GOVERNMENT OF BARBADOS

National Report to
The United Nations Commission for
Sustainable Development (UNCSD)
Cycle 18/19 (2009/2010)

Chemicals, Mining, Transport, Waste Management
&
The Ten Year Framework of Programmes on Sustainable Consumption and Production Patterns

Environment Division

Ministry of the Environment, Water Resources and Drainage
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Contents

ACRONYMS

APTO	Association of Private Transport Operators
BADMC	Barbados Agricultural Development Management Corporation
BNSI	Barbados National Standards Institute
BSDP	Barbados Sustainable Development Policy
CFCs	Chlorofluorocarbons
CPD	Central Purchasing Department
CSD	Commission on Sustainable Development
CZMU	Coastal Zone Management Unit
EMA	Environmental Management Act
EPD	Environmental Protection Department
GEF	Global Environmental Facility
GHS	Globally Harmonised System of Labeling of Chemicals
GPS	Global Positioning System
HMRP	Hazardous Materials Response Plan
IDB	Inter American Development Bank
MARPOL	International Convention for Prevention of Pollution from Ships
MSDS	Material Safety Data Sheet
MTW	Ministry of Transport and Works
NACOSH	National Advisory Committee on Occupational Health and Safety
NCC	National Conservation Commission
NIP	National Implementation Plan
NOSCP	National Oil Spill contingency Plan
NSCTE	National sub-Committee on Trade and Environment
ODS	Ozone Depleting Substances
PCB	Pesticide Control Board
PIF	Project Identification Form
POPs	Persistent Organic Pollutants
PSV	Public Service Vehicles
RAMCID	Risk Analysis and Monitoring Committee on Industrial Development
SAICM	Strategic Approach to International Chemicals Management
SSA	Sanitation Services Authority
SWPU	Solid Waste Project Unit
TCDPO	Town and Country Development Planning Office
TOR	Terms of Reference
UNEP	United Nations Environment Programme
UWI	University of the West Indies

1.0 INTRODUCTION

The Commission on Sustainable Development (CSD), at its eleventh session, decided that its multi-year programme of work beyond 2003 would be organized on the basis of seven (7) two-year cycles, with each cycle focusing on selected thematic clusters of issues. The CSD encouraged countries to provide national reports, on a voluntary basis, in particular to the CSD's review sessions. Countries report once on the thematic issues during the two-year implementation cycle of the CSD.

The Government of Barbados has been consistently providing National Reports to the CSD since 1996, and has most recently submitted reports to the CSD for the second and third implementation cycles, i.e. cycle 14 and 15 (2005/2006) and cycle 16 and 17 (2007/2008).

National Reports which are submitted to the United Nations Commission on Sustainable Development (UNCSD) are regarded as key tools in allowing Governments to monitor the status of activities geared towards meeting their commitments under Agenda 21. They are of great value since they encourage Governments to:

- Reflect the overall progress in all three dimensions of sustainable development, focusing on the thematic cluster of issues for the cycle
- Flag examples of best practices
- Indicate material progress achieved in implementation,
- Document any actions taken or strategies employed
- Highlight lessons learnt
- Draw attention to relevant trends, constraints, challenges and emerging issues
- Incorporate where appropriate, the inclusion of indicators for monitoring sustainable development

This current report provides information for the fourth implementation cycle of the CSD, that is, for sessions 18 and 19 (2010/2011). This report focuses on the following thematic areas:

- **Chemicals,**
- **Mining,**
- **The Ten Year Framework of Programmes on Sustainable Consumption and Production Patterns,**
- **Transport**, and
- **Waste Management**

This report has been based on several information sources. These include documented materials, research and interviews with relevant agencies. Appendix A of the report provides a list of persons consulted and the agencies that they represent.

2.0 BACKGROUND

2.1 Country Background

Barbados is the most easterly of the islands in the Caribbean chain with a total land mass of 431km^2. The climate is classified as a moderate tropical maritime one which features distinct rainy (June – November) and dry seasons (December to May). The island experiences average temperatures which range between 20 and 32^{o}C and records indicate that average rainfall levels are approximately 1,254 mm per year.

Barbados is comprised mostly of limestone, as well as older clastic sedimentary rocks, sandstones, siltstones and clay. The absence of a solid limestone cap on the north eastern side of the island has resulted in what is commonly referred to as the Scotland District, which is an area that has been historically highly susceptible to soil erosion and land slippage. Outside of this area, the remainder of the island's limestone formation is covered by a very thin layer of surface-soil cover.

Barbados' population is estimated at 295,000 in 2008. Forty per cent (40%) of the population resides in urban areas. The population is 90% of African descent, 4% of European descent, and the remaining 6% of Asian or mixed descent. English is the official and first language of the country.

The country has a national health service and the general health profile and life expectancy of a developed country. The entire population has access to a potable water supply and adequate sanitation facilities.

Barbados has free primary, secondary and tertiary education, with eleven (11) years of compulsory education beginning from the age of four (4) years. The literacy rate is 97% among persons aged fifteen (15) to twenty-four (24) years.

2.2 Barbados National Sustainable Development Policy

The most visible and successful structure put in place for the co-ordination of national sustainable development is the Cabinet-appointed National Commission on Sustainable Development (NCSD). 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:

i. Advise Government on measures required to integrate environmental and economic considerations into the decision-making process and to global issues of sustainable development;

ii. Facilitate national level co-ordination mechanisms on sustainable development;

iii. Promote greater understanding and public awareness of cultural, social, economic and policy opportunities to attaining sustainable development in Barbados;

iv. 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:

i. Indicators of sustainable development,
ii. Implementation mechanism, assessing progress made and steps required to go forward,
iii. Science and technology, assessing research and development of alternative renewable energy sources,
iv. Natural resources,
v. Man-made resources and the built environment,
vi. Waste management and pollution control,
vii. Human resource development,
viii. 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 of the Environment, Water Resources and Drainage, the Government's policy-making arm for environment and sustainable development issues, facilitates the work of the NCSD by acting as the Secretariat. At present, the next three years of its lifespan of the NCSD is being charted. Its major task is projected to be educating members of the public and decision-makers alike on the Barbados Sustainable Development Policy and encouraging persons to inculcate the recommendations of the policy into their practices as applicable.

The Barbados Sustainable Development Policy (BSDP)

The BSDP was made a document 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 are:

i. to formulate a national definition of sustainable development;

ii. to provide a national framework for decision-making based on our principles of sustainable development;

iii. to promote principles of sustainable development and encourage all persons to adopt and apply these principles in every aspect of decision-making; and

iv. 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 policy recommendations supporting sustainable development but which are focused on specific sectors. These areas include:

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

3.0 CHEMICALS

3.1 Concrete Progress in Implementation

The Environmental Protection Department (EPD) (formerly the Environmental Engineering Division) was established in 1971. The EPD is a department under the Ministry of the Environment, Water Resources and Drainage. The EPD is the environmental monitoring and pollution control department of the Government of Barbados. The EPD is responsible for the monitoring and control of conditions likely to affect the quality of land, air and water and the general health and environmental well-being of the inhabitants of Barbados. Its functions are exercised throughout the entire island. The EPD's functions include the management and control of the use of chemicals which have the potential to affect human health and well being, and the environment.

