SIGNATURE PAGE

Country: **BARBADOS**

UNDAF Outcome(s)/Indicator(s):	Reduced poverty and food insecurity *(Link to UNDAF outcome., If no UNDAF, leave blank)*
Expected Outcome(s)/Indicator (s):	More rural persons with access to agricultural lands. Increased number of subsistence farmers *(CP outcomes linked t the SRF/MYFF goal and service line)*
Expected Output(s)/Indicator(s):	National Land use policy available Training in Good Agriculture Practice provided to rural poor. *(CP outcomes linked t the SRF/MYFF goal and service line)*
Implementing partner:	United Nations Development Program *(Designated institution/Executing agency)*
Other Partners:	The Government of Barbados, Ministry of Energy and the Environment, Ministry of Housing and Lands

Programme Period: _____	
Programme Component: OP15-SP1	
Project Title: Capacity Building for Sustainable Land Management in Barbados	
Project ID: 00046566	
Project Duration: 4 yrs	
Management Arrangement: NEX	
Total budget:	**1,238,317**
GEF Trust Fund	485,000
Allocated resources:	**753,317**
• Government (in-kind)	543,717
• Multilateral	209,600

PERMANENT SECRETARY
ECONOMIC AFFAIRS

[redacted]

UNDP

Michelle Gyles-McDonnough
Resident Representative

Date: 21/11/2008

Government of Barbados

United Nations Development Programme
and
The Global Environmental Facility

Capacity Building in and Mainstreaming of Sustainable Land Management in Barbados

PIMS 3408 - Atlas Project ID 00046566

Brief description

The sustainability of agricultural production and key economic sectors, as well as ecosystem integrity and functionality, are constrained by land degradation trends in Barbados. The long-term goal of the project is to ensure that agricultural land, wooded and protected areas, open spaces and other land uses are fully functioning, sustainable systems that maintain the ecological integrity and productivity of terrestrial and associated marine ecosystems. The objective of the project is to build capacity for sustainable land management within relevant government agencies, the private sector, non-governmental and civil society organisations, and to ensure that the practice of sustainable land management is institutionalised within national development planning processes, programmes and strategies. The project has 5 outcomes: (a) Development of a Policy/Regulatory Framework and Resource Mobilization for SLM (mainstreaming, inclusive of completion and ratification of the National Action Plan for the UNCCD); (b) Institutional Strengthening and Coordination among all relevant planning and land management agencies; (c) Development of an Information Management System; (d) Development of human resource capacity for sustainable land management at all levels; and (e) Adaptive Management and Learning. The project will be executed by Environmental Unit (EU) of the Ministry of Housing, Lands and the Environment. The project will receive guidance and oversight from a Steering Committee. A Project Management Unit will be established to execute the project. The total budget of the project is **US$ 1,244,317** of which **US$ 500,000** would be the GEF increment.

Expedited Medium Size Project Proposal
under the
LDC-SIDS Portfolio Project for Sustainable Land Management
REQUEST FOR GEF FUNDING

AGENCY'S PROJECT ID: PIMS 3408 (Atlas Project ID 00046566)
GEFSEC PROJECT ID:
COUNTRY: BARBADOS
PROJECT TITLE: Capacity Building for Sustainable Land Management in Barbados
GEF AGENCY: UNDP
OTHER EXECUTING AGENCY(IES): Ministry of Housing, Lands and the Environment
DURATION: 3 years
GEF FOCAL AREAS: Land Degradation
GEF OPERATIONAL PROGRAM: OP 15
GEF STRATEGIC PRIORITY: SP 1 (Capacity Building)
ESTIMATED STARTING DATE: November 2007

FINANCING PLAN (US$)	
GEF PROJECT/COMPONENT	
Project	485,000
PDF A	15,000
Sub-Total GEF	**500,000**
Co-financing	
Government	543,717
Others	209,600
Sub-total Co-financing:	**753,317**
Total Project Financing:	**1,253,317**
FINANCING FOR ASSOCIATED ACTIVITY IF ANY:	

COUNTRY ELIGIBILITY: Barbados ratified the United Nations Convention to Combat Drought and Desertification on May 14, 1997 and is eligible for funding under paragraph 9(b) of the GEF Instrument

CONTRIBUTION TO KEY INDICATORS OF THE BUSINESS PLAN: The project will build capacities for sustainable land management in Barbados, with environmental benefits accruing to the entire land surface of Barbados.

RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT:

GEF Operational Focal Point Endorsement: Mr. Lionel Nurse, Permanent Secretary, Ministry of Housing, Lands and the Environment	OFP Endorsement PDF A: 28 July 2005 OFP Endorsement: LDC-SIDS Umbrella Project: 26 May 2004
CCD National Focal Point: Environmental Unit	CCD FP Endorsement: 21 July 2004

This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the GEF Project Review Criteria for a Medium-sized Project under the LDC-SIDS Targeted Portfolio Project for Sustainable Land Management.

Name & Signature

J. Hough

John Hough
UNDP-GEF Deputy Executive Coordinator, a.i.
Date: 27 September 2007

Project Contact Person
Paula Caballero
Regional Technical Advisor
Tel. and email: 507 302 4571
paula.caballero@undp.org

TABLE OF CONTENTS

ACRONYMS

BADMC	- Barbados Agricultural Development and Marketing Corporation
BANGO	- Barbados Association of Environmental Organisations
BAS	- Barbados Agricultural Society
BWA	- Barbados Water Authority
CARDI	- Caribbean Agricultural Research and Development Institute
CCD	- Conservation to Combat Drought and Desertification
CDB	- Convention on Biological Diversity
CNIRD	- Caribbean Network for Integrated Rural Development
CPACC	- Caribbean Planning for Adaptation to Climate Change
DPP	- Director of Public Prosecutions
EMLUP	- Environmental Management and Land Use Planning
EU	- Environmental Unit
EU	- European Union
FCCC	- Framework Convention on Climate Change
GDP	- Gross Domestic Product
GEF	- Global Environmental Facility
IDB	- Inter-American Development Bank
IICA	- International Institute for Corporation in Agriculture
KAP	- Knowledge, Appraisal and Practice
MAR	- Ministry of Agriculture and Rural Development
MFEA	- Ministry of Finance and Economic Affairs
MHE	- Ministry of Housing, Lands and the Environment
MSP	- Medium Sized Portfolio Project
NAP	- National Action Programme
NBSAP	- National Biodiversity Strategy and Action Plan
NCB	- National Coordination Body
NCC	- National Coordination Committee
NCS	- National Steering Committee
NCSA	- National Capacity Needs Self Assessment
NFP	- National Focal Point
NPDP	- National Park Development Plan
NSP	- National Strategic Plan
OGCA	- Organic Growers and Consumers Association
PDC	- Planning and Priorities Committee
PDP	- Physical Development Plan
PM	- Project Manager
SCSCDS	- Scotland District Soil Conservation /Development Study
SCU	- Soil Conservation Unit
SDAP	- Sustainable Development Action Plan
SDP	- Sustainable Development Policy
SLM	- Sustainable Land Management
TAG	- Technical Advisory Group
TCDPO	- Town & Country Development Planning Office

SECTION I: ELABORATION OF THE NARRATIVE

PART I: SITUATION ANALYSIS

BACKGROUND AND CONTEXT

The Environmental Context

1. Barbados is the most easterly of the Caribbean islands. It is a small coral limestone island 34km long and 23km wide with a land mass of 432 square kilometres and a coastline measuring 97 kilometres. It has an Exclusive Economic Zone of 167 000 square kilometres. The island lies in the north-east trade wind belt, at the southern edge of the hurricane zone. It has a moderate tropical marine climate with average annual temperatures of 26-30°C. The rainfall is seasonal with a dry season from December to May and a wet season from around June to November. Average annual rainfall is about 56-60 inches. It is among the ten most water scarce countries in the world. During the wet season the island is affected by tropical depressions that often develop into tropical storms or hurricanes.

2. Barbados is non-volcanic, being composed entirely of sedimentary formations. Eighty-six (86) percent of the island is capped by a layer of coral up to 300 feet (90m) thick. A distinctive feature of this coral cap is that it is dissected by a complex system of gullies that extend from the upland regions in the central parts of the island to the west coast. These gullies are the result of geological processes involving the collapse of the roofs of underground streams. They form an integral part of the island's natural drainage system, acting as major conduits of recharge to the limestone aquifer via underground streams, and discharging into the west coast.

3. The island is relatively flat, with a series of terraced tablelands and no permanent rivers. For descriptive purposes it is divided into twelve physiographic regions, the details of which are provided in Annex B. The coral limestone cap has been completely eroded from about 14 percent of the island, exposing the complex mix of impermeable clays that comprise the sedimentary formations that lay beneath. This north eastern part of the island is known as the Scotland District, and may be regarded as the most distinctive physiographic region of the island, presenting a set of unique land management and other environmental problems. It is marked by highly rugged terrain and contains some of the most scenic landscapes on the island.

4. The unique geological and ecological characteristics as well as inherent vulnerability and scenic quality of Scotland District, have led proposals to have it designated as a national park consistent with the IUCN Category 5 designation of Protected Landscapes and Seascapes[1] or as the core of a proposed system of National Parks and other Natural Heritage Conservation Areas. Within the boundaries of the national park are ecologically significant sites, designated as Natural Heritage Conservation Areas, such as the estuarine lagoon at Long Pond, the dune system at Walkers Savannah, the Turners Hall Wood which is the best example of the original

[1] The International Union for the Conservation of Nature and Natural Resources (IUCN) defines its Category V designation as follows: "To maintain naturally significant natural landscapes which are characteristic of the harmonious interaction of man and land while providing opportunities for public enjoyment through recreation and tourism within the normal lifestyle and economic activity of these areas. These are mixed cultural/natural landscapes of high scenic value where traditional land uses are maintained." (IUCN/UNEP, 1986).

tropical mesophytic (semi-deciduous) forest on the island, and others. The most recent study of this was conducted as part of the national Environmental Management and Land Use Planning (EMLUP) study (to be discussed further in the following section), which produced the revised National Physical Development Plan (PDP, revised 1998) and the National Park Development Plan.

5. At the time of its colonization in 1627, Barbados was covered with forest. Within 30 years, however, 80% of the land was cleared for agriculture and a practice of monoculture ensued, lasting for over 300 years. This, along with the gradual growth in population, extensive land subdivision for residential development, and commercial, industrial and tourism development, accounted for a significant loss of terrestrial habitats and biodiversity. The total tree cover is reported to be two percent or 800 hectares of land area, including gullies (see paragraph 4), coastal wetlands, under-cliff woods and other planted woodlands. The Turner's Hall wood which occupies approximately 21 hectares of land in the Scotland District, is the least disturbed wooded area on the island. The gullies are important environments for a large proportion of Barbados' biological diversity. They tend to have a large and mature collection of native ferns, climbers, shrubs and trees. However, due to deforestation and habitat loss as well as predation by introduced mammals such as the raccoon, mongoose and the green monkey, biodiversity has been significantly reduced in Barbados. Today, terrestrial fauna of Barbados is quite limited. The bird fauna is much more diverse than the mammalian fauna, but is dominated by migratory and winter resident species.

6. The dominant former vegetation types are difficult to ascertain given that a process of intense deforestation described above. Over the past 300 years sugarcane was and continues to be the primary crop planted on the island. However there has been a steady decline in the area under sugarcane cultivation and an increase in the area under natural vegetation. Abandoned sugarcane lands, particularly in the Scotland District now have some secondary forest and regenerating natural vegetation. In 1991, Carrington estimated the total tree cover of Barbados to be about 2% of the area of the island or about 800 ha. Turner's Hall wood in the Scotland District is the least disturbed wooded habitat in Barbados and is the best local example of a Tropical Mesophytic (semi-deciduous) forest. It is considered to be the most species rich site on the island with respect of plant life. One can find palms, evergreen shrubs, a herbaceous layer, climbers and epiphytes. In addition to this, beaches, sand dunes and sandy bushlands are characterised by predominantly xerophytic and halophytic vegetation; and sea cliffs and sea rocks have sparse plant life that is restricted to halophytes (*Heliotropium microphyllum* and *Strumpfia maritima*). In plantation forests there is a predominance of *Swietenia mahogoni* (small leaf mahogany) and evidence of Honduras mahogany and other exotic species.

7. The incidence of land degradation has historically been concentrated in the Scotland District, due fundamentally to the geological structure of this area. Degradation is also occurring on the limestone lands, as evidenced by the levels of soil removal and sedimentation after periods of heavy rainfall. While the Scotland District area has been the subject of several studies, similar assessment of the limestone lands has been noticeably absent since the "Soil and Land Use Surveys of Barbados" carried out by Vernon and Carroll (1965). Evidence of degradation exists, however, in the seemingly significant levels of soil removal and sedimentation after periods of heavy rainfall. Much of this has been attributed to changing agricultural practices, including the removal of hedgerows to accommodate the increased mechanisation of farming. Hedgerows

have historically served to restrict soil movement and runoff from fields. In addition, decline or fluctuation in agricultural production (sugar and non-sugar) has been associated with market trends, although unfavourable weather conditions such as unseasonal rain and flooding at times affect levels of production (Ministry of Finance and Economic Affairs – MFEA - 2005).

8. Description of soil classifications are therefore based on the 1965 (Vernon and Carroll) study and an overview of the current status of land degradation with special reference to the Scotland District, with the understanding that there is need for in-depth study of the limestone lands. These are broadly classified as the soils of the coral region and the soils of the Scotland District. Within each these two broad groups Vernon and Carroll (1965) have developed a series of soil associations, a description of which is provided in Annex C. Along with this is a land capability classification based on soil and environmental factors. Six land capability classes have been developed and are also presented in Appendix B.

9. The exposure of the oceanics in the Scotland District caused by loss of the limestone cap has rendered this area highly susceptible to land degradation. The Draft Final Report of the Scotland District Soil Conservation/Development Study (Scott Wilson, 2000) notes that approximately 50% of this area has, either currently or in the past, been affected by landslides or erosion. Approximately one-fifth is at present actively undergoing some form of degradation. The main types include slope failure leading to landslides, and soil erosion.

10. The earliest recorded landslide appears to have been a deep-seated slide in the vicinity of St. Elizabeth Village in October 1785, with another deep-seated one occurring at Boscobel in October 1901. The former was reported to have caused land and built displacement of up to 100 yards. The latter was apparently associated with rainfall of 20 inches within a 24 hour period. Less dramatic events were recorded at Sedge Pond in 1934 and at Turner's Hall in 1966 (ibid.). In 1971 it was reported that about half of the Scotland District manifested problems of erosion or unstable ground at that time, and other more recent landslide and erosion events that impacted on land use and road stability have been recorded by the Central Emergency Relief Organisation, the Ministry of Public Works and Transport and the Soil Conservation Unit (Scott Wilson, 2000). The Scotland District is clearly a priority zone of land degradation.

11. Concerns have been expressed that land-based factors related to land degradation, such as soil movement and runoff, may negatively impact coastal and marine resources. The Barbados State of the Environment Report (2000) notes that the coastline and nearshore areas of the island are under stress from the many competing demands on its fragile ecosystems. The report further notes that, in assessing the impact of human activity on coastal and marine resources, it is difficult to establish clear causal linkages due to the number of complicating human and natural factors.

12. For the purpose of analysis, the Coastal Conservation Management Unit has divided the Barbados coastline into eight (8) sub-areas, four (4) of which show varying degrees of environmental impact. Despite the difficulty in establishing definitive causal impacts of land degradation on marine and coastal resources, some evidence of the effect of land-based sources exist in some of these sub-areas. For example, in the sub-area that constitutes the coastline of the Scotland District the main impact is the deposit of non-carbonate sediments derived from runoff from this area. Immediately to the south, analysis of coastal waters has revealed an increase in

nitrate concentrations by 0.25mg/l (milligrams per litre), and this level is expected to rise further due to agricultural changes. Surveys of the reefs along this eastern coast, however, revealed that they are healthy and support a rich and diverse community of marine flora. The North coast reefs are reported to be in near pristine condition while the west and south coasts, which have been the focus on most urban, tourism and industrial development, have consequently been significantly impacted. The installation of the west coast and south coast sewerage systems are expected to manifest substantial improvement in these areas.

13. Directly linked to the island's climate and geology is its water supply. The proportion of rainfall that is actually available for use is strongly affected by the geological structure and thereafter by the distribution system for the supply of fresh water. Based on the 1998 Water Resources Management and Water Loss Studies (WRMWLS), the annual renewable freshwater resource has recently been estimated at 225 410 m^3 or 49.59 million gallons per day (mgd). At its present population the available supply is well under the international limit of 1 000 m^3 per capita, below which a country is classified as "water scarce."

14. Groundwater accounts for 79 percent of the island's water resources and for 98.6 percent of its public water supply, a situation that is due to the limestone cap that covers most of the island. The main management issues, therefore, are water scarcity and protection of these groundwater resources. The key pressures relate to demand and water quality. On the demand side, the WRMWLS (1998) concluded that from a reserve of 47.3 million mgd, 44.8 mgd are extracted for public and private supply. Without effective conservation, it is estimated that demand will reach 53.8 mgd (89.4 million m^3) by 2016. Demands exceeding sustainable yields to such as extent create a risk of salt water intrusion into the aquifers due to over abstraction. This is a significant source of stress on the quality of the water supply. Added to this is the risk of contamination from agricultural activity, the petrochemical industry, hazardous waste and urban development.

15. The responses to the problems of water scarcity and threats to quality include a land use zoning policy that protects the aquifers, a policy framework for water resources development and management, and a comprehensive water resources development and management plan to the year 2016 and beyond. The land use zoning policy has been flagged for review as it has been in effect since 1963 when the status and process of physical development was significantly different. The current policy direction includes strategies for demand and supply management and supply augmentation, institutional capacity building and policy and legislation.

