

# THE BARBADOS SUSTAINABLE DEVELOPMENT POLICY

Doing the right things by doing things right!



National Commission on Sustainable Development  
Government of Barbados

NATIONAL COMMISSION ON SUSTAINABLE DEVELOPMENT

**THE BARBADOS  
SUSTAINABLE DEVELOPMENT  
POLICY**

*“Doing the right things by doing things right”*

January 2004



## National Sustainable Development Policy for Barbados

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*This policy is dedicated to  
the memory of Professor The Honourable Oliver Headley,  
Chairman of the National Commission on Sustainable Development  
who passed away during its final preparations.*

# Acknowledgements

Several persons and organisations from the private and public sectors and civil society have contributed to the preparation of the National Sustainable Development Policy. These persons have offered their assistance by participating in various consultations; providing useful information and comments; and giving their time and encouragement.

The Ministry of Housing, Lands and Environment recognises the effort and commitment of all these individuals and is grateful. Special mention however must be made of the outstanding leadership given by the late Professor the Honourable Oliver Headley who up until his untimely death guided the process up to the preparation of the final draft.

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# Foreword



**By the Honourable H. Elizabeth Thompson  
Minister  
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Sustainable Development has been on the international agenda for the last decade of the twentieth century. The Government of Barbados has participated in many of the various international discussions on this subject and agrees to the implementation and operationalisation of the principles of Sustainable Development at the national level. In particular, as hosts of the 1994 global Conference on Sustainable Development for Small Island Developing States (SIDS), Barbados is oftentimes perceived as the *de facto* guardians of the Barbados Programme of Action which is the main outcome of that meeting.

In direct response to this challenge, the Government of Barbados in 1997 appointed a multi-disciplinary National Commission on Sustainable Development (NCSD) which included members from government and civil society . The mandate of the NCSD included the formulation of a National Sustainable Development (NSD) Policy. The main purpose of this policy is to provide a definition for Barbados of Sustainable Development to guide all levels of national decision-making.

The NSD Policy calls for a change in attitude, behaviour and values by all persons, corporations and decision-makers. The lynch-pin of this policy is that the primary development objective in Barbados ought to be the optimization of quality of life for present and future generations, while ensuring that economic growth and development is not achieved at the expense of our ecological capital. In this regard, the Government, in partnership with civil society, is committed to providing the appropriate framework to facilitate the attainment of this goal.

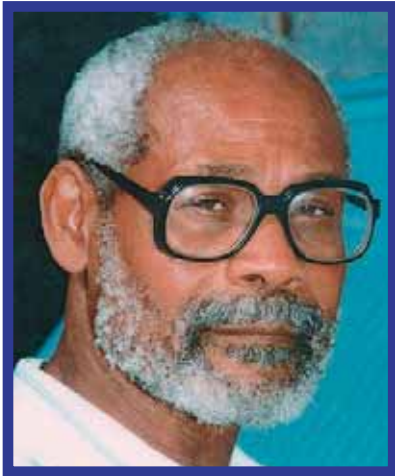
Every industry, business sector of society and individual needs to play a role in protecting our national patrimony. This policy document is aimed at ensuring that sustainable development considerations infuse all our planning and decision making processes and becomes part of the culture and ethic of how we live as people. I recommend it to you.

Our vision therefore calls for a new approach to decision-making in Barbados. An approach that ensures that we are **DOING THE RIGHT THINGS BY DOING THINGS RIGHT.**

A handwritten signature in blue ink, appearing to read 'H. Elizabeth Thompson'. The signature is fluid and cursive, with the first letters being larger and more prominent.

H. Elizabeth Thompson, M.P  
Ministry of Housing, Lands and Environment

# Chairman's Remarks



**Professor the Honourable Oliver Headley**  
**Chairman**  
**National Commission on Sustainable Development**

As a small island state with a high population density, Barbados needs to ensure that all members of our society have their legitimate needs met in ways that preserve adequate resources and a habitable environment for future generations. The National Sustainable Development Policy seeks to produce guidelines which will be used by decision makers as they determine the direction which national development will take, bearing in mind the constraints imposed by the previous sentence. Because of their limited resources, small island states are particularly vulnerable to negative changes in environmental, economic and social conditions. While many of these unwelcome changes are the direct result of events and processes which originate outside of our boundaries, we should strive not to exacerbate them by making unfortunate decisions which determine the way in which we utilize our own limited land space.

Some of the anthropogenic environmental changes, such as global warming and ozone depletion, which have been seen in recent years, have a special threat for small islands. Our Sustainable Development policy and the decisions which we make to preserve our local environment, should therefore demonstrate to the world that we are implementing mitigation and adaptation measures which will contribute to our long-term survival.

Social conditions are also an important component of sustainability, and these must demonstrate to the average citizen that he or she has a viable stake in the country and that it is in his or her interest to sustain a caring social system which does not exclude or marginalise anyone. Our cultural diversity must be harnessed and tapped to ensure that our development is built on fairness and promotes harmony. Wise and prudent economic growth should be at the centre of our development strategy.

A major concern for all Barbadians is the policy which we implement for land use. The expansion of the tourist industry in recent years means that an increasing amount of our land is being utilised to improve the comfort and convenience of our visitors. This industry is now the major provider of foreign exchange, hence it needs to be handled with care. However, even this vital sector has to be developed in a manner that does not compromise the sustainability of our island in the years to come.

A handwritten signature in blue ink, appearing to read 'Oliver Headley', written over a horizontal line.

Oliver Headley, PhD, CHB,  
Chairman, National Commission on Sustainable Development.

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# Acronyms & Abbreviations

|         |  |
|---------|--|
| NSD     | - National Sustainable Development                       |
| NCSD    | - National Commission on Sustainable Development         |
| UNCED   | - United Nations Conference on Environment & Development |
| BATNEEC | - Best Available Technique Not Entailing Excessive Cost  |
| BPM     | - Best Practicable Means                                 |
| BPEO    | - Best Practicable Environmental Option                  |
| PPP     | - Polluter Pays Principle                                |
| NCST    | - National Council for Science & Technology              |
| UWI     | - University of the West Indies                          |
| LPG     | - Liquefied Petroleum Gas                                |
| CNG     | - Compressed Natural Gas                                 |
| IPM     | - Integrated Pest Management                             |
| GIS     | - Geographic Information System                          |
| PDP     | - Physical Development Plan                              |
| SIDS    | - Small Island Developing States                         |
| NGO     | - Non Governmental Organisations                         |
| CZMU    | - Coastal Zone Management Unit                           |

# About Windmills...

Windmills represent not only the use of a renewable resource to generate energy but conjure up memories of sugar, once a driving force in the Barbadian economy in colonial and post colonial times. The work of many people focussed on using the windmill to create energy needed to grind canes, pump water for drinking, to feed livestock and other farming purposes.

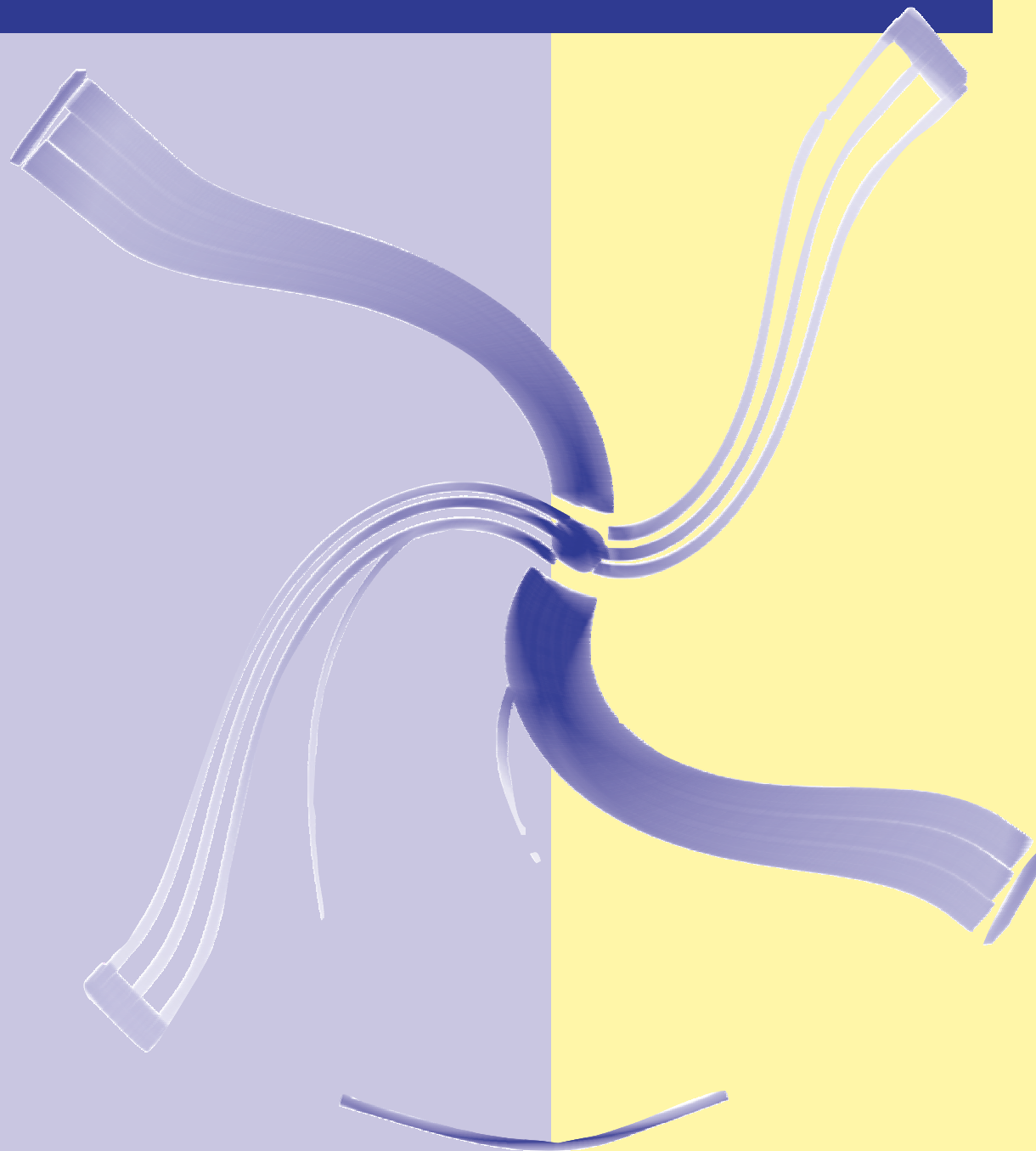
Windmills are icons of Barbadian heritage and one of the oldest symbols of sustainability on the island. They are closely linked with social, economic, environmental, technological and scientific matters from a Barbadian, regional and global perspective - the very facets of sustainability.







# PART I NATIONAL SUSTAINABLE DEVELOPMENT POLICY







# 1. INTRODUCTION

The National Sustainable Development (NSD) Policy is a product of the National Commission on Sustainable Development (NCSDD). The Commission was established by Cabinet directive on March 30th, 1997 with a mandate to develop a National Sustainable Development Policy for Barbados. Twenty-two individuals, representing a cross section of agencies and stakeholders, were designated to serve the Commission for a term of three years with the Ministry of Environment<sup>1</sup> serving as Secretariat.

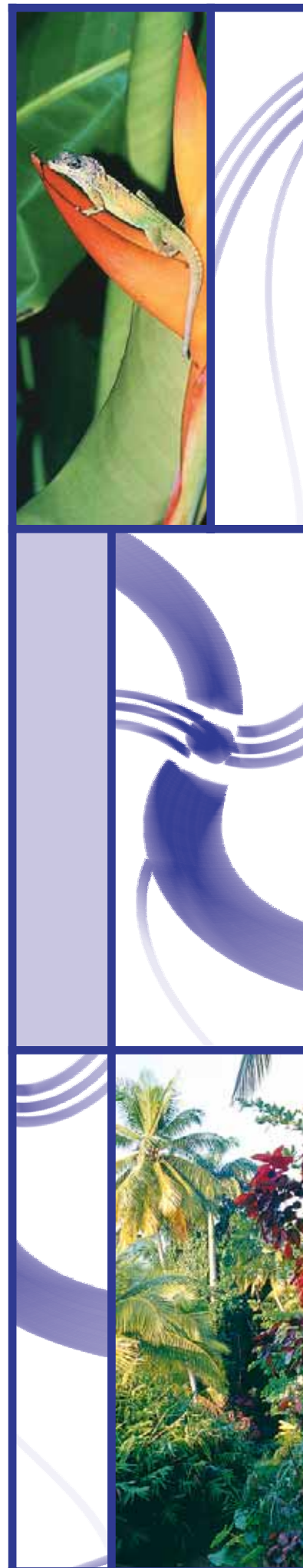
The formulation of the NSD Policy is envisaged as one component of a new approach to Sustainable Development in Barbados, one which aims to deal with individual issues from an integrated and holistic perspective. The NSD Policy has implications for a wide range and diversity of subjects going beyond the realm of environmental preservation to include social, cultural, economic, legal, educational and taxation issues to name a few.

The integrated framework is somewhat revolutionary as it seeks to depart from the traditional sectoral approach to national development planning. The integrated framework requires co-ordination of policies, plans, projects and programmes at the various levels in society. In this regard it will address the inherent weakness in the present approach to planning which results in (for example), weak links among the Physical Development Plan, the National Economic Plan and the National Strategic Plan.

The NSD Policy, for example, will seek to reconcile the inherent differences between the traditional twenty year development planning time frame and the longer time frame (50 years minimum) required for monitoring and assessing phenomena such as global climate. Ultimately, the Sustainable Development policy is intended to strengthen this process by providing a framework which promotes the development of our economic and social capital while ensuring the wise and proper stewardship of our environmental capital.

The NSD Policy seeks to ensure that development is undertaken not only in the right way but more importantly to ensure that the right things are done. It therefore requires that there are no inherent conflicts between substance and process. Doing things the right way will require an appropriate mechanism that verifies the process, whereas appropriate standards will validate the substantive things that are done.

The NSD Policy is divided into two inter-related sections. The first section contains the core concepts which inform the principles of Sustainable Development in Barbados. The second section provides specific policy recommendations which will inform sustainable practices and activities in Barbados.





The NSD Policy has been distilled from a long process of consultations at various levels and among the different partners of national development which include: government, the for-profit non-governmental organisations; the non-profit organisations; community based organisations; and the labour, youth and women

organisations.

<sup>1</sup>In 1997, the Ministry was designated the Ministry of Health and Environment; in 1999 the Ministry of Environment, Energy & Natural Resources. In 2002 it became the Ministry of Physical Development and Environment. In 2003 the designation of Ministry of Housing, Lands and the Environment was assigned.





## 2. POLICY AIMS

**G**enerally, the aim of a policy is to articulate the overall goal as well as the means whereby the goal will be achieved. In the case of the NSD Policy, the goal and therefore the aim, is the pursuit of Sustainable Development by all sectors, groups and individuals in Barbados. In other words the aim of the policy is to sensitize all persons in Barbados about the need to make wise choices daily, at the individual, household, business, community and national levels because these choices affect our national development. These choices include the things we consume, the way we produce goods and services, how we dispose of our waste and generally our lifestyles (habits, attitudes, conduct).

Sustainable Development is a broad-based concept that impinges on all sectors and activities of national development and so it is difficult to attempt to prescribe detailed actions for each actor, stakeholder and decision-maker. This policy therefore is not intended to be a blueprint for sustainability. Rather this policy is intended to provide guidelines and a pragmatic framework that facilitates decision-making at the level where costs and benefits accrue whether it is at the national, corporate or individual level. It is envisaged that this policy will be translated into concrete action plans by informing all programmes and projects prepared by the various sectors, businesses, communities and individuals.









