



1. INTRODUCTION

The National Sustainable Development (NSD) Policy is a product of the National Commission on Sustainable Development (NCSA). 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 Environment¹ serving as Secretariat.

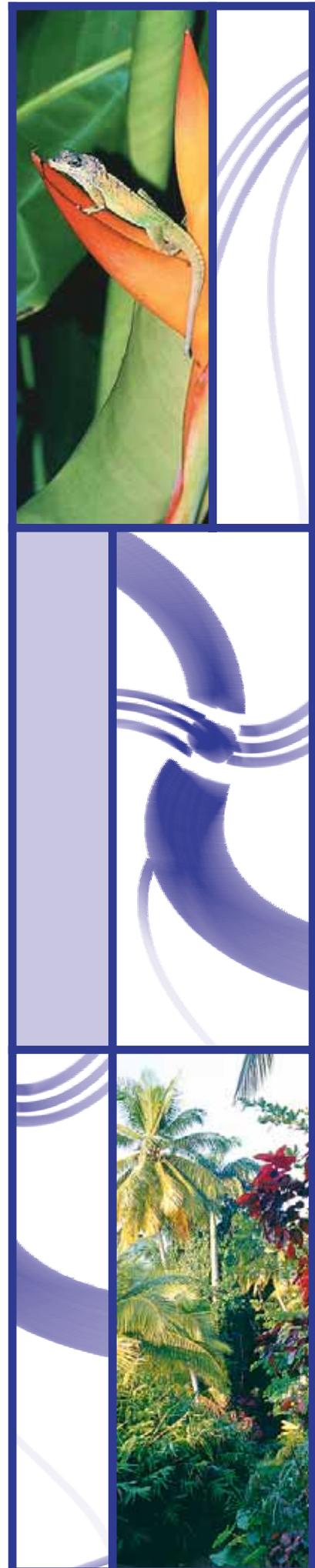
The formulation of the NSD Policy is envisaged as one component of a new approach to Sustainable Development in Barbados, one which aims to deal with individual issues from an integrated and holistic perspective. The NSD Policy has implications for a wide range and diversity of subjects going beyond 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.

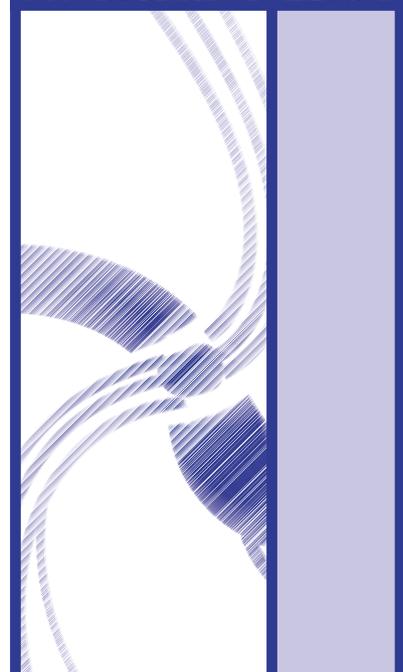
¹In 1997, the Ministry was designated the Ministry of Health and Environment; in 1999 the Ministry of Environment, Energy & Natural Resources. In 2002 it became the Ministry of Physical Development and Environment. In 2003 the designation of Ministry of Housing, Lands and the Environment was assigned.



2. POLICY AIMS

Generally, 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.

