the scheme with the approval of the Minister of Agriculture and the Chief Agricultural Officer who both have the authority to make procedural changes.

Management of the scheme is farmer-friendly and encourages farmers to apply while ensuring that the policy of Government and the financial rules are adhered to. Farmers who are not in compliance are encouraged and assisted toward becoming so.

Promoting equal access for men and women to land holdings and title

The issue of land tenure and security is a critical one for many developing countries. The ownership of land by individuals and or communities is one that is being addressed through the UN system right now especially in the Indigenous Peoples fora. The Beijing Platform also addressed the disparity between men and women on several different levels and across many issues.

In Barbados, the issue has been resolved to a large extent for decades. While some policy matters pertaining to gender have been dealt with adequately and some still remain unresolved. The issue of land rights and tenure were discussed in the 1960s and some resolutions were formulated. Therefore, policies and laws providing for equal access for men and women to land holdings and tenure have been in place since 1968. The Town and Country Planning Act (1968) [Amended 2003] provides for land and water rights and legal security of tenure for all individuals irrespective of gender.

With a large number of single female-headed households in Barbados this Act has contributed significantly to the quality of life for many Barbadians.

The Integrated Assessment approach to land use

The socio-economic and environmental linkages are often not clearly articulated in many of our national developmental programmes, and this can adversely affect the sustainability of those programmes. Barbados has done a comprehensive study on integrated assessments of these three broad pillars of sustainable development; the particular sector used was land resources.

Integrated assessments of socio-economic and environmental potentials of land resources have been recommended in the Environmental Management and Land Use Planning for Sustainable Development Project, the study was completed in 1998. The framework and approach are outlined in the instrument. The entire study is also available from the Ministry of the Environment, Water Resources and Drainage.

Land for the Landless Programme

Natural resources are used to engage in economic activity that can benefit our social development priorities. One of the most basic resources is land and many potential producers do not have access to this scarce productive base. The Government of Barbados has been attempting to address this need in a more structured way for the last decade.

The land for landless farmers programme started in 2001 and has progressed steadily. In 2006, there was a total of 220.5 acres of public land and 204 acres of private lands to be allotted by the BADMC, the agency charged with distribution. The total public and private lands currently in production are 204.0 acres and 100.0 acres respectively. These lands are allocated to livestock, root crops, vegetables and orchard production. The land for landless programme receives an average of eighty new applicants each year. The BADMC also has provisions for foreign investors to make application to the land bank.

Rural Development Commission

In many countries including small island developing states most of the development occurs in the urban corridors or coastal areas. Barbados has been able to successfully develop the rural areas to the point that it has become difficult to technically define the rural corridors. The formation of the Rural Development Commission helped to fast track those developmental programmes in the rural areas.

A Rural Development Commission Act⁷ has been in place since 1995. It provides for the establishment of a rural development commission that would, *inter alia*, provide for the improvement of social amenities, assist small farmers and establish and develop cottage industries in rural areas.

The integration of rural development strategies into Poverty Reduction Strategies (PRSPs) or other economic/development strategies have become commonplace in Barbados. The commission has been able to deliver significantly on several infrastructural and services needs such as building roads, repairing and replacing new homes, sinking and cleaning wells and septic tanks, and the cleanup of several areas.

Ecologically sound approaches to farming

Consumers are fast recognizing the benefits of eating healthier foods. Along with the ever-increasing cost of agricultural inputs, it has become urgent that we address in a more sustained manner the issue of ecologically sound agriculture. In an effort to produce healthier foods and in some instances reduce the cost of production, farmers with the support of the Ministry of Agriculture have been exploring different technologies for agricultural production.

There have been some attempts of local community-based programmes to sustainably enhance the productivity of land and the efficient use of water resources. The Bawden's Group in St Andrew and the Organic farmers in the Codrington College area have developed environmentally friendly technologies and methodologies for farming.

The organic farmers have formed a network and an umbrella group, most of them operate from out of the eastern part of the island. In the parishes of St. John and St. Andrew, the

⁷ 1995/12.

farmers are as sheltered as they can be from the potential ‘contaminations’ of pesticides agriculture. They still have significant challenges to overcome but have demonstrated that healthy food can be produced economically.

The use of protected cropping (greenhouses) would also assist greatly in promoting more environmentally sound farming practices, since closed system farmers would be afforded the opportunities to utilise strategies not based on the use of more harmful alternatives. Examples would include the use of *Encarsia formosa* for the control of whitefly and use of insect proof netting to reduce insect populations.

4.5 ENERGY

The Solar Water Heater Model

One of Latin America and the Caribbean’s best-known solar pioneers was Barbadian Professor Oliver Headley of the University of the West Indies at Cave Hill who developed many solar still and solar crop drying systems used throughout the Caribbean Basin, and spearheaded the installation of solar electric systems at several schools, government buildings and even the Barbados Light and Power Company Ltd.

The Solar Water Heating Industry has been extremely successful in Barbados and is now a model that is being emulated in many countries across the regions of the world. Barbados also developed and installed a solar hot water system (SHWS) in over 40,000 homes and approximately two-thirds of hotels on the island. This example of a renewable energy source for heating water has been successful largely in part because of the tax incentive support scheme designed and implemented by government far more than any other Caribbean nation. This programme is well documented and can be viewed online at <http://www.bajanpower.com>.

In total Barbados has an installed capacity of 239.1 Megawatts and an installed Renewable Energy capacity of 2kW from photovoltaics. However, thanks to the use of the solar water heaters and sugarcane bagasse, renewable energy sources contribute approximately 15% of all power used-again a major achievement for the region.

The use of wind energy is still underdeveloped in Barbados and the region as a whole. There are initiatives however, supported by the European Union donors to install and expand wind energy systems across the Caribbean. Negotiations have been completed with the Barbados Light and Power Company Ltd. to buy excess energy from private energy producers. The appropriate regulations have been drafted and will be submitted for approval.

4.6 BIODIVERSITY

Integrated Pest Management

Over the past 10 years the Entomology Section of the Ministry of Agriculture has dealt with the control of some 16 invasive species. These include the Pink Hibiscus mealybug, Papaya mealybug, West Indian fruitfly, Citrus Leafminer, Asian Citrus *Psylla*, *Cycad Aulacapsis* scale, Chilli thrips and the Giant African Snail. The Entomology Section has a long and distinctive history in the area of biological pest control, which is the most environmentally friendly means of pest suppression and control.

This started in the early 1920's with the Sugarcane mothborer and continued with a wide range of other pests including the citrus blackfly. More recently, Pink Hibiscus mealybug, Papaya mealybug and citrus leafminer have been brought under excellent biological control and similar programmes are underway for the West Indian fruitfly, Asian Citrus *Psylla* and *Cycad Aulacapsis* scale.

The Section also focuses on Integrated Pest management (IPM) and is in the process of developing an IPM programme for the major pests of cotton, including the Pink Bollworm through the use of pheromone mating disruption and Chilli thrips and Tobacco budworm through the use of selective insecticides and the preservation of natural enemies like parasitic wasps and predatory lacewing and pirate bugs.

Additionally the use of biorationals, (new pesticide formulations and active ingredients based on organic products) to supplement and in some cases replace pesticides currently being used will be one programme that will be concentrated upon. These products are not only more pest specific but have the additional features of being environmentally friendly, including not killing beneficial organisms

Co-management Approach to Natural Resources

A multi-stakeholder approach to management is being promoted throughout the United Nations System. Non-state actors are being integrated into several levels of management and decision making.

In Barbados, the fisheries sector has developed a framework for the management of the fisheries resources and associated habitats. The objective of the government in this initiative is to promote co-management within the fisheries sector so that stakeholders are involved in implementing measures aimed at protecting and preserving the fisheries resources. A framework was developed to facilitate the strengthening of fisher-folk organisations through technical and developmental assistance and actively promoting co-management and community-based management approaches.

A multi- sectoral committee has been able to:

- identify persons from among stakeholders to act as change agents;

- develop strategies to effect behavioural changes among fishers;
- prepare and distribute user-friendly information on the fisheries management issues;
- mount extension programmes that focus on the educating fishers and the public on fisheries management issues and practices; and
- establish strategic alliances between the industry and the coast guard to ensure protection of fisherfolk on the high seas.

Queen Conch (*Strombus gigas*) Study

In conjunction with its obligations under CITES, in March 2008, the “Preliminary Assessment of the Abundance of Queen Conch (*Strombus gigas*) along the shallow-water habitats of south-east and south-west coasts of Barbados” was completed. The results of this study were presented to the public in June 2008 during Environment Month.

Surveys of the shallow-water habitats of the west, north and east coasts commenced and were completed by October 2008.

The consultants submitted the following reports:

- Queen Conch Fishery and Abundance in Barbados
- Overview of Queen Conch Biology and Status
- A Preliminary Management Plan for Queen Conch Fishery in Barbados

Combined Findings of the Shallow Water (3 – 15 m) Investigation

The conch fishery in Barbados is small scale with approximately 50 active conch fishers. This number is augmented by ‘part-time’ conch fishers and recreational fishers. Conch fishing occurs off all coasts involving at least 15 fishing communities.