16. It is difficult to ascertain clear land use trends for Barbados. The total land area of the island is 43,218 hectares (ADP, 1998). According to the Barbados State of the Environment Report (2000), in 1976 62.2% of total rateable[2] land was used for sugar plantations and tenantries, 26.4% for residential with agriculture and commerce, 9.8% for residential purposes alone and 1.6% for tourism, commerce and industrial activities. The Area Development Plan (1998) reports agricultural land as approximately 33,000 ha. of which 19,000 ha. are classified as arable. Approximately 4,600 ha. are grassland and 5,618 ha are trees or scrub (ADP, 1999). Of the 19,000 ha of arable land only 12,750 ha are actually cropped, the remainder being idle, underutilised or used for livestock production.

[2] The Report does not provide a definition for "rateable" land.

17. The ADP also reports that 78% of the land area in agriculture is farmed by 10% of the farmers, and is dominated by Estates or Plantations of over 50 ha. In fact, the existing land tenure structure is as follows: there are 225 plantations occupying 27,447 ha. and 8,199 small holdings (0.2-10 ha.) occupying 6, 074 ha., for a total of 33,541 ha. An assessment of the plantation lands conducted in preparing the ADP revealed that 16,117 ha. were under arable plantation production, 4,220 ha. in mixed/livestock plantation production, 1,941 ha. temporarily idle and 5,169 permanently idle. Similarly, 126 plantations were in arable production, 44 in mixed/livestock production, 29 temporarily idle and 26 permanently idle.

18. There is reported decline in land under productive agriculture, with decreasing contribution of the sector to the national economy over more than a decade. These are often attributed to socio-economic factors such as the growth in urban population and in non-agricultural activities in the economy, as well as declining earnings from agricultural commodities in international trade. While there are no figures to support this, there is concern that agricultural lands have been subdivided for residential development, as well as the change of use from agriculture to recreational and tourism development. Often subdivided lands lie idle until the owners are in a position to construct residences on them. As a result, there is the concern that declining acreage under agriculture, along with changing agricultural practices, also lead to declining quality of arable land in Barbados.

19. However, the decline in agriculture production over the years has been attributed to global and local economic circumstances and unfavourable weather in addition to land quality due to centuries of monoculture. Responses have mainly taken the form of policies in diversification and land reform. For example, a programme is being implemented to reform the sugar industry, focusing in particular on diversification and the production of high fibre varieties of cane as a source of fuel (MFEA, 2004[3]). Incentives are offered to increase domestic productivity, upgrade technology, attract new investment and diversify the export arm of the sector (ibid.).

20. Although no direct linkage has been made between poverty levels and land degradation or agriculture, about 63% of the poor in Barbados live in non-urban areas.[4] In this regard, one of the strategies of the Draft National Strategic Plan is to "determine the appropriate uses of land in light of the rules of the new global economy and the traditional sensitivities of Barbadian to ownership of, and access to, land". The Barbados Land for the Landless Programme is therefore relevant. Aimed at boosting agricultural productivity and bringing unused land back into production, this programme has made available just over 350 hectares of public and private lands to landless farmers. Root crops, vegetables, fruit and livestock were produced in the programme in 2004. Some problems reported, which are relevant to land degradation issues, were that farmers objected to being assigned lands in the Scotland District due to its "fragile and difficult terrain," while others found private lands assigned to them unsuitable for their projects (MFEA, 2005). An additional challenge is that the programme brings new farmers into the Scotland District who then have to be educated on the special vulnerabilities of the area and appropriate farming practices.

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[3] *Economic and Financial Policies of the Government of Barbados. Minister of Finance and Economic Affairs. Dec. 7, 2004.*

[4] Draft National Action Plan to Combat Desertification and Land Degradation, and to Mitigate Against the Effects of Desertification, Land Degradation and Drought (2006).

Socio-Economic Context

21. The World Bank classifies Barbados as an upper middle income country. The UNDP Human Development Report (HDR) for 2005 gave Barbados a Human Development Index (HDI) of 0.878, ranking it 30th in the world (177 countries) and first among all Latin American and Caribbean countries. The total population in 2003 was 272 200, growing at a rate of 0.3% per year, and with a life expectancy of 74.8 years. The unemployment rate at the end of the third quarter of 2004 was 9.9% (Central Bank of Barbados and Barbados Statistical Services).

22. The Central Bank of Barbados reports a per capita GDP in 2003 (nominal factor cost) of BDS$15 900 (US$7 950). In that year agriculture contributed 3.7% of overall GDP compared to 11.8% from tourism and 19.5% from the finance and business sector. Of this, sugar contributed 0.9% and other agriculture and fisheries 2.8%. Only 1.6% of the total population (year 2000) is employed in (sugar and non-sugar) agriculture.[5]

23. With respect to human poverty, the UNDP HPI (human poverty index) for Barbados is 4.5%, ranking it fifth among the 103 developing countries for which the index has been calculated. In addition, the Draft National Action Plan for the UNCCD cites the IDB Report on Poverty and Income Distribution (1996/1997) as stating that 8.7% of households are affected by poverty. Although poverty is not considered a major issue, the Government of Barbados has established a poverty alleviation policy based on a poverty line at the income level of BDS$ 5,503.00 (approximately $US 2 761.00) per annum. It has also established a Poverty Alleviation Bureau to deal with cases involving households that fall below this level. In 2004, 793 requests for assistance were made of the bureau compared to 985 in 2003. Assistance rendered included training for employment creation while also assisting with meeting monthly expenses.

Policy, Institutional and Legal Context

National Development Framework

24. There are three broad planks to the National Development Framework which encompasses the vision of sustainable land management in Barbados. These are: the National Strategic Plan (NSP) of Barbados 2005-2025, the National Physical Development Plan (PDP, Amended 1998), and the Barbados Sustainable Development Policy and its associated Action Plan (SDAP). Collectively these broad policy structures have the potential to achieve a high level of integrated planning and management of national natural resources, including land resources. This section provides some details on these policies as well as the additional policies and plans that emanate from each. Individually they each address all the sectoral and natural resource issues that underpin national development. However, while the PDP seeks to direct the orderly development of land taking into account the associated environmental and natural heritage concerns, the NSP provides the overarching framework and national developments goals within which both the PDP and the SDAP are implemented, and the SDAP seeks to strengthen the linkages amongst these policies with the view to achieving an integrated approach to development. The figure below illustrates the interrelationship of the three planks of the

[5] Barbados Statistical Services, 2000.

framework. The success of that integration, however, will ultimately depend on the strength and effectiveness of the coordination and collaboration that is achieved at the level of implementation.

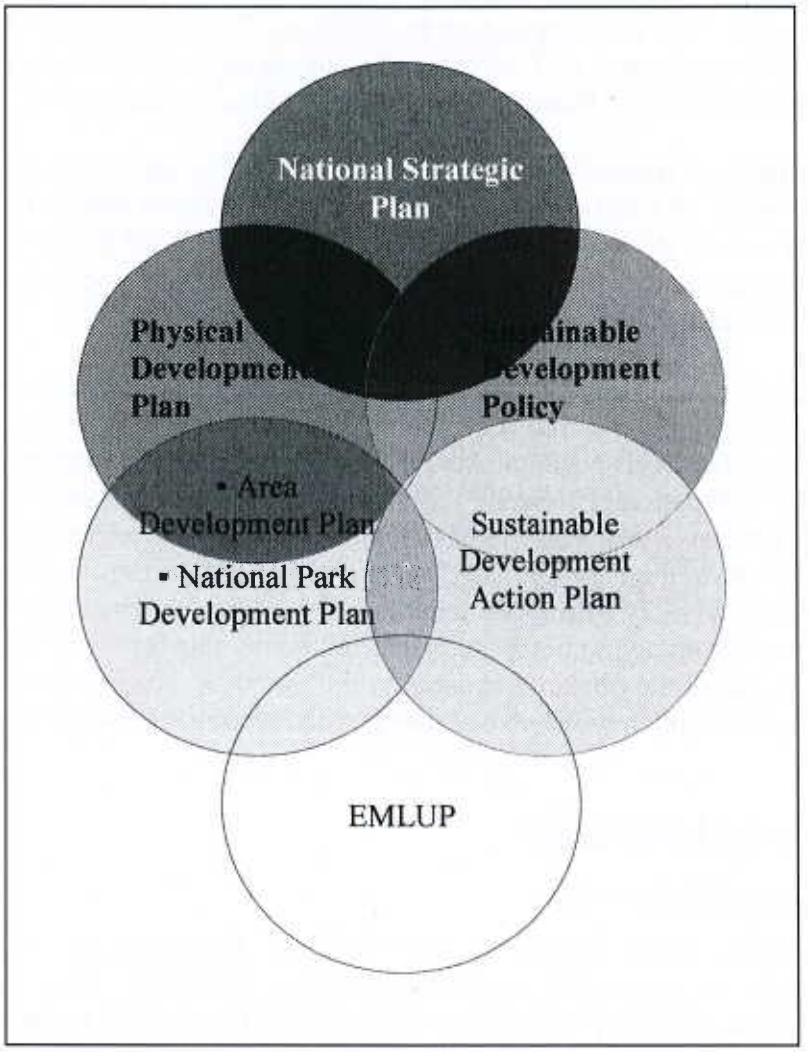


Figure 1: National Development Framework

25. The first plank of the national development framework is the National Strategic Plan of Barbados 2005-2025 articulates the vision of "*a fully developed society that is prosperous, socially just and globally competitive.*" The plan identifies a set of six national development goals to enable the achievement of this vision, and sets clear targets towards the achievement of these goals. The fourth of the six goals is "Strengthening the Physical Infrastructure and Preserving the Environment." Six objectives have been identified that directly or indirectly relate to land management, and by which this goal is to be reached. They include: (1.1) to promote and facilitate the environmentally sustainable use of our natural resources; (1.2) to maintain a safe and reliable water supply; and (1.6) to maintain an efficient land use policy. For

each of these objectives a series of strategies and targets are stated in the plan Those of relevance here include:

Strategies:

- Integrate environmental considerations into all aspects of national development
- Ensure that the integrity of natural features, wildlife habitats, significant flora and fauna, and important landscape and seascape features and protected areas are maintained during the process of development
- Protect the island's water supply including groundwater resources and coastal aquifers
- Ensure effective conservation of the island's coastal and marine eco-systems and living resources while improving their quality
- Promote sustainable land management practices
- Promote the development of green and open spaces throughout the island
- Ensure the efficient and effective management of the existing water resources
- Minimise the negative impact of residential and industrial buildings located in Zone 1 areas[6]
- Promote the efficient use of public infrastructure and safeguard arable agricultural land by discouraging the conversion of arable land to non-agricultural production, guiding non-agricultural uses to the Urban Corridor and minimising adverse impacts on agricultural operations; and,
- Promote and facilitate opportunities for small farm creation and increase ownership accessibility to arable lands.

26. The National Strategic Plan is the product of the collective effort of the public sector, private sector, labour and civil society. Draft sectoral strategic plans prepared by the public sector were instrumental in its preparation, consultations were held within the framework of the social partnership, and the plan was reviewed by representatives of the private sector, labour and civil society. The Plan has now been published for public review and comment, after which it will be discussed at Parliament before adoption. It has the potential to be a vehicle for integrating the principles of SLM in the Barbadian context: the effort is coordinated by the Ministry of Finance and Economic Affairs.

27. The second plank of the national development framework is the Physical Development Plan. Indeed, the most comprehensive national development framework for the management of land in Barbados is enshrined in the ***Town Planning Act (1968)*** which authorises state control and regulation of the use of all land in and around the island, and institutionalised the preparation of a national Physical Development Plan (PDP). In fact, the direct connection between the PDP and the National Strategic Plan is established by the single target in the NSP for achieving the objective of maintaining an efficient land-use policy (objective 1.6): *an amended Physical Development Plan every five (5) years*.

28. Under the Town Planning Act, the Town and Country Development Planning Office (TCDPO) which, notably, falls within the Ministry of Finance and Economic Affairs has primary responsibility for land use planning in Barbados, including the amending and implementing of the *Physical Development Plan (PDP)* every five years. The 1998 Physical Development Plan is

[6] This refers to the land use zoning policy mentioned above. Zone 1 is the zone of highest priority.

the current policy that guides development and the allocation of land amongst the various competing uses, and the relationships among land uses, communities, facilities and physical infrastructure. The 2003 revision has not yet been published. It is through implementation of the Physical Development Plan, therefore, that the land management objectives of the National Strategic Plan would largely be achieved.

29. A fundamental principle of the land use planning process is the protection of agricultural lands from incompatible urban development, and of ecologically significant areas, by means of appropriate decision-making that seeks to reconcile the competing needs of various land users. Not only does the National Strategic Plan address this concern (see strategies ii and ix in paragraph 29 above), but the Physical Development Plan also makes special reference to erosion-prone lands, which are guided by a policy that prevents the construction of permanent structures in places susceptible to erosion or land slippage. Specifically, this refers to land within the Scotland District. The policy states that all applications involving residential development or the construction of permanent structures in this area will be reviewed by the Officer in Charge of the Soil Conservation Unit, and applications which are located on sites that are susceptible to erosion or slippage will not be permitted. It is noteworthy that all that constitutes 'development' in Barbados are required to be the subject of an application to the TCDPO which is the only agency with legal responsibility for all land use throughout the island.

30. The PDP (1998) goes further and safeguards agricultural lands by discouraging the conversion of arable land to non-agricultural uses; encouraging the return of idle lands to agricultural uses and production; requiring environmental impact assessments for developments within natural heritage conservation areas, agricultural areas and for golf courses. More specific PDP policies include: requiring sediment control plans for certain developments; enforcing tree preservation in urban, rural and coastal areas; providing for the control of development within natural heritage conservation areas and the Barbados System of Parks and Open Spaces; and the protection of erosion prone lands.

31. The third plank of the national development framework for SLM is the *Barbados Sustainable Development Policy* (SDP) which was adopted in Parliament in 2004. It is the major output of the National Commission on Sustainable Development. The goal of this policy is "to ensure the social organisation of the quality of life of every person by ensuring that economic growth and development does not occur to the detriment of our ecological capital." The policy embraces five core principles: quality of life, conservation of resources, economic efficiency, equity and participation. It is intended that these core principles inform all national decision-making at the sectoral, organizational and individual levels.

32. The national Sustainable Development Policy is complemented by the national *Sustainable Development Action Plan SDAP),* which constitutes the Part II of the Policy. The SDAP recommends a series of actions to be taken by each sector towards achieving the goal of sustainable development. In the area of land management recommendations address such areas as data collection and management; land use management and research; monitoring the scarce fresh water resources to ensure equitable allocation and optimal utilization, conservation and protection; the preservation, conservation and sustainable use of agricultural resources with careful consideration given to ecological efficiency; and several others. The policy objectives in

the area of biodiversity are to ensure the sustainable use of terrestrial flora and fauna by developing appropriate policies and strategies to preserve and conserve those resources. Recommended actions include, among other things, formulating action plans for biodiversity management in general as well as the protection of ecologically significant areas, to be achieved through the development and implementation of necessary legislation, public education and species management activities.

33. Two other important and relevant policies for SLM fall under the purview of the TCDPO: these are the Area Development Plan and the National Park Development Plan. The *Area Development Plan* (ADP) aims to ensure that practices within the agricultural sector maximize productivity and achieve optimal use of land available for agriculture, promote the adoption of farming systems that are environmentally friendly, and preserve adequate areas of arable land for future generations. Part of the background to the ADP is that the existing subdivision policy has resulted in fragmented rural development. There is a need for codes of good agricultural practice to protect water resources and ensure other environmental benefits, as well as for a major tree planting initiative for erosion control in the Scotland District and amenity enhancement elsewhere. The *National Park Development Plan* (NPDP) seeks to promote land management within the designated Park boundaries in such a way that preserves biodiversity and sensitive ecological systems. The erosion-prone Scotland District constitutes by far the greatest component of the National Park, and is therefore subject to protection additional to that provided by the PDP.

34. Another important element of the national framework for sustainable land management in Barbados is the *Environmental Management and Land Use Planning Project* (1998). In addition, a number strategic action plans have been formulated and are being implemented as a result of the ratification of multilateral environmental agreements.

35. A comprehensive study on *Environmental Management and Land Use Planning for Sustainable Development* (EMLUP) was conducted over the period 1996-1998. The objectives of this study were: (a) to establish national policy priorities for natural resources management, including guidelines and procedures for Environmental Impact Assessment of development actions in Barbados; (b) to develop a framework for a comprehensive national information system of natural resources; (c) to formulate an environmentally sensitive framework and land use plan to govern land use development for the next ten years; and, (d) to make recommendations for institutional strengthening of the Environmental Unit within the Ministry of Health and the Environment, and the Town and Country Development Planning Office, regarding staff requirements and needs, as well as for training programmes for staff from all agencies involved in environmental management.

36. The outputs of the EMLUP study reflect the scope and depth of the framework envisaged for moving forward. They include, but were not limited to:

- A revised Physical Development Plan that provides detailed guidance on land use planning;
- An Environmental Management Plan that provides an integrative approach to environmental sustainability;
- A Draft Environmental Management Act for Barbados;

- An Institutional Framework for Environmental Management focusing on the Ministry with responsibility for environment, critical agencies within line ministries and the Town and Country Development Planning Office;
- A National Park Development Plan including an assessment and classification of sensitive ecosystems and proposals for their protection; and
- Establishment of a Geographic Information System as the foundation for developing and maintaining a long-term National Natural Resources Data Base of biophysical and other planning related information.

37. Several of the recommendations of this study have already been implemented including strengthening of key agencies involved in development and environmental control (namely the TCDPO and the Environmental Protection Department); enactment of marine pollution legislation; creation of the National Heritage Unit to oversee development of the National Park System and the conservation of terrestrial biodiversity); and others are on stream. A key output has been the revised Physical Development Plan described above and noted in the first bullet in the paragraph above. In addition, the Geographic Information System noted above has been fully established within the Town and Country Development Planning Office and is used as an essential tool for land use planning and development control. A similar database is also housed in the Environmental Unit of the Ministry of the Environment and is used in many of the projects and programmes executed by the Unit.