### 3. DEFINITIONS

The Sustainable Development concept is rather elusive in its meaning and it is difficult to reach a consensus on its definition. At worst, the Sustainable Development concept is in danger of becoming everything to everyone; such that environmentalists want ecosystems sustained, politicians want economic growth sustained, community organisations want communities sustained and so on. A practical definition of Sustainable Development therefore requires a balancing of these competing goals.

Notwithstanding the lack of universal consensus on its definition, most writers will agree that the Sustainable Development paradigm represents a marriage between development and environment. Sustainable Development is about maintaining an acceptable balance between these two limbs. In this regard it may perhaps be more appropriate for Sustainable Development to be defined at the national level.

To provide some focus in an area as immense and as hotly debated as Sustainable Development is, and to ensure that priorities are addressed from a common perspective, reference is drawn to two working definitions. The first comes from the 1992 report to the United Nations Conference on Environment and Development (UNCED) by the Bruntland Commission which defined Sustainable Development as:

***"...development that meets the needs of present generations without compromising the ability of future generations to meet their own needs."***

This definition was agreed to at UNCED by the global community as straightforward and workable for everybody. Essentially it says that one does not do things today that make life today, or the life of future generations, more difficult in terms of access to natural resources, industrial and commercial raw materials, food, shelter, ecosystem life support systems, secure social structures, and so on. Neither does one leave behind a legacy of waste, polluted environments, social disarray and economic demise for future generations to grapple with.

Secondly, the definition which has been generated by our NCSD applies directly to the Barbadian context. Sustainability in Barbados is demonstrated within a society which is not crippled by poverty, unemployment, social unrest and crime, but rather one which features strong community ties, stable and supportive family structures and a responsible and respected political climate.

Concurrent considerations which emerge from Barbados' small island characteristics include the opportunity to take advantage of a number of positive attributes which can enhance the



operationalisation of our goal. It is envisaged that our small physical size in combination with an educated and adaptable population, will facilitate speedier and more effective lifestyle changes in the pursuit of Sustainable Development.

The NCSD proposes a Barbadian-specific definition of Sustainable Development as:

***"Development which optimises the quality of life of every person without over-exploiting natural and environmental assets and services, or jeopardizing social and economic development."***

The essence of this definition of Sustainable Development is to distill a working definition from the ongoing international dialogue that includes Agenda 21, the Barbados Programme of Action, and the Bolivia Plan of Action. Indeed, this policy is meant to be the interpretation and functionality of the principles contained in those various international action plans.

The lynch-pin of this interpretation of Sustainable Development is that **the pursuit of economic growth (economic capital) and social development (social capital) in Barbados, ought to be balanced and in harmony with the inherent limits of our ecological capital.**



# 4. POLICY OBJECTIVES & GOALS

## Goal

The over-arching goal of this policy is to ensure the optimisation 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.

## Objectives

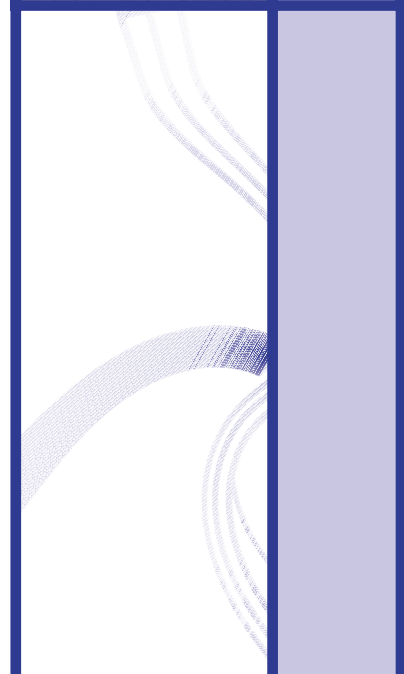
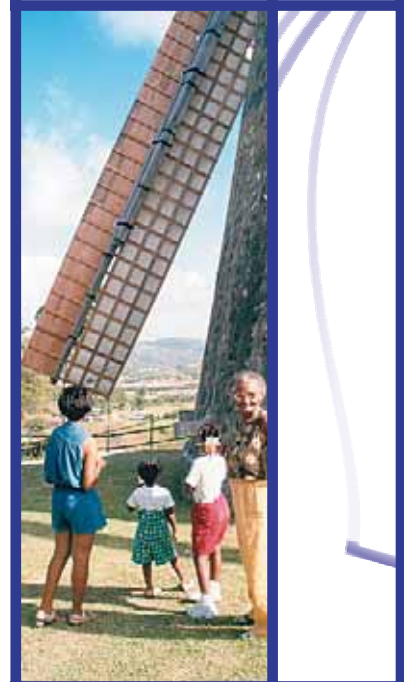
This policy examines the core concepts of Sustainable Development upon which the national definition was built and in light of which specific policy statements are made. The main objectives of this policy are:

1. To formulate (*or provide*) a national definition of Sustainable Development and identify national principles for the pursuit of Sustainable Development;
2. To provide a national framework for decision-making based on our principles of Sustainable Development;
3. To promote principles of Sustainable Development and encourage all persons in Barbados to adopt and apply these principles in every aspect of decision-making; and
4. To 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.

## Strategies

It is anticipated that these objectives will be achieved by ensuring that:

- 1 "Quality of life" is endorsed as the overarching goal and that this is composed of a variety of economic, social, cultural and personal factors and is not based on income earnings or accumulated wealth alone.
2. Bio-physical "limits to growth" are taken into consideration when decisions are made with regards to resource use. These limits include the:
  - finite supply of some resources
  - natural carrying capacity of ecosystems
  - fragility and vulnerability of some ecosystems
  - finite resilience of ecosystems to resist and recover from man's impacts
  - limited waste assimilation capacity of the natural environment





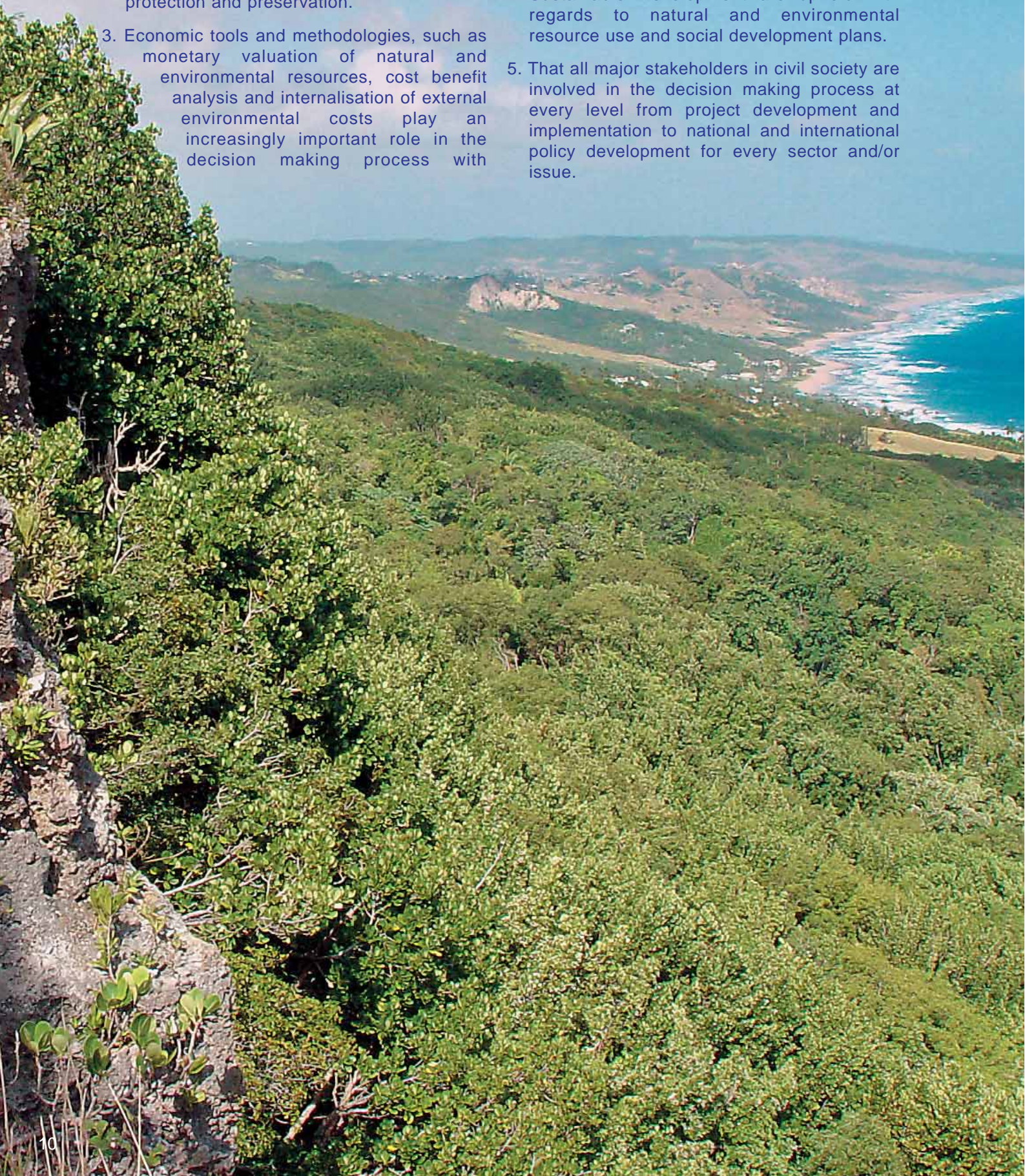
Natural resources are not to be exploited to the extent that it inhibits the ability of future generations to meet their own needs. In this regard it will be necessary to invoke the Precautionary Principle and to insist on the application of Safe Minimum Standards in respect of resource use, recognising the existence and aesthetic values of some natural assets over and above a utilitarian and/or monetary value that mandate their protection and preservation.

3. Economic tools and methodologies, such as monetary valuation of natural and environmental resources, cost benefit analysis and internalisation of external environmental costs play an increasingly important role in the decision making process with

regards to natural and environmental resource use, notwithstanding considerations of *physical sustainability constraints*.

4. All sectors of society as well as future generations are provided with an equitable opportunity to ensure that their quality of life is maintained at a level not lower than that of current generations . This is to be achieved in part by ensuring that the core concepts of Sustainable Development are upheld with regards to natural and environmental resource use and social development plans.

5. That all major stakeholders in civil society are involved in the decision making process at every level from project development and implementation to national and international policy development for every sector and/or issue.





# 5. PRINCIPLES OF SUSTAINABLE DEVELOPMENT FOR BARBADOS

A consideration of the core concepts of Sustainable Development and their operation in the Barbadian context reveals a somewhat paradoxical situation. On one hand, Barbados has demonstrated a utilitarian approach to resource use, typical of orthodox economics approaches. This "weak sustainable" approach means essentially that natural and environmental assets and services have traditionally been viewed as available and intended for our **present (human) utilisation**.

Conversely, Barbadians express very strong "normative" opinions about "the way things should be"; so that while viewing resources as ours to be used, Barbadians also want to ensure inter- and intra-generational equity and at the same time, promote the social components of "quality of life".

This policy seeks to promote the idea that economic development and sustainable management of resources are not incompatible goals. It is notable that environmentally benign systems may in some cases generate income for the company or agency instituting them .

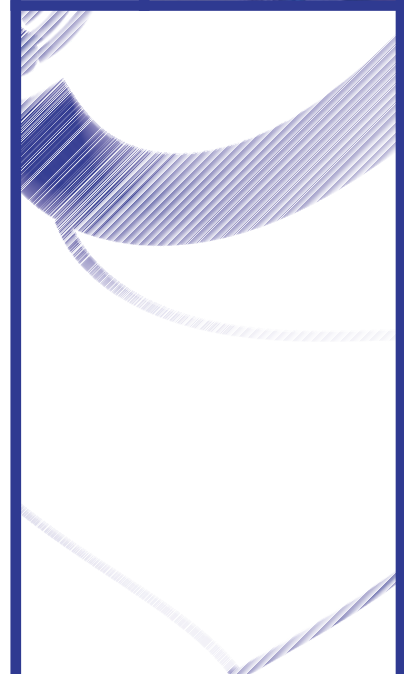
Largely absent from this approach has been the recognition that utilitarian actions and "green" views may not be compatible. It is not possible to over-exploit resources today while conserving them for future generations. The vision of Sustainable Development for Barbados encompasses five principles which are inextricably linked to the twin pillars of environment and development<sup>1</sup>. These principles are quality of life, conservation of resources, economic efficiency, equity and participation.

Full explanation of these principles are provided in the subsequent sections. This vision can be achieved by establishing a mechanism for public participation in decision-making.

## 5.1 Quality of Life

The Sustainable Development paradigm recognises "quality of life" as an overarching goal and this is seen to be composed of a conglomeration of economic, environmental, social, cultural and personal factors. The concept of "quality of life" introduces a different way of viewing the goal which has traditionally been referred to as "standard of living", a goal based almost solely on increasing one's income earnings.

Generally, adequate quality of life may be taken to mean a decent living standard for all which requires the provision of sufficient clean water, food, shelter, sanitation/sewage, health care, communication, transportation, education, security, recreation and energy.



Sustainable Development requires a society which is not crippled by poverty, unemployment, social unrest and crime. Social conditions are a very important component of Sustainable Development and of the quality of life for current and future generations. They require strong community ties, stable and supportive family structures and a responsible and respected political system.

It is recognised that there may at times be conflict between economic development and other aspects of Sustainable Development and that the latter are inadequately accommodated in conventional economic policy. Less emphasis is placed on material possessions and consumerism in a "strongly" sustainable society but it is important to recognise that Sustainable Development does not mean social regression or "zero growth".

Sustainable Development allows for technical progress, social advancement and economic growth while considering bio-physical and socio-ethical limits to growth, the finiteness of resources, the fragility of natural ecosystems, the realm of uncertainty which surrounds natural resource use and the limits thereof, and the possible irreversibility of impacts on the natural environment. A good example of this conflict is demonstrated in the case of exploiting non-renewable resources such as conventional energy resources in a sustainable way.

Promoting the concept of **quality of life as a primary indicator of social development, with preference over income growth , will for the most part be a novel challenge in Barbados.**

## 5.2 Conservation of Resources

Three broad categories of natural resources are recognised: "critical" natural resources, non-renewable resources and renewable resources:

- **"Critical"** natural resources are necessary for the continuation of "life support functions" for example water and air. They are key to maintaining the



integrity of ecological systems and bio-physical processes. Sustainable Development requires that, at the very least, critical natural resources should be transferred in full to future generations because their role cannot be fulfilled by any other natural or anthropogenic system or resource, for example clean air, uncontaminated aquifers, unpolluted soils. Another option is that where technologically possible and where it is economically feasible, recycling should be a part of the extraction, consumption cycle.

- **Non-renewable** resources are those that are eventually exhausted because the rate of depletion by man exceeds the rate of natural regeneration. All fossil fuels including oil and natural gas, metals and other minerals are non-renewable resources. Sustainability requires that efficient techniques are developed for extracting, processing and using these resources so as to extend their life as long as possible. At the same time, investments should be made in the development of appropriate substitutes or alternatives for non-renewables so that the dependence on non-renewables can ultimately be suspended or terminated and a switch made to the appropriate renewable alternative in the shortest possible time frame.
- **Renewable** resources are those that regenerate naturally like fish stocks and trees. These tend to be taken for granted because we expect them to take care of themselves. A sustainable approach to the use of renewable resources requires that their rate of depletion or harvest, does not exceed the rate of natural regeneration.