The total population of queen conch was crudely estimated to be approximately 37, 656, of which approximately 5,000 were mature adults. The field survey of shallow-water conch habitat revealed very low densities, especially of mature adults, approximately 9 conch per hectare over all coasts. It was concluded that the density of mature adults in shallow-water habitats in Barbados was extremely low when compared to other locations in the Caribbean and this will have an impact on reproduction and the ability of the current population to replace itself.

In November 2008, the consultants commenced investigation into the abundance and density of queen conch in deep-water habitats which is currently underway.

The Beautify Barbados Programme

Beautify Barbados is a programme designed to inculcate sound environmental practices amongst Barbadians via beautification of the major highways of the island, and encourage the establishment of green spaces.

The programme promotes a concept of maintenance of open spaces rather than simply de-bushing areas. It also exposes the public to new techniques in landscape design, including water conservation and xeri-scaping, that is, the use of drought tolerant plants. The Beautify Barbados Programme has also facilitated the training and skill development of a cadre of workers in the area of landscaping.

The programme enhances vistas along the highways; and encourages individuals, businessmen, and communities to participate in the care and beautification of their surroundings.

4.7 TRANSPORT

Capacity Building Needs on Transport Activity Assessment and Analysis for Integrated Planning

The Ministry of Transport has recently started a process with the Inter American Development Bank (IADB) to take a detailed look at capacity building needs. The new Transport Authority will develop the policy framework and guidelines for the operation of the Public Transport System. The system as a whole is currently working on establishing its personnel and augmenting its human resources. In addition to these activities, it will seek to cooperate with private owned public service transport, taxi drivers and the public sector to ensure that concessions are properly managed. These activities will be undertaken with a view to rationalizing the use of common physical facilities used by these stakeholders. The Authority is also seeking to develop an Association of Private Transport Operators (APTO) that will represent the concerns of route taxis and minibus operators and taxi drivers.

Road Construction and Changes in Anticipation of Climate Change Impacts

The Ministry is addressing climate change impacts by re-designing its road network to facilitate better drainage as a result of recent heavy rainfall events. However, some of these changes, such as curbs will assist with drainage in heavier downpours, which may be associated with climate change.

The Adams-Barrow-Cummins (ABC) Highway was constructed as an inland highway, running from the Grantley Adams International Airport to the West Coast of the island, bypassing the capital city, Bridgetown. Although not its sole reason for its construction, the development of this highway has successfully mitigated against the impact of the vulnerability of the coastal highways to sea level rise.

Improving the reliability and comfort of the public transport system, may also encourage more people to make use of these services rather than driving cars. It is anticipated that this may become an increasingly attractive alternative particularly in light of the increasingly severe traffic congestion situation. In the longer term, this could result in fewer vehicles and emissions, thereby contributing to ongoing climate change mitigation efforts.

4.8 SUSTAINABLE CONSUMPTION AND PRODUCTION

National assessment of the effectiveness of existing policies and incentives to promote SCP

The Ministry of the Environment, Water Resources and Drainage is currently, via the NSCTE, seeking to undertake a sectoral assessment of ongoing SCP initiatives as a means of identifying opportunities for new incentive measures and potential projects. The overarching goal of this project is to produce a report describing Barbados' national activities on SCP. The main objectives are to:

1. describe the current status of sustainable consumption and production in the following categories: Water, Energy, Waste, Construction, Transport and Food production.
2. describe where possible what policy tools exist (e.g. taxes and subsidies, other economic instruments and trade policies);
3. describe where applicable any analytical tools utilized e.g. life cycle analysis, indicators, technology impact assessment;
4. indicate where measures can be taken to improve consumption and production patterns, for example, *inter alia* application of regulations and incentives, investment incentives, emissions regulations and standards, cleaner production, pollution prevention and resource efficiency; and
5. provide a list of possible demonstration projects on the issue of sustainable consumption and production in accordance with the information obtained.

Living Sustainably: Theme for Environment Month 2008 and 2009

With respect to educating consumers and the general public, the Ministry of Environment, Water Resources and Drainage as of 2008, adopted "**Living Sustainably**"... as the theme for its environment month of activities. Public input on SCP issues is also being incorporated currently into the development of a National Environmental Education Strategy. The theme was maintained for environment month is 2009.

It should be noted that Barbados has participated in the activities of **Marrakech Task Force on Sustainable lifestyles since 2007**.

Mainstreaming Sustainable Consumption and Production in the Central Rural Communities: De Heart of Barbados® (DHUB)

The DHUB programme established the basis by which Barbados can adequately assess and promote its sustainable consumption and production patterns in relations to

agriculture, tourism and rural development. DHUB is unique in that it has extensive and accessible gully and cave systems, and has been designed as a protected Zone of Special Environmental Control (ZSEC). This ZSEC was established to protect the system of gullies and caves that are conduits to the underground aquifers for potable water. The area has also received international fame as the birthplace of the grapefruit⁸.

The network of communities in DHUB has collaborated with the Government of Barbados from 1999 to host a weekend of activities which celebrate the natural, cultural and rural features of the area. A survey done in 2006 indicated that both locals and visitors would support these types of initiatives and buy more local commodities if the price was favourable.

The programme has agri-business, agro-tourism and agro-processing potential and can be developed to facilitate and encourage small and medium size business ventures.

Sustainable Rural-based Gastronomic Tourism and Caribbean SIDS Sustainable Development partnership:As mentioned previously, the Ministry of the Environment, Water Resources and Drainage is also seeking to undertake sectoral assessments of ongoing SCP initiatives as a means of identifying opportunities for new green incentive measures and localised green economy projects.

With respect to the latter, a preliminary assessment of the production and consumption patterns of the rural community around Welchman Hall in St. Thomas, referred to as DHUB was conducted. The study reinforced agro-tourism opportunities as an economically viable development option for community members. And, via the collaboration and support of the Environmental Unit and the Natural Heritage Department, the **“Farm and Food Lovers” Trail** was successfully piloted by the local group. It is the intention of the Ministry to see this initiative promoted as a best practice within the 10 Year Framework of Programmes on SCP.

The Government has also undertaken an initiative to see this project integrated in a CSD partnership framework for Caribbean SIDS. A workshop was held in March 2009 to commence the partnership articulation.

⁸ Botanical name: *citrus paradisi*.

5. EFFECTIVENESS OF IMPLEMENTATION SUPPORT AND MECHANISMS, INCLUDING MONITORING SYSTEMS

The success of a programme or policy can only be measured through concrete results achieved after completing an assessment on its implementation. Success will be determined through the impact on the quality of life that citizens of the country may achieve or experience. Proper implementation requires the establishment of partnerships at the national, local and community levels where stakeholders are given the opportunity to demonstrate their comparative advantage and contribute to the economic and social fabric of this country. This is also buttressed through effective public education and awareness and cutting-edge information systems to enhance decision-making.

5.1 SUBSTANTIALLY INCREASING THE FLOW OF FINANCIAL AND OTHER RELEVANT RESOURCES, BOTH PUBLIC AND PRIVATE, AND ENSURING THEIR EFFECTIVE USE

Financial support for the work programmes of the Ministry of Environment comes from the consolidated fund. Supplementary resources are also received from the Global Environment Fund through the Resource Allocation Fund (RAF) allocation and the UNEP Secretariat based in Nairobi. Additional resources are also received from international donor agencies for specific thematic issues and activities. Environment programmes are also financed through loan facilities provided international financial institutions, in particular, from the IADB and the Caribbean Development Bank (CDB). Examples include IADB loans for the Integrated Solid Waste Management Programme, the CIP and CDB loan to facilitate the Redevelopment of the Harrison's Cave.

5.2 IMPROVED TRADE OPPORTUNITIES

In the Caribbean and in Barbados in particular, small size and skewed resources makes focusing on the domestic market an unsustainable option. Added to this is the fact that global changes in recent history make the chances of receiving special consideration and tolerance for protectionism less favourable.

The international trading environment is characterised by two opposing forces that challenge SIDS. One is the effort to promote global free trade under the label of *globalization*, while, the other is formation of major trading blocks. This juxtaposition of globalization and compartmentalization in world trading relationships requires developing countries to focus on the improvement of competitiveness in international trade since they are increasingly being made to fend for themselves.

Developing countries such as Barbados are being required to increase focus on international competitiveness and internal trading competitiveness since, if firms cannot learn to

compete with each other domestically, then they stand little to no chance of competing successfully in the international market. It is further noted that the only way a firm can succeed in the face of international competition is to produce what consumers want, at the quality they want and at the lowest possible cost. Increased competitiveness permits fuller use of capacity and allows reductions in unit costs through the exploitation of economies of scale. Exposure to foreign competition provides stimulus for technological change.

The WTO and the Caribbean

The conclusion of the Uruguay round of the GATT reform of the Common Agriculture Policy of the European Union, has threatened the preferential access of the former European colonies to the European market. At the same time, the European Union is now required to cut its lavish subsidies to domestic agriculture, including beet sugar. It is these subsidies and protective measures of the agricultural superpowers that have tended to lead to overproduction in the developed countries and the consequent artificially low level of prices of certain agricultural commodities and limited market access for these products coming from developing countries.

Whether the lower trade barriers under the WTO would have some favourable impact on the Caribbean countries is debatable. The sugar industry in the USA benefits, as in Europe, from substantial subsidies and protection, which, when removed or lowered should cause a rise in the price of sugar but new entrants into the world sugar market as suppliers (such as China) make the final position of sugar prices unclear.