38. The Draft Environmental Management Plan is intended to promote a vision for environmental management that sustains and enhances the natural resources and environmental attributes of the island, minimises threats to the environment and natural resources, and sustains and enhances the quality of the environment by minimising threats from pollution and natural events. The Plan addresses the environmental problems and issues facing Barbados such as agricultural practices, soil conservation and soil erosion; coastal and marine resources; drainage control and flood prevention; groundwater protection and others. It provides direction for appropriate intervention on these issues including an appropriate institutional and legal framework, the benefits to be achieved by achieved by good management of the issues and the consequences of mismanagement (GOV, 1998).

39. The Draft Environmental Management Act produced under the EMLUP study is intended to provide the legal framework for the preparation, approval and implementation of the Plan. The Act has provisions that deal with a number of environmental and natural resources management issues including issues related to SLM such as water resources protection, the Barbados National Park and Natural Heritage Areas, forestry and aboriculture, the felling of trees and the protection of wildlife. This draft formed the basis for a policy paper that has cabinet approval for the formal drafting of a Bill which once completed, will need to undergo a review and approval process. Once completed, this should lead to adoption and enactment of the Bill.

40. Given the national significance of the Scotland District, due in part to the fact that it comprises the greatest component of the proposed National Park, the management of land in this area is a critical component of the overall national development framework. Of direct relevance, therefore, is the *Soil Conservation Act (1959)* which is executed by the Soil Conservation Unit (SCU) of the Ministry of Agriculture and Rural Development. The SCU is responsible for the

management of all lands in the Scotland District and, since 1957, has undertaken extensive slope rehabilitation and stabilisation works in the area. The SCU also reviews all development proposals for the area that involve the establishment of permanent structures, with a view to preventing construction in areas prone to erosion and land slippage. The work of the TCDPO executed under the Town and Country Planning Act, and the Soil Conservation Unit in collaboration with the Ministry of Public Works, has been effective in managing land use and land resources in a context of increasing competition amongst various land uses on the island.

41. Two other strategic action plans of significance for SLM relate to water resources management and land tenure. As noted previously, water scarcity is a serious problem for Barbados. To address this, the Government of Barbados has adopted a Policy Framework for Water Resources Development and Management (1997), the main elements of which are: demand management, supply management and augmentation, institutional capacity building, policy and legislation.

42. From a land management perspective, the water resources policy framework contains an incentive scheme which provides a rebate of 18% of the cost of new drip irrigation equipment for non-sugar agriculture. The supply augmentation component includes impoundment of surface water in the Scotland District and the construction of check dams through the limestone gully system. It is also proposed that water resources management issues be included in a comprehensive education programme that focuses on desertification, land degradation and drought, to be addressed through the National Action Plan (NAP). Finally, the Barbados Water Authority (BWA) has pursued the development and implementation of an Emergency Drought Management Strategy comprising short, medium and long term activities which include the use of drought indicators, a water shortage response plan including the financial and administrative requirements for the plan, and technical activities which include management, water resources/supply and distribution system activities.

43. On the question of land tenure Barnes (1998), in a study of land tenure issues in Barbados cited the Barbados National Report to Habitat II (1996) which noted that in 1989 there 227 agricultural estates of more than 10 acres of land each, accounting for 45,395 acres of land. There were also 16,951 agricultural small holdings (less than 10 acres each) accounting for 7,880 acres. The Government (the Crown) is the largest land owner, having large tracts of agricultural land being administered by such agencies as the Barbados Agricultural and Development Corporation (BADC), the Barbados Agricultural Management Company (BAMC) and the Barbados Agricultural Credit Trust (BACT). Each of these agencies has a specific mandate and tend to determine the use of the lands under their purview accordingly. Therefore conflicts at an inter-institutional level are reflected in approaches to land use planning. In addition, an increasing amount of Crown lands are vested in the National Housing Corporation, another Government agency, for lease or sale to private households for residential purposes.

44. An important aspect of the land tenure policy of Barbados relates to the system of plantation tenantries. Under this system plantation workers were able to rent a small portion of land from the plantation owners and use it for residential, residential and agricultural, or purely agricultural purposes. In 1980 the Government instituted a land policy—through the Tenantries Freehold Purchase Act, the Tenantries Development Act and the Tenantries Control Act—that would move these tenantries towards freehold ownership of the lots by establishing the right for tenants

to purchase the freehold at the stipulated price of Bds$1.00 per square metre with a minimum price of Bds$300.00 (Barnes, 1998). Of the approximately 325 such tenantry lots, only 55-60% have actually been conveyed and recorded in the Land Registry. Nevertheless, the land policy is still firmly to establish a freehold system of tenure and this is based in part in the desire of the average Barbadian to own land. The implications of this for SLM are discussed in the section on Causes of Land Degradation and Barriers to Sustainable Land Management.

Institutional and Legal Framework

45. The key institutions involved in setting the national policy framework were mentioned in the preceding paragraphs – the Economic Planning Unit (EPU) of the Economic Affairs Division of the Ministry of Finance and Economic Affairs, the Town and Country Development Planning Office (TCDPO) also of the Economic Affairs Division of the Ministry of Finance and Economic Affairs, the Soil Conservation Unit (SCU) of the Ministry of Agriculture and Rural Development, and the Ministry of Energy and the Environment. All are responsible for the implementation of an integrated set of policies related to sustainable land management in Barbados.

46. The Economic Planning Unit is responsible for preparing the National Strategic Plan and coordinating the preparation and delivery of substantive inputs from the various sectoral Ministries. As noted, the NSP sets the broad policy framework for national development, including land management, calling for the preparation of Physical Development Plans every five (5) years. The PDP, executed by the TCDPO, sets the national land use policy. It works closely with the Soil Conservation Unit (SCU) which is responsible for managing the lands of the Scotland District, a special management area under the PDP. The SCU is linked to the TCDPO via the approval process for development applications in the Scotland District, and this is supported both by the Soil Conservation Act (1959) and the Town Planning Act (1963). Additionally, the Sustainable Development Policy is administered by the Environmental Unit of the Ministry of Energy and the Environment.

47. The National Park Development Plan and the Agricultural Development Plan are also integral components of the Physical Development Planning process, and the broad national policies for these are embodied in the National Strategic Plan. Further, it is envisaged that the National Park Development Plan will be implemented and managed by the Environmental Special Projects Unit[7] of the Ministry of Energy and the Environment, while the Agricultural Development Plan falls within the purview of the Ministry of Agriculture. Collaboration among these various agencies is achieved on an on-going basis through established inter-agency committees.

Inter-agency Coordination for sustainable land management

48. The various agencies involved in land management are responsible for developing and implementing their respective programmes, typically in accordance with broader sectoral and national plans and policies. With respect to the UNCCD, coordination is achieved through the

[7] This Unit is reportedly to be renamed the National Heritage Unit

work of the Land Degradation Committee. This is a Cabinet-appointed advisory committee charged with advising Cabinet on all issues relating to land degradation and sustainable land management, including advice on this project. The committee, which is chaired by the Environmental Unit of the Ministry of Energy and the Environment, comprises key government agencies whose mandates involve or impact on land use and land management, non-governmental organisations that bring a civil society perspective to bear on the issues, and technical and inter-governmental organisations. The full membership is as follows.

- The National Conservation Commission and the Coastal Zone Management Unit of the Ministry of Energy and the Environment;
- The Town and Country Development Planning Office;
- The Barbados Water Authority which falls under the Ministry of Public Works;
- The Soil Conservation Unit and the Meteorological Department of the Ministry of Agriculture; and
- The Ministry of Foreign Affairs.

49. In addition to these government agencies, the following non-governmental organisations are represented:

- The Barbados National Trust,
- The Barbados Environmental Society and
- The Barbados Environmental Youth Network.

50. Technical inputs and international perspectives are provided through representatives of:

- The University of the West Indies' Centre for Resource Management and Environmental Studies,
- The International Institute for Cooperation in Agriculture and
- The Food and Agricultural Organisation.

51. This broad-based committee provides an opportunity to ensure coordination of national level projects with components dealing with land management and land degradation, establishing linkages and avoiding duplication. However, meetings are held mainly in response to national actions arising from obligations under the UNCCD, or are project driven. There is still need for wider coordination consistent with SLM objectives.

52. At a higher level, all major projects in Barbados are reviewed by the Planning and Priorities Committee (PPC) of the Cabinet. This Committee, which is chaired by the Prime Minister, is a cross sectoral committee comprising cabinet ministers and senior technical personnel from a cross section of Government Agencies. It therefore brings to bear a wide range of information and perspectives that result in the identification of linkages, gaps and areas of overlap among major public sector and multilateral funded projects, thereby achieving a high level of coordination in the work of the key sectors. Several agencies whose responsibilities impact on or involve land management are represented on the PPC.

53. On matters related to the Sustainable Development Policy and the Sustainable Development Action Plan, the role and functions of the National Commission on Sustainable Development (NCSD) are relevant. This Commission was established by Cabinet in keeping with the recommendations of the 1992 United Nations Conference on Environment and Development and Agenda 21, the blueprint for environment and development produced by that conference. The NCSD is broad-based with representatives from government agencies and all

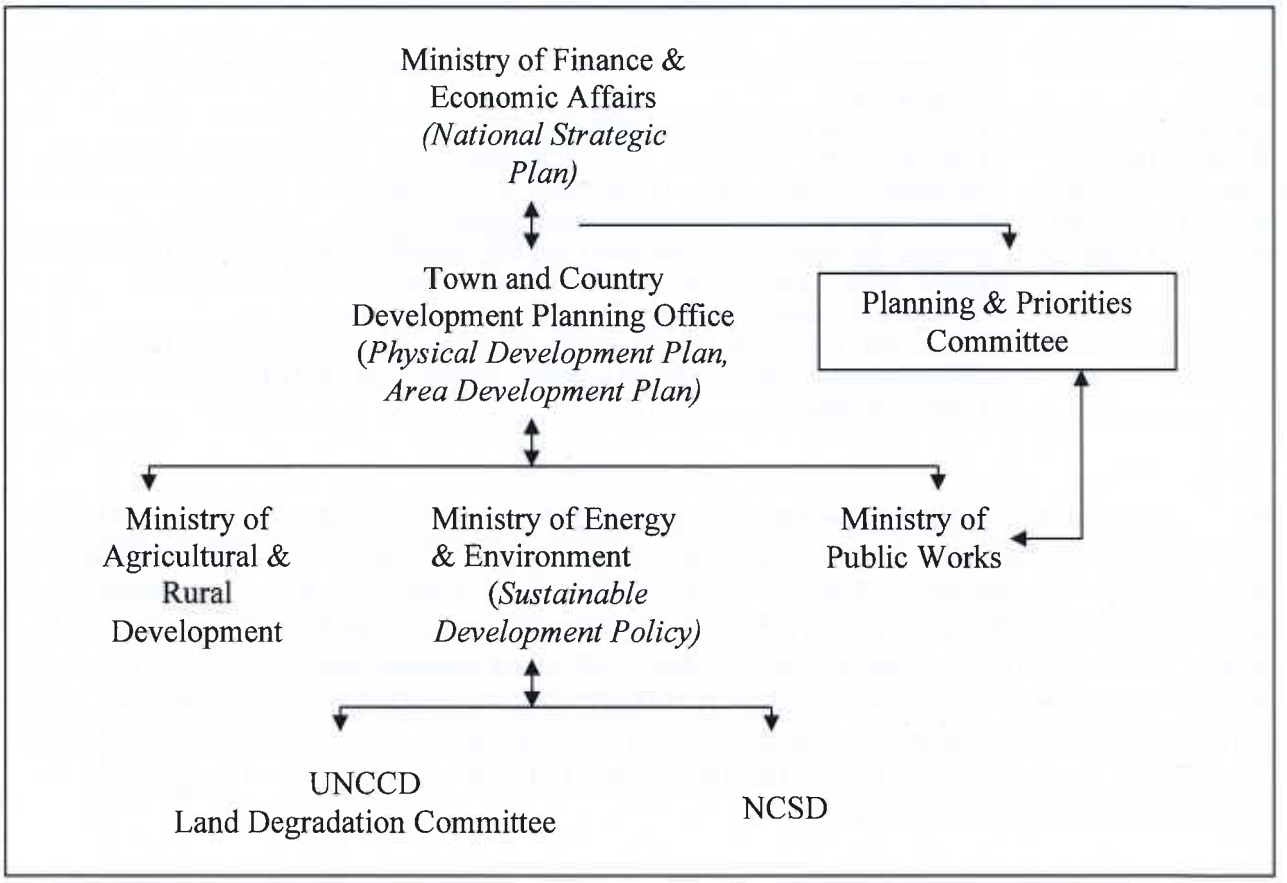
major groups including non-governmental organisations, community-based organisations, trade unions, women's organisations, the academic community and private sector entities. It is charged with advising government and facilitating coordination of sustainable development issues at the national level, promoting greater understanding on the principles and opportunities with respect to sustainable development, and reviewing and advising on actions in pursuit of sustainable development. The main outputs of the NCSD to date are the National Sustainable Development Policy and related Sustainable Development Action Plan.

54. Implicit in the role and functions of the NCSD is some level of responsibility for SLM. However, there is no specific relationship between the NCSD and the Land Degradation Committee. Both are advisory bodies appointed by Cabinet and, while some governmental and non-governmental agencies are represented on both, collaboration between the two is assumed rather than stipulated. The stakeholder consultation workshop held to provide input into the preparation of this MSP proposed that the NCSD be the central coordinating entity for sustainable land management, presumably due to its being perceived as an elite group of advisors that carry greater weight at the policy making level and thereby providing a higher, more influential tier to the work of the Land Degradation Committee. It is clear, however, that the relationship between these two bodies needs to the clarified and collaboration strengthened through a legal mechanism.

55. Finally, as noted in above, outside of the committee structure there are informal professional relationships that enable inputs from other agencies as the need arises. Informal networks are often easily formalised through ad hoc interagency meetings convened on an as needs basis. However, those relationships can disappear when personnel changes, highlighting the need for more formalised mechanisms for collaboration across agencies. Figure 2 below illustrates the perceived interrelationships of the major institutions.

56. The table below describes the major institutional framework for land management in Barbados. A full assessment of the institutional capacity for sustainable land management in Barbados has not been conducted and such an assessment is beyond the scope of this proposal. However, it is important to note that the responsibilities of several other agencies include other aspects of land management such as work of other units and departments of the Ministry of Agriculture and Rural Development, the Ministry of Energy and the Environment, the Drainage Unit of the Ministry of Public Works, and the Barbados Water Authority. This reflects the highly fragmented nature of the institutional structure, which also presents a significant challenge for integrated planning and coordinated management. A summary of the responsibilities and related legislation for these and the key agencies is contained in Table 1.

Figure 2. Existing Institutional Arrangements for Sustainable Land Management



57. The Ministry of Agriculture and Rural Development (MAR) has overall responsibility for the development of agriculture and agricultural lands in Barbados. Its functions are carried out through the livestock and crop divisions, and by several specialised sections including: the Agricultural Planning Unit, the Plant Pathology Unit, the Central Agronomic Research Station, the Entomology Unit, the Land and Water Use Unit, the Animal Nutrition Unit, Agricultural Stations, the Soil Conservation Unit and the department of Veterinary Services. The legislation relevant to operations of the MAR is also included in Table 1 at items with *.

Table 1: Selected Legislation Related to Land Management

Legislation	Provisions	Responsible Institution
The Town and Country Planning Act 1968 (cap. 240)*	Makes provision for, inter alia, the orderly and progressive development of land; the preparation of a Physical Development Plan; the allocation of land for parks and open spaces; preservation and/or protection of forests, woods, shrubs, plants and flowers. The Act has provisions that influence land use related to agriculture and forestry. It also protects ground water by controlling development in the various groundwater zones.	The Town and Country Development Planning Office

The Soil Conservation (Scotland District) Act 1959* The Soil Conservation (Scotland District) (Amendment) Act 1991 (cap. 396)*	Controls the use of land in the Scotland District. Responsible for all slope restoration and land management works within the Scotland District; reviews all development proposals for the area that involve permanent structures; executes the Soil Conservation (Scotland District) Act (1959).	The Soil Conservation Unit of the Ministry of Agriculture and Rural Development
Underground Water Control Act (cap 283)	Requirement for licence for new wells. Pumping restrictions during drought.	Barbados Water Authority
The Irrigation Act (cap. 263)	Provides for the development of irrigation systems	
The Barbados Agricultural Development and Marketing Corporation Act (cap. 254)*	Established the BADMC with responsibility for the development of agriculture on lands vested in the Corporation. A large proportion of such lands are in the Scotland District	Barbados Agricultural Development and Marketing corporation
The Prevention of Floods Act 1952 (Cap. 235)	Provides for flood prevention works and the designation of special flood areas; evaluates, monitors and reports on all development related to drainage control and flood prevention.	Ministry of Public Works, Drainage Unit
The Preservation of Trees Act 1981 (Cap. 397)	Makes the killing of any tree one metre or more in circumference an offence unless a permit is obtained from the Chief Town Planner;	Town and Country Development Planning Office

58. The ***Ministry of Energy and the Environment*** is the government agency with primary responsibility for activities related to global environmental management and the multilateral environmental conventions. The Environment Division comprises several environmental agencies whose functions have either direct or indirect relevance to land management. Each agency would therefore be represented on either or all of the national level entities convened to address these areas. The agencies within the Ministry are summarised in Table 2 below. The Environmental Unit manages implementation of, among others, the Convention to Combat Drought and Desertification (CCD), the Framework Convention on Climate Change, and the Convention on Biological Diversity.

59. As the agency responsible for managing national level involvement in multilateral environmental agreements, the Environmental Unit in the Environment Division of the Ministry of Energy and the Environment is the National Focal Point (NFP) for the UNCCD. The NFP is supported by a Cabinet appointed National Coordination Body (NCB) which acts as an advisory body to the NFP. It is a cross-sectoral committee comprising persons who have expertise in areas relevant to desertification and drought. The NCB has the clear mandate to find potential solutions to the problem of land degradation in the Scotland District first and foremost, and to articulate and facilitate concrete actions utilizing low technology and strong community based solutions, thus empowering resource users towards management.