3.1.1 Participation in International and Regional Initiatives

Barbados is signatory to the following international Conventions and Agreements which relate to the management of chemicals:

- The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal;
- The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade;
- The Vienna Convention for the Protection of the Ozone Layer;
- The Montreal Protocol on Substances that Deplete the Ozone Layer;
- The Stockholm Convention on Persistent Organic Pollutants;
- The Strategic Approach to International Chemicals Management (SAICM); and
- The International Convention for Prevention of Pollution from Ships (MARPOL).

In addition to meeting obligations under these various international agreements, the EPD has submitted a proposal to the Global Environmental Facility (GEF) for funding of a project geared at implementing the Globally Harmonised System of Classification and Labeling of Chemicals (GHS) locally.

3.1.2 Policy Measures to Phase out Chemicals that Pose Unreasonable and Unmanageable Risk to Human Health and Human Environment

Barbados has instituted a number of forward-looking policy measures geared at comprehensively phasing out a range of chemicals that pose significant risk to its populace.

A major initiative included under this comprehensive policy framework has been the preparation of the National Implementation Plan (NIP) for Persistent Organic Pollutants (POPs) listed under the Stockholm Convention.

Government is also implementing a refrigerant management programme to facilitate the phasing out of CFCs under the Montreal Protocol. It has also committed itself to designing,

developing and delivering related training which will be targeted at officers of the Customs Department and air conditioning and refrigerator technicians.

These measures are further being supported by a number of other regulatory instruments and the development of legislative instruments to assist in the phase out of Ozone Depleting Substances (ODS). Examples include the control of agrochemicals through the Pesticide Control Act, 1974 which is implemented by the Pesticides Control Board. The Regulations :Pesticide Control (Approval of Pesticides) Regulations 1974 and Pesticide Control (Labeling of Pesticides) Regulations 1976 provides for a register of banned, rejected or restricted pesticides which prohibits entry of these substances into the island.

These efforts, for example where the NIP is supported by pertinent legislation, and other systems, clearly indicate the targeted and coordinated actions that the Government of Barbados is utilizing to realize its goals to mitigate risks associated with chemicals.

3.1.3 Policies and Frameworks for Prevention of Accidents, Preparedness and Response

The Government has adopted a policy position of minimizing the risks posed by accidents involving chemicals through optimizing its level of preparedness and response. These goals have lead to the formulation of a strategy focused on limiting exposure to risks associated with oil spills and hazardous materials emergencies; there are currently two response plans within this strategy; the National Oil Spill Contingency Plan (NOSCP) and the Hazardous Materials Response Plan (HMRP).

The National Oil Spill Contingency Plan was approved in 2002 and delineates the national preparedness and response system, including both public and private resources, for oil spills on land or at sea. It is Government's intent that the NOSCP will act as a catalyst to facilitate the efforts of individual companies attempting to establish appropriate response plans themselves. Government is also encouraging companies to implement chemical assessment programs.

The National Oil Spill Contingency Plan is further reinforced by the implementation of the Hazardous Materials Response Plan. The latter plan outlines the responsibilities of responders and emergency personnel in the event of an incident. The HMRP is aimed at promoting the increased efficiency of the national response mechanism.

3.1.4 Policies Aimed at Reducing the Risks Posed by Lead, Mercury and Cadmium and Other Harmful Heavy Metals

Government's mandate to tackle the risks posed by lead, mercury and other heavy metals has been spearheaded by the Energy Division. While cognizant of the fact that at present there is no specific legislation prohibiting the sale and/or use of leaded gasoline in Barbados, the Energy Division has taken proactive steps to ensure some level of consumer protection is being afforded until the required legislative changes can be adopted. The Energy Division effectively tackled this issue in the short/medium term by successfully implementing a policy encouraging

the switch from the use of leaded to unleaded gasoline. This has been accomplished by working closely working with suppliers and retailers, while at the same time sensitizing the public and other stake-holders as to the benefits (both health and environmental) associated with this move.

In a similar manner, the EPD is currently implementing a similar project also associated with its policy of effectively mitigating the risks associated with the presence and use of heavy metals. This effort is focused on establishing a working inventory of facilities involved in the use of mercury on the island. This project will facilitate and build upon the EPD's ongoing efforts to monitor where and how mercury is used. This project will provide the EPD with the resources it needs to close the gap between its current position and the goals it has set regarding its ability to track and assess the risk posed by operations utilizing this heavy metal.

The outputs of the project will be used to design a policy framework that would focus on the identification of effective mechanisms regarding the control of these substances. It is anticipated that this process will be successfully replicated for other heavy metals which pose significant levels of risks.

3.1.5 Existing or Planned Mechanisms for Systematic Evaluation, Classification and Labelling of Chemicals

The Government of Barbados' determination to rationalize how it manages the risks associated with hazardous chemicals can be observed in the priority it has placed on the labeling of those materials. In addition to the existing policy framework, there are several articles of legislation in existence which address the issues and procedures associated with labeling of chemicals. Prominent examples of such legislation include the Pesticides Control Act and the Control of Standards Act. Providing this legislative support has been seen as a critical component in the regularization and promotion of the safe handling of chemicals.

In addition to the legislative support, Government has articulated the need to bolster its efforts regarding the systematic evaluation of chemicals. It is cognizant of the potential gains of having a formal chemical classification system. Government has recognized that as an interim measure, classifications systems for waste under the Basel Convention are being considered. In this regard, the EPD is developing a project based on the Globally Harmonized System (GHS) of labeling. Upon completion, this project will address classification of various chemicals.

Similar gains are also expected from the implementation of the **National Agriculture Health and Food Programme**. This program is funded under the Inter American Development Bank (IDB). It is expected to provide a mechanism for the systematic evaluation and classification of agriculturally related products. The project also includes the development of a system (inclusive of policy framework) which will seek to apply a life cycle approach to food safety. This system will;

- incorporate the inputs at farm level to the final consumer;

- investigate the establishment of the National Agricultural Health and Food Control Agency; and
- include the construction of a National Agricultural Health and Food Control laboratory.

The project commenced in July 2009 and is intended to enhance the competitiveness of agriculture and fisheries sectors in Barbados. It will also assess the extent of inter-agency collaboration process, including the Ministries of Health, Agriculture, and Consumer Affairs Department.

3.2 Lessons Learned and Best Practices

3.2.1 Strategies for Exposure Assessment and Environmental Monitoring

With respect to Barbados' treatment of chemicals, there is an on-going management of ground water resources. Government has established a systematic monitoring programme conducted under the purview of the EPD. Specifically, this monitoring regime has been established to investigate the impact of chemicals and other substances with the aim of early detection of any anomalies. High standards are applied to groundwater analysis, which is monitored for a range of chemical parameters, petroleum hydrocarbons, and pesticides. In addition, widescreen assessments of public supply wells are conducted twice annually.

The standards associated with marine water testing are also very stringent; marine water is analyzed for bacteriological parameters as well as Total Nitrogen and Total Phosphorus. The overall aim of the monitoring programme is to provide scientific information to improve decision making and protect the environment whilst building environmental monitoring capacity within the relevant agencies.