Sustainable Development requires that bio-physical "limits to growth" guide the utilisation of natural resources and services. These limits include the:

- finite supply of some resources
- natural carrying capacity of ecosystems
- fragility and vulnerability of some ecosystems
- finite resilience of ecosystems to resist and recover from exploitation
- limited waste assimilation capacity of the natural environment.

It is recognised that ecosystem degradation via a cascade effect can occur swiftly and unpredictably if the balance of the natural system is tipped too far beyond its ability to compensate for irregularities. Consequently, a Precautionary

Approach and the imposition of Safe Minimum Standards are advocated for sustainable resource use. This requires resource users to err on the side of caution especially when the risks of uncertainties in using resources have adverse implications for the supply and availability of these resources for current or future generations.

In essence, the precautionary approach stipulates that where there are threats of serious or irreversible damage the lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation. An illustration of this concept is shown in Box 1. The government supports the application of the precautionary principle as a policy-making strategy that governs how decision-makers, in their efforts at protecting the environment, apply science, technology and economics.

In this regard this policy seeks to encourage decision-makers and resource managers to adopt the following principles:

**BATNEEC: Best Available Technique Not Entailing Excessive Cost**

Best refers to "the most effective techniques for minimising, preventing or rendering harmless noxious emissions". Since there may be more than one "best" technique, the decision-maker is

required to perform a balancing act.

Available means that the technique must be available to the decision maker.

Technique means it includes both the process and the specific technology used.

Not Entailing Excessive Cost means that protection of the environment must be balanced alongside other tangible and non-tangible factors including economic concerns. It does not relate to whether the particular decision-maker finds the cost excessive, but requires the use of cost/benefit analysis for the process in question.

**BPM: Best Practicable Means**

This principle requires decision-makers to use the best practicable means to prevent or counteract the effects of pollution and nuisance.

**BPEO: Best Practicable Environmental Option**

This principle establishes, for a given set of objectives, the option that provides the most benefit or the least damage to the environment as a whole, at acceptable cost, in the long term as well as the short term.

**PPP: Polluter Pays Principle**

This is a key principle that requires that the cost

## BOX 1: PRECAUTIONARY APPROACH TO FISHERIES MANAGEMENT

*The precautionary approach to fisheries management has, as its foundation, the need for foresight in recognising and avoiding unsustainable fisheries management practices. The precautionary approach to fisheries management must be comprehensive in its scope and explicit in its preventative measures against undesirable outcomes. Thus, there is a need for monitoring and formulation of measures to mitigate fishing practices and externalities that may impact negatively on the fishing industry.*

*An integrated approach ensures that all stakeholders, such as fishermen, conservation groups and other interested parties, are consulted and involved. Stakeholder consultation ensures that all views and concerns are addressed, and that there is across-the-board acceptance of precautionary initiatives. Since fisheries are affected by and affect other coastal issues and activities, the integrative approach to fisheries management should be considered within the broader context of the integrated coastal-area management plans.*

*If a management plan is to be broadly accepted, it is best to consider a range of alternatives, such as:*

- *Specifying management objectives,*
- *Specifying operational targets and constraints,*
- *Specifying the procedure to apply and adjust management measures; and*
- *Prospective evaluation.*

*Management plan implementation involves the practical interpretation of objectives and procedures and the implementation of detailed instructions for compliance, monitoring of the fishery, and enforcement tactics.*

*With respect to implementation, guidelines should be provided on:*

- *New or developing fisheries,*
- *Over-utilised fisheries,*
- *Fully utilised fisheries, and*
- *Traditional or artisanal fisheries.*





of preventing pollution or of minimising environmental damage due to pollution will be borne by those responsible for pollution. The polluter should pay for the consequences of the pollution, such as compensation and clean-up. This principle will assist with the optimal allocation of limited resources.

Ecological efficiency represents one of the core elements of Sustainable Development in Barbados. It is recognised that it is difficult to protect every aspect of the environment forever and so in several instances development decisions will require trade-offs between social and environmental objectives simultaneously. In this regard this policy aims to prevent further overall deterioration of our environmental capital and to promote enhancements which contribute to improvement in the quality of life for all persons in Barbados.

The concept of ecological efficiency has been integrated to varying degrees into the decision making process relating to the use and management of our natural environmental resources. There is still the need to critically assess and evaluate the carrying capacity of our

natural and environmental resources to reconcile resource availability with current and future demands. Some examples of the critical environmental and natural resources in Barbados which demonstrate the need to ensure ecological efficiency include water resources, fisheries resources, and tourism resources.

Case Study 1 describes briefly the example of freshwater use in Barbados from the perspective of ensuring continued availability of that resource.

### 5.3 Economic Efficiency

Economic efficiency requires that the use of natural and man-made resources should be guided by appropriate incentives. These may be guided by specific economic tools and methodologies including monetary valuation of resources, use of cost benefit analyses and efficient or optimal allocations of resources amongst various competing users. This approach is aimed at ensuring that the external environmental costs and external social costs from resource use are determined and internalised into the cost of usage.

#### CASE STUDY 1: FRESHWATER

*Although technically a renewable resource freshwater is a limited commodity in Barbados. The United Nations has listed Barbados among the most water scarce countries in the world. Many factors may be highlighted as contributing to this situation including:*

- *Increasing demand per person*
- *Increasing demand from a mushrooming visitor population*
- *A main and pipe distribution system in dire need of rehabilitation*
- *Barbados' reliance on the natural aquifer capacity of the island's limestone cap*

*Freshwater is provided to domestic and commercial customers in Barbados at a standard fee which is intentionally low enough to ensure equity of distribution. The revenue generated by these low charges, however, fails to cover increasing operational and maintenance costs. It can be argued*

*that Government policy in the past has failed to charge appropriately for the provision of a common property resource subject to growing demand, the use of which generates external environmental and social costs. The environmental externality of diminishing quality has been observed more frequently in recent years, and the increasing scarcity of the resources has implications for the cost of supplying it by the Barbados Water Authority. Growing local and visitor consumers have no significant incentive to conserve freshwater, despite depleting supplies, since the scarcity factor is not internalised into the market price for the commodity.*

*Government has sought to address these market and/or policy failures by encouraging a more efficiently functioning market situation. A multi-faceted programme has been launched to, in part, meter all users of freshwater for more accurate monitoring, while a rising block tariff structure for determining water charges is to replace the standard fee currently in existence. Revised water use fees will seek to internalise the effect of resource scarcity on the cost of supplying the resource. Market efficiency is expected to improve with customers facing an economic incentive to reduce consumption and avoid high charges. Even without a revision of water use fees, it has been estimated that freshwater demand in Barbados has fallen by two million gallons per day since the introduction of the metering programme.*



It is essential that the estimated external costs of a planned development or project are not found to outweigh the projected benefits to society or individuals. In situations where this is the case, some alternative approach for the intended goal should be found. In all cases of natural resource use, it is vital to integrate sustainability criteria as discussed in this policy paper, into the decision making process in combination with cost benefit analysis.

The finiteness, or limited supply, of many natural resources results in part from their exhaustible nature which is sometimes further compounded by the excessively high rate of depletion by man. In light of these limits it is seen as vital that the use of natural resources occurs at optimal capacity via a strategy which:

- reduces total quantities used
- maximises net output from each unit of resource used
- minimises waste generated from all aspects of resource use; and
- optimises the net benefits from each unit of maximised resource used.

This strategy is expected to maximise the economic efficiency of resource use by ensuring that the useful lifespan of a resource is extended and that waste generation from resource use is minimised.

Integrating environmental concerns into the economic decision making process at the micro- and macro-economic levels in Barbados is essential. Barbados has demonstrated an unsatisfactory history of "economic efficiency" with regards to resource use. Emphasis has traditionally been placed on the "direct use value" of resources while their indirect use, intrinsic, existence and option values for future use have largely been ignored.

In general, no actual economic valuation, cost-benefit analysis or determination of the most efficient or "optimal" allocation has been carried out for most natural resources and environmental services depletion in Barbados. As a result, most if not all natural resources remain either un- or under-valued in monetary terms. This non- or under-valuation prohibits the optimal allocation of resources within the "market" of current and future users. Case study 2 explores the issue of quarrying in Barbados from the perspective of economic efficiency.

It is proposed that economic efficiency should be sought for all projected uses of natural resources. The decision- and policy -making processes should further be augmented by a consideration of sustainability criteria as identified in this policy.



### 5.3.1 Economic Instruments

Economic instruments are being increasingly recognised as an integral tool for the achievement of Sustainable Development. Economic instruments can play a complementary role to conventional regulation. Indeed, some authorities are of the view that more effective environmental management may be achieved through a reduction in the use of "command and control" methods and an increase in economic and market-oriented approaches. Ultimately it is desirable to have the appropriate mix of regulations, economic instruments and non-economic valuation techniques to ensure that environmental goals are met. At the same time every effort must be made to ensure that distortion of trade and investment at national and international levels are minimised.

For the purposes of this policy, economic instruments are to be taken to include the costs and benefits of alternative actions (providing economic agents) with the effect of influencing behaviour in a way favorable to the environment. Economic instruments may be broadly classified as:

- charges (emission charges, product charges, tax differentiation, etc.)
- deposit-refund systems (repayable surcharges on products, etc.)
- subsidies (grants, tax allowances, etc.)
- market instruments (tradeable emission permits, liability insurance, etc.)
- financial enforcement mechanisms (performance bonds, fines, etc.)

The Government of Barbados has started to apply economic instruments, to varying degrees, within the national decision-making process. One illustration is provided in Box 2. Examples include the environment levy, tax rebates on solar water heaters, fines for damage caused to coral reefs and the coastal/marine ecosystem based on proper resource evaluation, and it is proposed that planning permits for quarrying

## CASE STUDY 2: SAND & GRAVEL QUARRYING ALONG THE EAST COAST OF BARBADOS

*During the past ten years or so in order to provide virgin aggregate to the construction industry in Barbados, quarrying operations at certain points along the east coast have encroached upon adjacent beach areas and actually mined the sand dunes themselves. Remaining dunes have been scraped of stabilising vegetation by trucks and heavy equipment. Sustainability criteria require a cost benefit analysis incorporating the presence and magnitude of external environmental and social costs of such an activity.*

*The benefits of a quarrying operation are easy to identify:*

- *Reduced national dependence on material imports for the construction and building industries*
- *Opportunities for employment*
- *Income generation for individuals and the country*
- *Infrastructural improvements to surrounding areas, e.g. roads, and building equipment*

*In this case the external costs would include the increased:*

- *Damage to the integrity of the sand dunes and their associated vegetation*
- *Susceptibility of the coastal area to erosion and cost of litigation*
- *Risks to coastal areas posed by harsh weather events like hurricanes*
- *Social discomfort from dust and noise pollution*



*Economic tools for evaluating benefits and costs include monetary valuations of environmental and natural resources and cost benefit analysis. Via such methodologies, the Total Economic Value (TEV) of natural resources is determined and shown to include not only direct use values (such as for construction aggregates), but also the indirect use value, existence, intrinsic and option values of the resource. Efforts to determine economic values for natural and environmental resources and the external costs of their use generate previously unavailable statistical data which can contribute to a more balanced and realistic cost benefit analysis of a proposed project or development. This can be the case with quarrying in Barbados since to date we do not have any good cost benefit data available on quarrying.*

include a type of performance bond to ensure the proper rehabilitation of quarries.

### 5.3.2 Science & Technology

#### ***The Role of Science and Technology in Sustainable Development***

The need for significant social, environmental and economic change becomes more explicit when one considers the advances that have been made in the areas of Science and Technology in the last decade or so. No society or community is untouched by the phenomenal development of science and technology. Products ranging from radios, mobile phones and satellite communications, television, agricultural inputs and medical products can be found in the most remote communities. The entire population faces the challenge of becoming more aware of science and technology and the role it plays in Sustainable Development.

#### ***Clean Technology***

The year 2001 received much attention and was being touted as a year of major change when the adoption of new perceptions and attitudes were expected to encompass the principles of social

and economic reform.

The Government of Barbados, through the National Council of Science and Technology (NCST), the University of the West Indies (UWI) and the Energy Division of the Ministry of Economic Development, has to pioneer such paradigm shifts and has embarked on a number of Millennium Energy Projects which are expected to have significantly positive impacts on the daily lives of Barbadians. These projects are but a small part of Government's projection for the alternative energy sector, with plans on the drawing board for a Renewable Energy Centre that will harness the expertise and competencies of our scientists in an applied manner. It is noteworthy, therefore, that the Millennium Project will aid Government's efforts to comply with recommendations of the Intergovernmental Panel on Climate Change which specifies that action be taken by individual countries to reduce their emissions of greenhouse gases. See Case Study 3.

#### ***Technology Transfer***

The use of science and technology as a tool to promote Sustainable Development is a multi-faceted one and the objectives of the National



## BOX 2: NATURAL GAS PRODUCTION IN BARBADOS

*In Barbados, gas is usually produced as associated gas from oil. While its collection and distribution costs can easily be calculated, it is more difficult to extract the production costs for gas. Given the high costs of drilling the average oil well in Barbados, it would seem that to drill a well purely for gas production would be very uneconomic.*

*The biggest competitor to natural gas is Liquefied Petroleum Gas, LPG. However, the National Petroleum Corporation (NPC) has a mandate to sell natural gas 20% cheaper than LPG. Currently, domestic customers pay 30% less for natural gas than they would for the equivalent LPG in a 20lb bottle.*

*By maintaining a competitive price, development of the natural gas resource remains viable. In addition, it may prove to be very sustainable as the sale of natural gas provides employment, provides the opportunity to develop a local resource, saves valuable foreign exchange and is a more environmentally friendly energy source than refined crude oil products.*

Council for Science and Technology include the development of a broader programme aimed at popularising Sustainable Development and, in so doing, increasing financial efficiency and productivity in the economy. Medicine is already being transformed with advances in genetic engineering techniques and non-invasive surgical procedures. In agriculture, pest-resistant crops can be created and desirable characteristics engineered into produce. Continued advances in molecular biology are expected to result in new highly specialised materials, and the applications of

nanotechnology are infinite. Furthermore, information technology will be revolutionized with advanced video communication systems. E-commerce will create new and revamp old industries.

### ***The Future of Science and Technology in Sustainable Development***

Barbados needs to be far more organised and coordinated in its scientific and technological activities. The concept of Sustainable Development entails that appropriate forms of Science and Technology become a part of

## CASE STUDY 3: ENERGY

*Barbados is a small island developing state (SIDS) where petroleum products service 75% of our energy needs. The production and utilisation of fossil fuels has one of the largest human impacts on the environment. The emission of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases is a major contributor to global warming and the associated problems such as sea level rise and an increase in the number and intensity of hurricanes. Our main focus as a SIDS should therefore be in the area of renewable energy development and energy efficiency (to reduce energy use), both of which will reduce the impact of greenhouse gas emissions on the atmosphere.*



*Renewable energy technologies such as burning bagasse for power and process heat at the sugar factories, solar water heaters, wind turbines and solar photovoltaic panels for electricity generation do not produce any net greenhouse gas emissions, hence we need to encourage their use. The proposed Centre for Renewable Energy will address the above issue. There are already over 36,000 solar water heaters operating in the island and solar photovoltaic systems such as the 17.3 kilowatts at Harrison's Cave, 3 kilowatts at Combermere school and 11.1 kilowatts at Skeetes Bay for ice-making have been installed. Barbados ground sugar cane for nearly three hundred years using windmills, so our wind resource is well established. The Barbados Light and Power Company has recently indicated that they are interested in participating in a 9.2 megawatt wind turbine farm in St Lucy. Of all the fossil fuels, natural gas produces the least CO<sub>2</sub> per unit of energy, hence our supplies of this energy source may be exploited with the least global warming consequences. Coal has the highest CO<sub>2</sub> emissions per unit of energy and this fossil fuel also needs to be imported using foreign currency; it should therefore be used as little as possible.*

*Currently the major energy source in the world is from fossil fuels. Renewable Energy (R.E.) produces less than 25% of the total. While therefore it is desirable to use R.E. for environmental reasons Barbados as a net fuel importer has little alternative but to use oil and gas and to develop local reserves, if we are to grow while developing R.E. technology.*





everyday life for individuals and communities. In order for this to succeed, at least three conditions must be met. First, there must be significant expansion in the quantum and diversity of knowledge and information available to the population. Second, current knowledge and information should be repackaged so that they become more user-friendly. Third, the mode of acquiring knowledge and information, e.g. using the ever-expanding medium of information technology, should be adapted so that there is much greater interaction with Science and Technology at all levels to enhance Sustainable Development. The study of science and technology should be encouraged, especially if the region is to capitalise on the growing global interest in environmental management, information technology, biotechnology and other cutting edge technologies.