Table 2: Agencies within the Ministry of Energy and the Environment

The Environmental Unit	Responsible for policy development and coordination, environmental education and public awareness, advising on standards, guidelines and legislation, and environmental reporting.
The Coastal Zone Management Unit	Responsible for the environmental management of the coastal zone including: Monitoring and analysis of oceanographic conditions around the island; hydrographic surveys; GIS data management; water quality monitoring; evaluation of coastal related development planning applications submitted to the TCDPO; preservation of marine and nearshore biological assets.

The Environmental Special Projects Unit	A division of the Ministry responsible for execution of the **Barbados Beautification 2000** project, assisting in the development of the proposed **National Park** and the **Botanical Gardens**, and development of work programmes for the **Caves of Barbados Project**.
Environmental Protection Department	Responsible for pollution monitoring and control; monitoring and regulation of waste disposal; ensuring proper building development in relation to public health, including the operations of public swimming pools.
The National Conservation Commission (NCC)	The NCC is mandated to conserve the natural beauty of Barbados; control and develop public parks, public gardens, caves and beaches.

60. The Environmental Unit works closely with several other Government and non-Governmental agencies in the execution of its mandate that contributes to global environmental protection. While the relationships are largely informal, they have served to be highly effective in the development and implementation of national environmental policies and strategies. The agencies include: the Town and Country Development Planning Office, the Ministry of Agriculture and Rural Development (MAR), the Soil Conservation Unit of the MAR, the Drainage Unit of the Ministry of Public Works and Transport, the Barbados Water Authority, the Sewage and Solid Waste Management Unit and the Office of the Director of Public Prosecutions (DPP).

61. In addition, some collaboration and consultation takes place with non-governmental organisations, the University of the West Indies, and other research institutions on the island. For example:

- The University of the West Indies provides technical and scientific support by contributing to the work of several Cabinet-appointed committees including the Working Group on Biodiversity, the National Coordinating Committee for Development of a National Biosafety/Biotechnology Framework, and the Management Authority for the Convention on International Trade in Endangered Species of Flora and Fauna (CITES).
- The Barbados National Trust, the Graeme Hall Bird Sanctuary and the Barbados Primate Research Center and Wildlife Reserve have also been involved in the consultative process for the preparation of National Report to the UNCBD. A number of other NGOs are involved in yearly activities such as celebrations for World Environment Day, Arbor Day and others, as well as the Ministry's Environmental Education Programme.

National Programmes for Implementation of Multilateral Environmental Agreements

62. In addition to the foregoing, specific strategies and action plans have been developed to enable Barbados to respond to needs not only in relation to land degradation, but also in the related areas of biodiversity conservation and climate change. For example, Barbados has completed and submitted its First and Second National Reports to the Convention to Combat Drought and Desertification. A Draft National Action Programme (NAP) to Combat Desertification and Land Degradation and to Mitigate against the Effects of Desertification, Land Degradation and Drought has also been prepared, and is about to enter the final phase of

completion. The NAP is the culmination of a national consultation process which identified the constraints to effective control of land degradation, and developed action plans to address these constraints in the three thematic areas of agriculture, settlement, and resource use and conservation. A number of capacity needs have also been identified. The products of the NAP preparation process will form a direct input in this project for sustainable land management. The NAP process will be complemented by the National Capacity Needs Self Assessment (NCSA) that will shortly be undertaken. One of the objectives of the NCSA is to link country action to the broader environmental management and sustainable development framework.

63. In addition to the NAP, Barbados has also prepared the First National Communications to the United Nations Framework Convention on Climate Change and undertaken enabling activities. It has also prepared a National Biodiversity Strategy and Action Plan (NBSAP, 1999), and submitted its First and Second National Reports to the Secretariat to Convention on Biological Diversity and has finalized the Third National Report. These processes as well as participation in both the pilot studies and wider regional studies of CPACC, and NBSAP, draft NAP and all the associated national reports, has revealed capacity needs that must be addressed as Barbados moves forward in the area of sustainable land management.

Causes of Land Degradation and Barriers to Sustainable Land Management

64. Land degradation is occurring in both of the two main geologic regions of Barbados – the Scotland District and the limestone region. The Scotland District is naturally prone to land slippage due to its geological structure, and this is aggravated by inappropriate construction and agricultural activity. In the limestone regions, where the problem appears to be much more gradual but equally, if not more, damaging, most of the soil erosion is attributable to human activity. The causes have been identified primarily as inappropriate agricultural practices, overgrazing, soil removal and reallocation, inappropriate land-use management and encroachment of settlements and other physical development. The causes of land degradation described below are summarised in the root-cause matrix in Annex D (third column). The matrix also presents the types of land degradation with which these causes are associated, their biophysical impacts, and potential corrective measures. The following paragraphs provides some detail on the leading causes of land degradation in Barbados.

Agricultural sector

65. In Barbados poor agricultural land practice has been the largest overall contributor to land degradation, based on the relatively large geographic scale of activity across the island. Most of the lands that have been converted to sugarcane, or converted to other types of intensive cultivation, have suffered land degradation to varying degrees. With respect to sugar cane cultivation, lands tend to be most vulnerable to erosion during the period when the fields are ploughed ahead of planting and laid bare. Heavy rains impacting the bare ground can cause excessive erosion and gullying, mainly on sloped lands. Replacement of the cane-hole system[8] by cross contour-ploughing and furrowing that reflect the rapidly expanding use of machinery such as cane harvesters on large holdings has meant more intensive soil disturbance with

[8] Prior to the introduction of machinery on a large scale for preparation of the fields and for harvesting, canes were planted in rows of basin-like holes 2-3 feet in diameter. This system was effective in restricting runoff and preventing soil erosion.

increased potential for land degradation. This has been exacerbated in areas where there is improper drainage with little runoff control. In addition, the indiscriminate use of non-specific herbicides and loss of protective ground vegetation cover is of concern, particularly in areas that are prone to erosion on account of the soil instability and slope. Land degradation has also been associated with indiscriminate application of chemical fertilisers to boost declining productivity in response to declining soil fertility due to soil loss. It has been estimated that as much as $900m^3$ of top soil can be eroded from one hectare of agricultural land during a single rainy season.

66. Overgrazing is of serious concern in many locations over Barbados, although the problem is particularly severe in the Scotland District. While a large proportion of the livestock are penned, feral animals and herds kept by resource-poor farmers roam widely and their impacts are severe during the dry months when the food supply dwindles and they graze vegetation almost completely. With the loss of vegetative cover which may be permanent, depending on the severity of the grazing, the land may rendered highly vulnerable to surface erosion and gulleying.

Deforestation

67. Most of the natural forest cover of Barbados have been long lost to deforestation, the remaining vegetation cover highly modified with introduced exotic crop cultivars and ornamentals. The only substantial remaining areas of forest cover are located within the Turner's Hall Wood in the Scotland District, in the Undercliff Woods at Hackleton Cliff/Foster Hall, and in some of the gullies. Historic deforestation was driven by the opening up lands for sugar cane cultivation. The process of land conversion continues today although this tends to be within lands that have already been highly disturbed. For the most part, vegetative cover removal is now being driven by the market demands for lands for urban settlement needs and investment by the hospitality sector.

Construction Sector

68. The Scotland District is of national significance due to its size and the fact that it constitutes the country's most scenic and open area. It is the core of the proposed National Park System and is the location of several nationally significant ecologically sensitive areas. As land availability has become an increasing concern, the pressure for establishment of permanent structures and tourism facilities in this geologically sensitive region has also intensified. The result has been increased construction activity which not only serves to increase vibrations in the already weak bedrock but, due to the higher water use associated with expanding settlements, increases the input of water to the slip zones within the clays that characterise the area. The result is greater destabilisation and increased landslides and slippage.

69. A notable contributory factor is the practice of sand mining which is concentrated in the Walker's region of the District. This mining is taking place on backshore sand dunes which have been stabilised and colonised naturally by various species of coastal vegetation over numerous decades, and which have sheltered the Walkers Valley from the onslaught of the strong north-east trade winds blowing off the Atlantic Ocean. There is a real concern that the increased exposure of the valley by the lowering and removal of these dunes will increase the salinity of vegetation and soils of the area, intensifying the process of land degradation and complicating efforts at sustainable land management over the long-term.

Increased Mechanisation

70. The technological shift to mechanisation in the agricultural sector is evidenced in the now customary use of bobcats, harvesters, bulldozers and backhoes over less invasive technologies. It is estimated that several thousand acres of topsoil have been moved in the process of establishing buildings and other structures, golf course development and construction and repair of roads. The clearance of land for construction results in loss of surface shoots and subsurface roots, thereby increasing susceptibility to slippage and erosion (SOE Report, 2000). The extent of such land use change in Barbados is evidenced by the notable decline in the acreage of land that is actually cropped.

Water Scarcity

71. Water scarcity is a major contributory factor in land degradation, due essentially to the fact that Barbados is ranked among the ten most water scarce countries in the world. The most reliable estimate of average annual rainfall is 56 inches, most of which falls between June and November. Water scarcity concerns differ between the Scotland District and the limestone regions. For the former the issue is one of control of runoff and the input of water into the slip zones of the clays. In the case of the limestone water scarcity looms as a larger issue for two reasons: (a) relatively low rainfall and (b) high and growing level of demand – from a reserve estimated at 47.3 million gallons a day (mgd), 44.8 mgd is abstracted for private and public supply, and this figure is expected to reach 53.8 mgd by 2016 with business as usual.

72. The seasonality of rainfall and limited supply require efficient and effective irrigation systems, while creating critical management issues on non-irrigated lands. This situation is exacerbated during prolonged dry spells. The NAP notes that the incidence of drought in Barbados is about 3 in 10 years and has been related to El Niño occurrences. In recent times drought has been recorded in 1982, 1986, 1993, 1994 and 1997. In response, the Government of Barbados has adopted a Policy Framework for Water Resources Development and Management (1997), the main elements of which are: demand management, supply management and augmentation, institutional capacity building, policy and legislation (see paragraph 45-46).

73. The **main barriers** to sustainable land management are of four main types, all of which are found to varying degrees in Barbados: limited access to appropriate information and technology; weaknesses in institutional infrastructure; unsustainable land-use practices; and conflicts between land-use goals.

Limited Access to Appropriate Information and Technology

74. Fundamental to SLM is information on the quality of land resources and their actual land use. In the case of Barbados this would include information on basic land properties such as the potential for agricultural production, mineral extraction, and biodiversity; inherent limitations to the various forms of land; susceptibility to drought, erosion, groundwater pollution, and other aspects of degradation; distribution of land uses and ownership; and urban and industrial impacts among others. Some of this information exists, even in digital form, in various government agencies and serves specialized needs such as the GIS in the TCDPO and in the Lands and Surveys Department. Reportedly, the existing systems are not compatible across agencies. Where information systems exist, they are not designed to facilitate assessment and analysis of

ecosystem services in response to changes in land management, and there is limited analytical capacity to support this requirement. What is needed, therefore, is a comprehensive, integrated and functioning land information system housed within a designated agency responsible for overall SLM. An important output of this project is the development of such a system.

Weaknesses in Institutional Infrastructure

75. As described in the section on the Institutional and Policy Framework, there are several agencies which have responsibility for various aspects of land use planning and management, or whose responsibilities involve the use of, or responsibility for, significant portions of land. Despite the fact that some interagency committees exist, their mandates are often issue specific (such as the Land Degradation Committee or the National Biodiversity Working Group) and they lack the authority to address the broader question of land management. Land development planning in Barbados is largely sector-driven. There are no integrated cross-sectoral mechanisms that facilitate planning from a holistic ecosystem services perspective. Agencies tend to pursue their sectoral objectives and programmes, albeit within the context of the national Physical Development Plan. Further, the National Strategic Plan sets the overarching policy and development goals, but does not specifically address SLM. The ecosystem services conceptual framework for sustainable land management seeks to ensure that development considerations take into account the need to provide for maintenance and protection of ecosystem services and functions and make the necessary compensations to minimize adverse outcomes.

76. For the existing policy and institutional framework to be made effective with respect to SLM, a strong coordinating mechanism with the legal authority to oversee the actions of these agencies, including the incorporation of SLM in their programmes and activities, is necessary – things that are currently lacking in the Barbados context. It was the view of stakeholders at the National Consultation Workshop for this project, that this role could be performed by the appropriately strengthened National Commission on Sustainable Development. In addition, the draft National Strategic Plan is slated for debate in the House of Parliament in the near future. However, Policy directives for the integration of SLM into the next PDP and into relevant sectoral plans should be pursued, as well as the drafting of supporting national legislation. These are all identified as necessary outputs of this project.

77. The strengthening of the institutional infrastructure described above must be supported by corresponding strengthening of the human resource capacity of respective agencies that will be involved in SLM. These capacity needs are detailed in the section on Capacity and Mainstreaming Needs for SLM and should pave the way for effective SLM in Barbados.

Unsustainable Land-use Practices

78. Unsustainable land use practices include the overexploitation, pollution, and destruction of natural resources often due to the absence of, or failure to implement, appropriate land use policies. Barbados has an advanced national land use policy and planning process that has been effective in managing land use allocation and conflicts over the years. The difficulties that arise that constitute a barrier to SLM include economic pressures on the allocation of scarce resources, as well as inadequate education and information flows that cause unsustainable practices to become entrenched. An example of the former is sourcing of sand for the construction industry. The primary source of this resource is the Walkers sand dune system in the coastal area of the

Scotland District. The potential impacts of this activity have been described in a previous section. However, the mining is an economic necessity and therefore stringent controls are necessary to prevent the degradation that is likely to result from overexploitation. For this and other cases of unsustainable land use, sustained education and information flows must accompany regulatory systems in order to remove entrenched practices that militate against SLM.

Conflicts between Land-use Goals

79. Land tenure, particularly the issue of small holdings, is an additional barrier that represents conflict between land-use goals as well as an unsustainable land-use practice. The subdivision of land for agricultural purposes has been a socially desirable practice in Barbados for many years. It is recognised as having responded to that important feature of Barbadian culture that there should be opportunities for the ordinary citizen to acquire and farm his or her own land, and has therefore created opportunities for small holder farming. It has also created a market for the change of use from agriculture to residential developments, leading to fragmentation and creating barriers to sustainable land management.

80. It is further recognised, however, that small scale agriculture is uneconomic and therefore unsustainable (ADP, 1998). In a review of the policy that permitted subdivision of agricultural land was conducted during preparation of the 1998 ADP. A fundamental premise of that policy was that efficient farming in Barbados required that the farmer be resident on the plot being farmed. It was found that the gross area subdivided for agricultural purposes between 1968 and 1996 was at least 2, 954 hectares, of which only 27% remained in agricultural production. About 45% of the area subdivided was vacant while about 28% was used predominantly for residential purposes. In addition, of the plots still being used for agriculture, almost 60% did not have houses on them. The review concluded that overall about 2000 hectares of land went out of agricultural production and that about 45% was lying completely idle, providing no beneficial use (ADP, 1998). Current policy now seeks to put an end to the subdivision of agricultural land, and to allow the construction of dwellings on already approved subdivisions only under special circumstances. The creation of additional small holdings is directed to areas adjacent to existing holdings so as to concentrate resource use and avoid fragmentation of arable lands, and to encourage the expansion of existing small holdings. Conversely, the creation of new small holdings in areas that would involved the fragmentation of existing large scale arable lands is generally to be resisted (ADP, 1998).

81. Land tenure in the agricultural sector in Barbados may be considered in two broad categories: agricultural estates or plantations (mainly under sugar cane cultivation) which are parcels of land of more than ten (10) acres; and agricultural small holdings (mainly non-sugar, non-mechanized but intensively cultivated) which are parcels of less than ten (10) acres (Barnes 1998).[9] Land degradation arises as an issue as it relates to loss of soil productivity and income earning capacity from these small holdings. In 1998 there were 8,199 individual such holdings covering 6,074 hectares of land. They comprised agricultural small holdings, backyard garden small holdings, non-agricultural small holdings and landless farmers. This latter group—landless farmers—refers to a set of farmers engaged in livestock production (sheep and cattle) who "encroach on

[9] It is to be noted that the Area Development Plan (Agriculture Sector) produces as part of the EMLUP project defines the categories as over ten (10) hectares and 0.2 to 10 hectares respectively.

and use unoccupied derelict and undeveloped parcels of land not belonging to them for their hay and pasture needs" (ADP, 1998). This practice is reported to have led to land degradation and erosion in the Scotland District in particular. In addition, 40% of the small holdings were found to be underutilised for agricultural purposes, or inactive or used for residential purposes only (ibid.).

82. The combined approaches of strengthening key SLM agencies, developing a comprehensive and integrated land information system, building human resource capacity across stakeholder groups, and developing and implementing sustained education and awareness programmes are all necessary to overcome these barriers. In addition, the concerted implementation of land use policies set out in the 1998 Physical Development Plan is important in reversing land degradation associated with idle or unproductive lands. Planning for management of land resources in Barbados will need to be based on the broad principle of maintenance of ecosystem services (water, soil productivity, biodiversity, natural hazard reduction) not only for environmental benefit but also for multi-stakeholder social and economic benefit.

PART II: PROJECT STRATEGY

PROJECT DESCRIPTION

Baseline course of action

83. The baseline is a description of the programmes, initiatives and projects related to sustainable land management that would take place even in the absence of this GEF-funded capacity building project for SLM. They are presented here under the categories: mainstreaming, human resource capacity building, knowledge management and preparation of the UNCCD National Action Plan.

84. ***Mainstreaming of SLM*** Barbados has completed and submitted a proposal to the Global Environmental Facility for the preparation of a National Capacity Needs Self Assessment (NCSA). This has recently been approved. One of the objectives of the NCSA is to link country action to the broader environmental management and sustainable development framework. While the NCSA will focus on the synergies of the three named conventions (the UNFCCC, the CBD and the UNCCD) the synergistic approach of that project and its linkage to this MSP through the UNCCD together creates an opportunity for realising an integrated approach to these key aspects of sustainable land management in Barbados. Such an integrated approach will require a greater level of coordination and therefore some measure of mainstreaming.