Plans are in place to establish an ambient air-quality monitoring programme. This initiative is a component of the Global Atmospheric Passive Sampling Network Project supported by the Government of Canada in association with the Government of Barbados. The first phase of this project which involved an air quality monitoring station has been completed successfully and the samplers have been returned for a second phase. Financial and human constraints associated with the Graphical Air and Atmospheric Pollution System (GAPS) have impacted the ability to do any work in the area of exposure assessment. It should be noted that Government had previously installed a sampler in Bridgetown, the capital city, however that installation has since been made redundant.

3.3 Actions Taken

3.3.1 Initiatives for Assessment of Toxic Chemicals, Hazard and Risk Assessment

Barbados has also been very diligent regarding its commitments to assessing the threats associated with chemicals, hazards and risks. A national survey of pest control operators and their businesses was conducted in 2006, with a report on the study completed in the following year. The recommendations are awaiting ratification by Cabinet, upon ratification the

recommendations will result in heightened regulation in the use of chemicals in the chemical sector.

There are also other initiatives which are making significant inroads into the challenge of toxic chemicals assessment. One such project which is currently being implemented is aimed to upgrade the plant at the Government Analytical Services Laboratory to test for POPs. Developing this capability would assist with the identification of chemical stockpiles and allow for their appropriate disposal.

Another useful scheme involves conducting an inventory on a variety of smaller POPs stockpiles which are located across the island. To date, the program is ongoing and has successfully identified and located many of these potentially hazardous sites. It is the intention that the project would provide the EPD with a baseline to establish a more detailed monitoring program.

In addition to the success achieved on these fronts, the Pesticides Control Board (PCB) will also implement a revised and more efficient monitoring system as well. This system will allow the PCB to assess proposals by companies for import of chemicals to be used in the industrial, manufacturing and agricultural sectors. The function of the Pesticides Control Board will be to assess these import requests and place them within a classification system based on their relative toxicity.

The Ministry of Labor and Immigration through the Labor Department is currently working on numerous regulations to support the Safety and Health at Work Act. Of special note is the proposed Regulations entitled the Maximum Permissible Limits of Certain Chemical Substances in Work Environment Regulations. The Act and regulations are designed to improve worker safety and reducing the exposure of workers to certain toxic chemicals through increased education, establishment of safety committees and restrictions on discharges into the work environment.

3.4 Relevant Trends, Constraints, Challenges and Emerging Issues

3.4.1 Information Exchange and Cooperation

While there is much evidence of the free flow of information and significant levels of cooperation between agencies and similar bodies, a number of strategies have been identified to improve the system's efficiency. One such strategy would be to augment the current system by developing a formal mechanism to facilitate information exchange and communication. At present communication is facilitated by a number of multi-agency organizations; these include Risk Analysis and Monitoring Committee on Industrial Development (RAMCID) and the National Advisory Committee on Occupational Safety and Health (NACOSH), both of which effectively cover risk assessments. This mechanism facilitates a situation promoting information exchange among the countries social partners; Government, the private sector, and trade unions.

4.0 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.

4.1 Progress in Implementation

4.1.1 Features of National Mining Codes or Mineral Industry Code

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.

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. The committee establishes the Terms of Reference (TOR) for the EIA and reviews the final output prior to submission to the Chief Town Planner (CTP). The latter has the responsibility to grant or deny the license.

4.1.2 Regulations and Mechanisms for Compliance and Monitoring

At present reports of illegal mining are reported to the TCDPO. The TCDPO typically consults with other relevant stakeholders, such as the Natural Resources Department, concerning such reported incidents. Following investigation by the relevant authorities, the TCDPO's Enforcement Division has the authority to issue a stop notice and close the quarry should such action be warranted.

The new regime of mining regulations that are currently being developed will feature mechanisms that address the issues of compliance and monitoring. The aim of the new regulations is to enhance and further support the current role of the NRD by empowering the Department to carry out the enforcement and apply penalties. . The current legislation governing quarries include the Health Services Act (1963) and the Quarries Act and associated Subsidiary legislation (1963). The Quarries Act is in the process of being revised.

4.2 Lessons Learned and Best Practices

4.2.1 Public/Stakeholder Consultation and Participation in Decision-making Related to Mining

This aspect of the EIA process allows for the participation of the public through provision of information on the project and the opportunity to voice their concerns on proposed development projects, including proposed mining activities.

4.2.2 Environmental Impact Assessment (EIA) and Monitoring of all Mining Operations

The EIA which must be submitted as part of the planning approval process must cover all phases of operation including remedial and rehabilitative planning after the site has been decommissioned. The Natural Resources Department conducts periodic site visits whilst the quarry is in operation in order to ensure that the resources are extracted in an orderly and systematic manner.

4.2.3 Risk Assessment of Mines and Mining Activities

Risk minimization is managed locally under each individual quarry's Health and Safety plans. The new legislation takes into account Health and Safety for example, requiring benching and avoidance of overhanging ledges to reduce the risk to employees. This legislation aims to be proactive as opposed to reactive with respect to Health and Safety concerns.

4.2.4 Mine Closure Planning

The process applied to closure of mines involves the Natural Resources Department requesting that the area in question is either fenced, or, has berms installed to prevent children and other members of the public accessing the decommissioned quarry. The Department also requests that access roads be terminated to prevent dumping, both during and after operations. The operator is required to indicate what will be done with the site once the quarry is closed. Common proposals regarding site closure include sporting activities or backfilling of the site to pre-quarrying levels using construction waste and other materials with intermittent compacting to allow for development. The ideal situation regarding this issue would be to develop a national rehabilitation plan for quarries to establish post closure uses for each site for both safety and visual reasons.

4.2.5 Rehabilitation of Affected Communities and Life Supporting Ecosystems

The NRD, while responsible for encouraging the sustainable exploitation of natural resources for the benefit of the country, is cognizant of the fact that mining activities will have significant impacts on ecosystems through the loss of agricultural land, rerouting of watercourses, and removal of topsoil among other things. As such the department aims to work in tandem with other agencies, such as the Environmental Protection Department to ensure the minimization of risks to ecosystems.

The NRD encourages operators to use methods such as wetting, tree cover, berms, and netting to reduce potential negative impacts of their operations on persons residing in close proximity to a particular quarry. Operators will also inform residents of blasting times and schedules. Some quarry operators have contributed to the maintenance of community centres, the provision of community parks, and provided support for community activities, such as sponsoring sports teams.

4.3 Actions Taken

4.3.1 Technological, Institutional and Social Initiatives for Protecting the Life and Health of Mining Workers

Some quarry operators monitor the health of workers by providing full physicals when they start and allowing additional testing when the workers request it. However smaller operators may not be in a position to offer this support.

Operators typically carry out regular safety drills and post warnings in various locations onsite. Some safety aspects are required to be addressed under the EIA and others will be stipulated by the new legislation. As part of inspections carried out by the Natural Resources Department, safety requirements are assessed, such as first aid kits, and ensuring that drills are regularly conducted and that hard hats and steel toe shoes are being worn.

4.4 Relevant Trends, Constraints, Challenges and Emerging Issues

4.4.1 Relevant Trends and Emerging Issues

As the Government of Barbados progresses with its development program, greater demands are placed on its infrastructure. This has resulted in increased road maintenance and expansion of existing highways. Hard crystalline limestone, such as that which is present in Barbados, is an excellent road metal material and an average of 140,000m^3 of material is quarried annually for road maintenance and construction alone.