Efficiency concerns must also come to the fore in the case of bananas. Many claim the Caribbean bananas are high cost due to inefficient manual methods used in the region. The costs of mechanized production of bananas in Latin America result is approximately one-third of the costs of those harvested by manual methods on the small farms in the Caribbean

The upshot of all this is that the Caribbean now has to pay much more attention to its trade competitiveness at both the domestic and international level. Caribbean SIDS have to create a comparative advantage where none existed before. A competitive edge may be developed in the domestic or global market place, taking all factors into account, by way of a niche market focusing on product type or specific target markets. Lessons can be learnt from other developing countries such as Singapore which benefitted from a two-pronged approach to trade policy. First there was the production of goods for export with high income elasticity of demand – that is, goods that people want increasingly more as their income increases; and second there were deliberate efforts to reduce costs through greater technological developments that improved productivity and hence efficiency – that is, competitiveness. The difference between the falling costs and rising or at least constant price provides the investible surplus which becomes available to promote growth in the economy.

As a result of the Uruguay round which has produced a more liberal trading environment, there are certain key elements of a competitive economy. These include:

- the existence of Labour standards;
- the existence of Human rights;
- consideration of the environment - for example, values placed on use or abuse of bio-endowments and how design and collect appropriate taxes for use or exploitation of the environment;
- intellectual property rights - the ethics of knowledge ownership, creation and control;
- investment codes - standardization of investment regulations, tax regimes and operating procedures for foreign-owned enterprises; and
- competition policy – *inter alia* abuse of dominant position by firms.

The overarching elements impacting Barbados' ability to participate in the Global Trading arena include:

- market access issues.
- removal of trade barriers.
- special and differentiated treatment provisions.
- the role and functioning of small economies within the WTO context.
- activation of a SIDS platform within the World Intellectual Property Organisation framework.
- attracting investment for small service economies.

The Ministry of the Environment, Water Resources and Drainage in recognition of its role in enhancing the competitiveness of the Barbadian economy has, as part of its Trade and Environment work-programme undertaken a number of initiatives to enhance competitiveness of industry and small and medium enterprises. Some of the noteworthy initiatives included:

- participation in the negotiations at the request of the Ministry of Foreign Trade in the CARIFORUM-EU Economic Partnership Agreement (EPA);
- conducting a study on the issue of the Environmental Goods and Services (EGS) as well as Ecolabeling with a view to understanding how Barbados can benefit from appropriate markets; and
- The National Sub-committee on Trade and Environment has commissioned background research into the establishment of an Eco-efficiency Centre to guide small and medium-enterprises in improving overall efficiency of operations through incorporation of appropriate environmental practices.

5.3 ACCESS TO AND TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGIES ON A CONCESSIONAL OR PREFERENTIAL BASIS

Lack of access to advances in environmentally sound technology is a major obstacle to achieving sustainable development in Barbados. Efficient and effective technology is one of the primary factors that determine the level of competitiveness of our producers and manufacturers hence the international community will have to 'fast-track' the delivery of these technologies to Small Island States like Barbados. Barbados is prepared to pursue

areas for south-south exchange of proven technologies. The relevant agencies and institutions need to intensify the lobby for access to resources to support the development of endogenous technologies.

Transport

There is ad-hoc research by individuals in the Transport Board and the use of technology has been applied to electronic ticket machines on buses, closed circuit television on buses, and global positioning systems (GPS) to track buses. There are plans to start implementing a next bus – electronic signaling system telling people waiting at the bus stops when the next bus is coming, along with electronic scheduling. Researchers from the University of the West Indies (UWI) are investigating electronic tracking of vehicles by planting devices on telephone poles.

Within MTW, the synchronizing of traffic lights has started with some in existence and plans for further expansion. The strips installed to count traffic and monitor speeds on specific roads are used for monitoring road use.

Waste

The engineering department at SSA was recently augmented to increase its capabilities to research and address queries and issues with the existing landfill, the landfill gas to energy project and the tyre recycling project among others. Within recent times training has been conducted in several areas including landfill gases and landfill management

5.4 EDUCATION AND AWARENESS RAISING

Much of the Environmental Education Programming carried out by the Ministry of the Environment, Water Resources and Drainage is done via the Environmental Education Committee (EEC), which was established in March 2000. The initial objective of the EEC was the creation and implementation of various public relations strategies to support the interaction of the Ministry with a variety of audiences, on issues related to the environment. In recent years the EEC, has been at the forefront of the planning and execution of Environment Month Celebrations, the Minister of Environment Awards, and the review and selection of applications and proposals to the Fund for Non-Profit Organisations.

Strategic Planning Process

As mentioned previously, the Environment Education Programme (EEP) of the Ministry of Environment was set up with a mandate of providing education to the public and co-ordinating the education and public awareness activities of the various units within the Ministry of the Environment. There has been an increasing demand for the services of the EEP especially with the expansion of the Ministry's sectoral focus and mandate 2008. The

EEP is therefore at the juncture where it needs to design and develop a framework for interacting with our various units, to critically look at its role and identify how best it can serve its stakeholders. The EEP therefore with the full participation of the internal and external stakeholders commenced a strategic planning process in 2009 to chart its course over the next three to five years. The overall goal of this exercise is to develop a national environmental education strategy for the MEWD.

The Fund for Non-Profit Organizations

This fund was established in the Financial Year 2002-2003, to assist community-based organizations, including schools, PTAs, sports clubs and churches, with initiating or enhancing projects, within their communities, which have an environmental theme. Initially the extent of the grants fund was \$BDS60, 000.00, but as the number of applications for funding increased, a strong case was made to move the amount to \$BDS100, 000.00. The Ministry believes that these initiatives will assist in raising community environmental stewardship and consciousness across Barbados.

Environment Month and Awards

Inherent in this Ministry's mission, is the promotion and facilitation of the use of resources by encouraging the involvement of all citizens and the integration of environmental considerations into all aspects of sustainable national development.

It is for these reasons that the awards were established, and seek to recognise and reward the excellent achievements that organisations and individuals have made in the facilitation of environmental works, innovation and enterprise, that have helped protect and sustain the environment and the natural resources of Barbados. The 2008 Awards were presented under the theme *"Living sustainably is...living responsibly"* and much focus was afforded individuals, organizations and business entities which had demonstrated their contribution to sustainable living by way of sound environmental practices, community-based stewardship involvement, and by providing good examples of leadership through innovation.

Environment Month celebrations for 2008 and 2009 also gave focus to Sustainable Living, as well as the impacts of Climate Change.

The Media

The Government Information Service remains critical to the advancement of sustainable development agenda via radio and television documentaries. In 2008 the Coastal Zone Management Unit highlighted various aspects of the CIP, including the development of the new south coast board walk, while the Environmental Unit focused on the 2008 Minister of Environment Awardees.

Informal education continues to be a useful outreach tool via a number of presentations both electronic and in situ to a variety of audiences. Presentations are often requested on coral reefs, marine eco-system conservation, climate change, plant propagation, gullies, local flora and fauna, and the ozone layer. The in situ presentations comprised hikes, coastal walks and bus tours among other things.

The Ministry also supports the Arts as an invaluable medium for communication, and has for the past seven years awarded National Independent Festival of Creative Arts (NIFCA) participants who have achieved excellence in highlighting environmental issues or saluting Barbados' environment by way of artistic presentations. The Ministry, in collaboration with the NCF, plans to utilize some of these pieces in our public outreach and communication programming.

5.5 CAPACITY –BUILDING AND INFORMATION FOR DECISION-MAKING AND SCIENTIFIC CAPABILITIES

It is recognized that Barbados' capacity requirements could be substantially addressed through the full implementation of the Bali Strategic Plan adopted in Johannesburg in 2002. Barbados also applauds the ongoing initiative to develop the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES), which now includes a capacity –building component, and which shall be concluded by February 2011.

Development of Green Economy Indicators

At the United Nations Summit on Environment and Development held in Rio de Janeiro in 1992, it was resolved that a core set of indicators be developed in order to measure and assess progress towards achieving Sustainable Development. In 1995, the UN Commission on Sustainable Development (CSD) initiated the development of indicators for measurement of sustainable development. A working list of 134 indicators was selected and 22 countries volunteered as pilot testing countries. The pilot testing process commenced in 1996 and was co-ordinated by the United Nations Department of Economic and Social Affairs (UNDESA).

The Government of Barbados joined the United Nations testing programme for the development of Sustainable Indicators in 1997 and took a very active role in the international process to develop a set of indicators of sustainable development, very often representing the concerns of SIDS in the process and articulating its National List of Indicators of Sustainable Development in 2000. A list of 169 Indicators of Sustainable Development for Barbados was identified through a national initiative entitled the National Indicators of Sustainable Development Programme which was spearheaded by a Steering Committee on Indicators of Sustainable Development comprising of the following agencies:

- i. Barbados Statistical Service
- ii. Town and Country Department Planning Office
- iii. Bureau of Women's Affairs

- iv. The Welfare Department
- v. Caribbean Development Bank
- vi. Sir Arthur Lewis Institute of Social and Economic Affairs, UWI
- vii. Ministry of Health
- viii. Future Centre Trust
- ix. Coastal Zone Management Unit
- x. Sewerage and Waste Project Unit
- xi. Central Bank of Barbados
- xii. Ministry of Housing and Lands
- xiii. The National Council of Science and Technology
- xiv. The Environmental Unit, Ministry of Environment (Secretariat)

The Government of Barbados produced the Barbados Sustainable Development Policy in 2004 which fully supported the development and use of appropriate indicators to demonstrate the country's progress along the road of sustainability and, more specifically, to monitor and evaluate the implementation of the policy recommendations articulated within the document.