85. The Biodiversity Enabling Activities Project (BEAP) has the overall goal of contributing to the improved and sustainable management of biodiversity resources in Barbados, as well as the effective implementation of relevant provisions of the Convention on Biological Diversity (CBD). An important component of this project is enabling the articulation, adoption and implementation of the National Park Development Plan (NPDP) that was an output of the EMLUP project. The NPDP details a set of land use categories within the park boundaries, which coincide substantially with the boundary of the Scotland District. These land use categories seek to preserve and protect ecologically significant areas, and serve to reinforce the land use objectives of the national Physical Development Plan for this area. In fact, the proposed land use policies and plans for this area are directly incorporated into the national Physical Development Plan. Therefore, the Biodiversity Enabling Activities Project (BEAP) will continue to build on the significant strides already taken towards mainstreaming SLM for this area as manifested in the form of the Physical Development Plan. Under the Coastal Zone Management Programme which is now into its second phase, the Coastal Zone Management Act and the Marine pollution Act have been enacted, both of which recognise the relationships between land management activities and the quality of the coastal environment.

86. ***Human Resource Capacity for SLM*** The Scotland District Soil Conservation/Development Study (SDSCDS) has provided counterpart staff training in areas including aerial photograph interpretation in remote sensing and Arc View data manipulation in GIS. Training workshops were conducted in the same areas. Beneficiary institutions were the Soil Conservation Unit (SCU), the Town and Country Development Planning Office (TCDPO) and the Lands and Surveys Department. Five (5) persons in all were trained. The study also identified and recommended areas of further training necessary for effective land management in

the Scotland District which have not been secured. This SLM project will build on the training already conducted.

87. The process of preparing the NCSA (see paragraph 84 above) will afford Barbados an important opportunity to conduct a thorough assessment of its national capacity, including its human resource capacity, to assist in protecting the global environment by effectively implementing the Rio Conventions. Specific objectives to be accomplished include:

- to identify, confirm and review priority issues for action within the thematic areas of biodiversity, climate change and desertification/land degradation respectively,
- to explore related capacity needs within and across the three thematic areas,
- to catalyse targeted and coordinated action and requests for future funding and assistance, and
- to link country action to the broader environmental management and sustainable development framework.

88. The human resource capacity needs identified in the NCSA will be linked to those for the SLM in order maximise resources for training and to avoid duplication of effort. This and the other objectives are considered to be of major importance in the Barbados context since it is necessary to assess human resource and other issues and needs in a holistic and integrated manner in order to develop coordinated, strategic approaches to addressing them.

89. The Food and Agricultural Organisation (FAO) is executing a US$ 4.9 million Regional Food Security Project, two aspects of which are: (i) water resources management for irrigation purposes and (ii) the construction of greenhouses. Both of these aspects have direct linkages to sustainable land management not only by providing technical assistance but also with training of counterpart staff. They have a total value of US $ 48,000.00, provided by the Italian Trust Fund. The second FAO project involves the training of farmers in vermiculture and vermicomposting. Jointly executed with the Caribbean Development Bank (CDB) and the Inter-American Institute for Cooperation in Agriculture (IICA), this project was financed by the CDB China Fund to the tune of US $ 10,000.00. IICA works very closely with the FAO on several projects, providing technical support in several areas including vermiculture and vermicomposting, greenhouse development, organic farming and agro tourism.

90. The Government of Barbados is involved in other projects which will enable it to meet the Millennium Development Goals (MDGs) while continuing to advance national priorities and initiatives. First, the national Health Sector Programme, which is funded by the European Union (EU), is geared towards improving health conditions among the poor and vulnerable and the population in general while advancing productivity and improving quality of life. The second is the HIV/AIDS Prevention and Control Project which is funded by the World Bank. Together these two projects are directly linked to national sustainability through improved health and quality of life.

91. At the regional level Barbados participated in the global ten-year review of the Programme of Action on the Sustainable Development of Small Island Developing States (SIDS +10) for the review meeting convened in Mauritius in 2005. The national report for that review notes several initiatives in building capacity for environmental management in general and land management in particular. Some of the initiatives have been described in previous sections. They include the

outputs of the EMLUP study which involved the strengthening of the Town and Country Development Planning Office and the Environmental Protection Department, establishment of the Environmental Special Projects Unit, as well as institutionalisation of Environmental Impact Assessment and preparation of the draft Environmental Management Act. Also included is the implementation of Phases I and II of the Coastal Conservation Programme which involved strengthening of the Coastal Zone Management Unit, whose role involves advising on land management activities that impact on the coastal zone.

92. ***Knowledge Management for SLM*** The Scotland District Soil Conservation/Development Study (SCSCDS) was conducted with the aim of "using remote sensing and other desk study data sources to establish the basis for mapping land degradation in the Scotland District".[10] This study found that slightly less than half of the District has been affected by landslide or erosion, either currently or in the past. In addition, one-fifth of the area is presently undergoing active degradation of one form or another. The major outputs of the study are the following mapped data sets of the Scotland District:

- Landslide and instability map
- Location and spread of the major springs and wet areas
- Classification of lands/degradation
- Slope categories
- Soil classification

93. The study has achieved the following results:

- Major spring flows emanating from under the coral limestone cap have been identified and mapped
- Types and extent of eroded and degraded areas have been identified and mapped
- Land use capability has been analysed, elaborated and documented
- Maps identifying actual land use and land use capabilities have been prepared, and
- Documents characterising and correlating problem areas and causal factors have been prepared.

94. The SCSCDS has therefore produced a body of information that forms a basis on which ongoing land management programmes and actions for the area are designed. With the full utilisation of the information base and the required capacity built, an important platform would have been laid for the mainstreaming of sustainable land management as envisaged by this SLM project. The Soil Conservation Unit will continue to execute its day to day work in the Scotland District with funding from the Government of Barbados as the RLM project progresses.

95. ***National Action Plan for the UNCCD*** Barbados has completed and submitted its First and Second National Reports to the Convention to Combat Drought and Desertification. A draft National Action Programme (NAP) to Combat Desertification and Land Degradation and to Mitigate against the Effects of Desertification, Land Degradation and Drought has also been completed. The draft NAP is the culmination of a consultative process, including a National Consultation on Desertification, Land Degradation and Drought. This consultation enabled the coming together of a range of stakeholders including plantation owners; small land holders;

[10] Scott Wilson Kirkpatrick & Co. 2000. Scotland District Soil Conservation/Development Study – Barbados. Draft Final Report

government agencies; cooperatives; NGOs and community representatives; transportation, utilities and waste disposal agencies; mining, quarrying and construction companies; riding, tour and other recreational companies; hoteliers, restaurateurs and horticulturalists. Stakeholders identified the constraints to effective control of land degradation, and developed action plans to address these constraints in the three thematic areas of agriculture, settlement, and resource use and conservation. The proceedings from the consultation informed the draft NAP and likewise inform this proposal.

96. Funding has been made available through the Global Mechanism, the funding mechanism for the UNCCD, to complete the NAP. Through this a second consultation was convened and a Final Draft Report has been prepared and circulated for comment at the national level. The report is expected to be submitted to the secretariat in the near future.

Capacity and mainstreaming needs for SLM

97. Despite the recognition that there is a problem of land degradation in Barbados, and despite the fact that land use management and planning is addressed in several policy documents at a level that would facilitate mainstreaming, sustainable land management principles, goals and objectives have not been mainstreamed into national development policies and plans. There is a need to articulate the concept and practice of sustainable land management in a more precise way in national policy for decision making purposes.

98. Moreover, there is a clear need for greater coordination of land management. This is critical if the goal of SLM is to be achieved. Currently responsibility for land management is fragmented across several government agencies, based on their various involvements in the use of land, and these agencies pursue their respective goals and objectives largely on a sectoral basis. While the TCDPO manages overall land use policy, there is no central or high level agency with the legislative responsibility and oversight for land degradation and land management on the national scale. It is envisaged that this function be performed by the appropriately strengthened national Commission on Sustainable Development, which should work closely with the proposed Scotland District Authority.

99. The assessments which would have occurred as part of the preparation of the First and Second National Reports and the draft NAP, have uncovered a number of gaps and shortfalls in the different levels of capacity–individual, institutional and systemic. In addition, similar assessment conducted in implementing the other "Rio Conventions" (UNFCCC and UNCBD), the preliminary consultations and process of preparing the GEF proposal for the National Capacity Needs Self Assessment (NCSA), and the earlier (2000) SDSCD study, have revealed that more needs to be done to mainstream sustainable land management.

100. Training and human resource capacity building are needed in key governmental and non-governmental agencies involved in land management. The Soil Conservation Unit is the key agency responsible for regulation and land management within the Scotland District. Over the last several decades the unit has conducted, and continues to carry out, important aforestation, terracing and other slope stabilisation work in the Scotland District. The SCU also plays a major role in development control for the area. The consultations to date have revealed, however, that

a full institutional assessment of the agency is needed to identifying areas of strength and weakness, and appropriate strengthening of the unit in the areas of technology and equipment, knowledge and information management, personnel and financial resources and systems, as needed.

101. There is a need for coordinated collection and compilation of desertification and drought monitoring parameters such as rainfall, evaporation rates, temperature, humidity, wind direction, wind speed and radiation, as well as wider geographical coverage of the key parameters. This would lead to a stronger climate monitoring network at the Barbados Meteorological Service and thereby enhance the work of the SCU and other land management agencies.

102. The Provision of personnel, equipment and financial resources is critical to enable key agencies to establish and manage databases with information that is essential for effective land management (for example climatic, geographical and geological parameters, detailed land use). First is the strengthening of geotechnical capability through training that covers geotechnical and slope stability principles, basic soil mechanics issues, slope analysis and design and methods of slope stabilisation. Courses of study in these areas are available at the University of the West St. Augustine Campus in the Faculty of Engineering. Geomorphological interpretation in the SCU also needs to be strengthened, preferably through on-site demonstration and mapping. Training in GIS analysis, image processing and data management within the SCU needs to continue, and this should be done within the context of a full awareness of the land management issues within the Scotland District. Other specific training needs include forestry, nursery care and management, silviculture, water conservation and management, aquaculture and other technical areas.

103. It is recommended that full assessment of land degradation in the limestone areas be conducted. In this regard, the training described above needs to be addressed not only to the Scotland District but to the island as a whole.

104. The plant nursery at the Soil Conservation Unit needs to be upgraded. This includes upgrading and increasing the number of measuring instruments, and increasing the number of vehicles used to collect germplasm from various parts of the island.

105. The capacity needs for mainstreaming SLM also relate to the non-governmental stakeholders such as farmers organisations, community-based organisations and other NGOs that have an interest in SLM. It is important to note that Barbados does not have a system of Local Government and therefore a category of local authorities does not apply. Land management is centrally directed through the Ministries and state agencies assigned such responsibility.

106. The non-governmental stakeholders consist primarily of small farmers and livestock producers as well as any existing community-based organisations. With respect to the former, critical among these is the Barbados Agricultural Society (BAS) which, according to the Draft NAP, serves as an umbrella organisation and secretariat to seven commodity groups. There is no available capacity assessment for these producers, either individually or as a group, to date. However, the Draft NAP assesses the BAS as lacking the necessary administrative, technical and scientific competence to function as the national coordinating civil society focal point for the UNCCD. It follows that the BAS would require some capacity building in these areas in order to

serve as the platform for promoting sustainable land management among its constituents. The training activities described above will therefore be extended to these non-governmental stakeholders where applicable.

107. Apart from the umbrella BAS, there is a small number of grass roots community groups that are involved in rural development projects, in collaboration with private sector, academic and government agencies. Examples of projects include the formation of farmer's cooperatives such as the Organic Growers and Consumers Association (OGCA) and the St. Andrew's Small Farmers and Cottage Industry Cooperative. The main objective of this latter group is to maintain the more than 600 acres of farmlands that was being divested by the government as a part of the land for the landless programme. The OGCA requires members to complete a training programme, which is now conducted by the OGCA itself, in order to become full members. Finally, the Bawden Environmental Park Group (BEPG) is a grass roots community group that is involved in a number of rural development projects that primarily create sustain employment, while utilising the environmental benefits of the Bawden area of the Scotland District, and the skills of local people. The BEPG has brought together the existing organic farmers and this advocacy group quickly developed into a farmer based organization. It was instrumental in establishing the OCGA. Community based farmers' organisations such as these are important resource users. They have some capacity and roles in sustainable land management, but could benefit from additional capacity building to effectively participate in the mainstreaming of SLM at the community level.

Project rationale and objective

108. The overall goal of the project under the UNDP/GEF Targeted Portfolio Approach is to develop capacities and mainstream for effective mitigation of land degradation through sustainable land management. As a participating country, Barbados will realise important benefits from this global activity. The project rationale and objectives for Barbados are presented in relation to the Logical Framework presented in Table 6. In the long term, the project will contribute to the achievement of the following goal:

- *Agricultural land, wooded and protected areas, open spaces and other land uses are fully functioning, sustainable systems that maintain the ecological integrity and productivity of terrestrial and associated marine ecosystems.*

109. The intent of this project is to build capacity for sustainable land management in Barbados, with potential benefit at both national and global levels. At the national level, the specific objective is as follows:

> *Land degradation trends are reversed through enhanced capacity for sustainable land management within relevant government agencies, the private sector, non-governmental and civil society organisations, and the institutionalization of sustainable land management practices within national development planning processes, programmes and strategies.*

110. As part of the UNDP/GEF LDC-SIDS Portfolio Project for Capacity Building and Mainstreaming of Sustainable Land Management, this national project addresses the overall goal and objective of the global project: Assistance to LDC and SIDS for improved capacities for sustainable land management and mainstreaming of SLM. To achieve this the following outcomes are articulated:

- SLM is integrated into national development policies and the legislative and macro-economic framework for land use planning and management – *i.e. mainstreaming.*
- Capacity for SLM, including capacity for knowledge management is strengthened at the individual, institutional and policy levels.
- Routine and consistent coordination and collaboration mechanisms and activities among all relevant planning and land management agencies are established.

111. Without specific actions designed to meet the stated objective, it is anticipated that the existing situation in which there is a sectoral rather than integrated and coordinated approach to land management will continue. Without establishment of the key coordinating mechanism for SLM, reinforced by a legal mandate, the goal of sustainable land management will remain elusive.

112. Similarly, numerous studies over the years have produced substantial information related to land in Barbados, but this data is often housed in discrete databases (electronic and hard copy) in the agencies which executed the studies. Access to complete and accurate information is a necessity for effective and integrated management. To advance the process of SLM the existing body of knowledge needs to be consolidated and expanded through a comprehensive land information system. Without this MSP decisions will continue to be based on incomplete and inadequate information, and therefore sustainability will not be realised.

113. Related to these is the necessary institutional strengthen and human resource capacity development both to ensure that coordination takes place and to provide the expertise necessary in the technical aspects of sustainable land management, including management of land information systems.

114. Based on the foregoing, it stands to reason that without this MSP the current types and process of land degradation will continue and the quality of land in Barbados (arable, wooded and protected areas, open spaces) will thus continue to decline. If allowed, this could have serious negative implications for agricultural production, food security, economic development and overall quality of life.

Expected project outcomes and outputs

115. The project is expected to deliver the following outcomes and outputs:

116. **Outcome 1 – Policy/Regulatory Frameworks and Resource Mobilization for SLM** integrated into national development policies and legislative / regulatory frameworks governing land use planning and management. (*i.e. mainstreaming)*

- **Output 1.1:** SLM fully integrated into National Strategic Plan and Physical Development Plan. (GEF – US$22,400).
- **Output 1.2:** SLM integrated into specific sectoral plans. (GEF – US$24,050).
- **Output 1.3:** National legislation incorporates the principles of sustainable land management. (GEF – US$45,000; Co-financing/GOV US$32,000).
- **Output 1.4:** An SLM Investment Plan developed. (Co-financing/GOV US$18,900)
- **Output 1.5:** The National Action Plan for the UNCCD finalized and adopted (Co financing/Global Mechanism – US$12,500).

117. **Outcome 2 : - Institutional Strengthening and Coordination for SLM** achieved through routine consistent coordination and collaboration among all relevant planning and land management agencies

- **Output 2.1:** The key SLM agencies strengthened. (Co-financing/GOV – US$37,400; Global Mechanism – US$147,100).
- **Output 2.2:** The National Commission on Sustainable Development legally constituted and designated as coordinating mechanism for SLM. (GEF – US$117,700; Co-financing/GOV – US$100,000).
- **Output 2.3:** A legal mechanism for stakeholder involvement in sustainable land management created and functioning. (GEF - US$11,950/ Co-financing/GOV – US$14,900).

118. **Outcome 3 – An efficient Information Management System to support SLM decision-making developed**

- **Output 3.1:** A comprehensive body of data on land degradation island-wide compiled within the Ministry of Agriculture. - Updated and available to all stakeholders. (GEF – US$ 37,700).
- **Output 3.2:** An integrated, functioning land information system housed in the Ministry of Agriculture prepared and accessible to all stakeholders. (GEF – US$16,850).

119. **Outcome 4 – Human resource capacity for sustainable land management developed at all levels.**

- **Output 4.1:** Capacity for SLM at senior and middle technical levels in SCU and relevant sections of the MAR built up. (GEF – US$44,600)
- **Output 4.2:** Adequate capacities among personnel in key land management agencies (MAR, TCDPO, MHE, Lands and Surveys Department) for the use of land information systems developed and enhanced. (GEF – US$10,100)
- **Output 4.3:** Capacity for sustainable agriculture among farmers and other relevant stakeholder groups enhanced and disseminated. (GEF – US$13,350; Co-Financing/FAO – US$50,000).
- **Output 4.4:** A national public awareness programme on sustainable land management launched. (GEF – US$26,100).

- **Output 4.5:** Best practices for soil and soil water management developed, disseminated and widely used (GEF – US$21,200, Co-financing/GOV – US$29,000).