In developing countries such as Barbados, the industrial minerals offer perhaps the only real scope for a locally owned and controlled mining industry. The benefits that can be derived from such an industry include creation of employment opportunities, development of associated infra-structural services and savings in foreign exchange. With the growth of the mining industry opportunities for export of finished products and /or raw materials would be possible.

4.4.2 Constraints and Challenges

The primary constraint for the Natural Resources Department (NRD) is that the 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. 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 recommendations that the NRD provides, address issues such as appropriate quarrying times and benchmarks. The anticipated legislative support would give the Department the leverage to effect more fundamental improvements. Given the important implications of the legislation the NRD has scheduled several sessions with relevant stakeholders to inform them about role the new legislation within its organizational strategy.

5.0 TRANSPORT

The Barbados Transport Board is a Government owned and funded public transport system. The Transport Board was established as a result of an Act of Parliament in 1955.

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. Within the context of these broader goals, however, the policy has identified specific recommendations that will place a special emphasis on improving the efficiency and reliability of the public transport system.

Specific policy recommendations which were identified within the Barbados Sustainable Development Strategy include:

4.1 The environmental hazards of all the constituents of a blended fuel should be fully documented. Appropriate measures should also be taken to address occupational health and safety of workers handling these fuels.

4.2 Development of a Clean Air Policy which will define strategies and/or options for reducing the release of polluting vehicle emissions into the atmosphere and including possibly a "flexitime" approach for the use of heavy vehicles in particular;

4.3 Development of safe minimum standards for atmospheric pollutants, especially those from vehicle emissions, which are appropriate to Barbadian circumstances while meeting internationally accepted standards. These standards could be informed in part by biological monitoring programmes to determine existing internal levels of pollutants and the variable distribution of these levels amongst members of the population;

4.4 Development of appropriate economic instruments/incentives, legislation and regulations towards ensuring the successful implementation of policy objectives and programmes developed to facilitate energy efficiency in the transport sector, and improved air quality in general;

4.5 Efficient and timely maintenance of heavy duty diesel vehicles especially those involved in public transport, cargo/load transport and construction;

4.6 Promoting energy efficiency in the transport sector including giving consideration to the feasibility of using electric cars as well as inter alia Liquid Petroleum Gas (LPG), Compressed Natural Gas (CNG) and hydrogen-powered vehicles and ensuring the provision of facilities for efficient ongoing maintenance of these vehicles;

4.7 The development, introduction and use of appropriate scientific technologies and practices with a view to improving the efficiency of the transport sector and its

sustainability, in particular with regards to maintaining a clean and safe environment;

4.8 Conducting of studies on mass transit options in high traffic areas;

4.9 Areas where hydrocarbons are stored can be classified as potential hazardous sites and should be taken into consideration when considering development activities.

The Transport Board has a fleet of approximately 304 buses, which include two buses with wheel-chair access for the disabled. The headquarters of the Transport Board is located at Roebuck Street in Bridgetown, the capital of Barbados. Additionally, the Transport Board operates three (3) bus terminals; these are located at Fairchild Street, Bridgetown, Princess Alice Highway, St. Michael and Speightstown, St. Peter. A central staging depot is located at Mangrove, St. Philip, and a sub-terminal at Oistins, Christ Church.

The Transport Board's management team consists of eight (8) senior managers and eight (8) middle managers including operational managers for each terminal and depot. The organization is now operating on ninety-eight (98) routes across the island. Buses run from as early as 6 a.m. and as late as 12 a.m.

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

5.1 Concrete Progress in Implementation

5.1.1 Progress on Transport 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.

5.1.2 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.

5.1.3 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.

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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.

5.1.4 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.

5.2 Lessons Learned and Best Practices

5.2.1 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 (IDB) 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 public service operators, 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.

5.3 Actions Taken

5.3.1 Road Construction and Changes in Anticipation of Climate Change Impacts

The Ministry is addressing climate change impacts by re-designing its road net-work 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 Highway (ABC) 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 vulnerability of the coastal highways being vulnerable 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 hence fewer vehicle emissions, thereby contributing to other climate change mitigation efforts.

5.4 Relevant Trends, Constraints, Challenges and Emerging Issues

5.4.1 Availability of Vehicles

Currently, the Barbados Transport Board has an inadequate number of buses in service to meet the demands of commuters, particularly during peak hours of the day.

6.0 WASTE MANAGEMENT

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 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
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 island 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 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.

6.1 Non-Hazardous Waste

6.1.1 Concrete Progress in Implementation

6.1.1.1 Recommendations of the BSD Policy

The BSDP makes the following recommendations with respect to the management of solid waste:

- *Continuing the development, implementation and execution of an appropriate, comprehensive and efficient solid waste management programme for Barbados, including elements such as the comprehensive public awareness and education programme developed and being implemented by the [Sewerage and] Solid Waste Project Unit.*

- *Continuing efforts towards introducing and adopting the various recommendations of the Integrated Solid Waste Management Plan.*

- *Encouraging the involvement of private sector enterprises and other stakeholders in sustainable waste management initiatives.*

- *Initiating appropriate mechanisms and procedures to support small scale, sustainable waste management practices, including recycling and backyard composting where possible, and re-education of farmers in the techniques of organic farming.*

- *Completion of the various projects for sewerage treatment and management.*

- *Continuing to implement programmes and activities which comply with and address Barbados' national obligations as Party to various international Environmental Agreements which seek to eliminate marine pollution from the disposal of ship-generated waste, including but not limited to the Convention on the Prevention of Marine Pollution from Ship Generated Waster (MARPOL).*

6.1.1.2 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% 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).

6.1.1.3 Financial Mechanisms for Waste Management Service Development in Deprived Areas

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, 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.

6.1.2 Lessons Learned and Best Practices

6.1.2.1 Development of Environmentally Sound Disposal Facilities, Including Technology to Convert Waste to Energy

The main landfill in use, the Mangrove Landfill, is an engineered landfill. The Government of Barbados has plans for the development of another environmentally sound facility which will be properly engineered, with stormwater and leachate collection systems. There will also be a leachate treatment plant with tertiary level standards.

The Mangrove landfill receives approximately 1000 tonnes of garbage daily. The tonnages for domestic waste have not increased significantly in recent years, but construction and demolition waste has done so 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.

There is a new waste management facility at Vaucluse, St. Thomas. It comprises a transfer station with a materials recovery facility, composting facility and 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. There is a significant amount of waste which is diverted-approximately 70%, and this includes construction and demolition waste, green waste, wood pallets and other recyclables including plastics, glass and metals.

The SSA also handles liquid waste, for example, blood and grease. These are managed at the Lonesome Hill disposal sites. Other non-sewage waste, such as effluent from the paint industry, is disposed of at the Mangrove.

6.1.2.2 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.

6.1.3 Actions Taken

6.1.3.1 The Integrated Solid Waste Management Programme

The SWPU implements the Integrated Solid Waste Management Programme (ISWMP) which focuses on waste minimization and the 3Rs, Reduce, Reuse and Recycle. More recently the Government of Barbados has been looking at the feasibility the recovery of energy from waste which introduces the fourth R, Recover.