Within this context the Policy recommended that:

- consideration be given to the findings and recommendations of the Indicators Steering Committee of the National Commission on Sustainable Development.
- review of the indicators work be conducted from an integrated perspective so as to ensure that consideration is given to the Steering Committee recommendations by a wide cross-section of interest groups;
- some procedure be put in place to allow amendment or augmentation of the agreed list of core indicators for Sustainable Development, so that this can be updated appropriately as national and/or international circumstances change

The National Indicators of Sustainable Development while developed during participation in the UNDESA pilot testing process benefitted from the participatory mechanism set up for the articulation of the Barbados Sustainable Development Policy. Indicators of sustainable development for Barbados were developed through a dynamic process interactive process and dialogues among a wide range of stakeholders including government representatives, technical experts and civil society

In 2005, UNDESA decided to review and update the current set of indicators. The review was timely, because countries and organizations had by then increased their knowledge of and experiences with indicators of sustainable development and because of the increasing emphasis on measuring development progress, as evidenced for example by the Millennium Development Goals. As part of the review process, two global Expert Group Meetings, one in 2005 and one in 2006, were convened. The objectives of these meetings were to review, update and finalise the existing list of indicators developed by the Commission of Sustainable Development and to consider future areas of work on indicators. The Government of Barbados was an active participant at these *fora*.

In 2006 when the GOB, articulated the National Strategic Plan for Barbados 2006-2025, more specifically Goal 4 which speaks to *“These Fields and Hills: Building a Green Economy –*

Strengthening the Physical Infrastructure and Preserving the Environment”, the Ministry of the Environment, Water Resources and Drainage was mandated to produce a set of Indicators of the Green Economy. These indicators mostly drawn from the original national list of Indicators of Sustainable Development, will be used to monitor progress with achieving Goal 4 of the National Strategic Plan.

Between 2006 to present, the National Indicators of Sustainable Development/Indicators of the Green Economy Process have benefitted from and contributed to a number of national, regional and international initiatives including:

- **The IADB/GOB Project for the Modernization of the Barbados Statistical System**
In 2006 the GOB, through the Ministry of Economic Affairs, and the IADB commenced work on a joint US\$6 mil project to modernize the BSS, with the objective to strengthen the ability of the BSS to provide accurate and timely economic and social statistics. It will also address the strengthening of other agencies and ministries in their ability to collect data/statistics.

- **Key Statistics and Indicators Required under the CARICOM CSME Environment Component**

In 2000, the Government of Barbados via the Ministry of Environment and the Barbados Statistical Service was instrumental in the development of a list of environmental issues and corresponding statistics and indicators for the CARICOM Region. This initiative was a major output of a United Nations Project entitled *“Strengthening Capacity in the Compilation of Statistics and Indicators for Conference follow-up in the CARICOM Region”*. The project was jointly carried out by the United Nations Statistics Division (UNSD) and the CARICOM Secretariat.

At the 25th Special Meeting of the Council for Trade and Economic Development (COTED) Environment, held in Georgetown, Guyana, April 14th-18th 2008, the COTED noted the list of statistics which was presented as a proposed set of key statistics required under the CARICOM CSME. The COTED reviewed and endorsed the recommended initial set of core statistics that may be used to evaluate environmental performance within the context of the CSME and a proposed Community Environment and Natural Resources Policy Framework.

- **UN Statistics Division /UNEP Questionnaire 2004 on Environment Statistics**
The preparation of this questionnaire is facilitated through the Barbados Statistical Service with the assistance of the Ministry of Environment and other local environmental entities.
- **Goal 7 of the MDGs: Ensure Environmental Sustainability**
The Ministry of the Environment, Water Resources and Drainage submits reports on its progress as necessary, the most recent report submitted to the Ministry of Foreign Affairs in February 2007. The Ministry also actively participates at the UN Economic and Social Council (ECOSOC) forum which has taken the lead role in key policy areas such as the MDGs.

- **National State of the Environment Reporting /Global Environment Outlook**
Indicators are in integral part of the preparation of the above national and international reports the latter which is prepared by the United Nations Environment Programme.

Regional Cooperation. At the 15th Meeting of the Forum of Minister of the Environment of Latin America and the Caribbean, held in Venezuela from October 31st to November 4th, 2005, Decision 11 focused on Environmental Indicators.

- **Multilateral Environmental Agreements (MEAs)**
Some of the MEAs to which Barbados is signatory have attached indicators programmes specifically the United Nations Convention on Biological Diversity and the United Nations Convention to Combat Desertification and Drought. The GOB has been able to participate meaningfully in these processes due to its National Indicators Programme.

5.6 NATIONAL AND COUNTRY-DRIVEN AND COUNTRY-OWNED STRATEGIES FOR SUSTAINABLE DEVELOPMENT, INCLUDING POVERTY REDUCTION AND RESILIENCE –BUILDING

Barbados continues to build on its national institutional capacity necessary to coordinate sustainable development initiatives; however technical assistance is required from relevant international agencies and institutions if Barbados is to put in place the optimal governance framework required.

Preliminary discussions broached by the Barbados Delegation at the 15th UN Commission on Sustainable Development in 2007, indicated an interest in developing the concept of establishing a formal sustainable development partnership built on integrating environmental sustainability, local gastronomy and rural tourism.

Barbados has achieved approximately 70 % of its sustainable development objectives utilizing national resources. It has also committed to regional initiatives to develop opportunities for rural communities to obtain economic benefits from sustainable use of natural resources. To this effect a “Regional Workshop on Environmental Sustainability, Local Gastronomy and Rural Tourism - An Experts Workshop”, was convened by the Ministry of the Environment, Water Resources and Drainage in March 2009, to bring together select experts from across the Caribbean sub-region and from the international community to dialogue on the interaction, challenges and opportunities surrounding environmental sustainability, local gastronomy and rural tourism development.

The initiative was predicated on the understanding that efforts to make maximum use of the linkage between environmental sustainability, gastronomy and rural tourism can lead to

significant contribution to sound rural community policies and national sustainable development. The promotion of environmentally friendly food production and preparation in the tourism sector within the setting of the rural experience can lead to direct economic benefits to rural areas and this can counteract the migration of people from the rural sector and can also help to underpin the importance and maintenance of traditional cultural activities and values. Additionally, the linkages would in effect, encourage sound environmental practices in agricultural food production as well as increase the volumes of food produced. There would be the likely encouragement to reduce the use of pesticides and other harmful agricultural chemicals that impact or pollute the environment. Notwithstanding the above, it would be critical for national enabling policies and strategies to be put in place to assist the development of gastronomic linkages to tourism and in fact to encourage the development of another aspect of greening national economies.

The specific objectives of the workshop were to:

1. Discuss the sustainability issues associated with production and consumption of agro-biodiversity;
2. Discuss the current status, opportunities and challenges associated with the development of a regional platform for gastronomy-based sustainable rural tourism;
3. Consistent with the UNCSD promotion of sustainable development partnerships, commence the articulation of technical, financial, policy and institutional elements needed to establish a 3-year pilot partnership for developing a Caribbean gastronomic tourism experience; and
4. Establish a roadmap for instituting the partnership within 12-months of the workshop.

The workshop occurred from March 23-25, 2009 with participants arriving from the 20th March. Local participants were invited from the Ministry of Environment, Water Resources and Drainage, the Ministry of Agriculture, the Barbados Agricultural Society, the Ministry of Tourism, the University of the West Indies, the Natural Heritage Department, the Inter-American Institute for Cooperation on Agriculture (IICA) and the Coastal Zone Management Unit. Regional participants were invited from the NGO community from St. Vincent and the Grenadines, Trinidad and Tobago, St. Lucia and Grenada as well as a representative from the Caribbean Policy Development Centre (CPDC). In terms of the international participants, representatives from the French Culinary Institute of New York, a food journalist/chef, and UNDESA, attended the workshop.

6. SPECIAL CONSTRAINTS AND CHALLENGES

Although the Government of Barbados has realized a measure of success towards achieving sustainable development, there are a number of inherent constraints which continue to arise. This chapter aims to describe some of the sector specific issues but first gives an idea of the institutional issues which transcends all sectors.

6.1 INSTITUTIONAL ISSUES

Access to Technology: With respect to access to technologies, the Government of Barbados has thus far been proactive in using technologies but assistance is needed with respect to training and enhancing technical capabilities for surveillance, monitoring and early warning systems.

Implementation mechanisms: Barbados has had some measure of success with articulation of sustainable development goals and policies. This has been tempered however by the following constraints:

- There is a vital need to employ measures to strengthen National Commissions on Sustainable Development via improved organizational and administrative structures, as well as through an improved overall governance process;
- There is a lack of clarity with respect to where decision making with respect to Sustainable Development resides among various stakeholders;
- In general a greater emphasis needs to be placed on implementation of sustainable development strategies as opposed to simply reporting. While partnerships exists with respect to developing the strategy, a low level of public-private partnerships focused on implementation existed;
- There is a need for enhanced harmonisation between the MEAs and reporting on Sustainable development goals (CSD, MDGs, BPOA);
- Levels of awareness and understanding by public at large of Sustainable development; and
- The need for adequate financial and human resources for implementation, monitoring and evaluation of plans and policies.