120. **Outcome 5 – Adaptive Management and Learning.**

- **Output 5.1:** Project implemented in a cost-effective manner in accordance with agreed work plans and budgets (GEF – US$50,000, Co-financing/GOV – US$311,517)
- **Output 5.2:** Monitoring and Evaluation Plan provides inputs for robust adaptive management (GEF – US$44,000)

121. The key assumptions underlying this project, and which could pose problems to its successful completion, are as follows:

- Government agencies remain committed to the mainstreaming of sustainable land management and commit the resources to ensure that it continues beyond the life of the project.
- The various institutions will be willing to collaborate and to share access to land information systems.
- Adequate funding and technologies will be made available to sustain the process beyond the project life.
- There is strong stakeholder ownership of and involvement in the project.
- All stakeholders are aware and educated about the principles and practice of sustainable land management.
- Officials in relevant agencies recognise the benefits of applying natural resource economics techniques in decision making.

Global and Local Benefits

122. At the global level the project will have the direct benefit of enhancing capacity to contribute to the enhancement and maintenance of the ecological integrity and productivity of terrestrial and nearshore ecosystems through the integrated management of land resources. In addition, it will have several indirect global benefits including the following:

- Integrated planning for sustainable land management
- Maintenance and protection of ecosystem functionality and integrity
- Enhanced biodiversity conservation due to reduced runoff and soil erosion and reduced sedimentation in nearshore marine areas
- Enhanced carbon sequestration resulting from enhanced soil cover (agriculture, woodland, pasture etc.)
- Encouragement of stakeholder ownership and stewardship of terrestrial systems through sustainable land management.

123. At the national level the project seeks to address negative outcomes associated with the predominantly sector-driven approach to land development planning in Barbados. Emphasis will

be placed on development of integrated cross-sectoral mechanisms, along with enhancement of requisite systemic, institutional and individual capacities that will facilitate land management planning from a holistic "ecosystem services" perspective. The ecosystem services conceptual framework for sustainable land management seeks to ensure that development considerations take stock of implications of development on flow of benefits from land resources to all stakeholders, and make the necessary compensations to minimize adverse outcomes.

Linkages to Implementing Agency activities and programmes

124. There are currently several UNDP funded projects in Barbados, the outputs of which can be linked into this project on capacity building for mainstreaming sustainable land management. Most directly related is the project: *Reforest Barbados – Designing a project proposal for the reforestation of a section of the Scotland District, Saint Joseph, Barbados* (**BAR/05/11**). As the title suggests, this project is being designed to begin a reforestation programme on 100 acres in a long denuded area of the Scotland District. Initial funding is for the Barbados National Trust to obtain services to prepare the discussion paper and proposal. Given its geographical focus, however, this project will link directly into the MSP for SLM in that it is expected to produce a community stakeholder-based discussion paper on a key strategy for SLM in the erosion-prone Scotland District, that of reforestation.

125. The project submitted by the Barbados Association of Environmental Organisations (BANGO) which seeks to train civil society organisations in accessing GEF funds by training personnel in the preparation of GEF small grant proposals is also relevant. It is entitled: *Building Capacity in the GEF SGP Methodology in Project Development, Project Proposal Writing and Project Management* (**BAR/05/10**). Small Grants projects such as the one outlined above have the potential to enhance national initiatives for sustainable land management while directly meeting the objectives of stakeholder involvement. As an umbrella organisation NGOs, the BANGO work forms of a direct linkage with both the preceding Barbados National Trust reforestation project, and the Barbados Marine Trust's coastal conservation project which follows.

126. In island ecosystems there is a direct and vital interrelationship between terrestrial and marine ecosystems. Given this connection, the project being developed by the Barbados Marine Trust on *The Conservation of the Marine Environment along the South Coast of Barbados (Phase 1)* (**BAR/05/06**) is important. Aimed primarily at education and awareness building, the project will improve understanding of the impacts of land based activities on the marine environment. This has the potential to lead to improve land management practices in the long term.

127. At the regional level, Barbados is participating in the Integrated Watershed and Coastal Areas Management (IWCAM) project being implemented jointly by the UNDP and UNEP and executed by the Caribbean Environmental Health Institute (CEHI) and the Secretariat of the Cartagena Convention. This Project aims to strengthen the capacity of the participating countries to implement an integrated approach to the management of watersheds and coastal areas, with the overall goal of enhancing the capacity of the countries to manage their aquatic resources and

ecosystems in a sustainable manner. Given the integrated and interlinked nature of watersheds and coastal areas in small island ecosystems, the project will develop a more sectorally-coordinated management approach, with a strong emphasis on stakeholders within participation. As is the case with the SLM project, the national focal point for this project is also the Ministry of the Environment, with the Coastal Zone Management Unit working closely with the Barbados Water Authority and the Drainage Unit of the Ministry of Public Works – agencies that will also be involved in the SLM project. There is therefore an existing mechanism the two projects, which deal with related subject matter, to be coordinated with each other.

128. In addition to the UNDP projects noted above there are additional projects at both the national and regional levels with which linkages will be established primarily through stakeholder involvement activities. They include: (1) the Coastal Infrastructure Programme funded by the Inter-American Development Bank (IDB), which continues to advance Barbados' work in integrated coastal management (ICM). This involves various coastal stabilisation and recovery works as well public education and awareness activities; (2) the Harrison's Cave Development project funded by the Caribbean Development Bank (CDB), which involves the expansion and protection of this ecologically sensitive and attractive site and (3) the Integrated Solid Waste Management Programme which is also funded by the IDB.

129. A fourth project is the regional GEF-funded project on Mainstreaming Adaptation to Climate Change (MACC). This project, which follows the successful CPACC (Caribbean Planning for Adaptation to Climate Change) Project, will build on CPACC's achievements and aims to integrate climate change and variability into the agendas of the tourism, agriculture, fisheries and infrastructure sectors in participating countries. Because of the direct relationship between climate change and land based activities, direct linkages will be made at the regional level between the MACC and the SLM in order to explore and develop the synergies of these two important activities.

Stakeholder Involvement Plan

130. In the very early stages of preparation of this MSP a stakeholder consultation workshop was convened to provide background information on, and obtain stakeholder input to the project and its preparation process; to identify the root causes of land degradation in Barbados and its potential corrective or mitigation measures; to identify the goal, objectives, outcomes and key performance indicators of the project; and to prepare a stakeholder involvement plan. Representatives from a wide cross section of government ministries and statutory bodies, private sector and civil society organisations, non-governmental organisations and resource users in general were invited to participate in the consultation. While the total number of participants was notably less than those invited, the level of engagement was remarkably high and those in attendance contributed substantially to the Root Cause Analysis of land degradation in Barbados, the Logical Framework Analysis for sustainable land management and the preparation of the Stakeholder Involvement Plan.

131. A ***Stakeholder Involvement Matrix*** is presented in Annex F, providing the details on stakeholder involvement in the project. The key stakeholders identified for this project include

government ministries and statutory bodies, private sector bodies, civil society organisations and resource users.

132. The Environmental Unit of the Ministry of Energy and the Environment (MEE) is the focal point for the United Nations Convention to Combat Drought and Desertification (UNCCD). As such it is currently coordinating both the finalization of the National Action Plan (NAP) and the National Capacity Needs Self Assessment for Barbados. The MEE will therefore be the lead agency in the mainstreaming process. The Environmental Unit will be an active participant ensuring that the outcomes of the NAP and the NCSA are integrated into to the planning process, and also as beneficiaries of training and other capacity building under this LDC-SIDS portfolio project. The MEE will also work in collaboration with the Ministry of Education, the Government Information Service and other members of the national Environmental Education Committee which is chaired by the MEE, in building public awareness and education about the project.

133. The Ministry of Agriculture and Rural Development (MAR) is considered a very important stakeholder, since many of the divisions and units of the MAR, in particular the Soil Conservation Unit, have mandates, responsibilities and interests that are directly or indirectly related to sustainable land management above and beyond any other agency in Barbados. The MAR will be involved in identifying and prioritizing problems and issues in mainstreaming sustainable land management, and in identifying capacity development needs in the area. They will also be involved in training and in the delivery of technology and other resources for capacity building.

134. The Barbados Agricultural Development and Marketing Corporation (BADMC) and other statutory bodies in agriculture, will all have a role to play as beneficiaries of capacity building activities. The BADMC is a major holder of public owned agricultural lands (Crown lands) in Barbados. There are also several large scale private land owners such as the holders of plantation lands, who will benefit from the project, and can contribute to the sustainable management of lands on the island.

135. The Barbados Agricultural Society (BAS) serves as a nongovernmental umbrella organisation and secretariat to seven commodity groups comprising more than 500 farmers of which women account for approximately 30%. These commodity groups comprise pig farmers, egg and poultry producers, fruit and vegetable growers, flower producers and exporters, dairy and beef producers, sheep farmers and cotton growers. These are the3 most vulnerable stakeholder groups in that in most cases they depend almost entirely on the land for their livelihoods. The BAS is therefore an important stakeholder in SLM, representing the interests of these groups, and will participate not only as a beneficiary of the relevant training and capacity building activities, but in identifying issues and solutions in SLM and as the primary mechanism for sustaining local participation. The BAS is also represented on the Land Degradation Committee.

136. There are farmer's cooperatives such as the Organic Growers and Consumers Association (OGCA) and the St. Andrew's Small Farmers and Cottage Industry Cooperative. The latter group maintains more than 600 acres of farmlands divested by the government as a part of the

land for the landless programme. Non-governmental community-based farmers' organisations such as these have some capacity and roles in sustainable land management, could benefit from additional capacity building to effectively participate in the mainstreaming of SLM at the community level.

137. In addition to agriculture, other land uses impact on land quality and, therefore, stakeholders in other related sector will have important roles to play. The Housing Division of the Ministry of Housing, Lands and the Environment, and the National Housing Corporation are identified as key stakeholders. Equally important are agencies in the tourism sector. The planning and promotion policies of government agencies such as the Ministry of Tourism and the Barbados Tourism Authority have implications for the carrying capacity of the land used for tourism. Also critical are the operations of private sector tourism entities such as those involved in safari type tours and other outdoor recreational activities, including entities represented by the Barbados Hotel and Tourism Association. These will all be beneficiaries of the project, as it is important to ensure that awareness of, and capacity for, SLM are enhanced within these agencies.

138. Of critical importance will be other government agencies such as the Town and Country Development Planning Office, which is responsible for the control of development and the allocation of all lands on the island to various uses, and the Barbados Water Authority which manages the collection and distribution of the island's water resources including for agricultural use. The Ministry of Finance and Economic Affairs which is responsible for the overall coordination of the National Strategic Plan will have an important role to play in the mainstreaming of sustainable land management. The Lands and Surveys Department houses a broad-based information system on lands in Barbados and will be a key participant in the development in and integrated national land information system.

139. Other stakeholders, who will participate in the project, primarily as beneficiaries of training in SLM and information systems management, include the Coastal Zone Management Unit, the National Conservation Commission, and the Environmental Special Projects Unit, all of which fall within the Ministry of Housing, Lands and the Environment, and the Drainage Unit of the Ministry of Public Works and Transport.

140. Regional and international agencies such as the Caribbean Agricultural Research and Development Institute (CARDI) and the International Institute for Cooperation in Agriculture (IICA) already collaborate with the government of Barbados on matters related to land management and will participate in the project as part of this collaborative process.

141. With respect to academic institutions the University of the West Indies (UWI), mainly through the Centre for Resource Management and Environmental Studies, already provides technical and scientific support by contributing to the work of several cabinet appointed committees such as the National Biodiversity Committee. The UWI will be expected to continue to provide technical advice on SLM.

142. The Barbados National Trust (BNT) is an NGO concerned with heritage issues. This and other NGOs such as the Barbados Environmental Society, the Barbados Marine Trust with

similar interest in environmental conservation will provide guidance on SLM issues especially in relation to ecologically sensitive and national heritage sites. There is scope for representation on the Land Degradation Committee by the umbrella NGO – the Barbados Association of Non-Governmental Organisations.

FINANCIAL PLAN

Streamlined Incremental Costs Assessment

143. This project will secure GEF funding to the tune of **US$500,000** to mainstream and build capacity for sustainable land management in Barbados. These funds will be complemented with other financing sourced from the Government of Barbados, and the Global Mechanism for the UNCCD.

144. The project will execute a series of interventions needed to build the capacity that would enable Barbados to develop and implement sustainable land management systems. The SLM systems developed will be targeted to address the underlying problems of land degradation that include soil nutrient loss, salinization of soil and vegetation, soil erosion, land slippage, the increasing expansion of hard surfaces, sediment contamination and the potential conversion of land to water.

145. The baseline activities that will contribute to realisation of the project objective have been costed over the period 2006-2009. The costs are summarised in Table 3 – co-financing sources – with full financing sources in Table 4. They are described here as follows:

Outcome 1: The Policy Framework for SLM:

146. Once the consultants have produced the policy documents for the integration of SLM into national plans and policies along with the supporting legislation, the respective government agencies will direct the draft policies through the approval process.

i) The Government of Barbados: **US$ 50,900 – Co-financing** (staff salaries).

ii) Global Environmental Facility (SLM): **US$ 91,450**.

The National Action Plan for the UNCCD:

147. Under this programme the Global Mechanism has made available to the Government of Barbados (GOV) **US$12,500 in co-financing** for completion of the NAP. This work is a baseline activity for the SLM project.

Outcome 2: Institutional Strengthening and Coordinating Activities:

148. **The National Capacity Needs Self Assessment** will contribute directly to this component of the project by laying the groundwork for capacity building for sustainable land management. In addition, officers of the Environmental Unit responsible for the Land Degradation programme area will constitute counterpart staffing to review and revise the mandate of the Land Degradation Committee (LDC) in order to ensure stakeholder participation, and to achieve coordination with the work of the National Commission on Sustainable Development (NCSD).

The Government of Barbados will also continue to contribute to the ongoing upgrading of the Soil Conservation Unit. The budget for this outcome is as follows:

i) The Government of Barbados: **US$ 152,300 – Co-financing**

ii) Global Mechanism (UNCCD): **US$ 147,100 – Co-financing**

iii) Global Environmental Facility (SLM): **US$ 129,650**

Outcome 3: Database Development and Training and Human Resource Capacity Development

149. An integrated land information system comprising of a comprehensive body of data and relevant information products, along with the requisite human resource management capacity will be developed. The land information system, to be housed within the Ministry of Agriculture will assist land planners, managers and stakeholders in improved decision making in the context of sustainable land development to mitigate land degradation. The detailed activities needed to build on the baseline situation are described in the Logical Framework analysis presented in Table 8. The budget for this outcome to be wholly financed by the GEF is as follows:

i) Global Environmental Facility (SLM): **US $54,550**

Outcome 4: Human resource capacity for SLM developed at all levels

150. Financing for these project outcomes will be provided through the GEF funding for this project, as well as through Government co-financing and FAO technical assistance. These outcomes will build on the baseline activities utilising co-financing as outlined above, by adding the critical capacity enhancement needed to mainstream sustainable land management in Barbados. The detailed activities needed to build on the baseline situation are described in the Logical Framework analysis presented in Table 8. The budget for these two outcomes is as follows:

i) FAO: **US$ 50,000**

ii) The Government of Barbados: **US $29,000**

iii) Global Environmental Facility (SLM): **US $115,350**

Outcome 5: Project Management:

151. The final pipeline of co-financing is for project management activities. The GEF will contribute **US50,000** in part-financing to the salaries of a Project Manager, Administrative Assistant, Technical Assistant and Driver/Messenger for the three-year period. The GOV will contribute **US$311,517 in co-financing** for salaries, upkeep of office facilities and the running and maintenance costs of a vehicle, for the duration of the project.

152. A summary of the Project Budget is presented in Table 3 and the estimated co-financing and respective sources are presented in Table 4.