6.1.4 Relevant Trends, Constraints, Challenges and Emerging Issues

6.1.4.1 Need for an Alternative to the Mangrove Landfill

The Government of Barbados is 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.

6.1.4.2 New Developments

The SSA attempts to work closely with the appropriate government agencies to facilitate the location of stationary waste management equipment, for example stationary compactors, to manage shop generated waste in the central business district.

6.1.4.3 Financial Support of the Sanitation Services Authority

Financial support comes from the consolidated fund to facilitate operations at the SSA for purchasing equipment and materials like compactor trucks and for the, management of disposal facilities and administration.

6.1.4.4 Handling of Meat Processing Waste

In an effort to reduce the quantity of offal being disposed to landfill, the SSA is currently working with a private sector entity to make greater use of the local rendering facility to manage the offal. The types of offal that are accepted are currently limited to that of chicken and fish. It is recycled to produce a beneficial protein meal as animal feed. In the event that the offal is not fresh, it cannot be rendered and so the producers of the offal are asked to treat it with lime to reduce odors and transport it to the landfill.

6.2 Hazardous Waste

6.2.1 Concrete Progress in Implementation

6.2.1.1 Recommendations of the National Sustainable Development Policy

The BSD Policy makes the following recommendations with respect to hazardous wastes:

- *Development of a comprehensive policy to guide the management of hazardous materials including chemicals for agriculture and manufacturing, as well as wastes.*

- *Including in the policy, mechanisms and procedures for the importation, handling, transport, storage and disposal of hazardous wastes in accordance with Barbados' obligations as party to the Basel Convention.*

- *Development of appropriate legislative measures to support the implementation of policy recommendations.*

- *Investigating incidents of groundwater contamination by the disposal and/or accidental release of liquid and solid hazardous substances, with a view to devising mitigative measures to minimize future incidents of pollution.*

6.2.1.2 Policy Measures for the Prevention and Minimization of Hazardous Wastes

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 expressed a need for a holistic framework for chemicals and other hazardous wastes. The National Implementation Plan (NIP) for the Stockholm Convention exists and was endorsed by Cabinet in 2007. The NIP contains a number of activities that would address chemicals management, but it is focused on POPs. The EPD is currently assessing the status of action items under the NIP.

The EPD is also looking for project opportunities to further their work in chemicals management and have supported a draft Project Identification Form (PIF) to the United Nations Environment Programme (UNEP) for "Implementing NIPS and Chemicals Management for Small Island Developing States (SIDS)".

6.2.1.3 Notification Systems and Registries of Exposed Populations

There is a National Oil Spill Contingency Plan and a Hazardous Materials Response Plan which were developed with the involvement of the relevant stakeholders. These would deal with the notification on procedures. The oil spill plan was approved in 2002 and is being reviewed with stakeholder input. As part of the review, appendices regarding disposal, sensitivity mapping, dispersants policy among other things will be added. It is anticipated that a revised plan will be sent to Cabinet with revisions based on a simulation exercise that was recently completed.

There was also a notification exercise for the oil spill plan in 2008, and a full exercise will be executed in the short-term.

There is currently no registry of exposed populations since there have been no health matters as a result of incidents, requiring follow-up procedures.

6.2.2 Lessons Learned and Best Practices

6.2.2.1 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. Recommendations are made for companies to improve their environmental performance.

6.2.2.2 Initiatives to Treat, Recycle, Reuse and Dispose of Wastes at the Source of Generation and Regulatory Mechanisms

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.

As mentioned previously, persons who have hazardous materials to be disposed can contact the EPD to get advice on the best way to proceed. Where the item can be neutralized, the EPD will provide the necessary information to the waste generator. Though it is the responsibility of the generator to identify a shipper with the necessary capabilities, the EPD will undertake background checks to ensure that the proposed shipper will be able to meet the requirements of the Basel convention. The EPD also makes checks to ensure that the country where the waste will be disposed is signatory to Basel convention. Typically, chemicals from Barbados are shipped to Canada. The paperwork for shipping between the EPD and Environment Canada has to be facilitated for the waste generator.

The EPD has responsibility for reporting the number of shipments to the Basel Secretariat. A major challenge in this 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. Particularly, in the case of gaseous emissions, sufficient technical capacity to monitor and collect the relevant information for POPs is currently lacking.

6.2.2.3 Procedures for Environmental Impact Assessment

In Barbados, and application to undertake a development must be submitted to the TCDPO, which is the development control authority. Depending on the nature of the development, the

TCDPO may request the developer to submit and EIA. Review of the EIA documents is undertaken by a panel of relevant Government agencies, which includes the EPD. Concerns of the agencies with respect to the potential impacts of a development, and recommendations with respect to impact mitigation and environmental monitoring will be submitted to the TCDPO. The Chief Town Planner will make a decision on whether the development should be granted approval, taking the recommendations of the EIA Review Panel into consideration.

The Health Services (Building) Regulations, 1969 require persons wishing to construct, extend, alter or change the use of a building to obtain the permission of the Minister of Health via the Director of the Environmental Protection Department. This legal requirement is independent of that requiring permission from the TCDPO.

If an application is submitted to the Town and Country Development Planning Office a separate application to the Environmental Protection Department is not necessary since that Office is required by Regulation 3 of the Health Services (Building) Regulations, 1969 to submit copies of building development applications to the Environmental Protection Department.

In the case of proposals that do not require approval from Town and Country Development Planning Office such as internal renovations or alterations to approved structures, an application must be submitted directly to the Environmental Protection Department.

6.2.2.4 Asbestos

The current policy for the regulation of asbestos requires the participation of the EPD in the removal and disposal activities. Inspectors will visit the site, give advice and generally work with accredited contractors who have been trained in asbestos removal. The EPD held a workshop in 2008 to certify qualified contractors. The EPD's proactive involvement at this level is consistent with the policy and guidelines on asbestos management which have been approved by the Cabinet of Barbados.

6.2.2.5 Radioactive Materials

The EPD is currently working on establishing a database to increase their efficiency in monitoring radioactive materials. Following a cabinet decision, EPD was given the responsibility of assessing and approving applications to import radioactive materials, while the Consumer Affairs Department issues the requisite import licenses. The database system will support these processes; it will be designed to capture logistical information on radioactive imports/ exports; as well as provide additional information on responsible companies and businesses. This project will also include an evaluation and review of the approval forms systems associated with this process

6.2.3 Actions Taken

6.2.3.1 Inventories of Hazardous Waste Production, their Treatment/Disposal, and Contaminated Sites

The National Profile of Chemicals Management has indicated that there are inadequate or absent inventories of the chemicals stored by individual companies. This is both a constraint and a challenge for the EPD in quantifying what is stored, where and how, and ultimately leads to problems with identifying the waste chemical and how to deal with it.

6.2.3.2 Phase-out of Toxic, Persistent and Bio-Accumulative Waste

The POPs project under the Stockholm Convention undertook inventories of the various sub-groupings of POPs and developed a National Implementation Plan (NIP) for managing POPs in Barbados. The NIP was approved and contains the various steps needed to reduce emissions. A review of the NIP is underway to see whether each agency responsible for the specific activities in the plan has made any progress in implementing those activities.