## 5.4 Equity

The concept of equity needs to be applied to ensure equal access for both current and future generations to natural and environmental assets, services and opportunities. Many current resource use practices explicitly and implicitly "discount" future generations and less well off sectors of society at a high rate, thus placing

them at a severe disadvantage in terms of maintaining an appropriate and sustainable quality of life.

The ethical and moral arguments against imposing a high rate of discount on benefits accruing through "discounting" future generations and social sectors are strong. A primary requirement for Sustainable Development is that all sectors of society, as well as future generations, are afforded the opportunity for a quality of life maintained at a level at least the same as that of current generations. A local example is provided in Case Study 4.

The position of Barbadian society on equity is evidenced by powerful ethical and moral beliefs with regards to equality within current and future generations. This is exemplified within major government policies aimed at ensuring intra- and inter-generational equity which focus on poverty eradication, providing adequate housing for all and generating employment. These policies in part seek to establish an acceptable quality of life for all persons and to improve the quality of life of poor people.

Box 3 provides an example of the Education sector and highlights efforts within that sector which seek to ensure equity that spans generations.

Barbados has demonstrated an admirable level of national investment in human or man-made capital, especially in the form of institutional strengthening, human resource development programmes, training and education initiatives and technological research and development (for example in the renewable energy sector). This kind of investment is an essential contribution to equipping future generations with the technical skills to meet evolving challenges and obstacles.

Occurring concomitantly with the above, however, are over-exploitative behaviour and resource use practices. Implicit discounting continues to result from the absence of sustainable policy approaches to natural resource use in many sectors. It must be recalled that certain critical and non-renewable

### CASE STUDY 4: THE FISHING INDUSTRY

*The 1997 Fisheries Management Plan and Act seeks to ensure the sustainable use of the eight major fish stocks harvested by Barbadian fishermen. The new regulations permit certain levels of resource utilisation according to the status of each fish stock and provide for the imposition of severe financial penalties for contravention of the harvest limits established. The Fisheries Management Plan therefore aims to avoid discounting the total quantity and value of the fisheries resource to future generations. The Plan is based on sound analysis of the status of fish stocks and defines in detail management strategies required to ensure the preservation and replenishment of reserves where necessary. For example, harvesting turtles is prohibited since all three species commonly found in Barbadian territorial waters are categorised as "threatened". Lobsters and sea urchins are "over-fished" and as such a severe harvest limit and a complete ban respectively have been placed on them.*

### BOX 3: EDUCATION TO MAINTAIN A HIGH STANDARD OF LIVING

*The Ministry of Education, Youth Affairs and Sports has accepted that education is the major vehicle to bring about positive, relevant changes within our society. To facilitate this, the initiative was taken to revamp the curriculum within the school system. Since equality is of paramount importance, a provision has been made to improve the quality of education of students with special needs. In this regard, the Ministry has adopted the motto "Each One Matters- Quality Education for All."*

*To ensure that education is of high quality the revised curriculum is a skill-based one aimed at achieving integration within and across subject areas. The use of technology within all subjects is also a stated requirement. Another feature of the new curriculum is the renewed emphasis on the child-centered approach, as opposed to the teacher-centered one. This paradigm shift is aimed at producing individuals with adequate critical-thinking and problem-solving skills.*

*Social and emotional learning is also embedded in all areas of the curriculum. Another of the new innovations in the reform is the integration of cultural art forms across subject areas. Changes have also been implemented in the area of assessment. The new thrust is to ascertain the children's strengths and weaknesses at an early stage.*

*This multi-faceted approach was taken to ensure that well-rounded individuals exit the school system. This would benefit the nation as a whole, since persons would possess the skills, attributes and competencies which will allow them to function in any situation.*



natural resources are irreplaceable and non-substitutable with man-made capital. In such cases, the equity criteria would call for a consideration of the constraints in the utilisation of these resources so as to ensure their full or at least partial transfer to future generations.

## 5.5 Participation

Of fundamental importance for Sustainable Development is that all major stakeholders are involved in the decision making process at all levels from national and international policy development to project development and implementation for every sector and/or issue. Part of the rationale here is that social preferences regarding natural resource use will incorporate concerns for disadvantaged social sectors and future generations. This has been evidenced through town hall meetings by the Town and Country Development Planning Office on the National Physical Development Plan and by the Ministry of Tourism and International Transport with its draft policy framework on sustainable tourism.

Decision makers will be better equipped to ensure that those resources are used, and developments pursued, which meet the outlined criteria especially for quality of life and inter-/intra-generational equity, by integrating social preferences into the decision making process via the participatory approach.

For the purpose of this policy, it is recognised that civil society is organised into various sectors and includes individuals, the private sector, the labor sector, political parties, academics and other non-governmental actors and organisations.

Public participation refers to the interaction between civil society and government and includes the process by which government and civil society open dialogue, establish partnerships, share information, and otherwise interact to design, implement and evaluate development policies, projects and programmes. This process requires the genuine involvement and commitment of all interested parties, including among others, the poor and traditionally marginalised groups in Barbados.

The importance of stakeholder participation in the decision making process is well recognised in Barbados. This approach was a fundamental feature of the compilation of the NSD Policy. Case Study 5 below expands on this experience.

Further to the above example, town hall meetings and cross-sectoral workshops have become standard practice when addressing environmental issues in general. Consultations have ranged in topic from biodiversity conservation to public debate on applications for industrial developments submitted to the Town and Country Development Planning Office. It is a new requirement that applications submitted to

the Town and Country Development Planning Office are screened to determine a potential requirement for an Environmental Impact Assessment to be conducted by the proponent. Applications deemed to have wide socio-environmental implications are subject to public review. Having only been recently introduced the effectiveness of this approach cannot be properly analysed but it has been cause for much resistance by new applicants and for active social debate on a number of issues.

Despite the respectable record and practice of stakeholder participation in Barbados, the most vital step of this practice may still be missing. It is essential that stakeholder views actually influence Government's decisions in a significant way at every level from the development of national policies to the project development and execution stages. In this regard, this policy encourages all decision makers to adopt the following guidelines for facilitating genuine public participation in Sustainable Development:

**Proactivity**

Government and civil society shall take initiatives, in accordance with their respective

roles, to develop their maximum potential and enrich the process of decision-making for Sustainable Development.

**Inclusiveness**

The full participation of all those interested in or affected by Sustainable Development issues is essential to achievement of durable solutions. Special efforts shall be made by decision-makers to secure the participation of the private sector, and to create opportunities for the participation of marginalised groups. Box 4 provides an example of government policy designed to include the precepts of public participation and public/private sector participation.

**Shared Responsibility**

Government and civil society must share equitably the commitments, burdens, and benefits of development.

**Openness**

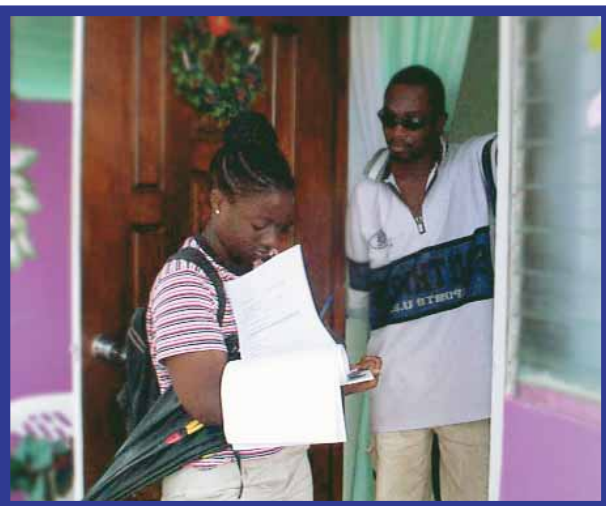
Decision-makers will endeavour to ensure inclusive and continuous participation throughout the process of design, implementation, and evaluation of projects, policies and programmes in order to inspire new ideas and expertise; legitimise decisions; and enrich outcomes. The decision-making process ought to be open and flexible to allow for the inclusion of new information and ideas at all phases of the process.

**Access**

In order to participate effectively, citizens must have timely access to information, to the political process, and to the justice system.

**Transparency**

Productive relationships between civil society and government require that both be more accountable and transparent. Transparency will



**CASE STUDY 5:  
THE NATIONAL COMMISSION ON SUSTAINABLE DEVELOPMENT**

*In 1996 the National Commission on Sustainable Development was established essentially as a "think tank" with the mandate to advise and guide government towards the achievement of Sustainable Development. 22 volunteers representing a wide cross-section of Barbadian society including Non-Governmental Organisations, Community Based Organisations, and the private sector and government departments serve the Commission. Five public consultations have been convened under the aegis of the Commission to gain in-depth and specific insight on pressing environmental issues including:*

- *Energy*
- *The role of youth and communities in Sustainable Development*
- *Agriculture*
- *Water*
- *Solid waste management*

*The recommendations which emanated from these fora contributed to the final National Sustainable Development Policy. These consultations, in effect, facilitated wider social input into the policy making process.*



## BOX 4: MAKING COMMUNITY SPORTS SUSTAINABLE

The Ministry of Education, Sports and Youth Affairs in 2000 formulated a National Sports Policy for Barbados aimed at promoting "sports-for-all". It is recognised that "sports are multi-dimensional and multi-focal in nature and operate within the society to promote self-awareness, discipline, cognitive and kinetic skills at the individual level, social interaction and co-operation amongst the different ethnic and social groups at the level of the community and a sense of community well-being at the level of the state".

The objectives of the National Sports Policy are:

- the development and improvement of sporting facilities and venues
- the promotion and fostering of competitive sports
- the training and utilisation of proficient sports instructors
- the co-ordination of amateur and professional sports
- the promotion of a sports-for-all policy
- the development and stimulation of an appreciation and interest in sports
- the achievement of excellence and national prestige
- the enhancement of national goodwill and standing within the international community
- the promotion and development of sports as a productive sector of the economy



The Ministry of Education, Sports and Youth Affairs has also developed an implementation plan for the National Sports Policy. It is anticipated that the National Sports Council, the main policy implementation agency in the Ministry of Sports, will play a leading role in the pursuit of the objectives identified by the policy. In addition, it is proposed that an Advisory Committee on Sports should be established to assist the Ministry of Sports and the National Sports Council with effectively managing the national sports programme. Some of the proposals of the implementation plan are:

- the review and strengthening of the legal framework governing sports development;
- the proper maintenance of sports facilities and venues;
- the development of sports;
- the establishment of an Academy of Excellence/Resource Centre/Sports Library;
- the expansion of existing training programmes in sports;
- encouragement of greater participation by women in sports;
- increased public awareness and education; and
- fostering partnerships between the public and private sectors.

facilitate more meaningful participation by ensuring that all motivations and objectives are explicit and that all information vital to the decision is reliable and available in a timely manner.

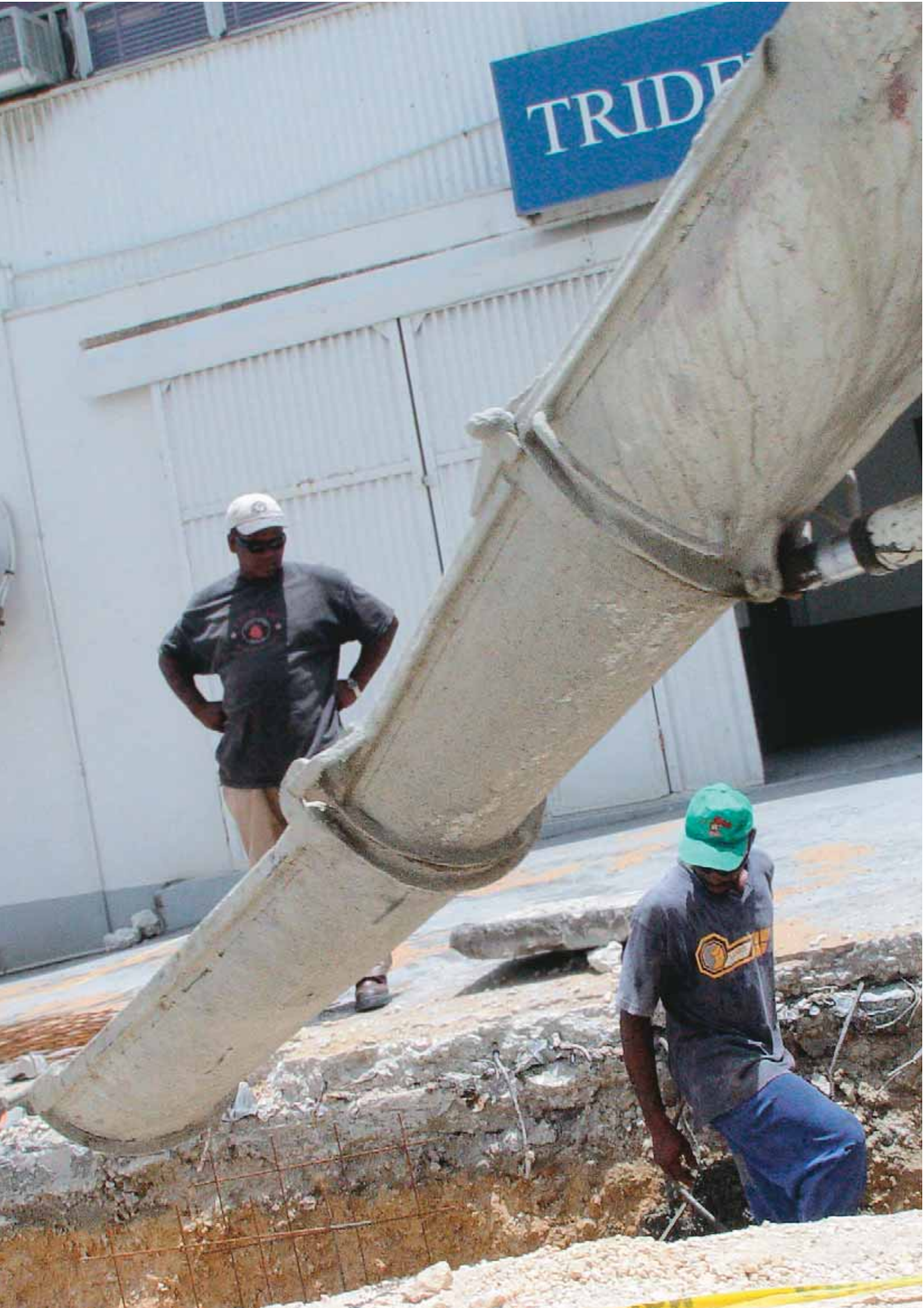
### **Respect**

Citizen participation will be more effective and

efficient where there is assurance that, in the decision-making process, contributions deriving from the implementation of various mechanisms for participation are valued, analysed, and given proper consideration in a timely manner.