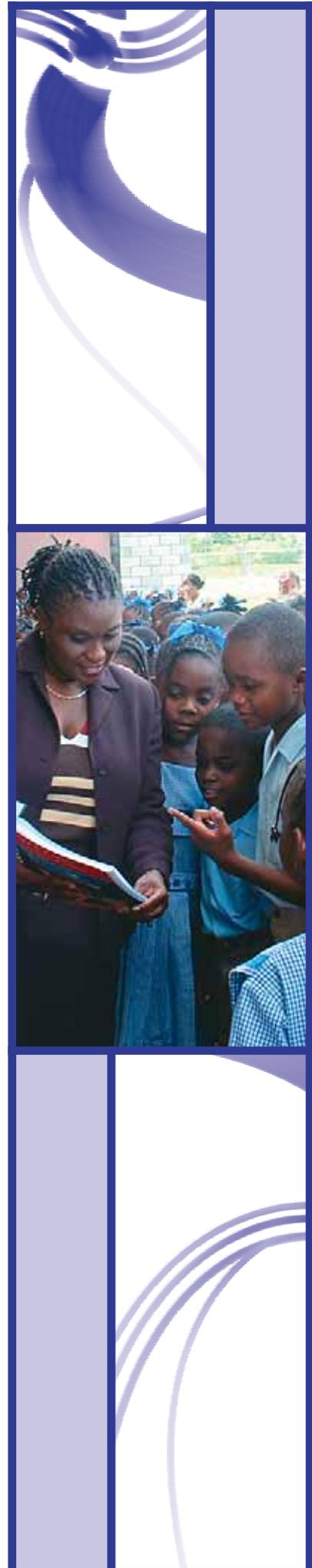
To provide some focus in an area as immense and as hotly debated as Sustainable Development is, and to ensure that priorities are addressed from a common perspective, reference is drawn to two working definitions. The first comes from the 1992 report to the United Nations Conference on Environment and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

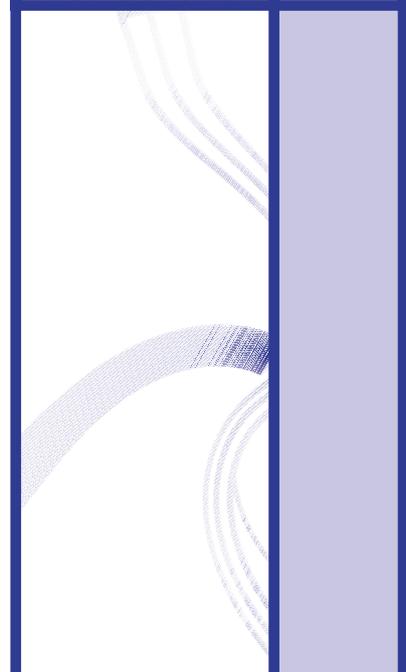
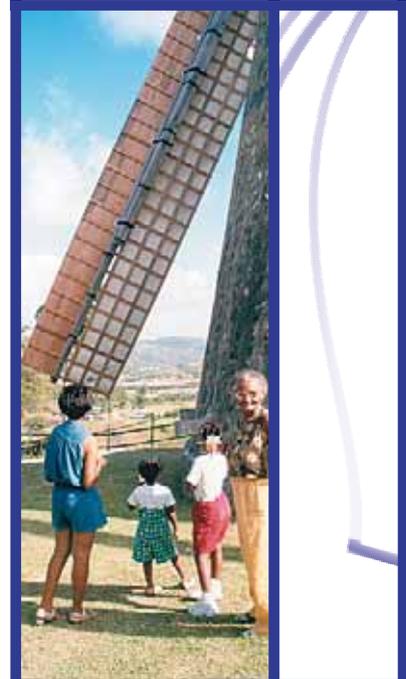
This policy examines the core concepts of Sustainable Development upon which the national definition was built and in light of which specific policy statements are made. The main objectives of this policy are:

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



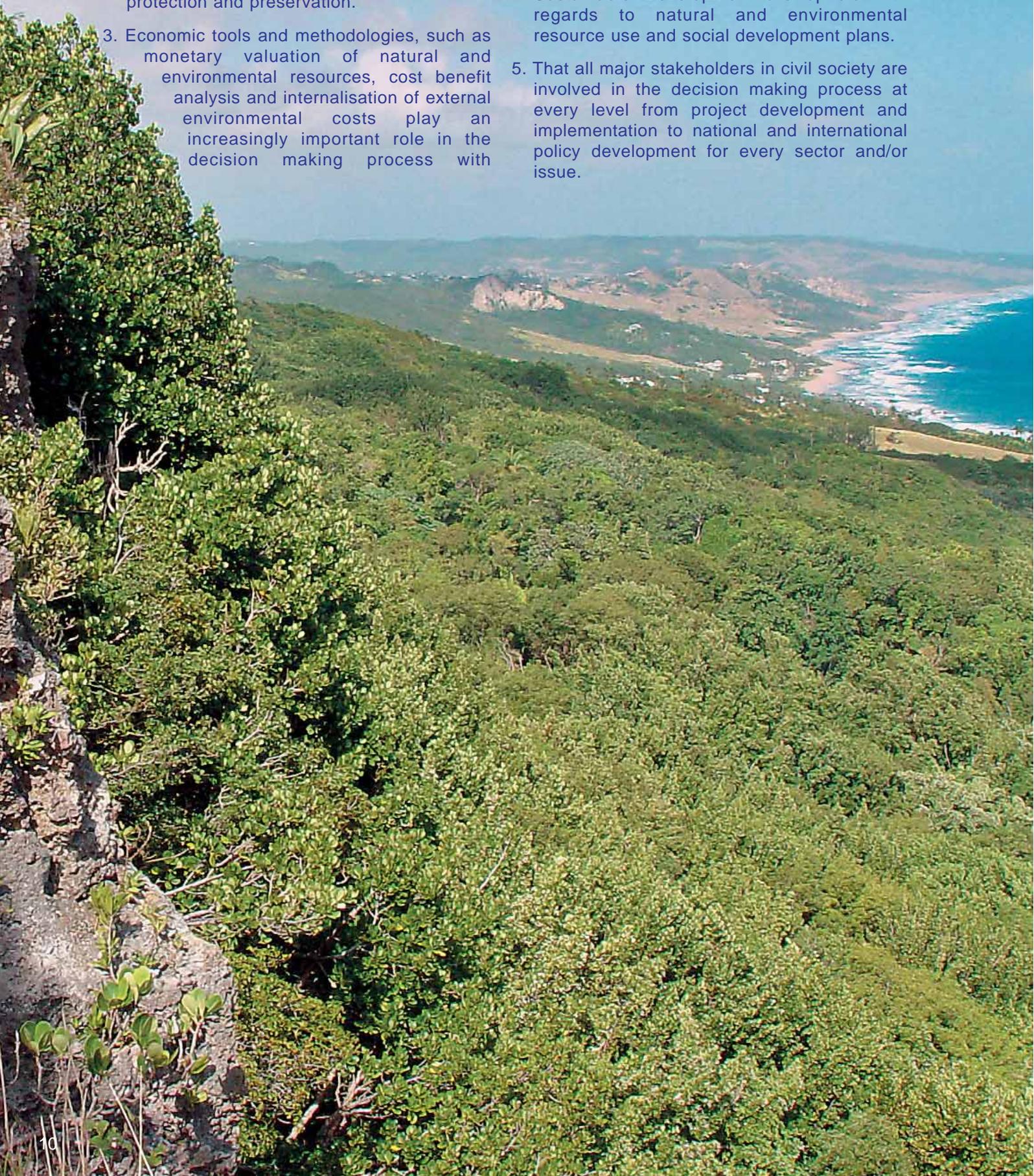
Natural resources are not to be exploited to the extent that it inhibits the ability of future generations to meet their own needs. In this regard it will be necessary to invoke the Precautionary Principle and to insist on the application of Safe Minimum Standards in respect of resource use, recognising 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 .

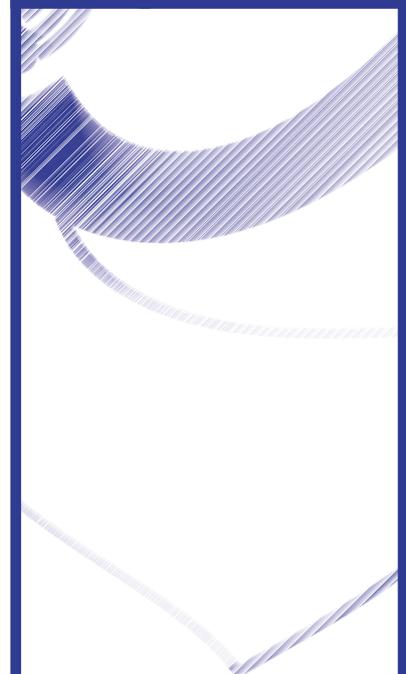
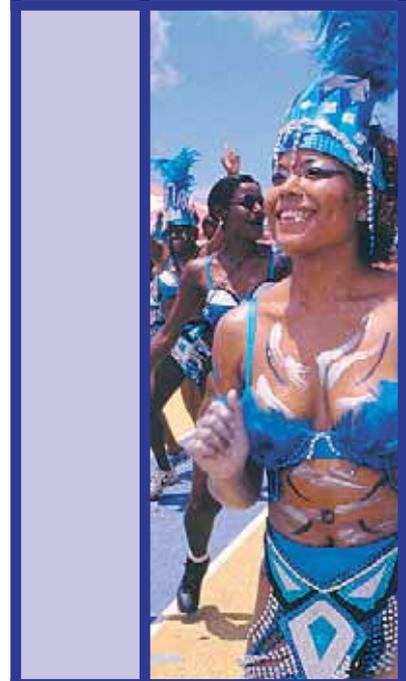
Largely absent from this approach has been the recognition that utilitarian actions and "green" views may not be compatible. It is not possible to over-exploit resources today while conserving them for future generations. The vision of Sustainable Development for Barbados encompasses five principles which are inextricably linked to the twin pillars of environment and development¹. 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 (CO₂) 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 CO₂ per unit of energy, hence our supplies of this energy source may be exploited with the least global warming consequences. Coal has the highest CO₂ 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.