Financial Resources: With respect to the lack of financial resources, the matter of accessing long term financing for the process must receive special attention from national and international sources. Currently, in reference to SIDS, as much as 80% of GEF resources (in the Pacific) go to reporting on MEAs. All indications show that a similar situation exists in the Caribbean.

Management of Information systems: As described previously the Government of Barbados has some measure of success with the development and utilisation of indicators of Sustainable development. There have been constraints experienced throughout the process to develop, institutionalize and utilise indicators of sustainable development. These can be summarized as follows:

- i. During the initial stages of the National Indicators Programme, there was a degree of uncertainty regarding the focus of the CSD Indicator set, whether it was for national use only or also for international comparison, however it was clarified that the focus of the programme is to develop a core set for use at national level and this has been the approach adopted by the Government of Barbados. Participation in the international process is 'bottom- up' where national experiences are used to inform the international dialogue often representing the concerns of SIDS.
- ii. Limited existing human resources exists in the Ministry of Environment to collect, analyse and publish data on a sustained basis;
- iii. In the initial stages of the programme there was a slow response by agencies in providing information;
- iv. The challenge of sensitizing and maintaining the interest of all government agencies that will have to play their part in developing and maintaining this system. This is compounded by the fact that a process of experimentation and trial and error is often necessary to arrive at the most suitable list of Indicators for a country.
- v. Limited financial resources for purchasing equipment including necessary hardware and software for all the agencies involved in producing information for the initiative, as well as filling any gaps in training.
- vi. With respect to indicators a recognised challenge is the absence of data and information systems in the area of environment in particular, which lags behind experience with socio-economic data. In addition to this, where they are in existence, they often cannot be regarded as user-friendly. Other important points of concern include the depth of indicators analysis, and the fact that a number of the national statistical systems in the region need strengthening initiative in respect of Sustainable Development data. It should be noted that the Government of Barbados is currently addressing this challenge through the Modernisation of the Barbados Statistical Service Project and the development of a National Energy Information System.
- vii. There has to be improvement of data availability on the national level especially with respect to data identified as important to measure Sustainable Development but for which data is currently not available and basic research will be required. Additionally there needs to be integration of data collection to existing information systems.
- viii. There is a need for high level policy makers or politicians to be involved and committed to Sustainable Development since the work on Indicators progresses more rapidly. This was demonstrated in 2007 when the then Prime Minister and Minister of Finance called for Green Economic Indicators and the process was spearheaded by the Director of Finance and Planning of the Ministry of Finance.

Legislative Frameworks: While Barbados has in place a comprehensive listing of legislation governing environment and sustainable development and a number of effective institutions, there still remains some inherent problems which impact the attainment of sustainable development goals. These include:

- Weak existing governance structure for implementation of Multilateral Environmental Agreements;
- Lack the capacity to fully utilize the established legislative frameworks;
- Poor Enforcement of existing legislative framework accompanied by weak enforcement capacity and a lack of clarity of administrative jurisdiction.

Integrating Cross-Cutting Issues into Sustainable Development Strategies: There is still much scope to increase efforts towards non-partisan ownership of the Sustainable Development policy, build intergovernmental and agency linkages, and bolster the inclusion of civil society in the process.

6.2 CLIMATE CHANGE AND SEAL LEVEL RISE

Availability and Use of Coastal Risk Information for Coastal Zone Management (CZM): If the Coastal Zone Management Unit (CZMU) is to continue fulfilling its its mandate to protect significant public infrastructure from coastal processes such as beach erosion and flooding, the capacity to analyze and understand the interplay of physical, ecological and socio-economic factors must continue to improve, incorporating new considerations such as sea level rise. A major constraint for the CZMU has been to maintain updated high quality risk information on coastal and nearshore processes and specific issues such as cliff and slope stability, as for example, in the Scotland District. Existing information on coastal vulnerability is not linked to a national risk information database with a Geographical Information System (GIS) and modeling capabilities. There is a need for improved capabilities for comprehensive vulnerability and risk assessment of the coastal zone, which incorporates climate modelling, as well as appropriate long term continuous monitoring and evaluation tools to support decision-making in CZM and meet the challenges in the face of climate change.

6.3 NATURAL AND ENVIRONMENTAL DISASTERS

Addressing Disaster Risk and Climate Change Adaptation: A number of challenges exist in the area of disaster risk management. While the Government of Barbados (GOB) endorsed Comprehensive Disaster Management (CDM) in 2001, there has been little progress in applying its core principle of mainstreaming disaster risk management into development decision making. For example, preparedness and response remain the main focus of the national disaster management system; and awareness of the need for the more cost-effective preventive approach to disaster risk management is still incipient at most levels of public administration. In addition, there is a lack of appropriate legislation that provides the requisite authority and institutional framework for disaster risk management; inadequate promotion of the building code and setback requirements, poor enforcement of zoning and land-use regulation and inadequate public education on and awareness of disaster risk. A lack of high-quality information on disaster risk in Barbados has also been a major constraint to the implementation of CDM. These challenges will be accentuated in the context of adapting to the impacts of climate change.

Addressing these challenges will require a reorientation of the national approach to managing natural hazards and disasters, from one that is largely ex post facto to one that embraces integrated disaster risk management. This may be achieved through the systematic implementation of a national integrated disaster risk management strategy, that embraces CDM and emphasizes proactive action, specifically in the areas of:

- i. improved information on country disaster risk;
- ii. prevention and mitigation;
- iii. institutional strengthening for integrated disaster risk management and climate change adaptation at the national level and sectoral levels, including a multi-institutional, multi-sectoral approach to disaster risk management with appropriate roles for the CZMU, the Central Emergency Relief Organization (CERO), planning, environment and other public and private sector agencies; and
- iv. improved financial risk management.

Climate change is likely to increase the frequency and severity of natural hazards and disasters in Barbados and thus has the potential to affect shoreline stability, the health of coastal and marine ecosystems, the tourism industry and private property in general. For example, according to data from the CZMU, the 100-year flood model projects that 6,000 residences along the south and west coasts and 70% of west coast hotels would be affected by the event. Coral bleaching, the intensification of beach erosion and encroachment of mangroves and lagoons associated with sea level rise could have serious implications for future development, recreational activities and land use in the coastal zone. The Government of Barbados needs baseline data, modelling and regulatory tools to enhance the resilience of future development to present-day variability, disaster risk and projected climate change.

6.4 MANAGEMENT OF WASTES

There are specific pieces of legislation for different hazardous materials, for example pesticides and explosives, but there is no over-arching law that addresses all hazardous materials. This is possibly because the chemicals are used by very different sectors, for multiple purposes. The Draft Environmental Management Act will go a long way in filling the gaps left by the different pieces of legislation. The absence of this legislation is the primary constraint on the operations of EPD in relation to hazardous waste management since the current system is dependent upon the waste producer realizing and reporting the waste as hazardous. There is also the constraint of the lack of space when considering the most appropriate method of hazardous waste storage and disposal.

With respect to the SSA, in the past, access to certain areas for household waste collection might have been considered problematic, however, more recently, with the infrastructural improvements by the Rural and Urban Development Commissions in community access, this constraint is now much less relevant. Another issue surrounds the composition of the types of vehicles in the fleet operated by the SSA. The fleet now consists of vehicles of various sizes including smaller collection vehicles to service some of the small alleys in an overall effort to increase the level of efficiency of their service.

6.5 COASTAL AND MARINE RESOURCES

The Degradation of Coastal and Marine Ecosystem Services Threatens the Resilience of the Tourism Sector and Public Infrastructure: Coastal and marine ecosystems provide a number of services that are essential to Barbados' tourism-based economy. For example, coral reefs function as natural barriers to wave action, produce sand that nourishes beaches and support recreational diving. Beaches also buffer wave action, protecting coastal infrastructure from erosion and support recreational activities. The health and status of these and other ecosystems and landscapes (dunes, cliffs) are showing signs of stress. For example, 80% of Barbados' fringing reefs are reported as seriously degraded. Bank reefs have decreased from 37% to 23% over a decade. Shoreline erosion rates are estimated at 15 meters/100 years. With tourism accounting directly and indirectly for approximately 39% of GDP in 2008 and 50% of total export earnings and employing up to 44% of the labour force, losses to coastal ecosystems services and the public and private infrastructure that depend on them represent significant threats to the resilience of the economy.

Another issue of concern in this sector is the exploitation of coastal and marine organisms (including corals and sponges) without the associated administrative structure in place to address intellectual property rights issues.

6.6 LAND RESOURCES

Mining: The primary constraint for the Natural Resources Department (NRD) is that the previously described new legislation has not yet been enacted. Until this support is made available, the Department does not have the authority to implement the appropriate mitigation measures associated with the impacts of mining. In its present capacity, the Department can only provide recommendations to operators on good practice under an assumption that the companies will operate in good faith. The Natural Resources Department has made recommendations for revision of existing legislation which addresses *inter alia* issues such as appropriate quarrying times and benchmarks. The anticipated legislative support would give the Department the leverage to effect more fundamental improvements.

Agriculture and Food Production: Currently, farmers are finding it difficult to access funds and loans which are advertised as being available and have suggested that alternative mechanisms have to be employed to help them finance projects.