<sup>1</sup>These may be further disaggregated into the fundamental elements of economy, equity and ecology.

TRIDE





# 6. POLICY IMPLEMENTATION

Barbados' traditional approach to macroeconomic development has been typical of developing countries in terms of striving to maximise economic growth. However, despite an acknowledgment and understanding of the interconnection and co-dependence between the goals of environmental preservation, social welfare and economic development, these concerns have not to any great extent been integrated into the economic decision making process. This policy is intended to remedy this short-coming.

In 1999, the Ministry of Finance initiated a new approach to the drafting of the National Strategic Plan (2000/2010), one aimed at ensuring a wide range of cross-sectoral input. This is a good start towards introducing environmental economic instruments and incentives into national macroeconomic policy but the opportunity possibly came too late for significant environmental and social input.

The NSD Policy is intended to provide an integrated and holistic representation of Barbados' goals with regards to Sustainable Development, and to articulate specific recommendations for policy within a range of sectors, all aimed at fostering National Sustainable Development. The various actors, stakeholders and interest groups are required to translate these principles and recommendations into concrete action through plans, programmes and projects.

## 6.1 Recommendations

I. The overarching policy recommendation is that the core principles of Sustainable Development shall inform all levels of national decision-making at the sectoral, organisational and individual levels. These principles are:

1. "Quality of life", comprising a variety of economic, social, cultural and personal factors that go beyond mere income earnings, is endorsed as the overarching goal.
2. Bio-physical "limits to growth" are taken into consideration when decisions are made with regards to resource use. These limits include the:
  - finite supply of some resources
  - natural carrying capacity of ecosystems
  - fragility and vulnerability of some ecosystems
  - finite resilience of ecosystems in resisting and recovering from man's impacts as well as natural disasters



- limited waste assimilation capacity of the natural environment

Natural resources are not to be exploited to a degree which inhibits the ability of future generations to meet their own needs. As such the Precautionary Principle and the imposition of Safe Minimum Standards with regards to natural and environmental resource use are supported.

3. Economic tools and methodologies such as monetary valuation of natural and environmental resources, cost benefit analysis and the internalisation of external environmental costs, play an increasingly important role in the decision making process with regards to natural and environmental resource use, notwithstanding considerations of constraints on sustainability.
4. All sectors of society as well as future generations are provided with an equitable opportunity to ensure that their own standard of living is maintained at a level at least the same as current generations or better. This is to be achieved in part by ensuring that the core concepts of Sustainable Development are upheld with regards to natural and environmental resource use and social development plans.
5. All major stakeholders in civil society are involved in the decision making process at every level from project development and implementation to national and



international policy development for every sector an/or issue.

- II. The NCSD shall be responsible for monitoring the implementation of this policy.
- III. The NCSD shall formulate appropriate criteria for the evaluation, assessment and review of the implementation of this policy at the sectoral, corporate, and individual levels, including the formulation of a plan of action and incorporation of the use of indicators of Sustainable Development in measuring our progress towards achieving Sustainable Development. See Box 5.
- IV. The NCSD shall formulate an appropriate public awareness and education strategy for sensitising all decision-makers, organisations, and individuals to the national principles of Sustainable Development with a

## BOX 5: INDICATORS OF SUSTAINABLE DEVELOPMENT

*Indicators are policy instruments that enable us to have informed decision making through the use of extensive data collection. The use of Indicators of Sustainable Development will help decision-makers, technicians and the public at large to focus on the issue of Sustainable Development by monitoring progress towards sustainability in three major areas: human well-being, ecological welfare and sustainable interactions (including issues such as gender empowerment, economic development, communication and transport).*

*In effect, using indicators of Sustainable Development will assist decision-makers in determining how far Barbados has progressed in the pursuit of our Sustainable Development goal. The indicators will allow us to make comparisons with other countries (spatial comparison) and with different time periods (temporal comparison). The indicators may be used to assist with the preparation of national state of the environment reports that give a snap-shot of the health of our environment. Ultimately it is anticipated that indicators of Sustainable Development will inform national accounting systems.*

*Barbados currently has a National Indicators Programme where indicators of Sustainable Development for Barbados have been developed under the three major areas of human well-being, ecological welfare and sustainable interactions. At present 170 indicators have been identified, of which approximately 65 are environmental. **These indicators are currently being tested and should assist with the monitoring and evaluation of the implementation of the policy.***

view to incorporating them into the decision-making process.

V. The government, as a partner in the pursuit of Sustainable Development, endeavours to:

1. Information

Create and/or strengthen existing formal and informal communication mechanisms to encourage information sharing, collaboration and cooperation within and among civil society groups, and between all levels of government and civil society.

2. Legal framework

Create, expand and implement the appropriate enabling legal and regulatory frameworks for Sustainable Development. The legislative framework should be sufficiently flexible to include a combination of measures such as command and control, economic and market instruments, voluntary compliance, etc.

The legal framework should also ensure the participation of civil society in Sustainable Development decisions by ensuring the inclusion of provisions in new and existing laws that guarantee timely access to information, process and justice, and when necessary eliminate impediments to public participation.

The legal framework should be strengthened to resolve issues and conflicts relating to environment and development. The legislation should encourage the use of non-adversarial and non-judicial dispute resolution mechanisms. These mechanisms may include negotiation, mediation, facilitation and arbitration. Consideration should be given to widening the powers of the Ombudsman or to the establishment of a Parliamentary Commission of Environment to assume jurisdiction for resolving issues between environment and development.

3. Institutional Changes

Develop and support institutional structures, policies and procedures that promote and facilitate interaction in Sustainable Development decisions within all levels of government and civil society, and encourage change within existing institutions to pursue a basis for long-term dialogue and innovative solutions.

4. Capacity Building

Develop and strengthen the capacity of individuals to participate in Sustainable Development decision-making with an increased base of knowledge (local, traditional and technical) of Sustainable Development issues and public participation practices.

5. Resources

Procure and expand resources (financial, human, and technological) to initiate, strengthen, and continue participatory practices in decision-making for Sustainable Development.

6. Access

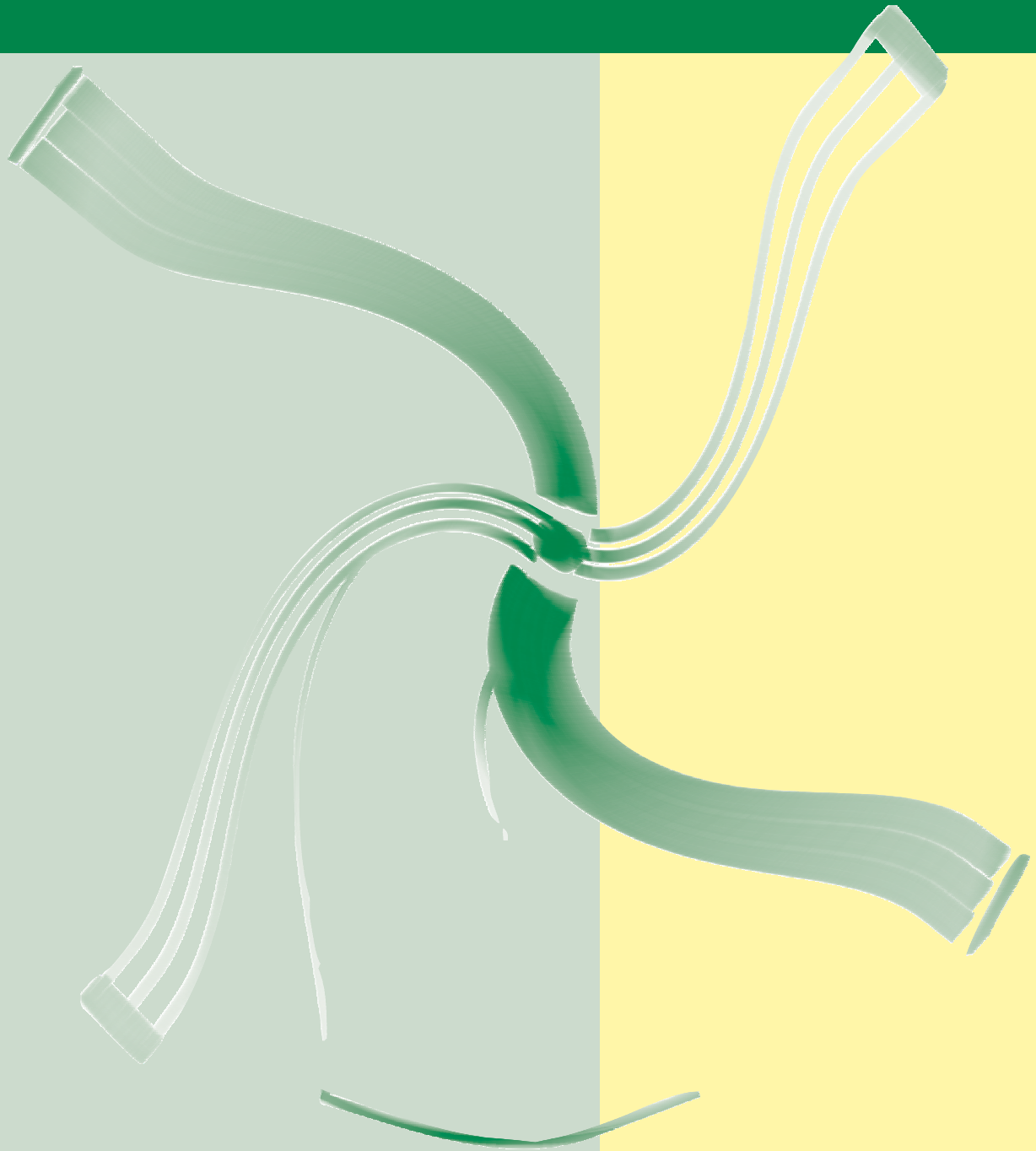
Create, strengthen, and support formal and informal opportunities and mechanisms for public participation in discussion of and decision-making in Sustainable Development activities.

VI. Civil Society including the business sector, non-governmental organisations, and community based organisations as partners in the pursuit of Sustainable Development are required to adopt and implement the national principles of Sustainable Development as outlined by this policy. Civil society is also required to incorporate these principles within their organisational action plans, strategies and programmes.





PART II  
NATIONAL  
SUSTAINABLE DEVELOPMENT  
ACTION PLAN









## 1. Introduction

This section forms the second part of the National Sustainable Development Policy. Detailed policy recommendations pertaining to specific sectors and/or issues are articulated, all with a view to fostering and supporting the pursuit of Sustainable Development. It must be noted however that although policy recommendations are detailed in a sector by sector approach, policy makers and stakeholders are encouraged to adopt an integrated approach towards policy implementation and resource management wherever possible.

## 2. Stakeholder Involvement in National Decision Making

The importance of stakeholder participation in the decision making, policy development and national planning processes is recognised and articulated as one of the core principles of Sustainable Development. This principle is best served by appropriate and enforced legislation and accountability and is advanced by the following recommendations:

2.1 The functioning of the National Commission on Sustainable Development will be bolstered with a clear legal mandate and institutional mechanism to facilitate its future roles as:

1. Monitoring body to oversee and evaluate the implementation of the National Sustainable Development Policy.
2. Ex officio member on all developmental and/or planning boards with authority over the use of natural and environmental resources, including but not limited to the BWA, BHTA, PPC etc.
3. Advisory body to Government on Sustainable Development issues or other issues with as yet unrecognised implications for Sustainable Development ("think tank").
4. Advisory body to national delegations to international and regional meetings addressing issues of Sustainable Development, or issues with implications for Sustainable Development.
5. "Endorser" of publications, projects or other initiatives which intend to promote Sustainable Development.
6. Publisher of documents evaluating in detail specific issues for concern in Barbados pertaining to Sustainable Development.



2.2 The recommendations of the National Commission on Sustainable Development will be considered with respect to decision making on national policy, projects, plans and activities related to Sustainable Development and the environment, with a view to ensuring a holistic approach to decision making within these areas;

2.3 Public participation will be facilitated and encouraged in all processes of national decision making, policy development and planning pertaining to natural resource utilisation specifically and Sustainable Development in general.

### 3. Fresh Water Resources

It is recognised that Barbados is a water scarce country and that committed work is necessary to ensure the sustainable management of this resource. Equitable allocation and ongoing monitoring of the fresh water resources of Barbados are necessary to ensure its optimal utilisation, conservation and protection.

Specific policy recommendations towards this end include:

3.1 Obtaining and analysing information and maintaining up-to-date records of the total available fresh water resources of Barbados;

3.2 Considering the establishment of a joint working agreement with the University of the West Indies (UWI) and/or any other appropriate institution, to facilitate the development and execution of an effective and comprehensive ground water research programme;

3.3 Establishment of a system whereby data related to water resources including rainfall collection, extraction, rainfall levels etc, is collected, collated and stored effectively. This information should then contribute to the development of future water use and management policies and programmes;

3.4 Phase out of the importation and use of devices that do not comply with international water conservation standards;

3.5 Conduct public education and awareness building programmes to inform about the importance of employing water conservation practices in daily life;

3.6 Continued support for the policy requiring new dwellings of a particular size to construct rain water catchment and storage tanks, including the possible revision of the policy to include existing dwellings and new dwellings of smaller sizes;

3.7 Establishment and implementation of appropriate pricing and financial concessions to encourage the above and other water conservation policies, and to render these policies economically attractive;

3.8 Continued work towards implementing an island wide metering programme supported by the introduction of an appropriate demand suppressant block tariff pricing structure of charges for water use;

3.9 Internalisation of external environmental costs of fresh water supply and utilisation into the cost of supplying the resource;

3.10 Internalisation of external social costs of fresh water supply and utilisation into the cost of supplying the resource, including the scarcity factor and the number of competing demands in Barbados;

3.11 Rationalisation of competing demands for water use in order to arrange them in an appropriate list bearing in mind the limited supplies available.

3.12 Maintaining human, financial and technical commitments towards ensuring a firm foundation for managing water use in a sustainable manner as well as for devising methods for augmenting the fresh water supply appropriately;

3.13 Development, implementation and enforcement of comprehensive and appropriate sustainable water resources management regulations and legislation;

3.14 Conducting research into the effects of the climate change phenomena including the specific effects on fresh water resources and the influence of expected rainfall reduction and increased evapo-transpiration due to temperature rise. This research will include an exploration of the most appropriate procedures to prepare for climate change and mitigate its adverse effects;

3.15 Exploring the feasibility of adopting, on an island-wide scale, the use of water-efficient technologies and practices. Consideration will be given to:

- Establishing the most appropriate pricing policies (rising block tariff structure) for water use;
- Introducing new technologies for industrial processes which allow recycling and use appliances and fixtures that meet international water conservation standards;
- Enhancing public awareness and educational campaigns to inform about the necessity and benefits of reducing water use.



3.16 Conducting an assessment of existing national expertise and knowledge available to address technical and socio-economic aspects of groundwater resources management. Any deficiencies identified will be remedied bearing in mind the resources available to the relevant national and regional agencies and institutions;

3.17 Under the West Coast Sewerage system the option of waste water treatment and reuse is to be fully explored to determine its feasibility in Barbados;

3.18 Reducing the percentage of unaccounted for water from leaks in the distribution system from an estimated 60% to 30% by the year 2016, via an integrated approach including:

- Leak detection and repair programme
- Review, monitoring and modification of the distribution system
- Assessment of total water consumption (public and private).