6.2.4 Relevant Trends, Constraints, Challenges and Emerging Issues

6.2.4.1 Policy Measures for the Prevention and Minimization of Hazardous 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.

6.2.4.2 Prevention and Minimization and Environmentally Sound Management of Hazardous Wastes

The recommendations of the BSDP pertaining to waste management address the issues of solid and liquid waste, as well as air emissions. In general, it is recommended that waste generation, emission, disposal and management standards which are appropriate in the Barbadian context, be developed as part of comprehensive environmental quality guidelines to be completed by all individuals, sectors and industries as appropriate.

6.2.4.3 Establishment of Combined Treatment/Disposal Facilities for Hazardous Wastes in Small and Medium-sized Industries

Disposal of hazardous wastes is still a difficult issue because there are no facilities readily available for handling them. The transfer station located at Vaucluse in the parish of St. Thomas does have facilities for the storage of hazardous waste, but this service is not yet operational. Once this situation is remedied in the short to medium term, the Vaucluse facility will be able to accommodate hazardous wastes.

7.0 THE TEN YEAR FRAMEWORK OF PROGRAMMES ON SUSTAINABLE CONSUMPTION AND PRODUCTION (SCP) PATTERNS

7.1 Overview: The Green Economy

The greening of economies has been promoted by United Nations as one of the major goals of the Marrakech Process[1] – a global process established in 2003 to support the elaboration of a 10-Year Framework of Programs (10YFP) on sustainable consumption and production, as called for by the 2002 World Summit on Sustainable Development's Johannesburg Plan of Implementation. Specifically, articulated at the Chapter 3 of the JPOI, governments agreed to:

> *"Encourage and promote the development of a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems by addressing and, where appropriate, delinking economic growth and environmental degradation through improving efficiency and sustainability in the use of resources and production processes and reducing resource degradation, pollution and waste."*

The application and pursuit of the Green Economy in Barbados is rooted in the country's pursuit of sustainable development which has been defined in the Barbados Sustainable Development Policy. And underpinning that thrust are 5 core principles. There are:

- Quality of Life
- Conservation of Resources
- Economic Efficiency
- Equity
- Participation

Inherent in the concept of greening is thrust towards greater resource efficiency, reduction of waste and the expansion of multiuse and reuse where economically and environmentally viable. Examples of Green Initiatives are presented in **Table 1**.

Barbados has moved to further consolidate its Green Economic priorities within National Strategic Plan 2006-2025. Furthermore, the Prime Minister and Minister of Finance in his 2009 Budget has outlined his vision of making Barbados the most environmentally and advanced green country in Latin America and the Caribbean.

[1] The goals of the Marrakech Process, a United Nations Environmental Programme and United Nations Department of Economic and Social Affairs coordinated initiative, are:

1. to assist **countries** in their efforts to green their economies
2. to help **corporations** develop greener business models
3. to encourage **consumers** to adopt more sustainable lifestyles.

TABLE 1 EXAMPLES OF ONGOING "GREENING" INITIATIVES IN BARBADOS

Policy/Programmes	Current Responsibility
1. Beautify Barbados Programme	Beautify Barbados Project- Natural Heritage Department
2. Business and Environment- Barbados Sustainable Finance Group	Environment Unit and The Barbados Banking Association
3. Climate Change Knowledge Survey- Initial Survey	Environmental Unit
4. Climate Change-Articulating a National Policy	Environmental Unit and CEES Inc
5. Eco-Friendly Living –Demonstration Solar House	Energy Division
6. Study Eco-Labelling: Role and Future Use	National Sub-Committee on Trade and Environment
7. Energy Policy	Energy and Environment
8. Study on Environmental Preferable Products	National Sub-Committee on Trade and Environment
9. Green Economy – "Environmental Sustainability"- 3 Year Medium Term Plan (2006-2008)	Economic Affairs-Research and Planning Unit and Environment Division
10. Green Economy – "Strengthening the Physical Infrastructure and Preserving the Environment"- The National Strategic Plan 2006-2025– Goal 4 Articulation	Economic Affairs-Research and Planning Unit and the Environment Division
11. Greening Household Energy Audit Programme	Energy Division
12. Greening Of Government- Articulating A Policy	Greening Government Project Sub-Committee and Ecoisle
13. Household Environmental Audit Pilot Programme	Environment Division
14. Independent Review of the Implementation of the Barbados Sustainable Development Policy and the Design of Indicators to monitor the further implementation	Environmental Unit and Chairman of the National Commission on Sustainable Development
15. Instituting a Public Conservation Programme	Minster of Civil Service and Energy Division
16. Instituting a Refrigerant Management Plan	Environmental Unit/ Environmental Protection Department and
17. Integrated Chemicals Management	Environmental Protection Department
18. Minister of Environment Awards	Ministry of Environment
19. Production/Consumption and Environment- Community Based Research Initiative	Environment Division
20. Second National Communication Programme	Environmental Unit and National Climate Change Committee

7.2 Concrete Actions Taken and Specific Progress Made In Implementation

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.

- **The Barbados Sustainable Development Policy**

Ratified by the Parliament in 2004, the Barbados Sustainable Development Policy (BSDP) 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
- 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 Indictors, 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.

A summary of the National Strategic Plan can be seen at **Appendix B**

- **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:

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

ii) Establishment of natural carrying capacity limits for planning purposes via the establishment of an integrated environmental information system;

iii) Adopting green procurement procedures;

iv) Promotion of Sustainable Transportation;

v) Promotion of green approaches within the design and construction fraternities and establishment of green business centres;

vi) 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. Assist in developing national policies and programmes on trade and environment issues; and
4. 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)

7.3 Emerging Issues- Assessments, Programmes, Partnerships and Sub-Regional Actions for the 10-FYP

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:

1. To 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. An indication of where measures can be taken to improve consumption and production patterns e.g. *inter alia* application of regulations and incentives, investment incentives, emissions regulations and standards, cleaner production, pollution prevention and resource efficiency;
5. In accordance with the information obtained, provide a list of possible demonstration projects on the issue of sustainable consumption and production.

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.

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

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 "De Heart uh Barbados ®" (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.

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

The LAC Council of Experts, Implementation of the Caribbean Sub-region Action Plan and Indicators for SCP: As a result of its ongoing programming to implement sustainable consumption and production at the national and regional level the Government of Barbados (GOB) via the Ministry of Environment, Water Resources and Drainage has been recently nominated to the Executive Committee of Latin and America (LAC) Council of Experts on SCP. It is proposed that the Executive Committee represent the four sub-regions of LAC in advancing the Regional Action Plan over the biennium.

As an active advocate for cohesive environmental governance at the United Nations level, the GOB has also been in discussion with United Nations Department of Economic and Social Affairs (UNDESA) to establish concrete synergies between the Indicators of Sustainable Development process and the SCP process which will require the use of indicators to measure the success of targeted interventions. SCP Indicators featured at the September 2009 GOB-UNDESA Experts Meeting on Sustainable Development Indicators, held in Bridgetown, Barbados, September 17th -19th 2009.

Priority Areas related to SCP in Barbados are provided in the following Table 2. An analysis of policy instruments is presented at Table 3.

7.4 Constraints and Challenges

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 LAC 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
- The need to widen the economic space within the Caribbean

TABLE 2 PRIORITY AREAS RELATED TO SUSTAINABLE CONSUMPTION AND PRODUCTION.