Table 3: Proposed Cost Benchmarks

Component	GEF	Co-finance		Total
		Govt Co-finance	Other Co-finance	
1 Policy/Regulatory Framework and Resource Mobilization (Mainstreaming)	91,450	50,900	12,500	**154,850**
2 Institutional Strengthening	129,650	152,300	147,100	**429,050**
3 Knowledge Management	54,550			**54,550**
4 Human Resource Capacity development	115,350	29,000	50,000	**194,350**
5 Project Management	50,000	311,517		**361,517**
5 Monitoring and Evaluation	44,000			**44,000**
PDF-A	15,000			**15,000**
TOTAL MSP	***500,000***	***543,717***	***209,600***	***1,253,317***

Table 4: Detailed Description of Estimated Co-financing Sources

Co-financing Sources				
Name of Co-financier (source)	**Classification**	**Type**	**Amount (US$)**	**Status**
Government of Barbados	Government	In kind	543,717	Confirmed
Global Mechanism	Multilateral	Cash	12,500	Committed
Global Mechanism	Multilateral	Cash	147,100	In approval process
FAO	Multilateral	Cash	50,000	Committed
Sub-Total Co-financing			**753,317**	

Table 5. Project management Budget/cost

Component	Estimated consultant weeks	GEF($)	Other Sources ($)	Project Total ($)
Locally recruited consultants*	156	50,000	180,880	**230,880**
Internationally recruited consultants*				
Office facilities, equipment, vehicles and communications		0	80,637	**80,637**
Travel		0	0	**0**
Miscellaneous				
Total		**50,000**	**261,517**	**311,517**

** **Local and international consultants in this table are those who are hired for functions related to the management of project. The daily rate includes the fees for the following** local consultants hired for project management: Project Manager; Administrative assistant; Technical assistant.*

Table 6. Consultants working for technical assistance components:

Component	Estimated consultant weeks	GEF($)	Other sources ($)	Project total ($)
Local consultants	231	124,900	101,900	**226,800**
International consultants	50	50,000	73,500	**131,500**
Total	**281**	**174,900**	**175,400**	**350,300**

Budget Notes

a. **Locally recruited consultants** will provide support for project management.
b. **Travel:** No separate budget lines are anticipated. Travel expenses associated with external consultants will be accounted for within consultant fees.
c. **Office expenditures:** These will be in-kind contribution by the GOV. The PMU will be established within the Environmental Unit of the Ministry of Housing, Lands and the Environment
d. **Consultants:** contracted both individually and through existing technical organizations and NGOs, include:
    1. ***Policy and legal specialist*** (local) - Outcome 1: Policy mainstreaming
    2. ***Finance policy specialists*** (local and international) – Outcome 1: Development of SLM investment plans
    3. ***Institutional analyst*** (local and international) - Outcome 2: Institutional analysis to determine best institutional arrangements to support SLM
    4. ***Legal specialist*** (local) - Outcome 2: Legal mechanism for stakeholder involvement in sustainable land management
    5. ***IT/Database Management Specialist*** (local) – Outcome 3: Development and appropriate information management systems for data archival and information dissemination
    6. ***Land Information Systems Specialist*** (local and international) – Outcome 3: Development of the functional basis for the land information system
    7. ***SLM Technical specialists/trainers*** (local and international): - Outcome 4: Capacity building for best practices in SLM (including use of land information system)
    8. ***Communications specialist*** (local) – Outcome 4: Awareness-raising strategy development and execution
    9. ***Production services*** (local) – Outcome 4: Awareness-raising materials production
    10. ***Auditor*** (local) – Outcome 5: Carry out audits of the project
e. **Contractual services – individual:** These are additional short-term services provided by individuals in support of main activities either by consultants or by the PCU. Such services will include, but not limited to, conduct of surveys, conduct of research, preparation of documentation, etc.
f. **Contractual services – Company:** These are additional services rendered by specialized organizations. These services will include, but not limited to, conduct of surveys, conduct of research, preparation of documentation, equipment installation and service, and evaluations.
g. **Supplies:** Materials and other consumables
h. **Information technology equipment:** Costs associated with procurement and installation
i. **Rental & Maintenance-premises:** It is anticipated that several meetings and training workshops will be held across the country and the budget is reflective of the costs associated with hosting of these meetings. This includes the venue rental and catering for participants.
j. **Rental of information technology equipment:**
k. **Professional services:** These services will include but not limited to media production, advisory, facilitation, etc.
l. **Audio, visual and printing production costs:** Costs associated with multiplication of resource materials.

PART III: MANAGEMENT ARRANGEMENTS

PROJECT IMPLEMENTATION PROCESS

Institutional framework and project implementation arrangements

153. This project will be implemented over a period of three (3) years. The implementing agency will be the UNDP Country Office for Barbados and the Eastern Caribbean. The Environmental Unit (EU) of the Ministry of Housing, Lands and the Environment, as the focal point for the UNCCD, will be the lead agency at the national level, and thus function as Executing Agency. However, the EU will work very closely with a number of key ministries in Barbados, particularly the Ministry of Agriculture and Rural Development (MAR). The following institutional structure will be established to execute the project at the national level:

154. **A Project Management Unit** (PMU) headed by a **Project Manager** (PM) will be established within the Environmental Unit (EU) of the Ministry of Housing, Lands and the Environment (MHE). The PM will provide day-to-day oversight of consultants contracted to the project, as well as overall management services. He/she will be responsible for the application of UNDP administrative procedures and for use of the UNDP/GEF project funds. The PMU will have overall responsibility for project management, administrative, technical and financial reporting. The PMU will manage all contracts with consultants and other local service providers as well as the GOV funds for the operations of the PMU. This will include preparation of TOR, call for bids and organisation of the selection process. This will all be done in close coordination with UNDP but the contracts will be awarded by the PMU. The PMU/PM will have lead responsibility for reporting requirements to the UNDP and ensure that the project complies with UNDP's monitoring, evaluation and reporting requirements.

155. **Implementation Arrangements.** UNDP through its office in Barbados will serve as the Implementing Agency. The project will follow the UNDP National Execution (NEX) modality. The SLM-MSP will utilize Direct Payment Request modality for funds disbursement to ensure greater financial accountability and transparency. UNDP-Barbados will act to ensure that all implementation activities comply with policies outlined in UNDP's Programming and Financial manuals and are in line with UNDP GEF procedures. Where petite cash is needed for office support or similar activities, UNDP will advance funds for a three-month period. At the end of the three-month period, the PMU will submit justification for expenses and the funds spent will be renewed by UNDP. The Government will provide the Resident Representative with certified periodic financial reports and open its accounts to certified auditors in keeping with UNDP and GEF requirements. The project will comply with UNDP's monitoring, evaluation and reporting requirements as spelled out in the UNDP Programming Manual. The PMU PM will have lead responsibility for reporting requirements to UNDP. Financial management and accountability of resources as well as other project execution activities will be under UNDP country office direct supervision.

156. The Country Office of the UNDP, the implementing agency, will be responsible GEF funds for this project. Payments will **be** made to the project fund specifically created by the EU/MHE. The implementing agency will also apply established GEF/UNDP procedures for project oversight. An indicative annual work programme tied to each of the project outputs is incorporated into the Detailed Activity Budget .UNDP-Barbados will also act to provide

management oversight and is ultimately responsible for project monitoring, evaluation, timely reporting by the PMU and ensuring the submission of annual audits to UNDP HQ. The regional Coordination Unit in Panama will provide technical backstopping, UNDP GEF policy advice and trouble shooting and advisory services as necessary.

157. The Project Manager will be guided by a **National Steering Committee** (NSC) which will comprise the Permanent Secretaries or senior technical personnel from the key Government and non-governmental stakeholders in land management in Barbados, and UNDP. Members of this group will include the MAR; the Barbados Agricultural Development Management Corporation (BADMC); the Barbados Agricultural Management Company (BAMC); the Town and Country Development Planning Office; the Housing Division of the Ministry of Housing, Lands and the Environment; the Barbados Water Authority; the Ministry of Tourism, the National Commission on Sustainable Development and the Barbados Association of Non-Governmental Organisations. It will also include representation from the National Coordination Committee (NCC) of the National Capacity Needs Self-Assessment (NCSA) to establish an effective linkage between the two projects. The NSC will be responsible for the final selection of consultants to the project. It is proposed that the NSC meets once monthly, with the flexibility to convene special meetings as required.

158. The Environmental Unit will follow the norms and procedures specified in UNDP's NEX manual in the execution of the project. UNDP-Barbados will act to provide management oversight and is ultimately responsible for project monitoring, evaluation, timely reporting by the PMU and ensuring the submission of annual audits to UNDP HQ. The regional Coordination Unit in Panama will provide technical backstopping, UNDP GEF policy advice and trouble shooting and advisory services as is necessary.

159. This Project Document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of Barbados and the United Nations Development Programme, signed by the parties on 7th June 1982. The host country Implementing Agency shall, for the purpose of the Standard Basic Assistance Agreement (SBAA), refer to the government co-operating agency described in that agreement.

160. The Environment Unit, through UNDP/PMU, will prepare the Annual Work Plan reflecting the Project's activities and the outcomes to be achieved through their implementation. The Plan will indicate the implementation periods of each activity and the parties responsible for carrying them out. The first Work Plan will be completed and attached to the present Project Document no later than 30 days after its signing.

161. A **Technical Advisory Group** (TAG) will be drawn largely from the existing Cabinet appointed Land Degradation Committee and the National Coordinating Body for the UNCCD. The TAG will provide technical support to the Project Manager and NSC. The members of the TAG will be selected based on their expertise in areas directly related to sustainable land management, and will be drawn from government agencies, the University of the West Indies, national and regional agricultural research agencies and civil society as a whole. It is expected that some members of the TAG will also be serving on the NCC of the NCSA, thereby providing

another level of coordination between the two projects. The TAG will review technical reports and other deliverables and make recommendations on the work of the consultations.

162. **Administrative support** will be provided by the Environment Division of the MHE and will include a technical assistant and an administrative assistant. Secretariat services will also be provided by the Environment Division.

163. **Responsibility for Outcomes:** The Environmental Unit of the MHE will have ultimate responsibility for the outcomes and deliverables of the project. However, due to the project's predominant relationship to the agriculture sector, the MAR will designate a point person to serve as a direct liaison with the PM. Work on the project deliverables will be done largely by consultants. The role of the MAR liaison will be to work with the MP in the development of the Term of Reference for consultants, and also to work with the PM to ensure that the agriculture-related deliverables meet the expectations of the MAR.

164. In accordance with standard UNDP procedures, all resources and equipment gained through project support remain the property of UNDP until project closure when a decision will be taken as to how to dispose of these resources.

165. Finally, in order to accord proper acknowledgement to GEF for providing funding, all projects documents will include a paragraph to explicitly require that a GEF logo appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgment to GEF.

PART IV: MONITORING AND EVALUATION

Monitoring and Evaluation Plan

166. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures for MSPs under the SLM Portfolio Project and will be provided by the project team and the UNDP Country Office with support from UNDP/GEF Global Support Programme and includes the following elements:

167. The Logical Framework Matrix (attached) provides *performance* and *impact* indicators for project implementation along with their corresponding means of verification. These indicators have been derived from the *Resource Kit for Monitoring, Evaluation, and Reporting on GEF/UNDP supported Sustainable Land Management Medium-Sized Projects in LDC and SIDS countries.* The baseline situation presented in this document also utilizes these indicators.

168. Additional baseline information will be documented by the Barbados Country Office and Project Steering Committee using the *National MSP Annual Project Review Form* in which all 'compulsory' and 'optional' questions and indicators will be completed by 1 July 2007 and updated by that date each year. The Form provides a basis for the annual review of project progress, achievements and weaknesses, for planning future activities, and to obtain lessons learned to inform adaptive management processes. It also supports UNDP Barbados Country Office-wide reporting and planning. For the *optional* indicators, the EU will select the most appropriate indicators for the project and include these in the form. Those indicators included in the Logical Framework Matrix are compulsory and will not be modified. Once completed, the Review form will be forwarded to the UNDP CO which will then forward to the GSU latest by 16 July of the respective year.

169. The EU will work with the GSU and the UNDP Barbados Country Office to complete two annual surveys that each respond to two of the compulsory indicators, which are (a) a compulsory indicator at the Objective level of public awareness regarding sustainable land management; and (b) a compulsory indicator for Portfolio Outcome 1 that requires a survey of a group of land users to determine the percentage that is satisfied with available technical support.

170. These surveys will be implemented with funding included in this MSP project budget.

Monitoring Responsibilities, Events and Communication

171. A detailed schedule of project review meetings will be developed by the EU in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. The schedule will include (i) tentative time frames for Tripartite Reviews, Project Coordination Committee Meetings, (or relevant advisory and/or coordination mechanisms) and (ii) project related Monitoring and Evaluation activities (see Indicative Monitoring and Evaluation Budget, Table 7).

172. *Day to Day Monitoring of Implementation Process* will be the responsibility of the Project Support Unit, operating out of the EU and based on the project's Annual Work Plan and its indicators. The EU will inform the UNDP Barbados Country Office of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

173. *Periodic Monitoring of Implementation Process* will be undertaken by the UNDP Barbados Country Office through quarterly meetings with the project proponent, or more frequently as deemed necessary. This will allow parties to take stock and troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities. The Project Coordinator in conjunction with the UNDP-GEF extended team will be responsible for the preparation and submission of the following reports that form part of the monitoring process.

174. *An Inception Report (IR)* will be prepared immediately following the Inception Workshop and submitted within 3 months from the start of project implementation. It will include a detailed First Year/Annual Work Plan divided in quarterly time frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include the dates of specific field visits, support missions from the UNDP Barbados Country Office, or the Regional Coordinating Unit (RCU) or consultants, as well as time frames for meetings of the Project Steering Committee. The report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12-month time frame. The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions, and feedback mechanisms of project related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation. When finalized, the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond to comments or queries. Prior to this circulation of the IR, the UNDP Barbados Country Office and the UNDP-GEF's Regional Coordinating Unit will review the document.

175. *Quarterly Operational Reports:* Short reports outlining main updates in the project progress will be provided quarterly to the local UNDP Country Office and the UNDP-GEF regional office by the project team.

176. *Technical Reports* will be scheduled as part of the Inception Report, the project team will prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary/applicable, this Reports List will be revised and updated, and included in subsequent Annual Progress Reports (APRs). Where necessary, Technical Reports will be prepared by external consultants and will be comprehensive with *specialized* analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels. Information from reports will be shared with the CCD focal point and Project Steering Committee.

Annual Project Report (APR) and Project Implementation Review (PIR)

177. The APR is a UNDP requirement and part of UNDP's Country Office central oversight, monitoring and project management. It is a self-assessment report by project management to the Country Office and provides CO input to the reporting process and the ROAR (Results Oriented Annual Report), as well as forming a key input to the Tripartite Project Review. The PIR is an

annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects. These two reporting requirements are so similar in input, purpose and timing that they have now been amalgamated into a single Report.

178. An APR/PIR is prepared on an annual basis following the first 12 months of project implementation and prior to the Tripartite Project Review. The purpose of the APR/PIR is to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work. The APR/PIR is discussed in the TPR so that the resultant report represents a document that has been agreed upon by all of the primary stakeholders.

179. A standard format/template for the APR/PIR is provided by UNDP GEF. This includes the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome
- The constraints experienced in the progress towards results and the reasons for these
- The three (at most) major constraints to achievement of results
- Annual Work Plans and related expenditure reports
- Lessons learned
- Clear recommendations for future orientation in addressing key problems in lack of progress

180. The UNDP/GEF M&E Unit will analyse the individual APR/PIRs by focal area, theme and region for common issues/results and lessons. The Reports are also valuable for the Independent Evaluators who can utilise them to identify any changes in project structure, indicators, work-plan, etc. and view a past history of delivery and assessment.

Mid Term and Final Evaluation

181. The project will be subject to two independent external evaluations. An independent external *Mid-Term Evaluation* (MTE) will be undertaken 18 months after project initiation. The focus of the MTE will be to make recommendations that will assist in adaptive management of the project and enable the PM to better achieve the project objective and outcomes during the remaining life of the project. The Final Evaluation will take place three months before the project is operationally closed, prior to the terminal tripartite review meeting, and will focus on determining progress being made towards the achievement of outcomes and will identify effectiveness, efficiency and timeliness of project implementation; highlight issues requiring decisions and actions; and present initial lesions learned about project design, implementation and management. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals.

Audits

182. The Government of Barbados will provide the UNDP Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set

out in the Programming and Finance manuals. The Audit will be conducted by the Office of the Auditor General of the Government of Barbados, or by a commercial auditor engaged by the Government. The project foresees an audit to be conducted at the end of the project by a recognized national firm.

Adaptive Management

183. Lessons learnt will be continuously extracted from the MSP Project. Lessons will be disseminated through the national network established by the NAP, and through the National Steering Committee for UNCCD. Among the mechanisms to be used will be inter-Agency MoUs, incorporation into Annual Work Plans and through capacity development and training initiatives. As well, there will be the sharing of information between projects, stakeholders and policy representatives as an effective measure of mainstreaming. There is an opportunity during the implementation of the MSP for review of the implementation of the NAP and to take into consideration the lessons learnt from the MSP.

184. The lessons learnt from the MSP through evaluations will be incorporated into implementation of the MSP. In addition to the monitoring, evaluation and feedback mechanisms already identified, the Project Steering Committee will review progress on a quarterly basis, identifying lessons learnt and discuss project progress with the involvement of wider stakeholder audience as necessary. The ideas and lessons learnt will be incorporated into the management of the project and further implementation process by the Project Steering Committee with adjustments to the Work Plan as required.

Table 7: Monitoring and Evaluation (M&E) Plan

M&E Activity	Responsible Party (lead responsible party in bold)	Budget	Time Frame
Inception Report	**Project Implementation Team**	None	At project start-up
Annual Progress Report (PIR) and GEF Project Implementation Report	The National Executing Agency (MHE/PMU), **Project Team,** UNDP Country Office, UNDP/GEF Task Manager	None	By June each year
Tripartite meeting and report (TPR)	National Executing Agency, Project Team, **UNDP Country Office,** UNDP/GEF Task Manager	None	Each year on receipt of the APR
Mid-term External Evaluation	**National Executing Agency,** Project Team, **UNDP Country Office**, UNDP headquarters, UNDP Task Manager	$12,500	Middle of year 2 of project implementation
Final External Evaluation	**National Executing Agency, UNDP Country Office,** UNDP/GEF Task Manager, UNDP/GEF Headquarters, Project Team	$20,500	At end of project implementation.
Terminal Report	UNDP Country Office, UNDP/GEF Task Manager, **Project Team**	None	At least one month before end of project
Audit	**National Executing Agency**, UNDP Country Office, Project Team	$1000 per year	Yearly
Surveys (2)	Project Management Unit,	$5,500	Two surveys, annually

	UNDP/GEF RCU, UNDP/GEF Task Manager, UNDP **CO, Project Team**		At the outset of project implementation and mid-way through the project
Lessons learnt	UNDP-GEF, GEFSEC, **Project Team**	$2,500	For duration of project
Total		$44,000	

RESPONSE TO GEF SECRETARIAT REVIEW

GEFSEC Comment	**Response**	**Location where document was revised**

SECTION II: STRATEGIC RESULTS FRAMEWORK

Table 8: Logical Framework for Sustainable Land Management in Barbados

Project Strategy	Objectively verifiable indicators			Sources of verification	Risks and Assumptions
	Indicator	Baseline	Target		
Goal: Agricultural land, wooded and protected areas, open spaces and other land uses are fully functioning, sustainable systems that maintain the ecological integrity and productivity of terrestrial and associated marine ecosystems.					
Objective of the project: Land degradation trends are reversed through enhanced capacity for sustainable land management within relevant government agencies, the private sector, non-governmental and civil society organisations, and the institutionalization of sustainable land management practices within national development planning processes, programmes and strategies.	Best practices and guidelines for SLM disseminated by TCDPO, MAR and MEE are incorporated into at least 10 leading sectoral regulatory and policy instruments related to land use by Y2 NAP formulation completed and approved by Cabinet of Ministers by Y1	SLM not mainstreamed at the systemic level resulting in ineffective management of land resources NAP did not exist	Relevant legislative, regulatory, and policy sector instruments amended and accepted by Cabinet of Ministers by 2nd quarter Y2 NAP completed by last quarter Y1	Published revised legislative and policy instruments in agency reports and in National Gazette Cabinet decision published in national Gazette	Continued political support for integrating SLM into national development planning; Public education and awareness of SLM generates support for application of SLM practices and considerations in all relevant sectors
Outcome 1: Policy/Regulatory Frameworks and Resource Mobilization for SLM integrated into national development policies and legislative / regulatory	The Ministry of Economic Affairs and the Town and Country Development Planning Office (TCDPO) use natural resource economics as a tool in decision making on land use by Y2	Guidelines for incorporating SLM into macro-economic policies do not exist; limited capacity to effect mainstreaming process	Incorporation of SLM into macro-economic policies and planning (via best practices/guidelines for SLM integration) completed by first quarter Y2	Revised Planning and policy documents. (accompanied by relevant SLM economic analyses)	Senior policy and planning authorities are motivated to facilitate the process of integration of SLM considerations into sustainable development strategies and initiatives; high level political commitment is secured.