3.19 Revamping of the island's water resource management structure taking into consideration the findings and recommendations of the Water Resource Management and Water Loss Study;

3.20 A new national water policy shall be formulated if deemed appropriate from 3.19 above;

3.21 Separation of the regulatory and operational aspects of the Barbados Water Authority so as to eliminate the conflict of one agency being both supplier and regulator;

3.22 Conducting a cross-sectoral examination of policies which impact on fresh water resources in Barbados including, in particular, policies for tourism enhancement and agriculture;

3.23 Continuing to implement national programmes and activities which address Barbados' national obligations as Party to the United Nations Convention to Combat Desertification and drought.

## 4. Transportation

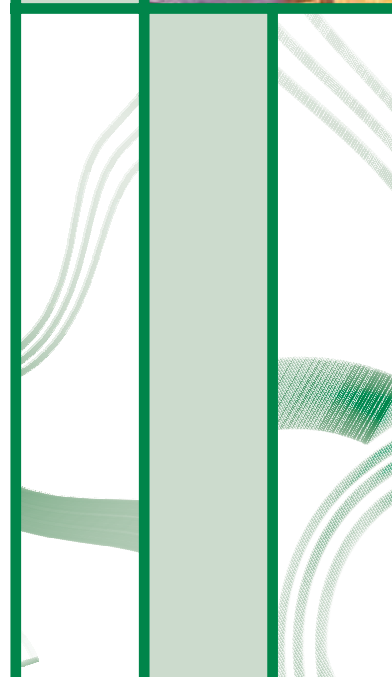
The National Sustainable Development Policy supports work to reduce environmental damage caused by various aspects of the transport sector. A major component of this thrust will be to improve the efficiency and reliability of the public transport sector so as to make this mode of transport attractive and acceptable for the majority of people in Barbados.

Policy recommendations towards this end 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.

## 5. Agriculture

Sustainable agriculture optimises the use of renewable, locally available resources and farming practices and ensures that sustainable farming technology is passed on to future generations for their continued benefit. In addition, it is envisaged that productive economic and environmental conditions with respect to the agricultural and food production sectors will be maintained into the future.

The overall policy objective is to pursue sustainable agriculture through the implementation of a strategy which preserves, conserves and sustainably uses the island's agricultural resources. Some considerations for ecological efficiency encompassed within the sustainable agriculture policy include:

- biodiversity preservation
- maintenance of water purity
- efficient and conservative water use
- conservation and improvement of chemical, physical and biological qualities of the soil
- energy conservation
- natural resource recycling and reuse where possible
- cultural appropriateness
- scientific inputs
- economic viability
- utilisation of local renewable resources
- minimisation of external and purchased inputs
- minimisation of synthetic pesticide and fertilizer inputs

- promotion of organic fertilizers
- research and development of appropriate biological pest control methods
- integrated crop management practices wherever possible

Specific policy objectives for sustainable agriculture include:

5.1 Formulating Barbados' agricultural policies via an integrated approach involving all concerned stakeholders and interest groups, with a view to ensuring sustainable domestic food production, food security and food safety;

5.2 With respect to food safety, the following recommendations are made:

- Develop national pesticide residual levels standards for food stuff both local and imported
- Develop national/regional capacity to monitor Maximum Residual Levels in food stuff , both local and imported and for food that is exported
- Develop national/regional capacity to screen genetically modified foods
- Adopt the Precautionary Principle as a policy with respect to genetically modified foods.

5.3 Carry out critical assessments of existing land use policies and legislation and amendment where necessary to ensure the sustainability of the agricultural sector;

5.4 Identify key areas of agricultural importance in Barbados with a view to optimising the use of limited biological resources which are suitable for agriculture;



5.5 Strengthening or development of mechanisms to assist small farmers in marketing and maintaining a constant supply of produce to hotels and the tourism sector in general;

5.6 Supporting farm and crop diversification as well as general production enhancement, through infrastructural developments and support such as:

- sustainable irrigation where necessary
- market facilities
- transport services for products
- education programmes on sustainable cultivation practices

5.7 Supporting and encouraging farmer training programmes which build awareness of sustainable cultivation practices;

5.8 Offering incentives, especially economic incentives, for sustainable agriculture production practices;

5.9 Promoting via suitable incentive schemes, the use of hydroponics to increase domestic agricultural production and self-sufficiency in food production to ensure efficient use of land by the agricultural sector;

5.10 Maintenance of networks to disseminate information on these practices to other farmers to encourage their adoption;

5.11 Strengthening national commitment of technical, financial and human resources towards agricultural research. This should include investigations into:

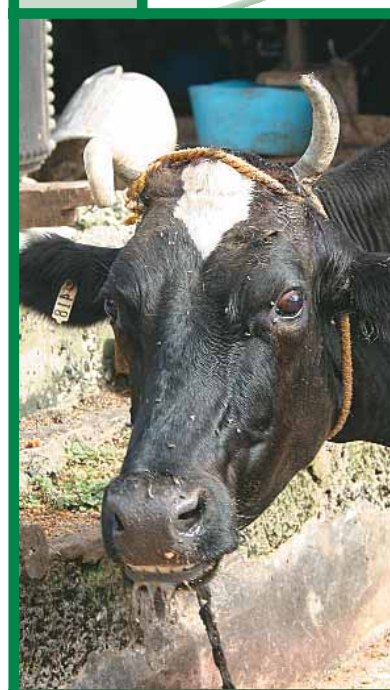
- opportunities and risks posed by bio-technology
- appropriate crop alternatives and possibilities for agricultural diversification
- alternative crops associated with less environmental "damage", for example water intensive species verses xerophytic species
- Best Management Practices for cultivation schemes
- presence and levels of chemical residuals and/or environmental contaminants in soils
- presence and levels of chemical residuals and/or environmental contaminants in food products which have been domestically produced and/or imported

5.12 Establishment of an effective and comprehensive data collection system and information dissemination service for the agricultural sector;

5.13 Within the sub-area of genetic resources for sustainable agriculture, the following recommendations are made (see also the section on biotechnology below):

5.13.1 Strengthening research into plant and animal genetic resources suitable for agricultural progress, including investigations into disease resistant strains of various crops, biological pest control agents, and alternative economically viable plants and animals;

5.13.2 Where appropriate, promoting crop diversification using cultivated strains of plants or animals which possess proven advantageous traits and no adverse effects on human health or the natural environment;



5.13.3 Dissemination of information on biotechnology and bio-safety among the agricultural sector as well as the general public;

5.13.4 Provision of training in the safe and Sustainable Development and use of plant or animal genetic resources for agriculture;

5.13.5 Development of programmes to preserve endangered populations of plants or animals which play a role in agriculture currently or may offer potential for future commercial development;

5.14 Within the sub-area of Integrated Pest Management (IPM) for sustainable agriculture, it is recommended that increased use be made of appropriate Integrated Pest Management practices and techniques to reduce chemical pesticide and fertilizer use in agriculture and to develop and introduce suitable biological controls for pest infestations.

Policy recommendations in support of Integrated Pest Management include:

5.14.1 Establishing programmes to monitor the incidence of crop diseases and pest infestations;

5.14.2 Recording in computerised form baseline information on the use of pesticides for crop maintenance in Barbados and the human and environmental side effects of their use;

5.14.3 Research into non-chemical pest management techniques which make use of pesticides that degrade to harmless substances and are suitable for use in Barbados;

5.14.4 Establishing programmes to control, via suitable IPM practices, the

incidence of crop diseases and pest infestations in Barbados;

5.14.5 Provision of education programmes on available and reliable options for pest management in agriculture which offer an alternative to chemical pesticides and support Integrated Pest Management techniques;

5.14.6 Reformulation of national policy to ensure the appropriate use and management of pesticides, especially those recognised as potentially harmful to human health or the natural environment;

5.15 With respect to energy conservation for sustainable agriculture, encouragement and support for the use of alternative renewable energy sources and improving the efficiency with which energy is utilised within the sector. Specific policy recommendations include:

5.15.1 Intensifying research into agricultural energy demands and options for improving the efficiency with which energy is used;

5.15.2 Development and use of alternative renewable energy sources and technologies suitable for integration into the agricultural sector in Barbados;

5.15.3 Execution of education programmes for farmers and other interest groups on the environmental and financial benefits of employing practices which maximise efficient energy use, or exploit renewable energy sources.

5.16 Wherever possible harness traditional knowledge within the industry with specific attention paid to sustainable technologies and practices.

## 6. Terrestrial Biodiversity Including Forestry

Sustainable use of terrestrial biodiversity is intended to ensure that such resources are enjoyed today as well as passed on to future generations for their benefit and enjoyment. The overall policy objective is to ensure sustainable use of terrestrial biodiversity in part through the implementation of a strategy which preserves, conserves and sustainably uses the island's terrestrial resources of flora and fauna.

This policy recommends:

6.1 Formulating Barbados' biodiversity conservation policies via an integrated approach which involves all concerned stakeholders and interest groups;

6.2 Making use of the findings of research studies already conducted and action plans for

biodiversity management already proposed with a view to formulating the optimal biodiversity conservation and management plan for Barbados;

6.3 Identifying key areas of ecological importance in Barbados with a view to focusing national conservation efforts on clearly defined areas and objectives;

6.4 Elaboration of appropriate sustainable management plans for ecosystems and/or species and areas of unique ecological value such as Turner's Hall Woods, Andromeda Botanical Gardens and Graeme Hall Swamp;

6.6 Pursuing the protection of biodiversity in Barbados through a combined legislative, public education and species-management approach;

6.7 Continuing to implement programmes and activities which comply with and address Barbados' national obligations as Party to the United Nations Convention on Biological Diversity, as well as the Convention for the Prevention of International Trade in Endangered Species of Flora and Fauna.

6.8 Preserve a minimum area of vegetative cover to prevent disruption of climatic patterns as well as reduce the potential economic and environmental impacts associated with soil erosion and change in rainfall patterns arising from drastic changes in natural areas and landscapes.

## 7. Fisheries

The Fisheries Division of the Ministry of Agriculture and Rural Development aims to ensure the optimum utilisation of the fisheries resources in the waters of Barbados for the benefit of the people of Barbados today and into the future. Specific policy objectives for sustainable fisheries management include:

7.1 Sustaining or increasing the potential of marine living resources to meet national human nutritional needs, as well as social and economic development goals;

7.2 Fostering the development of a sustainable fishing industry through, in part, an integrated approach to policy and decision-making concerning fisheries and coastal zone management;

7.3 Harnessing traditional knowledge within the industry with specific attention paid to sustainable technologies and practices;

7.4 Supporting the development, adoption and use of appropriate technologies within the fishing industry through information sharing and technology exchange initiatives with country partners in the Caribbean region as well as other small island states;

7.5 Ensuring that the economic interests of local communities are integrated in the development and management fisheries programmes;

7.6 Conducting periodic numerical assessments of commercial fish stocks to determine maximum sustainable yields based on historical, current and projected levels of exploitation, the relationships among species and between species and their environment, as well as all other relevant environmental, economic and social factors influencing fish harvests and the sustainability thereof;

7.7 Maintaining or restoring populations of marine species at levels that can sustainably produce maximum sustainable yields on a long term basis;

7.8 Promoting the development and use of selective fishing gear and practices that minimise waste in the catch of target species and minimise by-catch of non-target species;

7.9 Preserving rare or fragile ecosystems, ecologically-sensitive areas and endangered species, especially coral reefs, beaches, estuaries, mangroves, sea grass beds, spawning and nursery areas; and sea turtles;

7.10 Promoting scientific research and other programmes of cooperation with regional neighbours and the international community, for the sustainable management of shared, straddling and highly migratory fish stocks;





7.11 Supporting where appropriate freshwater fisheries, aquaculture and mariculture while ensuring that such operations are based on collaboration with relevant agencies and conducted in accordance with their technical guidelines;

7.12 Investigating the feasibility of using market-based economic instruments and incentives for promoting the sustainable management and use of commercial fish stocks in Barbados;

## 8. Energy

The sustainable energy policy for Barbados aims to assist Barbados in fulfilling its national obligations as party to the United Nations Framework Convention on Climate Change. In order to combat climate change induced global warming and the associated adverse repercussions, member states are required to reduce emissions of greenhouse gases. Barbados' primary greenhouse gas is carbon dioxide which is released from the combustion of fossil fuels such as oil and natural gas for electric power generation.

The sustainable energy policy recommends:

8.1 Determining and implementing appropriate economic instruments and incentives to promote energy conservation, efficient use, and where possible the switch to renewable energy alternatives;

8.2 Introduction of legislation supporting the development and use of alternative renewable energy sources, including:

- Fines and/or appropriate penalties for non-compliance with energy conservation standards
- Consumer protection with respect to electricity pricing
- Support for independent power producers
- Appliance labeling requirements

8.3 Articulation of standards for efficient energy use and performance of technologies;

8.4 Encouraging the large scale use of renewable energy sources through establishing guidelines to govern the contribution of renewable energy sources to domestic electric power

## 9. Biotechnology

This relatively new area in Barbados must progress in a safe and sustainable manner. The National Sustainable Development Policy recommends:

9.1 Development of a comprehensive national policy on the issues of biotechnology and biosafety, including:

7.13 Implementing the use of such instruments and incentives where they are shown to be potentially effective, accompanied by appropriate awareness building programmes for relevant stakeholders and the general public;

7.14 Continuing to implement programmes and activities which comply with and address Barbados' national obligations as party to various regional and international conventions and agreements related to sustaining global fisheries resources.

Such guidelines may include stipulations that:

- Electricity companies be required to purchase energy generated from renewable sources
- The major electricity supplier compensate for ebbs and flows in energy output from renewable sources during the development phase of these sources
- Electricity cost from renewable sources should exhibit long-term economic viability, even if initial Government subsidy during the implementation phase is necessary.
- Independent power producers should get access to the distribution system

8.5 Promoting research into the development of renewable energy technologies appropriate for use in Barbados;

8.6 Promoting and providing education and training opportunities in the renewable energy sector for postgraduate students as well as ongoing training for those employed in the sector, with a view to ensuring widespread adoption of renewable energy technologies;

8.7 Conducting public education and awareness building programmes about the use of renewable energy technologies;

8.8 Facilitating the involvement of all relevant stakeholders in promoting the use of renewable energy sources as well as in other related issues;

8.9 Cooperating in regional initiatives aimed at enhancing the development and use of renewable energy sources.

- Establishing a national position on the Biotechnology/Biosafety Protocol of the United Nations Convention on Biological Diversity;
- Developing specific guidelines and requirements for conducting bio-

prospecting operations in Barbados;

- Rationalisation of national copyright issues pertaining to bio-prospecting and the use of indigenous genetic resources.

9.2 Continued support for research into the national status of biodiversity resources in order to develop a comprehensive database/inventory of these resources;

9.3 Articulation of management plans for all species especially those which are unique, exotic or of particular value for use in biotechnology related programmes;

9.4 Encouraging and supporting biotechnology and biosafety-related research and development including allocating appropriate human, technical and financial resources to this field of study;

9.5 Initiating and/or strengthening programmes to collect germ plasm in gene banks for the use in bio-technology research and development initiatives;

9.6 Ensuring the security of state, community and individual property rights with regards to genetic resources found in Barbados and products developed therefrom.