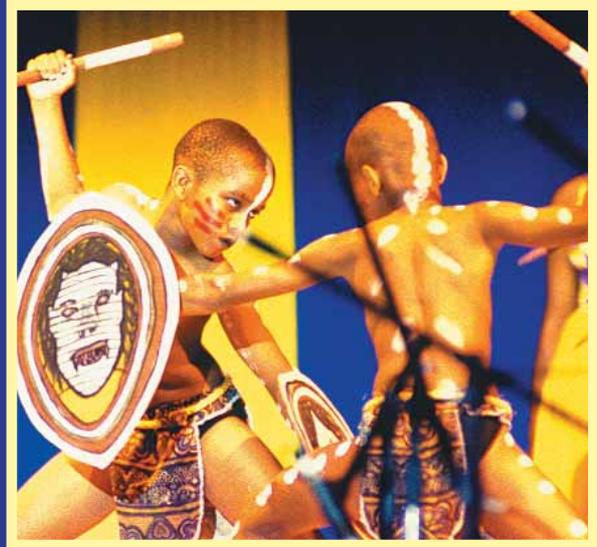
BOX 3: EDUCATION TO MAINTAIN A HIGH STANDARD OF LIVING

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

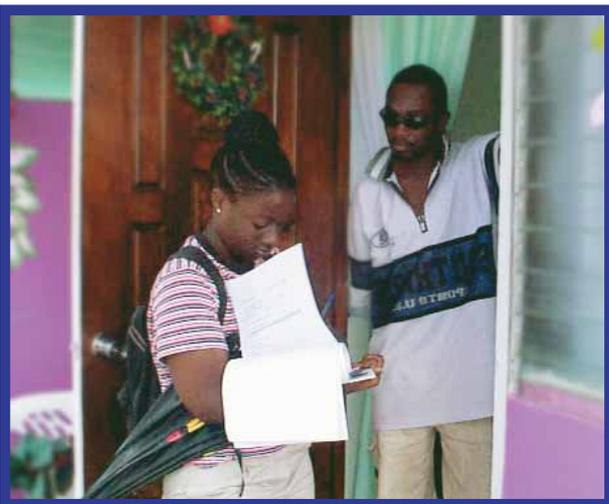
Decision-makers will endeavour to ensure inclusive and continuous participation throughout the process of design, implementation, and evaluation of projects, policies and programmes in order to inspire new ideas and expertise; legitimise decisions; and enrich outcomes. The decision-making process ought 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.