There is also difficulty in policing and regulating prices of goods. The sale of agricultural goods is a competitive market in Barbados, whereas in most countries food prices are subsidized keeping prices relatively low. Farmers are also working outside of the system, making the agricultural industry difficult to monitor and regulate.

As it relates to food supply and disaster management, Barbados has a three (3) month reserve of food in case of natural disaster. There is the need however, to create sufficient storage capacity to hold supplies, without creating a welfare-like system.

There is also the need for more involvement and interaction between research and development and the farmers and their practices. For example, limitations are placed on farmers due to the inefficient use of water, therefore training could be provided on separating and sanitizing water from organic waste. In addition, specifically designed programmes for extension officers at the tertiary level are needed. Courses should be short and intense lasting about 4-6 weeks to cater to age and family commitments of officers.

There is the need to enhance the use of mass media to inform and educate farmers and fishers alike, reducing the work burden placed on extension officers. There has been the call by some practitioners to move away from the idea of public awareness towards advocacy.

6.7 BIODIVERSITY

There is the need for increased collaboration and partnerships in the area of intellectual property rights with specific agencies such as WIPO and countries such as Costa Rica and Martinique with experience in the area. There are species of immediate importance for safeguarding of genetic material and establishment of intellectual property rights including the finger squash, *bonavis*, black belly sheep and the grapefruit, as well as seeds which would be indigenous to Barbados.

There is also the need for a gene bank that would store seedlings and embryos. Personnel would need to be trained in order to operate such facility. Opening a gene bank may bring in a new market and source of income. *Ex-Situ* conservation opportunities are needed and have to be developed.

There is need for increased partnerships between Government and the three campuses of UWI to store seeds of the different islands.

Finally, support is needed to achieve the goal of storage of genetic matter in the proposed National Botanic Garden and for supporting the work of the Cane Breeding Station in St. George as well as the CARDI's research unit in Deighton Valley which already has a gene bank for yams and dwarf pea.

6.8 TRANSPORT

Enhanced training for staff at the Transport Board is required following the computerization of the fleet management system. The system has not yet filtered through to the whole organization, but it is being used to manage stores and bus operations.

6.9 SUSTAINABLE CONSUMPTION AND PRODUCTION

Effective mainstreaming of SCP in the National Development Framework is challenged by the following:

- The absence of an integrated, multi-stakeholder governance mechanism. It should be noted that Government is committed to re-establish the National Commission on Sustainable Development;
- The need for an instituted monitoring and evaluation mechanism on SCP at the national level. It is critical that a system of indicators be institutionalized with the requisite technical and human resources;
- The need for a dedicated sub-regional institutional mechanism to support the implementation of the Caribbean Sub-regional Action Plan on SCP;
- The need for dedicated international facilities in the area of technological and financial resources to support implementation of SCP. It was proposed at the 5th regional SCP meeting in Latin America and the Caribbean that SCP be integrated in the GEF as a cross-cutting issue;
- The need for economic instruments and other enabling mechanisms such as cleaner production centers to support private sector involvement in SCP;
- The need for targeted educational programmes on SCP;
- The need for an integrated research programme;
- The need to heighten the involvement of SIDS in the SCP process; and
- The need to widen the economic space within the Caribbean within the interest of changing the market for green goods and services, and creating green economic opportunities for small business and entrepreneurs.

7. RECENT TRENDS AND EMERGING ISSUES

This chapter provides a snapshot of some of the medium to long term priorities which will shape Barbados' future development path. This by no means comprises a comprehensive list but instead highlights the main issues being addressed by policy planners in public, private and non-governmental sectors.

7.1 THE GREEN ECONOMY

In March 2009, the Prime Minister and Minister of Finance announced his vision for Barbados becoming 'the **most environmentally green country in Latin America and the Caribbean**'. This statement provides support for Goal 4 of the National Strategic Plan 2006-2025 ("Building a Green Economy- Strengthening the Physical Infrastructure and Preserving the Environment", and built on 2007 Budget proposals and the 2008 Speech from the Throne.

In the short to medium –term, the emphasis of the Government of Barbados will be to consolidate and elevate its efforts, many which have been described in the report, to engage businesses and consumers in Greening the Barbadian Economy. The definition of the green economy is:

"The production and consumption of products and services that promotes environmental protection, social empowerment and economic growth."

The approach to green the economy will be characterized by:

1. Upholding the principles of sustainable development laid out in the BSDP;
2. The public sector leading by example in areas such as sustainable procurement, energy efficiency and water conservation and the enhancement of a market for green goods and services;
3. Creating green economic opportunities for small businesses and entrepreneurs;
4. Building on existing capacities and systems in public and private sectors;
5. Developing the baseline to track progress.

7.2 PROVISION OF POLICY SPACE FOR THE PARTICIPATION OF CITIZENS IN LOCAL DECISION MAKING AND DEVELOPMENT PLANNING

Thirty Constituency Councils were established in 2009 to enable ordinary Barbadians in communities, to participate in the process of deciding what needs to be done in their constituencies and to link residents in a meaningful way to Parliament and Central Government. This initiative will devolve greater responsibility and authority to local people to decide on programmes and projects that will impact directly on their quality of life.

7.3 REDUCED SUBSIDY FROM POTABLE WATER

The Barbados Water Authority will be rationalized and fall under the ambit of the Fair Trading Commission. The price of water for end-users will be fairer and the Government will reduce its subsidy which is a huge burden on the national budget. The metering programmes for household connections continues to be expanded.

7.4 NEW TOURISM MASTER PLAN

A new unit in the Ministry of Tourism has been established to develop a new Tourism Master Plan. The new plan will look at the tourism development strategy in a holistic way addressing the tourism product, land use policy, marketing, carrying capacity and linkages to other sectors. The marketing programme has already started and is estimated to cost an additional US\$ 5 million. A specific component of the programme will focus on the Diaspora market.

The Tourism Development Act will also be amended to provide a gradation of concessions related to tourism-related investments.

7.5 LAND USE POLICY

A new land protection policy has been announced which protects our East Coast from Pico Teneriffe to Skeetes Bay as a national park area and from purchase of land by foreign buyers. The policy is not xenophobic but an attempt to protect the island's patrimony.

An Agricultural Protection Bill is being drafted which will protect large areas of agricultural land and require the approval of parliament for the change of use of land areas of 100 acres.

Importantly, the Town and Country Development Planning Office (TCDPO) will be undertaking an Institutional Strengthening exercise, intended to commence in March 2010. The main objective will be to enhance the ability of the TCDPO to deliver its services professionally and efficiently. The scope of work will include:

- A review of the current staffing structure with particular reference to the distribution of technical and professional staff to determine if this mix allows for maximum efficiency and make recommendations;
- A review of the existing institutional structure that is Development Control, Forward Planning, Planning Control and Administration to ensure alignment with Barbados' economic development framework.
- Reviewing and revising where necessary the criteria for collaboration between the planning office and the Government agencies which are consulted on a regular basis:
 - a) The Ministry of Transport and Works
 - b) The Ministry of Agriculture including the Soil Conservation Unit
 - c) The Office of the Attorney General and the Ministry of Home Affairs
 - Solicitor General Office
 - The Chief Parliamentary Council

- Barbados Fire Service
- d) The Ministry of the Environment, Water Resources and Drainage
 - Barbados Water Authority
 - Coastal Zone Management Unit
 - Drainage Division
 - Environmental Protection Department
- Reviewing existing practices and making recommendations for improving the communication channels between the planning office and government agencies.
- Reviewing current practices with respect to the handling of EIA applications and making recommendations to improve handling efficiency.

7.6 ACCESS TO AGRICULTURAL CONCESSIONS

All farmers entitled to concessions will get them up front and on the basis of the annual inspections which the Ministry of Agriculture will be required to conduct for the issue of farmer's licenses.

Persons engaged in aquaculture will now have the same type of incentives and access to capital as do other farmers.

7.7 REGIONAL TRANSPORT

Government will pursue the construction of a terminal for private jets in the north of the island. It will also build a new cruise ship pier and facility in the north of the island to reduce congestion at the Bridgetown port. The government has also discussed the investment in a regional ferry service. A private entrepreneur has invested in a ferry service connecting Barbados, St. Lucia, St. Vincent and Grenada.

7.8 ENERGY

Energy efficiency and Renewable energy (RE) are key building blocks to economic independence, sustainable development and making Barbados ***'become the most environmentally advance green country in the Caribbean and Latin America'***. It is important that over the medium- term further emphasis be placed on:

- Promoting our best practices to act as a catalyst for greater civic, private sector and international engagement. Examples include the Solar water industry, green infrastructure projects such as the Harrison's Cave where RE was used to provide some of the power to the island's number one tourist attraction, and the use of solar for powering ice maker at the Skeete's Bay fishing complex;
- Increase investment in capital infrastructure projects that have "triple bottom-line" impacts such as the mains replacement programme of the BWA and the landfill to gas to energy project;

- Reform the local environmental governance framework to play a lead advocacy and advisory role in the greening of the economy via the institutionalization of the 3rd National Commission on Sustainable Development;
- Strengthen the existing green fiscal policy regime commencing with a detailed review within the next 12 months; and
- Pursue a focused Greening of Government programme with emphasis on public procurement.