SECTORS AND ISSUES	Current Government Priority	Expected Future Priority
Solid waste management	HIGH	HIGH
- Waste disposal	HIGH	HIGH
- Reuse and recycling	HIGH	HIGH
- Waste reduction,	HIGH	HIGH
- Others		
Transport		
- Clean fuels and vehicles	MEDIUM	MEDIUM
- Public and alternative transportation	HIGH	HIGH
- Urban and regional transportation planning	HIGH	HIGH
- Others		
Cleaner production		
- Resource efficiency	MEDIUM	MEDIUM
- Pollution prevention	HIGH	HIGH
- Technology strategies	MEDIUM	MEDIUM
- Others		
Energy efficiency and renewable energy		
- Industrial energy efficiency	HIGH	HIGH
- Household energy efficiency	HIGH	HIGH
- Renewable energy markets	MEDIUM	MEDIUM
- Others		
Housing and construction		
- Energy efficiency	HIGH	HIGH
- Building materials	MEDIUM	HIGH
- Construction standards	HIGH	HIGH
-Building operations	MEDIUM	HIGH
- Others		
Food and clothing		
- Organic products	MEDIUM	HIGH
Chemical management	HIGH	HIGH
Hazardous waste	HIGH	HIGH

TABLE 3 SCP POLICY INSTRUMENTS AND ASSOCIATED PRIORITY

B. POLICY INSTRUMENTS	CURRENT GOVERNMENT ACTIVITIES	EXPECTED FUTURE PRIORITIES
General policy instruments		
- Taxes, subsidies	REGULATED BY INTERNATIOAL TRADING REGIME	
- Preferential tariffs and trade policies	REGULATED BY INTERNATIOAL TRADING REGIME	
- Economic instruments	HIGH	HIGH
- Tax reform	HIGH	HIGH
- Consumer protection policies	HIGH	HIGH
- Polluter-pays principle	MEDIUM	HIGH
- Integrated product policies	MEDIUM	HIGH
Changing consumer behaviour		
- Education and public information	HIGH	HIGH
- Consumer information	HIGH	HIGH
- Labeling, eco-labels	MEDIUM	MEDIUM
- Consumer organizations	HIGH	HIGH
- Public procurement policies	HIGH	HIGH
- Others		
Changing production patterns		
- Regulation of emissions and effluents	HIGH	HIGH
- Charges or incentives for cleaner production	HIGH	HIGH
- Product standards (e.g. energy efficiency)	HIGH	HIGH
- Cleaner production programmes	HIGH	HIGH
(R&D, training, technical assistance)	HIGH	HIGH
- Pollutant reporting and registers	HIGH	HIGH
- Strategic industrial and technology planning	HIGH	HIGH
- Investment incentives	HIGH	HIGH
- Voluntary initiatives and codes of conduct	HIGH	HIGH
- Corporate social/environmental responsibility	HIGH	HIGH
- Improved management accounting	HIGH	HIGH
- Investment analysis	HIGH	HIGH
- Others		
Analytical tools		
- Life-cycle analysis	MEDIUM	HIGH
- Indicators of sustainability	HIGH	HIGH
- Technology impact assessment	MEDIUM	HIGH
- Policy impact assessment	MEDIUM	HIGH
- Impacts of globalization and urbanization	HIGH	HIGH
-Impacts of changes in international markets	HIGH	HIGH
-Others		

8.0 COMMON ISSUES

8.1 Education, Training, Awareness-Raising and Capacity Building

8.1.1 Chemicals

Given the frequency with which they occur some areas have been flagged as common issues. One such area which has been identified is education and capacity building. From its experiences, in working with the POPs and SAICM projects, the EPD has identified a need for greater awareness, training of regulators, education of workers and the public. With respect to the general public some educational activities on POPs has been undertaken, this work will also be reinforced by a collaborative project between the Ministry of Agriculture and EPD to supply public notices and information on this issue.

A capacity assessment conducted under the SAICM project identified specific areas of chemicals management which will need to be strengthened, a workshop is being planned which will further define priorities for action.

Other relevant initiatives include a Laboratory enhancement capacity project which will improve the ability to test for POPs in blood, breast milk, and air.

In terms of its own efforts regarding the training of regulators and the public, the EPD advises on the handling, storage and disposal of chemicals.

8.1.2 Mining

The Natural Resources Department works with the Earth Science Programme at the UWI to stimulate more interest in geology and other mining sectors. Representatives of the Department also attend career days at secondary schools to talk to students about what their job entails. Generally good feedback has been received from the students. There are possibly fewer than twenty (20) persons trained and fewer than five (5) working in geological related fields in the country.

8.1.3 Transport

The Transport Board established a website a few years ago, which details bus routes to help commuters to plan their trips. The Transport Board also produces newsletters which provide relevant information to the general public. Additionally, the Transport Board has access to the Government Information Service (GIS) for dissemination of information about services.

8.1.4 Waste

As part of the Integrated Solid Waste Programme, the SWPU has an educational component aimed at promoting an increased awareness of proper solid waste practices. This programme utilizes a combination of both formal and informal activities e.g. town hall meetings, media programmes, literature and website promotion, work-shops, and educational expos. Examples of success that could be held up would include the recycling programs at schools, churches, and

communities; and ongoing efforts to engage and work with NGOs and the business community. In addition, there are institutional strengthening programmes which facilitates training opportunities for Government Agencies dealing with solid waste management

The EPD prepares newsletters twice a year, display brochures and posters, and have the capacity to run advertisements on television or in newspapers through the Government Information Service (GIS). There has been some discussion with the Ministry of Agriculture and GIS on running a series of notices on banned agricultural chemicals. If requested the EPD will also do school visits, but most of their educational activities are based on the role of EPD and water. They would be more likely to handle questions at Town Hall meetings or other similar *fora* or via working directly with the separate industries.

8.2 National Legal Frameworks

8.2.1 Chemicals

As mentioned above the system is very fragmented and this is demonstrated in the long list of legal frameworks that cover different aspects of chemicals management. The main pieces of legislation are the Pesticides Control Act (1974), the Services (Control of Drugs) Regulations (1970) and the Marine Pollution Control Act (1998).

8.2.2 Mining

Quarrying takes place under the Quarries Act (1963) Cap. 353. The Energy Division is currently in the process of creating new legislation and it is presently with the Solicitor General or Attorney General to work out the legality of the draft. The legislation outlines the criteria for registration and licensing of quarries.

8.2.3 Transport

Relevant legislation in place includes the Transport Authority Act, the Transport Board Act, and the Road Traffic Act.

8.2.4 Waste

The SSA operates under the Sanitation Service Authority Act and the Health Services Act (1963).

8.3 Institutional Capacity Building

8.3.1 Chemicals

In terms of institutional capacity EPD is in need of both human resources and technical capacity to better manage chemicals in Barbados. At present it is considered a priority to get staff to undertake some training on hazardous waste, in the event of a chemical incident/ accident, they EPD is expected to play a primary role with respect to disaster management. In addition to staff, another crucial area for consideration is increased use of technology. While the EPD is improving, with respect to the hardware, there is a need for the upgrade of software to include specialist programmes on modeling, GIS, and statistics.