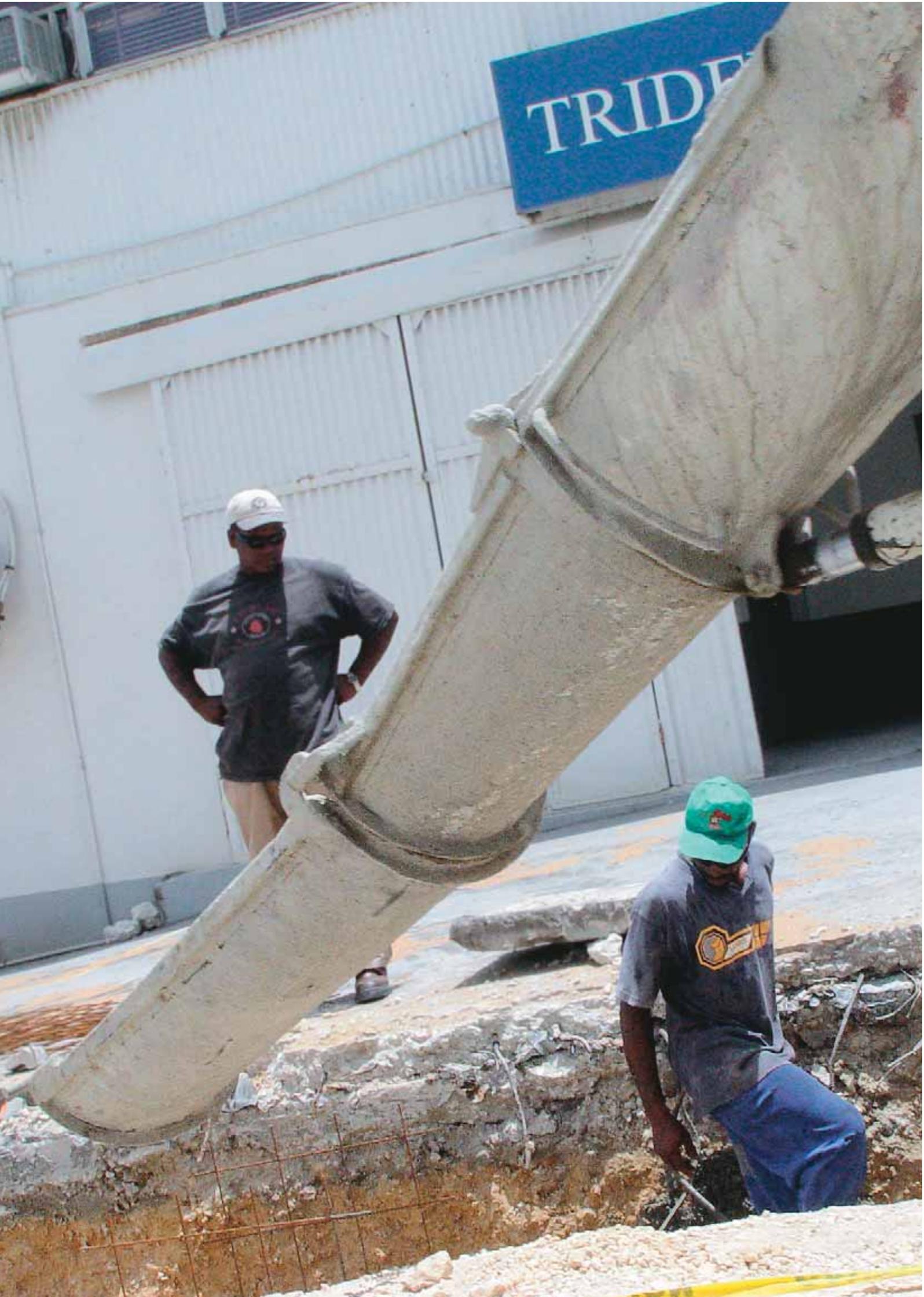
Respect

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.

¹These 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:

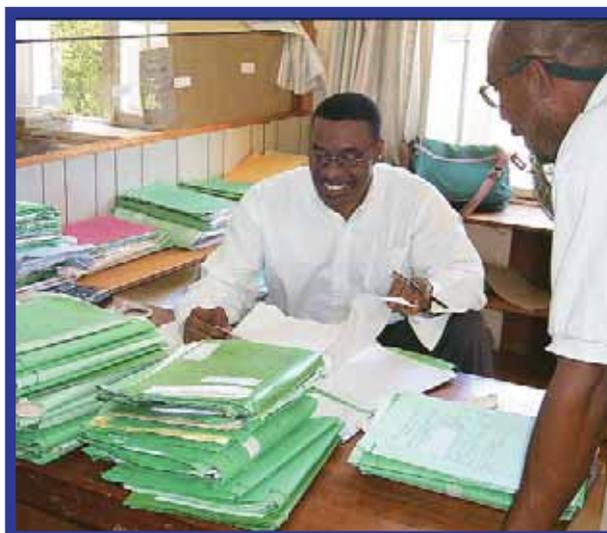
1. "Quality of life", comprising a variety of economic, social, cultural and personal factors that go beyond mere income earnings, is endorsed as the overarching goal.
2. Bio-physical "limits to growth" are taken into consideration when decisions are made with regards to resource use. These limits include 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.