## 10. Research & Development

The potential benefit offered for by the promotion of Sustainable Development in many sectors through research and development within those sectors, is recognised. Research and development in a wide range of relevant disciplines is recognised as critical for encouraging the evolution of renewable resources, sustainable manufacturing processes, waste management, and so on. Policy recommendations within this context include:

10.1 Supporting existing research programmes related to Sustainable Development and environmental issues, as well as initiating and pursuing new and innovative programmes as appropriate;

10.2 Encouraging research and development of environmental management practices and/or "clean technologies" that are appropriate for introduction to the industrial, manufacturing and/or any other sector in Barbados;

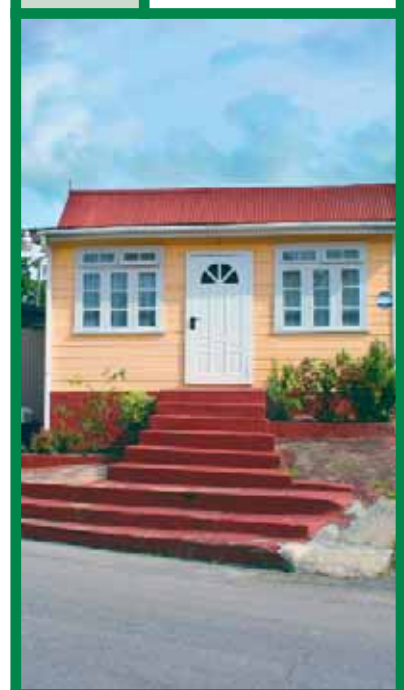
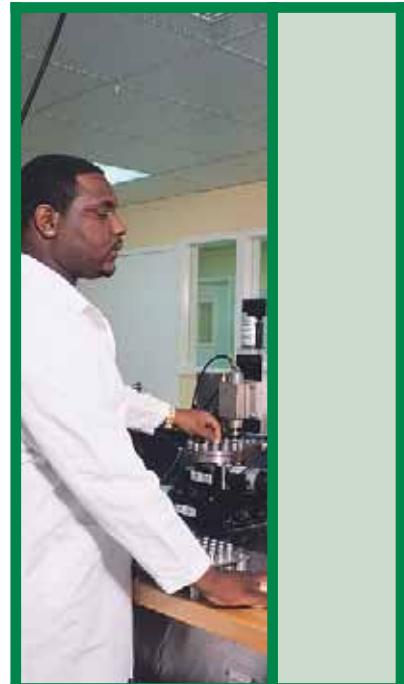
10.3 Compiling and maintaining a comprehensive databases of information on research studies and their findings related to the field of Sustainable Development, especially those with a specific angle towards small island developing states. Such a database should be:

- Accessible by Internet
- Updatable by information submitters
- Searchable by users
- Downloadable
- Linked to other relevant web sites
- Varied in content

10.4 Encourage the dissemination of information to disadvantaged groups in particular.

## 11. The Built Environment

The National Sustainable Development Policy aims to ensure that the built environment in Barbados, that is all structures and



surfaces that are man-made, are manufactured, constructed, and/or erected, in a sustainable manner. The policy therefore aims to safeguard individuals from risk or danger associated with the utilisation of those structures and surfaces, as well as their continued existence in a desirable and functional state as long as possible. To this end, policy recommendations include:

### **Building Code**

- 11.1 Full adoption and implementation of an agreed Barbados National Building Code;
- 11.2 Establishing, introducing and enforcing appropriate legislation and regulations to support the implementation of the Barbados National Building Code;
- 11.3 Developing appropriate and effective institutional and administrative structures to support the building code;
- 11.4 Conducting awareness building and education programmes targeted at pertinent interest groups and the general public to inform about the importance of adopting basic sustainable construction practices and code requirements, as well as about the specific code requirements themselves;
- 11.5 Encouraging the insurance sector to promote sustainable building practices possibly by offering lower premiums or special deals for

## **12. Land Resources**

Policy recommendations for sustainable land use span many sectors. Reference should be made to other sections within this policy paper including but not limited to transport, the built environment, waste management, agriculture, biodiversity, coastal and marine resources, and fresh water resources. Policy recommendations towards achieving sustainable land use include:

- 12.1 Continued maintenance by the Town and Country Development Planning Office of a computerised Geographic Information System (GIS) land use database for Barbados;
- 12.2 Use of the GIS land use database to facilitate the coordination, collection, storage and sharing of land use information with governmental agencies and other interest groups;
- 12.3 Use of the GIS land use database for national development planning, review of planning/development applications, and general decision and policy-making with regards to sustainable land use;
- 12.4 Ensuring that such data as defined above is available for use by interested individuals including in particular contractors, architects and engineers, so that they too are in a position to promote sustainable land use

appropriately constructed buildings as well as those that have been refurbished with consideration for the Barbados National Building Code;

### **Materials and Design**

- 11.6 Encouraging interest groups to manufacture materials via sustainable processes, using materials that are themselves sustainable. For example, composite boards like chipboard and medium density fibreboard contain resin which deters termites and in some cases may be a useful alternative to plywood;
- 11.7 Encourage the integration of cultural considerations and influences into building design and project developments with particular reference to the use of indigenous construction materials and encouraging the promotion of a unique island-wide Barbadian appearance to the built environment e.g. chattel house features;
- 11.8 Investigating options for building materials and design which reduce energy demand, for example, from lighting and air conditioning;

### **Roads And Traffic Flow**

- 11.9 Including sidewalks, access for the disabled and cycle paths wherever possible in plans for new roads and road upgrades. (See also Section 4 on Transport).

programmes;

- 12.5 Integrating concerns for sustainability into the establishment of future national land use plans and policies (especially the Physical Development Plan) and amending or enacting relevant legislation so that the Physical Development Plan becomes legally binding by all parties including the crown;
- 12.6 Any changes to the Physical Development Plan (PDP) after the Development Application approval process should be transparent with clearly stated reasons when decisions are in conflict with the guidelines in the PDP. The PDP should be amended to reflect any changes in land use.
- 12.7 Application by the Town and Country Development Planning Office of the requirement that an Environmental Impact Assessment be conducted and submitted to an Environmental Committee for consideration prior to deciding on approval or denial for certain applications to that office;
- 12.8 Approving land use plans and developments based on the requirement that the development does not adversely effect the environment or inhibit national Sustainable Development;



12.9 Researching options available for more efficient utilisation of limited land space, including a possible revision of current building height restrictions;

12.10 Designating areas where hazardous chemicals are used, as hazardous sites, particularly if the land use is to be changed.

### 13. Natural Resources

This section refers in general to any aspect of Barbados' natural resource endowment. More detailed policy recommendations regarding terrestrial biodiversity, fisheries, coastal and marine resources, as well as land resources, may be found in sections dedicated to those topics. It is recommended that:

13.1 Detailed investigations be conducted to determine the potential carrying capacity of Barbados' terrestrial and marine ecosystems with a view to assessing their ability to continue functioning as sources of resources and services for use by the present and future generations;

13.2 Information generated from the above be used to articulate the potential for continued use of Barbados' natural resources and services along "Business as Usual" scenarios, as well as changes in use practices that are necessary to ensure the sustainability of Barbados' natural resources and services.

### 14. Education & Training

Recognising that education policies have facilitated Barbados' development to date, it is strongly recommended that these policies be preserved, improved upon and passed on.

The National Sustainable Development Policy supports the sustainable evolution of the formal education sector in Barbados. Other appropriate forms of education also have an immense part to play in knowledge sharing and information dissemination and these initiatives are welcomed in order to affect attitudinal change. It is noted that recommendations of the National Sustainable Development Policy in general, and pertaining specifically to education, are intended to target the general public as well as specific target groups wherever appropriate. Within this context it is recommended that:

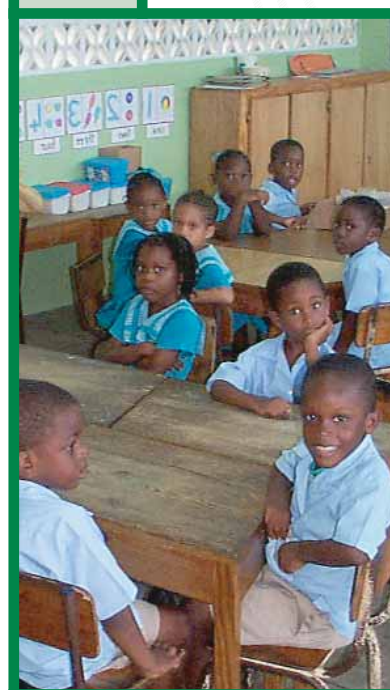
14.1 Awareness building and educational programmes be executed to provide information on Sustainable Development and specific environmental issues that are of particular concern to Barbados;

14.2 The involvement of individuals and interest groups in activities which focus on environmental conservation and Sustainable Development is be encouraged;

14.3 Information be gathered and disseminated to the private sector on options available for implementing Environmental Management Systems for daily practices and operation, with a view ultimately to encouraging the voluntary adoption of a private sector led Sustainable Development programme;

14.4 Promote information and education in the areas of environmental health and safety programmes in keeping with accepted environmental standards;

14.5 Various groups involved in education and awareness building programmes with relevance to Sustainable Development, cooperate so as to ensure comprehensive coverage of important issues, efficient dissemination of information, and to avoid duplication of responsibilities.



## 15. Waste Management

The recommendations of the National Sustainable Development Policy 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 complied with by all individuals, sectors, industries etc, as appropriate. More specific policy recommendations include:

### Air Emissions

15.1 Establishing monitoring programmes to measure air quality both indoors and at low-level atmospheric levels;

15.2 Developing standards to ensure maintenance of appropriate air quality levels which protect human health and meet at least minimum international standards;

15.3 Establishing guidelines and procedural requirements to guide the management of sectors that impact on air quality, e.g. transport, in order to ensure minimisation, and if possible elimination, of adverse environmental and health effects from poor air quality;

15.4 Continuing to implement programmes and activities which comply with and address Barbados' national obligations as Party to relevant international Environmental Agreements such as the Vienna Convention on the Ozone Layer and the associated Montreal Protocol on the Phase Out of Ozone Depleting Substances.

### Solid Waste Management

15.5 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 and which the Commission fully endorses.

15.6 Continuing efforts towards introducing and adopting the various recommendations of

the Integrated Solid Waste Management Plan;

15.7 Encouraging the involvement of private sector enterprises and other stakeholders in sustainable waste management initiatives;

15.8 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;

15.9 Completion of the various projects for sewerage treatment and management, including the South Coast Sewage Project, the planned west coast facility, as well as the upgrade of the Bridgetown plant;

15.10 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 Waste (MARPOL73/78).

### Hazardous Waste

15.11 Development of a comprehensive policy to guide the management of hazardous materials including chemicals for agriculture and/or manufacturing, as well as wastes;

15.12 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;

15.13 Development of appropriate legislative measures to support the implementation of policy recommendations;

15.14 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 minimise future incidents of pollution.

## 16. Regional Cooperation

Cooperation in initiatives in the region to promote Sustainable Development is recognised as a pivotal component in the achievement of this goal at any level, from national to global. Aspects of the regional cooperation policy would include:

16.1 Assisting in and pursuing as appropriate the further articulation and detailing of the resolution to designate the Caribbean Sea as a

Special Area in the Context of Sustainable Development;

16.2 Developing procedures and codes of practice to facilitate the establishment of joint regional positions regarding new international environmental agreements (or amendments to existing agreements), with a view to ensuring that Small Island Developing States (SIDS) specific concerns are considered at negotiating

fora;

16.3 Agreeing on joint regional representation at international fora wherever possible so as to ensure that optimal use is made of limited regional skills and expertise;

16.4 Coordinating regional enforcement procedures and mechanisms for compliance with international environmental laws and regulations, especially those pertaining to the protection and sustainable management of the Caribbean Sea and its resources;

16.5 Coordinating wherever possible region-wide recycling efforts for non-bio-degradable waste so as to achieve economies of scale in the production of recycled commodities.

16.6 Cognizant of the fact that many problems affect the entire region and collaboration between nations is necessary, the Commission encourages and supports transparency in enforcement of procedures and mechanisms dealing with communicable diseases and pests (eg. the pink mealy bug) that have to be addressed on a regional front.

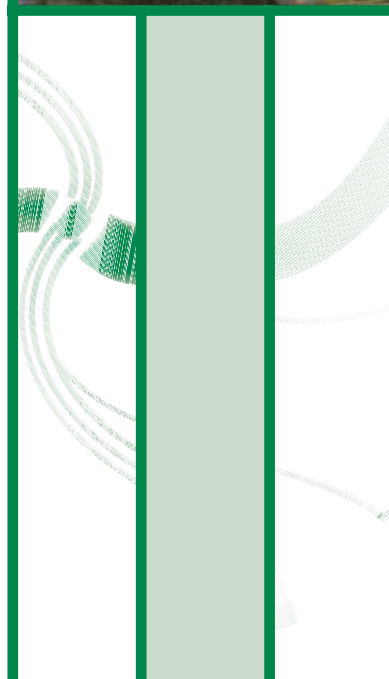
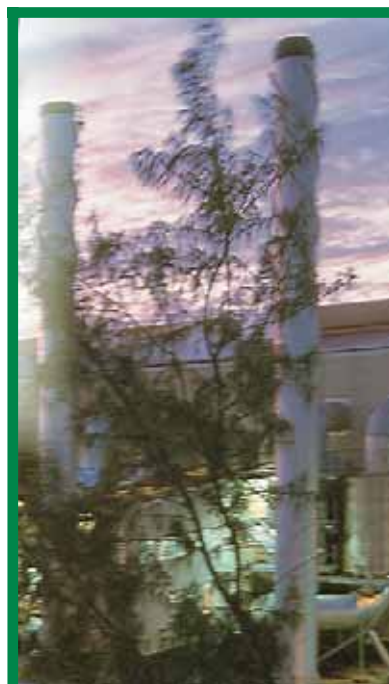
16.7 Government awareness of the problems related to transfer of exotic species and possible detrimental environmental consequence. Attention should be paid to intra-regional movement of equipment, soil, wood and quarrying materials (e.g. sand and limestone).

## 17. Concessions & Incentives

It is recognised that the achievement of Sustainable Development in many cases is facilitated and encouraged through the use of various and appropriate financial and economic instruments and incentives. An example of this in Barbados is the existing policy on the provision of BDS \$3,500 tax rebate for the installation of domestic solar water heaters.

The foremost recommendation made to encourage the use of economic incentives and instruments for Sustainable Development and management of natural resources is that a comprehensive assessment of such mechanisms be conducted to determine those appropriate for use in Barbados. This analysis should reveal:

- A. The feasibility of offering tax-back incentives to encourage various environmentally friendly and/or sustainable practices including:
  - Installation of water saving devices;
  - Installation of energy conserving equipment and fixtures;
- B. Appropriate incentives to encourage:
  - Adoption of appropriate waste disposal practices;
  - Implementation of voluntary programmes by the industrial and business sectors, including meeting environmental standards and establishment of Environmental Management Systems.
  - Manufacturers who produce/utilise equipment operating on clean energy.
- C. The possibility of providing duty free concessions for imports of:
  - Equipment/machinery which utilise 'clean' fuels, for example compressed natural gas





- Goods or equipment for recycling processes
- Recycled goods and/or "green" products
- Goods with minimal packaging material
- Equipment/products which utilise clean energy

The assessment report and the associated recommendations are to be discussed by the National Commission on Sustainable Development and the relevant Government Ministry for further refining, public review, Cabinet approval and implementation.

## 18. Human Health, Well-Being & Poverty

The National Sustainable Development Policy recognises that human resources are critical to national development. Individuals must be educated and encouraged to be productive for the successful pursuit of Sustainable Development. Within this context the National Sustainable Development Policy is based on the key principles of equity, quality of life and participation, which all seek to ensure adequate, appropriate and sustained development of the country's human resources.

The following are recommended:

18.1 Support for and strengthening of community efforts towards self-reliance and self-development;

18.2 Continued commitment of financial, human and other resources to caring for vulnerable social groups including the elderly, mentally challenged, disabled, poor, homeless and abused. Programmes initiated towards this objective may include:

- Establishment or strengthening of community outreach programmes and centres;
- Joint initiatives between Government, Non Governmental Organisations (NGO) and the private sector;
- Community level programmes specifically targeting young males;
- Reproductive health programmes targeting specific groups.