8.3.2 Mining

The lack of suitably qualified persons is a constraint for the Natural Resources Department. Currently the Department comprises the Director and two (2) trained geologists. The Director facilitates training for the staff. The new offshore sector should also create more opportunities.

8.3.3 Transport

The Transport Board has a new computer system with a 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. The Transport Board also has plans to develop an in-house training system on customer service.

8.3.4 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.

8.4 Cooperative Frameworks and Partnerships

8.4.1 Chemicals

The National Profile is a cooperative effort from all stakeholders. The EPD is seeking to develop a Memorandum of Understanding (MOU) with the University of the West Indies (UWI) for local research. The National Chemicals Convention Committee is comprised of chemical management stakeholders and is involved in all chemicals related projects and instrumental in the development of the NIP, the chemicals profile and the work coming out of the POPs and SIACM projects. They will also be integral to the GHS project if approved

8.4.2 Mining

The Natural Resources Department collaborates with a number of agencies, such as the BWA, EPD, CZMU, TCDPO, and Ministry of Agriculture, as well as with oil and mining companies. The Department is also represented a number of national committees, such as the Fiscal Planning group of the Ministry of Finance, Investment and Energy which is responsible for assessing trends on gas prices. The Department has created a centralized database- the National Energy Information System which is a partnership between government and the energy stakeholders. It will house all energy information including mining on the national network. The database will be accessible to stakeholders with levels of clearance for different users.

8.4.3 Waste

The waste Management Facility at Vaucluse, St Thomas, is a private public partnership (PPP) between the Government of Barbados and Sustainable Barbados Recycling Centre (SBRC) Inc. It comprises a transfer station where all wastes will be taken to be sorted and processed. All recyclables are redirected away from the landfill to more sustainable avenues.

8.5 Technology Development, Transfer and Dissemination

8.5.1 Chemicals

Within their respective sectors, companies undertake technology development, transfer and dissemination on an individual basis as commonly seen with many competitive situations and markets, the individual strategies and approaches that companies employ in their efforts to comply with regulatory requirements and laws vary tremendously. In Barbados, companies are seeking to become ISO 14001 certified, as this process does lead to improvements in environmental performance, which are generally consistent with domestic environmental requirements

8.5.2 Mining

The training that the staff of the Department receives exposes them to new technology. The Department has recently acquired a Ground Penetrating Radar to allow them to search and map the Brittons Hill area, where there was a collapsed cave resulting in the loss of life. The staff has also had some experience on scientific and seismic vessels to familiarized themselves with their operations. The Department acquires equipment where necessary.

8.5.3 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.

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.

Researchers from the University of the West Indies (UWI) are investigating electronic tracking by planting devices on telephone poles.

8.5.4 Waste

Composting workshops are held by the SWPU where individuals attending may learn solutions to particular problems that they are experiencing with their composting.

REFERENCES

Barbados Country Profile – World Summit on Sustainable Development, Feb 2002

Barbados Economic and Social Report 2007

Barbados National Report to the World Summit on Sustainable Development, June 2001

Barbados Sustainable Development Policy

Medium Term Strategic Framework of Barbados 2007- 2009, Nov. 2007

National Strategic Plan 2006 – 2025

The Financial Statement and Budgetary Proposals of 2008

The National Profile on Chemicals Management for Barbados, 2009

The Speech from the Throne, Feb. 2008

APPENDIX A: Contributing Officers and Agencies

Agency Name	Contributor	Position
Environmental Protection Department	Mr. Anthony Headley	Deputy Director
	Ms. Ingrid Lavine	Senior Environmental Technical Officer
	Mr. Philip Pile	Environmental Technical Officer
	Mr. Mark Welch	Senior Environmental Protection Officer
Environmental Unit	Mr. Travis Sinckler	Senior Environmental Officer
	Ms. Amrikha Singh	Environmental Officer
	Mr. Allan Franklin	Research Officer (ag.)
	Mr. Sean Sealy	Research Officer
Ministry of Transport and Works	Mr. Lionel Nurse,	Permanent Secretary
	Mr. Frank Thornhill	Chief Technical Officer
	Mr. Jonlyn Harewood	Chief Planning Officer
	Mr. Trevor Clement	Director of Transport Authority
	Mr. Desmond Sabir	Operations Manager, Transport Board
Natural Resources Department	Ms. Nesha Nurse	Petroleum Officer
	Mr. Jamar White	Petroleum Officer
Sanitation Service Authority	Ms. Leona Deane	Engineer
	Ms. Dianne Dennis	Technical Officer
Solid Waste Project Unit	Mrs. Thora Lorde	Waste Management Coordinator
	Mr. Neil Gilkes	Technical Officer

APPENDIX B: 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.

PART II: Updated Information on National Focal Point for Sustainable Development

Name(s) of National Focal Point: Mr. Lionel Weekes

Title(s): Permanent Secretary

Ministry/Office: Ministry of the Environment, Water Resources and Drainage (Environment Division), Government of Barbados.

Key functions in relation to national reporting:

The Environment Division acts as the focal agency for collecting, disseminating and reporting on issues pertaining to sustainable development both locally and internationally. With respect to reporting to CSD, required information is collected and/or generated by several different sectors and the Ministry acts as a repository for information, collating in the prescribed United Nations Department of Economic and Social Affairs (UNDESA) format, obtaining the necessary approvals by senior officials and submitting in report format to UNDESA.

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First Floor
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PART III: Draft Profile on National Sustainable Development Strategies and Indicators for Sustainable Development

a. Strategy Title: The Barbados Sustainable Development Policy (BSDP)

Strategy website: http://www.un.org/esa/sustdev/natlinfo/nsds.

Coordinating Body: The National Commission on Sustainable Development (NCSD**)**

Coordinating Body website: The website which will be included in the website of the Environment Division is currently being developed**.**

Strategy Status: The BSDP is being implemented

Date of Adoption: In 2002, the Barbados Sustainable Development Policy was finalized by the National Commission on Sustainable Development (NCSD) and the Environment Division. It was approved by Cabinet in 2003 and was laid in Parliament in January 2004.

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Strategy contact:
The Permanent Secretary (Environment)
Ministry of the Environment, Water Resources and Drainage
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Hincks Street
Bridgetown, BB11144
Barbados
Tel: 246-467-5700
Fax: 246-437-8859
E-mail: becklesp@gob.bb

Additional Information: The Environment Division will soon commence an assessment of success of implementation of the Barbados Sustainable Development Policy. Conservative estimations indicate that over 80% implementation has been achieved.

b. Information on Indicators for sustainable development

Name of indicator set: National Indicators of Sustainable Development.

Indicators website: The website which will be included in the website of the Environment Division of the Ministry of the Environment, Water Resources and Drainage is currently being developed**.**

Date of last update: 2000

Indicators contact:

The Permanent Secretary (Environment)
Ministry of the Environment, Water Resources and Drainage
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Additional Information:

Following the announcement by the Minister of Finance of Green Economy Fiscal and Economic Proposals in 2007, with a call for the establishment of a task force to develop targets and indicators of Green Economics and Sustainable Development and building upon the national initiatives already in existence, a Technical Working Group (TWG) was assembled to articulate an initial list of indicators of the Green Economy. This initial list has been prepared and is currently under review.