Government will take the lead using its properties in the generation of electricity from solar, wind and waste for its own facilities and for sale into the national electricity grid. The initiative will also be accompanied by any necessary fiscal incentives to encourage the efficient generation of energy from these alternative sources.

The Government of Barbados is also looking at the feasibility of introducing waste-to-energy facilities in Barbados. This would be of benefit to the island as it would address the issues of waste management, energy security and carbon capture and storage. It is proposed that such a facility will provide 6 to 8 megawatts of power to the grid when commissioned.

A new and separate allowance called the Energy Conservation and Renewable Energy Deduction has been created. It allows a deduction of up to five thousand dollars per year over five year to cover the cost of an energy audit and fifty per cent of the cost of retrofitting a residence or installing a system to produce electricity from a source other than fossil fuels. It also applies to businesses whether incorporated or not.

The Cabinet has already approved the Government approaching the Inter-American Development Bank (IADB) for assistance in preparing the appropriate legislation that would require the Barbados Light and Power Co. Ltd. to purchase all the electricity produced from renewable energy sources. The rates of the electricity from independent producers will be set by the Fair Trading Commission.

7.9 TRADE FACILITATION

A tripartite council called the Council for Investment, Exports and Foreign Exchange (CIEX) has been established. It has a mandate to develop, exploit and monitor opportunities for earning and conserving foreign exchange; to identify and remove operational constraints to the earning of foreign exchange and to coordinate and monitor an overall strategy for promoting Barbados' economic interest abroad. To this effect, the government has designed a new policy directive aimed at restoring the relationship between residents and the tens of thousands of Barbadians living overseas. The Diaspora is viewed as an integral part of the economic, social and cultural development of Barbados.

A unit for Overseas Barbadians will be established and called the Barbados Network. They will review incentives, create a bond to encourage investment, develop a data bank and host a biennial consultation of all Barbadian organisations.

In connection with the renewed thrust towards agricultural production, Trade can enable farmers to capitalize on the economic potential of their produce with the profits ensuring the long-term productive potential of natural resources, such as soil, water, and vegetation, and their sustainable management. It is crucial that trade and agricultural production be seen as part of the same equation. Trade can help to turn agriculture into one of the most important contributors to sustainable livelihoods, food security and income generation for developing countries.

The Aid for Trade initiative promoted by the international community provides a framework in which an integrated approach involving agriculture, trade and sustainable land management (SLM) can be effectively applied. The Government of Barbados is concerned however that Small Island Development States have difficulties benefitting from Aid for Trade initiatives due to the inherent constraint of human capacity to both prepare necessary proposals and conduct follow-ups required to secure funding.

With respect to the issue of trade and environment, the Government of Barbados believes that in general there is need for analysis of the trade related impact on SIDS of all Multilateral Environment Agreement including the United Nations Framework Convention on Climate Change. It should be noted that such analysis forms part of the ongoing Doha Round negotiations under the work programme of the WTO Committee on Trade and Environment.

7.10 CORPORATE SOCIAL RESPONSIBILITY AND PHILANTHROPY

The government signalled its intentions and the work has started on setting up a foundation for corporate social responsibility and philanthropy designed to provide a legal framework for high net worth individuals to make contributions to local development in a more tangible way. Several Barbadian businesses currently make contributions to diverse community events but the scope of their contributions are limited by the inadequacy of the current domestic fiscal and legal regime governing charitable donations. The new policy and legal framework will address these issues.

7.11 ECONOMIC INNOVATION

A national imperative is to grow the size of Barbados' economic base and increase the net growth rate in order to induce sustainable economic growth and several other development priorities. The Government therefore proposes to establish the Barbados Quick Response Revolving Seed Capital Fund (SCF) and the Barbados Quick Response Venture Capital Fund (VCF). Those funds are designed to meet the needs of clients that find it difficult to access all the seed and venture capital finance required.

8. RECOMMENDATIONS

Based on the review of the plans and programmes in place as well as a detailed examination of the current constraints and challenges facing the country with respect to implementation of its sustainable development agenda, the following is evident. Barbados has to be bold and aggressive in its review of the National Strategic Plan; it also has to establish specific instruments and mechanisms that help in creating an enabling environment to support implementation.

It is also evident that Small island developing states require support to strengthen national and institutional capacities; sustainable capacity development in policy formulation and implementation. Further action is required at the national level to improve education for sustainable development initiatives. A lot has been achieved but a lot more can be produced within our available existing resources.

Therefore this report recommends the following critical steps for action:

- i. Reaffirm the establishment of the National Commission for Sustainable Development (NCSD) as the overarching mechanism for monitoring and evaluation of implementation as well as an advisory body to policymakers;
- ii. Identify a specific research and development agenda within the ambit of the NCSD;
- iii. Barbados should make maximum use of SIDSNET and SIDSTAP facilities.
- iv. Barbados should promote the use of Sustainable Development Indicators across the Caribbean region and provide technical assistance if necessary to its Caribbean counterparts.
- v. Barbados should review the sustainable development policy with the context of its current thrust to create a green economy.
- vi. Work on Fiscal Policy reform to better support sustainable development should continue;
- vii. A national sustainable consumption and production framework should be articulated before the launch of the implementation of the ten year global framework in 2012;
- viii. Barbados should also intensify efforts on the matter of giving AOSIS a political identity and secretariat; and
- ix. Finally, Barbados should also take the lead in building partnerships for technical cooperation for SIDS and developing deeper triangular cooperation for the Caribbean.

Appendix 1

Sources of Information

Documents:

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20. The Revised Treaty of Chaguaramas establishing the Caribbean Community including the CARICOM Single Market and Economy

Face –to-Face Interviews:

1. Ms Valerie Brown, International Transport Division, Ministry of International Business and International Transport.
2. Mr. Steve Devonish, Natural Heritage Department
3. Mr. Nigel Jones, National Botanic Gardens
4. Ms. Eleanor Jordan, Ministry of Tourism
5. Mr. Travis Sinckler, Ministry of the Environment, Water Resources and Drainage
6. Ms. Amrikha Singh, Ministry of the Environment, Water Resources and Drainage
7. Ms. Andrea Wells, National Cultural Foundation
8. The Chief Telecommunications Officer (ag.), Telecommunications Unit

Written Responses:

1. Chief Town Planner, Town and Country Planning Office

2. Director, The Coastal Zone Management Unit
3. Director, The Environmental Protection Department
4. Director, The Natural Heritage Department
5. Director, The Department of Emergency Management
6. Director, The National Council for Science and Technology
7. Permanent Secretary, Ministry of Foreign Affairs and Foreign Trade
8. Permanent Secretary, Ministry of Transport and Works
9. Permanent Secretary (Education), Ministry of Education and Human Resource Development

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2. <http://www.telecoms.gov.bb>
3. <http://www.cavehill.uwi.edu/>
4. <http://www.bajanpower.com>.

National Stakeholder Consultation:

Name	Designation	Organisation
1. Dr. Dennis Blackman	Senior Agricultural Officer	Ministry of Agriculture
2. Mr. David Bowen	Senior Exchange Control Officer	Central Bank of Barbados
3. Mrs. Renne Boyce-Drakes	Member	Caribbean Youth Environment Network
4. Ms. Mariama Branker	Member	Caribbean Youth Environment Network
5. Mr. George Browne	Deputy Chief Town Planner	Town & Country Development Planning Office
6. Mr. Trevor Clement	Director	Transport Authority
7. Mr. Steve Devonish	Director	Natural Heritage Department
8. Mrs. Kim Downes-Agard	Senior Environmental Officer (ag)	Environmental Unit
9. Mr. Richard Goddard	Senior Energy Conservation Officer	Energy Division
10. Mr. Jeffery Headley	Director	Environmental Protection Department
11. Mr. Fabian Hinds	Research Officer	Coastal Zone Management Unit
12. Ms. Lynette Holder	CEO	Barbados Small Business Association
13. Mr. Alex Ifill	Water Quality Technologist	Barbados Water Authority
14. Mrs. Eleanor Jordan	Tourism Development Officer	Ministry of Tourism
15. Mr. Nigel Jones	Senior Technical Officer	National Botanic Gardens
16. Mrs. Donna King-Brathwaite	Environmental Education Officer	Environmental Unit
17. Ms. Davina Layne	Environmental Officer	Barbados Hotel and Tourism Association

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18.	Ms. Vernel Nicholls	President	Barbados National Union of Fisherfolk Organisations
19.	Mr. Christopher Parker	Fisheries Biologist	Fisheries Division
20.	Mr. James Paul	CEO	Barbados Agricultural Society
21.	Mr. Jovan Reid	Foreign Service Officer	Ministry of Foreign Affairs
22.	Ms. Simone Rudder	Senior Foreign Service Officer	Ministry of Foreign Affairs
23.	Mr. Sean Sealy	Research Officer	Environmental Unit
24.	Ms. Lisa Senhouse	Environmental Technical Officer	Environmental Protection Department
25.	Ms. Amrikha Singh	Environmental Officer	Environmental Unit
26.	Ms. Kimberly Waithe	Economist	Ministry of Economic Affairs
27.	Mr. Rickardo Ward	Project Manager	Environmental Unit
28.	Ms. Yvonne Walkes	President	National Organisation of Women
29.	Ms. Allison Wiggins	Coastal Planner	Coastal Zone Management Unit
30.	Mr. Gordon Bispham	Consultant/Facilitator	Caribbean Policy Development Centre

Appendix 2

National Strategic Plan (NSP) Summary 2006 - 2025

Barbadian Traditions provides the blueprint for the realization of Barbados' vision of becoming a fully developed society that is prosperous, socially just and globally competitive by the end of the first quarter of this century.