18.3 Continuing and supporting the execution of Government's programmes for poverty eradication and the provision of adequate shelter for all persons;

18.4 Execution of programmes by relevant agencies and organisations, with the support of other concerned stakeholders, to raise awareness among the general public and specific target groups of socially regressive problems and options for avoiding and/or combating them. Problems to be included in such programmes include:

- Drug abuse
- Sexual promiscuity and the spread of sexually transmitted infections

- Domestic violence
- Gender and race discrimination
- Alcohol and tobacco dependency

18.5 Addressing the issues of population growth through the articulation of a definitive national policy for the achievement of a sustainable demographic structure for Barbados.

It is recognised that within the broad group of those living below the poverty line some, especially women, children and the elderly, are more vulnerable than others. Recognising the role played by agencies such as the Ministry of Social Transformation, the Urban Development Commission, Rural Development Commission and the Youth Entrepreneurship Scheme in reducing poverty and empowering communities, it is recommended that in the context of Sustainable Development, an effective poverty mechanism should encompass demographic issues, rights of women, the role of youth and local communities in conjunction with the continued promotion of economic growth and the strengthening of employment and income generating programmes. The Commission therefore endorses:

18.6 The further empowerment of the poor through protection of their civil rights, policy reforms, and actions to allow them access to basic amenities including *inter alia* food, shelter and reliable transport.

18.7 The continued collaboration between government and NGOs in the development of social safety nets to prevent persons from falling into destitution.

18.8 The formation of partnerships between Government, other organisations and international groups to support a community - driven approach to sustainability.

18.9 Seeking, where appropriate, to recognise and integrate informal sector activities into the economy by removing regulations and hindrances that discriminate against activities in those sectors.

The Commission further encourages that poverty eradication be a core priority of national economic policy.

## 19. Gender

Recognising that Sustainable Development requires the full involvement and integration of all persons into the development process; and recognising that all forms of gender-based discrimination must be eliminated, the Commission recommends:

19.1 Development of a broad gender perspective at all levels of education;

19.2 The development of curricula in gender studies for all teachers;

19.3 The harmonisation of legal reforms geared towards eliminating gender discrimination;.

19.4 The formulation and implementation of clear governmental policies and national guidelines, strategies and plans for the achievement of equality in all aspects of society, including the promotion of literacy, education and training; nutrition and health;

19.5 Implementation of a gender perspective in all governmental policy planning.

## 20. Population

The ability of any country to achieve Sustainable Development depends largely on the patterns of social, economic and related behaviour of its population. Several population or demographic variables impact on Sustainable Development and these include fertility, mortality, population growth, migration, population redistribution and urbanisation. The age and gender composition of the population together with the patterns of social and economic development, production patterns and consumption practices and preferences also impact on the achievement of Sustainable Development.

In Barbados, the main issues include the lack of a clearly defined national population policy and the need to sustain current levels of population growth.

Population related issues include gender and equity, population aging and demographic transition (i.e. declining fertility and mortality, stagnant population growth, increasing urbanisation, life expectancy and population aging; etc.). There is also the issue of the high incidence and prevalence of HIV/AIDS, which has the potential to adversely impact on the country's population, in particular, the labour force. The National Commission on Sustainable Development recommends:

20.1 Establishment of a national institution with the mandate for population issues.

20.2 Formulation, development and implementation of a national population policy to set directions for, and clearly define, the country's population goals and objectives.

20.3 Development of strategies and mechanisms to ensure the adequate inclusion of population variables in the formulation, development and delivery of policies and social programmes.

20.4 Strengthening institutions such as the Ministries of Health, Housing and Social Transformation to enable them to deal adequately with issues associated with population aging (geriatric services in housing, health, recreation etc.).

20.5 Encouraging public and private sector agencies to consider gender issues in planning, development and delivery of programs and



policies.

20.6 The improvement of strategies to ensure the sustainability of current levels of fertility, mortality and population growth by providing requisite resources to agencies such as the Barbados Family Planning Association, the Ministry of Health and relevant NGOs to address issues related to fertility, family planning and sexual and reproductive health.

20.7 Development of strategies to ensure the provision of adequate amenities to meet the needs of growing population centres including food, housing, transportation, energy, water and sewerage, waste management, recreation, telecommunications and other urban infrastructure.

## 21. Disaster Management

The National Sustainable Development Policy recognises the importance of preparing as far as possible for and mitigating against the adverse repercussions of man-made and natural disasters. The following recommendations are made:

21.1 Support for programmes of the Central Emergency Relief Organization and strengthening of that agency's risk assessment, disaster mitigation, management and emergency response capacity;

21.2 Establishment of temporary emergency shelters and coordinated community programmes to deal appropriately with disaster and/or emergency situations;

21.3 Minimise loss of life by having adequate disaster evacuation plans;

20.8 Encouraging and strengthening the appropriate ministry to develop and implement appropriate land use policies and practices, reduce undesired environmental practices, and educate Barbadians about positive practices.

20.9 Strengthening the national statistical organization, Barbados Statistical Service, to enable it to collect, compile, analyze and present accurate, complete, reliable, disaggregated and timely demographic data for planning, policy and program development.

20.10 Strengthening, funding and encouraging demographic training and research and in particular research on the complex issues involved in population and the environment.

21.4 Conduct of post-disaster assessments of environmental consequences and implementation of procedures and programmes to address pertinent issues;

21.5 Consideration of the implications of natural and man-made disasters in the appraisal of planning development applications, and any Environmental Impact Assessment Reports associated with such applications;

21.6 Assessment of vulnerability to particular natural disasters to be carried out. The risk assessment approach to land-use management is encouraged as well as greater awareness of the hazardous index .

Reference should also be made to Section 11 of this paper addressing the issue of the "Built Environment".

## 22. Coastal & Marine Preservation

The National Sustainable Development Policy supports the work of the Coastal Zone Management Unit (CZMU) in promoting the sustainable management of the island's coastal and marine resources in order to retain their vital and pivotal role in the economic, social and physical development of Barbados.

Specific policy objectives for sustainable management of coastal and marine resources include:

22.1 Improving control of the development process within the island's coastal zone;

22.2 Providing for maintenance and/or rehabilitation of coastal environments and their resources;

22.3 Identifying coastal reaches which may benefit from structural and non-structural protection or enhancement;

22.4 Providing water quality objectives for

coastal waters that will be used to evaluate and control discharges, and to develop remedial action plans;

22.5 Providing measurement and monitoring of key parameters of the coastal area for environmental and human health;

22.6 Offering an improved opportunity for education and training on coastal management amongst Government and coastal user groups;

22.7 Providing increased public education and sensitisation to all sectors of society on the importance and proper use of the coast and the factors affecting coastal integrity;

22.8 Adapting and implementing recommendations from the ongoing study being executed by the Coastal Zone Management Unit;

22.9 Completing the construction of the coastal sewerage treatment facilities, commencing the analogous project for the west



coast and the upgrade of the Bridgetown facility, in order to eliminate point sources of pollution along the island's coastline;

22.10 Compliance with international conventions and instruments aimed at general ocean preservation;

22.11 Cooperation with other Caribbean Governments through the CARICOM Sustainable Development Programme towards further pursuing the designation of the Caribbean Sea as a Special Area within the Context of Sustainable Development;

22.12 Designating specific marine areas for protection and preservation. These areas need to be shown on the official maps of Barbados.

## 23. Consumption Patterns

The National Sustainable Development Policy requires the development of a comprehensive eco-labeling procedure and mechanism for consumer goods so as to allow the average consumer to be a more active participant in the pursuit of Sustainable Development. The Commission encourages sustainable consumption patterns, through public education.

## 24. Implementaion & Legislation

The stated objectives of the National Sustainable Development Policy will be supported and facilitated through the articulation of appropriate and enforceable legislation and regulations. Within this context, the following policy recommendations are included:

24.1 Evaluating from a national perspective, the issue of property rights as it relates to environmental matters (including natural resource conservation, biotechnology and biosafety, emission reduction, pollution, etc);

24.2 Determining appropriate liability regulations (strict liability versus negligence), for Barbados while considering different environmental circumstances/situations;

24.3 Determining most appropriate procedures and mechanisms for effectively enforcing policy and legislated requirements;

24.4 Endorsing the "Polluter Pays Principle" as a pivotal component of the foundation of Barbados' National Sustainable Development Policy;

24.5 Reviewing, considering and amending as appropriate the legislative recommendations governing the environment;

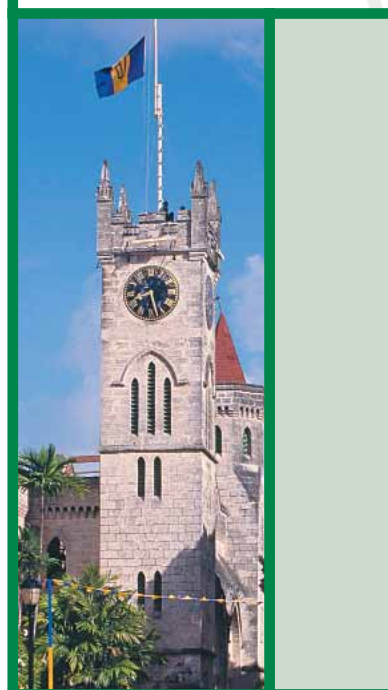
24.6 Designing, reviewing and amending appropriately legislative instruments, liability rules, penalties and compensation requirements for pollution prevention and sound environmental management.

24.7 Enacting agreed legislation for environmental management and Sustainable Development in the shortest possible time frame;

24.8 Execution of public awareness programmes to inform of requirements relating to new or amended legislation and regulations for environmental management and Sustainable Development;

24.9 Providing personnel training opportunities to:

- Improve the capability of existing attorneys to deal with matters pertaining to environmental law;
- Equip enforcement personnel with knowledge of new



legislation, requirements etc, and their enforcement responsibilities; and

- Strengthen the Environmental Law component of the University of the West Indies Law Programme;

24.10 Supporting programmes to develop standards for various environmental concerns e.g. waste disposal, emission levels, etc., which would form part of national regulations and legislation.

## 25. Indicators for Sustainable Development

The National Policy for Sustainable Development supports fully the development and use of appropriate indicators to demonstrate the country's progress along the road of sustainability and, more specifically, to monitor and evaluate the implementation of policy recommendations articulated within this document. Within this context it is recommended that:

25.1 Consideration be given to the findings and recommendations of the Indicators Steering Committee of the National Commission on Sustainable Development.

25.2 Review of the indicators work be conducted from an integrated perspective so as to ensure that consideration is given to the Steering Committee recommendations by a wide cross-section of interest groups;

25.3 Some procedure be put in place to allow amendment or augmentation of the agreed list of core indicators for Sustainable Development, so that this can be updated appropriately as national and/or international circumstances change.

## 26. Sustainable Tourism Development

The National Commission on Sustainable Development recognises that the tourism industry is Barbados' "major economic engine" and that many thousands of employment opportunities are provided, and livelihoods supported, by that industry. It also notes that Barbados' tourism industry has not traditionally evolved along a sustainable path. Major and urgent transformations away from the "business as usual" mode of operation are critical if this country is to experience positive social and economic progress into the future through tourism.

Concerns for environmental conservation and preservation are integral considerations in this sustainable tourism policy by virtue of the fact that Barbados' natural and environmental resources and services have always dominated our tourism product, and are expected to continue to do so. Having said this, the Commission acknowledges the efforts of the Ministry of Tourism to prevent or reduce the adverse impacts on our environment through the adoption of new legislation and tourism policy. Within this context it is recommended that:

26.1 A critical and comprehensive assessment of Barbados' tourism industry be conducted with a view to determining its potential viability into the future (i.e. carrying capacity) under various developmental scenarios including:

- "Business as usual"

- More conservative use of natural resources
- Voluntary environmental management
- Regulated environmental management
- Economic incentives and instruments to promote environmental compliance

26.2 Marketing programmes promoting Barbados as a tourism destination stress this country's efforts to promote sustainable national development and to contribute to global sustainable initiatives;

26.3 Visitors to the island are encouraged via appropriate means to comply with voluntary or regulated environmental management efforts;

26.4 All those involved in the tourism sector be required to implement environmental management programmes for their individual operation;

26.5 Conduct for the general public in Barbados, including those involved in the industry, awareness programmes that stress the importance of developing sustainable projects which focus on the tourism product in Barbados;

26.6 Appropriate support be offered to stakeholders attempting to pursue tourism-related initiatives which are socially, economically and environmentally sustainable.

## 27. Conclusions

The National Sustainable Development Policy is intended to provide an integrated and holistic

representation of Barbados' goals with regard to Sustainable Development, and to articulate

specific recommendations for policy within a range of sectors, all aimed at fostering national Sustainable Development.

This list of specific policy recommendations has been compiled via a wide consultative process with the intention of encompassing the great range of concerns which impinge upon Sustainable Development. It is evident that the issues of which Sustainable Development is constituted are many and varied and this list should not be considered to be exhaustive. Rather, the recommendations are intended to offer some initial guidance to those involved in specific sectors or fields and, in particular, those involved in making decisions about how those sectors and fields progress into the future.

The National Sustainable Development Policy is intended to function as an essential tool for every policy and decision-maker in Barbados. It is expected that those persons in whose hands this country's future lies will use the policy document as an aide in their daily decision-making process. Overarching principles and concepts which form the foundation of Sustainable Development for any sector are articulated in Part A of the policy document.







# ANNEX 1: CONTRIBUTORS TO THE NATIONAL SUSTAINABLE DEVELOPMENT POLICY AND ACTION PLAN

## NATIONAL COMMISSION ON SUSTAINABLE DEVELOPMENT

### CABINET APPOINTED 2000

Professor The Honourable Oliver Headley, Director, Centre for Resource Management and Environmental Studies (CERMES), University of the West Indies, Chairman  
Director of Research and Planning, Ministry of Finance and Economic Affairs, Deputy Chairman

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Ms. Undine Whittaker/Mr. Orlando Scott, Coalition of Trade Unions and Staff Associates (CTUSAB)

Mr. Andy Taitt, Small Business Association

Ms. Esther Marshall, nominee of Chief Town Planner

Mr. Richard Carter, Director of Youth Affairs

Mr. Nigel Jones, Nominee of Chief Agricultural Officer

Dr. Colin Hudson, Technologist

Chief Community Development Officer or nominee

Mrs. Gwendah Alleyne, nominee of Permanent Secretary, Ministry of Social Transformation

Mr. Gordon Bispham, Barbados Association of Non Governmental Organisations (BANGO)

Ms. Jacqueline Banfield, National Organisation of Women

Rev. Errol Connor/Kes Amha Selassie Yaicob, Barbados Christian Council

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Mr. Carson Browne, Development Planner/Mr. Barry Headley, Ministry of finance and Economic Affairs

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Mr. Tom Cowards, Project Officer, Caribbean Development Bank

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Dr. Leonard Nurse, Director/Ms. Althea Batson, Coastal Zone Management Unit

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Dr. Delisle Worrell, Deputy Governor/Ms. Denny Lewis-Bynoe,, Central Bank of Barbados

Mr. Rudy Headley, Ministry of Housing and Lands

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Mr. Wendell Burnett, Chief Environmental Assistant, Environmental Engineering Division  
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Ms. Glendine Sealy, National Conservation Commission  
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Mr. W. Levine, Barbados Industrial Development Corporation  
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National Commission on Sustainable Development  
Ministry of Housing, Lands and the Environment  
Government of Barbados

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