The Plan first presents an economic and social picture of Barbados as it sets out on its journey. This picture, sketched from the last twelve years, shows a Barbados that has achieved remarkable economic and social progress. One defining indicator of this performance is its 29th ranking among all countries in the world in the **United Nations Human Development Report 2004** and its designation as a leading developing country.

This picture further highlights Barbados' strengths, weaknesses, opportunities and threats. The analysis supports the firm conclusion that Barbados can secure its desired place in the world as a fully developed society that is prosperous, socially just and globally competitive.

The Plan embodies the theme "**Global Excellence, Barbadian Traditions**". This theme conveys the message of a Barbados that is a successful and globally competitive society, fully integrated into the world economy, but at the same time capable of preserving and strengthening its own identity, enterprise, national sovereignty, and traditions.

There is also a set of core values that provides an ethical framework for the transformed Barbadian society we envisage. The Plan advances **six strategic goals** in pursuit of the national vision for 2025.

GOAL ONE speaks to a cultural transformation that will reinforce Barbadian values and national identity and act as a catalyst for propelling Barbados into the 21st century as a fully developed society. This goal will seek to create greater equity and social justice, while building an inclusive society with opportunities for all.

GOAL TWO envisions vastly improved governance. It foresees a Barbados with a "fully Barbadianised" constitution free of all vestiges of colonialism; a modernized parliamentary and electoral system; greatly enhanced political participation and the empowerment of all communities. It also envisions a radical overhaul of the administrative machinery of government as a catalyst for change, while also strengthening civil society as a critical part of the governance for the 21st century. It further envisages that there will be higher levels of self-reliance, less dependency on the state and greater diversity and tolerance.

GOAL THREE places people at the heart of the development process. It promotes the building of social capital. This involves the development of the human resources necessary to function in a knowledge-based services economy and the creation of appropriate family and community values. This calls for a revolution in education which will unlock the productive potential of all Barbadians. A good quality of life will also be paramount and, therefore, a well-developed public health system and the eradication of poverty from our social landscape will all be part of this social transformation.

GOAL FOUR requires the protection, preservation and enhancement of our physical infrastructure, environment and scarce resources as we seek to advance our social and economic development. It demands that we find the right balance between our development and the preservation of our physical surroundings. It calls for access to adequate water and energy supplies, a good transportation system and the development and maintenance of sound infrastructure.

GOAL FIVE seeks to enhance Barbados' prosperity and competitiveness in the world economy. This will require rapid and radical transformation in the way we carry out our productive activities. We must identify those areas of economic activity that are viable and competitive, and that can contribute to sustainable growth, employment and overall prosperity for everyone. Focusing on the export of services such as tourism and international business, while exploiting new ones such as culture and health, will all contribute to a more diversified and prosperous economy.

GOAL SIX calls for us to continue consolidating our image in the world. This image has served us well and has brought us considerable international respect since independence. Our political stability, education, democratic governance and good leadership have all earned for Barbados worldwide recognition. Our duty will be to continue to show others how a small country can be successful and yet retain its identity; in other words, we have to brand Barbados globally.

The above-mentioned goals are explained in detail in Section VI. Section VII presents the national objectives, strategies and targets of each goal. Collectively, the goals, national objectives, strategies and targets provide the road map to a fully developed Barbados. There is a planning matrix at Section X that summaries all the goals, national objectives, strategies, targets and indicators for ease of reference.

The Appendix provides an indication of the key objectives and strategies that will guide the development of the individual sectors - economic, social, governance, infrastructure and environmental - over the next 20 years. Section VIII indicates that substantial financial resources will be required to bring about the fundamental transformation of Barbados by 2025.

The National Strategic Plan will be updated to take into account the views of the private sector, labour and civil society and changes in the economic and social environment. The preparation of periodic sectoral strategic plans, at five-yearly intervals, will be undertaken to help shape revisions to the National Strategic Plan. The Ministry of Finance and Economic Affairs will work with Government Ministries, Departments and Statutory Bodies, the private sector, labour and civil society to prepare the detailed sectoral plans.

The Ministry will also be responsible for ensuring that the review, monitoring and implementation of the goals, national objectives, strategies and targets are effectively undertaken. The Ministry will therefore be strengthened by the creation of a special unit whose mandate will be to oversee the implementation of the National Strategic Plan.

The National Economic Council, with expanded membership, will provide the overall oversight and guidance. The formulation of the National Strategic Plan has benefited from the collective effort of the public sector, private sector, labour and civil society. In 2003, the Cabinet established a Working Group on Strategic Planning which fashioned the vision and identified the broad strategies for its realization. The vision and broad strategies were endorsed by the Cabinet in 2004.

Draft sectoral strategic plans prepared by the public sector were also instrumental in the preparation of the Plan. In addition, consultations within the framework of the Social Partnership were essential inputs into the formulation of the National Strategic Plan. Representatives of the private sector, labour and civil society reviewed the Plan in its draft form.

Appendix 3

Physical Development Plan (PDP) Amended [2003]

Since 1970 there has been a comprehensive land use policy, the Physical Development Plan (PDP), in Barbados. The first PDP was developed in 1970 with a ten year plan period that lasted until 1985 because the PDP became operational in 1976. Barbados is currently into its third revision of the national Physical Development Plan with the most recent document having been amended in 2003⁹ and approved by both houses of parliament in 2007.

The legal basis for the preparation of the PDP is the Town and Country Planning Act, Cap 240 which requires the preparation of Development Plans for the whole island or parts of the island.

The PDP is a broad administrative policy document that seeks to set out a settlement and land strategy for the island. It is intended to set out a settlement and land strategy for the island. It is intended to co-ordinate public and private development initiatives within a framework of sustainable development. The PDP seeks to create a direct link between national development and land resources by ensuring the allocation of adequate land to support economic development, social development and environmental conservation. This is achieved by allocating land space for all economic activities including agricultural, industrial, residential, commercial and recreational land uses.

The PDP is used to ensure the orderly, progressive and proper development of land in Barbados by reducing or preventing adverse conflicts between and among competing land uses. The PDP is used to achieve social, economic and environmental outcomes. The concept of sustainable development leads directly to several basic planning principles that serve as the foundation for the PDP embracing the following basic planning principles:

- emphasis on the protection of the natural environment and cultural heritage resources;
- establishment of criteria and procedures for Environmental Impact Assessments (EIA);
- a national development strategy which aims to minimize scattered urban development, by concentrating new growth into a defined urban corridor;
- protection of agricultural lands from incompatible urban development;
- promotion of a strong diversified economy through land use policies which encourage a wide variety of locations throughout the Island;
- promotion of the tourism industry by encouraging redevelopment and modernisation of older beach front properties, and providing opportunities for other visitor experience in the National Park.

The PDP [Amended 2003], contains a number of social development goals aimed at the addressing the following issues:

- Growth Management and Agricultural Preservation;
- Housing
- Social and Community Facilities
- Cultural Heritage

The PDP [Amended 2003], contains two main economic development goals:

- to promote further diversification and expansion of the national economy, while at the same time promoting the efficient use of land and the protection and conservation of significant natural and heritage features;
- to assist in the achievement of national economic development goals by ensuring that sufficient land is available to meet the needs of the various economic sectors.

The PDP [Amended 2003], contains three main environmental goals:

- to conserve and manage natural resources for valued ecological functions and to provide an improved

⁹ The second PDP was prepared in 1983 and adopted in 1998.

- quality of life for the residents and future generations of Barbados;
- to advance public awareness and appreciation of the essential linkages between the environment, quality of life and sustainable development;
- to limit the unnecessary and inefficient use of fossil fuels, by promoting environmentally friendly sustainable modes of transportation.

The PDP as a planning instrument is not governed by rigid zoning policies. The PDP is operated as a flexible guideline with a few exceptions where it is necessary in the interest of public health and safety to enforce strict guidelines¹⁰. In a perfect world scenario economic efficiency would expect that a scarce resource would be diverted to uses which result in maximum net benefits to the society. In Barbados the land use model may best be described as a hybrid where both market-driven and plan-led approaches co-exist.

The land space of Barbados has been divided into three main physical planning units:

1. The Urban Corridor where there is a presumption in favour of urban settlement development;
2. The Agricultural green belt where there is a presumption in favour of agricultural development interspersed with rural villages and hamlets;
3. The National Park area where the presumption is in favour of resource conservation, amenity and open space development.

The PDP [Amended 2003], contains specific strategies consistent with the overall objectives of the three broad planning units, *viz*:

1. New settlement growth is confined to the Urban Corridor. This will ensure the preservation of a predominantly urban landscape;
2. The Agricultural green belt is protected from incompatible urban development. In addition a minimum amount of agricultural lands have been designated for protection from conversion to non-agricultural use. This will ensure the preservation of a predominantly rural landscape ;
3. The designation and implementation of a National Park and Open Space system, including gullies. This will ensure the preservation of a predominantly open space and recreation area.

¹⁰ For example, there are strict planning zones to protect the ground water resources; and in controlling the use of lands surrounding the airport.