Project Strategy	Objectively verifiable indicators			Sources of verification	Risks and Assumptions
	Indicator	Baseline	Target		
frameworks governing land use planning and management. (*i.e. mainstreaming*)	The National Strategic Plan and the Physical Development Plan contain specific sections that address land degradation and sustainable land management by Y3	Most policy instruments (outside of PDP and Agricultural Plans do not incorporate SLM	Integration of SLM into National Strategic Plan and the Physical Development Plan completed by Y3	Revised National Strategic Plan and the Physical Development Plan documents	
	Investment plans in key economic sectors (agriculture, tourism, construction, commercial) incorporate priority actions for SLM as defined in NAP by Y2	Sector investment plans generally do incorporate SLM considerations	SLM investment plans completed by Y1; Incentive instruments in support of SLM investments approved by Ministry of Finance by Y2	Sector Investment plans of Agriculture, Water, Housing, Tourism, Environment, Economic and Financial Agencies; reports of government budgetary allocation;Gazetted new/revised incentive regimes	Investment climate remains favourable; political commitment continues
Outcome 2: Institutional strengthening and coordination for SLM achieved through routine consistent coordination and collaboration among all relevant planning and land management agencies	SCU staff has been increased by 2 and its budget in support of SLM expanded by 2%	SCU capacity inadequate to provide effective support to SLM considerations in developmental planning; low level of resource support to SCU	At least 5 staff members in SCU receiving advanced training in soil conservation; additional of 3 staff members; increase in annual budgetary allocations by 2% by Y2	Gazetted new staffing structure, Unit reports, budget allocation	Planning and land management agencies understand benefits of coordination and collaboration and are willing to participate. Budgetary allocations for the SCU are increased
	Mechanism for coordination and collaboration among relevant agencies has been developed, formalised and is in effect by Y1	Agency mandates and mechanisms for effective coordination for SLM poorly defined; no formal arrangements for inclusion of NGOs and private sector in land management	Coordinating mechanism between key agencies defined and established by last quarter of Y1	Gazetted collaborative mechanism, Memoranda of Understanding between agencies, development approval documentation(reflect administrative process)	

Project Strategy	Objectively verifiable indicators			Sources of verification	Risks and Assumptions
	Indicator	Baseline	Target		
	Role of the Land Degradation Committee on the National Commission for Sustainable Development is formalized by Y1	Land Degradation Committee only meets on ad hoc basis	Land Degradation Committee is formally constituted by Y1	Cabinet decision published in National Gazette	
Outcome 3: An efficient Information Management System to support SLM decision-making developed	The integrated Land Resources Information System (LRIS) created within Ministry of Agriculture is being consulted by at least 5 stakeholders every month by Y2	Central land information system does not exist; Spatial information systems (GIS) with limited datasets exist in Agriculture, Land and Surveys and Town Planning Dept. but not oriented to SLM decision making	Computerized land information system completed and functional by Y2	Computer hardware and software procurement documentation; Consultant reports; record of consultations	Stakeholder institutions are willing to collaborate on integrated approaches to sustainable land management and to share access to land information; Adequate Institutional and financial support are provided
	100% of studies on the status of land degradation in the limestone areas of Barbados conducted, as well as the new land use and soil survey, are available in the integrated Land Resources Information System (LRIS) by Y2	Land degradation data in environmental hot-spots (Scotland District) is outdated compromising effective decision making and planning	Relevant spatial/attribute datasets compiled by Y2 and readily available on the LRIS; ew soils survey completed and published by ; new land use cover maps available by Y2	Spatial data sets; Consultant reports; Planning/development application documentation Published soil survey and land use maps	
Outcome 4: Human resource capacity for SLM developed at all levels	Capacity to utilize spatial land resources information in support of SLM planning within key land management and decision making agencies is enhanced by Y2	Capacity for effective application of spatial land information systems in support of SLM planning inadequate	At least 37 technical officers from Agriculture, Environment, TCPO and NGOs trained in the use/application (and maintenance) of land information systems for SLM planning each year	Agency reports, planning/development documentation accompanied land information products; LRIS operating and maintenance procedures	Funding for SLM has been made available; There is stakeholder consensus for, and buy-in to, the process; Appropriate technologies for SLM are available

Project Strategy	Objectively verifiable indicators			Sources of verification	Risks and Assumptions
	Indicator	Baseline	Target		
	Percentage of land-users satisfied with available technical support has increased	Low level of uptake of soil/land conservation measures in project design and execution the economic sectors (agriculture, tourism, industry, construction); technical staff in agencies lack requisite skills in delivering technical support for SLM	At least 35 farmers, agricultural officers, land developers and other major land users from the public and private sectors and from NGOs trained in land management principles and techniques each year	Training documentation and surveys	
Outcome 5: Adaptive Management and Learning	Project Management Unit established and effective	none	PMU is operational within 1 month of Project start-up.	Annual project progress reports Annual work plans	
	Project implementation guided by monitoring and evaluation programme	None	M+E benchmarks and targets realized	Quarterly Operational and Annual project progress reports; Published annual M+E evaluations; Revised Annual work plans (based on findings of M+E)	
	Documented lessons from project implementation	none	Lessons learnt documentation incorporated into annual progress report	Quarterly Operational and Annual project progress reports	

Table 9: Project Activity schedule

Output	Activity	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Outcome 1: Policy/Regulatory Frameworks and Resource Mobilization for SLM integrated into national development policies and legislative / regulatory frameworks governing land use planning and management. (*i.e. mainstreaming*)													
Outputs													
1.1 SLM fully integrated into NSP and PDP	1.1.1.Review of the National Strategic Plan												
	1.1.2. Prepare policy papers on the use of natural resource economics in decision making on the allocation of land uses												
	1.1.3. Prepare policy paper to amend TCDPO guidelines												
1.2. SLM integrated into specific sectoral plans	1.2.1 Review relevant existing sectoral plans and develop appropriate proposals for SLM integration												
	1.2.2 Conduct seminars within sectoral groups on the integration of SLM into policies and plans												
1.3 National legislation incorporates the principles of SLM	1.3.1. Review and amend existing legislation relevant to land management to incorporate SLM												
	1.3.2 Prepare cabinet paper to obtain drafting policy for legislation to establish SDA												
	1.3.3 Conduct workshop for stakeholder input Direct draft legislation through approval process												
	1.3.4. Direct draft legislation through approval process												
1.4 SLM Investment Plan developed	1.4.1.Identify priority SLM investment needs and opportunities												
	1.4.2.Develop costed SLM Investment Plan including brief concept papers for priority investments												
	1.4.3.Source investments for SLM												
1.5. NAP finalized and adopted	1.5.1 Convene national stakeholder consultation for finalization (validation) of the draft NAP												
	1.5.2 Guide formal adoption of NAP by Government (negotiation of allocation of national budget for NAP implementation)												
	1.5.3 Publication and dissemination of the NAP through awareness and media programmes												
Outcome 2: Institutional Strengthening and Coordination for SLM achieved													
Outputs													

Output	Activity	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
2.1 The key SLM agencies strengthened.	2.1.1.Conduct comprehensive institutional review of the SCU				■	■	■						
	2.1.2. Strengthen the unit in the areas of technology and equipment, personnel and financial resources and systems, as needed.						■	■	■	■	■	■	■
2.2. The NCSD legally constituted and designated as coordinating mechanism for SLM	2.2.1. Review and revise mandate of the NCSD	■	■										
	2.2.2. Draft legislation to establish the NCSD		■	■									
2.3 Creation and functioning of a legal mechanism for stakeholder involvement in sustainable land management.	2.3.1 Review and revise membership of the Land Degradation Committee		■										
	2.3.2.Establish SLM as part of the work Programme of the LDC		■	■	■								
	2.3.3.Draft legislation for stakeholder involvement in SLM					■	■	■					
	2.3.4.Guide draft legislation through the approval process								■	■	■		
Outcome 3: An efficient Information Management System to support SLM decision-making developed													
Outputs													
3.1 A comprehensive body of data on LD island-wide complied within the Min of Agriculture	3.1.1 Prepare TORs and contract consultants for a comprehensive study of soils and land	■											
	3.1.2. Identify data gaps on land degradation issues island wide and develop strategies to fill those gaps	■	■	■									
	3.1.3.Publish and disseminate study report and convene stakeholder consultations				■	■							
	3.1.4. Prioritise recommendations relevant to SLM and develop work plans					■	■						
	3.1.5 Develop training plan necessary for implementing SLM priorities							■	■				
3.2. An integrated and functioning LIS housed in the Ministry of Agriculture	3.2.1.Review and assess all existing GIS and recommend procedures for coordination and integration into a central LIS	■	■										
	3.2.2. Identify and recommend a central entity/agencies or network for housing and managing the national LIS		■										
	3.2.3.Develop and recommend terms and conditions of stakeholder access to the LIS		■	■									
Outcome 4: Human Resource Capacity for SLM developed at all levels													
Outputs													
4.1. Capacity for senior and middle level	4.1.1 Source undergraduate and post-graduate programmes at the UWI			■	■								

Output	Activity	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
technical levels in SCU and relevant sections of the MAR built up	4.1.2 Identify 4 middle and 3 senior level technical personnel from the SCU for training at the undergraduate and post graduate levels												
	4.1.3 Identify 5 additional personnel within the SCU and MAR in general, and in the Environmental Unit of the MHE for training in SLM supporting areas at the undergraduate and post graduate levels												
4.2. Adequate capacities among personnel in key land management agencies for the use of LIS developed and enhanced	4.2.1 Identify or develop appropriate training courses in LIS												
	4.2.2 Identify or develop and execute courses for the training of trainers in LIS												
	4.2.3 Identify candidates from among stakeholder groups and execute training programmes												
4.3. Capacity for sustainable agriculture among farmers and other relevant stakeholder groups enhanced and disseminated	4.3.1 Prepare guidelines and training manuals on SLM												
	4.3.2 Deliver training to stakeholders and user groups												
4.4 A National public education and awareness campaign launched	4.4.1 Develop public awareness material for a nationwide campaign on SLM												
	4.4.2.Plan and execute high profile launch of the SLM process												
	4.4.3Execute the public awareness programme over prescribed period												
4.5. Best practices for soil and water management developed, disseminated and widely used	4.5.1.Identify and promote best management practices to assist in addressing each type of land degradation identified in the root cause matrix												
	4.5.Develop and conduct pilot study on best management practices for soil and land management												
	4.5.3.Develop and conduct pilot study on soil water management for SLM												
Outcome 5: Adaptive Management and Learning													
Outputs													
5.1 Project implemented in a cost-effective manner in	Recruitment of PMU staff and office establishment												
	Recruitment of PMU staff and office establishment												
	Inception meeting												

Output	Activity	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
accordance with agreed work plans and budgets													
5.2. Monitoring and Evaluation Plan provides inputs for robust adaptive management	Bi-annual meetings of the PSC												
	Annual review meetings												
	Surveys of stakeholders												
5.3. Lessons learned from the project captured and disseminated	Evaluations (Mid and Final)												
	Document production and dissemination												

Table 10: Total Budget and Workplan

AWARD ID : 00040957 PROJECT TITLE: Capacity building and Mainstreaming of Sustainable Land Management in Barbados – PIMS 3408						
GEF Outcome/ Atlas Activity	**Responsible Parties**	**Source of Funds**	**Amount US $ (Year 1)**	**Amount US$ (Year 2)**	**Amount US $ (Year 3)**	**Amount US$ (Total)**
Outcome 1: A Policy and Regulatory Framework for SLM in effect and integrated into national development policies and the legislative and macro-economic framework for land use planning and management.	PMU, MHE, TCDPO, UNCCD FP - MHE	GEF	32,183	45,484	13,783	**91,450**
Outcome 2: Institutional Strengthening and coordination for SLM achieved through routine and consistent coordination and collaboration among all relevant planning and land management agencies	PMU, MHE	GEF	55,983	58,133	15,534	**129,650**
Outcome 3: An efficient Information Management System to support SLM decision-making developed	PMU, MAR	GEF	23,434	17,233	13,883	**54,550**
Outcome 4: Human Resource Capacity for SLM developed at all levels	PMU, MAR, MHE, CCPU, NCC	GEF	60,483	34,083	20,784	**115,350**
Outcome 5: Adaptive management and learning (includes M&E)	PMU	GEF	20,416	32,917	40,667	**94,000**
Total GEF			192,499	187,850	104,651	**485,000**
Total Other (GOV in-kind and other co-financing)			251,072	251,173	251,072	753,317
PDF-A						**15,000**
TOTAL PROJECT			443,571	439,023	355,723	1,238,317

SECTION III: ADDITIONAL INFORMATION

PART I: GEF Operational focal point endorsement letter (see separate file).

MINISTRY OF HOUSING, LANDS AND THE ENVIRONMENT (ENVIRONMENT DIVISION)

PUBLIC SECTOR REFORM

REF: UNEP 4/8 **DATE:** 2004-05-26

Ms. Rosina Wiltshire
United Nations Resident Coordinator
UNDP Resident Representative
UN House, Marine Gardens
Christ Church

File
X-Ref.
UNDP JUN 11 2004 8:00 $
Action | Info RA; RM

Dear Ms. Wiltshire,

Portfolio Approach – LDC and SIDS Targeted Portfolio Approach For Capacity Building and Mainstreaming of Sustainable Land Management

The Ministry of Housing, Lands and the Environment of Barbados, as Focal Point for the United Nations Convention to Combat Desertification, lauds the efforts of UNDP to assist LDC's and SIDS in the implementation of the Convention.

Implementation of the UNCCD has been difficult due to extremely limited financial resources. Additionally SIDS have not been given the attention which they deserve under the UNCCD.

As a SIDS, Barbados recognizes that our situation is not as dire as that of Africa's, however we also recognize that because of our limited land mass, vulnerability to disasters and limited capacity it is imperative that we take preventative measures to ensure that we do not reach such dire circumstances.

Barbados currently has a draft National Action Plan, but requires financial assistance for finalization and implementation of the Plan.

The Ministry therefore readily endorses the above – captioned project. We look forward to fruitful collaboration with your Organization and all other agencies involved in this Portfolio Approach.

Yours faithfully,

Lionel Nurse
Permanent Secretary

LN/jai

ENVIRONMENT DIVISION
1ST Floor, S.P. Musson Building
Hincks Street, Bridgetown, BARBADOS
TEL NO.: (246) 467-5700 / FAX NO.: (246) 437-8859
Email: envirobdos@gov.bb

Rec 11-06

PART II: CO-FINANCING LETTERS

MINISTRY OF ENERGY AND THE ENVIRONMENT
(ENVIRONMENT DIVISION)

PUBLIC SECTOR REFORM
Making Barbados Work Better

REF. NO.: UNEP/4/8/2 **DATE:** 2007-09-20

Mr. Yannick Glemarec
Executive Cordinator, a.i
UNDP GEF, NY
One United Nations Plaza (FF-9)
New York
NY 10017

Dear Mr. Glemarac,

Co-financing letter from the Government of Barbados for the LDC-SIDS Targeted Portfolio Approach to Sustainable Land Management Project

The LDC-SIDS Targeted Portfolio Approach to Sustainable Land Management (SLM) project represents Barbados' efforts to further the implementation of the UNCCD Convention at the national level.

The process of developing the LDC-SIDS project document started in July 2005 with the initial inception workshop. From that time there has been a series of National Consultations in order to arrive at the final draft document.

At this time, the Ministry of Energy and the Environment would like to formally endorse this project. The Ministry of Energy and the Environment recognizes that there is a GEF requirement for this medium-sized project, of a co-financing ratio of 1:1.

With this in mind, the Ministry of Energy and the Environment wishes to submit its formal in-kind co-financing commitment to the project of US$543,717.

The Ministry of Energy and the Environment is looking forward to participating in this project.

Yours truly

Lionel Nurse
Permanent Secretary

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

OFFICE OF THE SUBREGIONAL REPRESENTATIVE FOR THE CARIBBEAN AND FAO REPRESENTATIVE IN BARBADOS

POSTAL ADDRESS
P.O. BOX 631-C
BRIDGETOWN, BARBADOS

SECOND FLOOR
UNITED NATIONS HOUSE
MARINE GARDENS, HASTINGS,
CHRIST CHURCH BB11000, BARBADOS

TEL: (246) 426-7110/429-2062
CABLES: FOODAGRI BRIDGETOWN
E-MAIL: FAO-SLAC@FAO.ORG
FACSIMILE: (246) 427-6075

LA 1/1

March 12, 2007

Dear Ms. Barbut:

"LDC/SIDS Portfolio Project for Sustainable Land Management

I refer to the above-mentioned project, which is currently being implemented in the Caribbean. I am pleased to inform you that the Food and Agriculture Organization supports this project and we have committed, as co-financing, the sum of US $ 40,000 from the Forestry Policy Initiative entitled *"Participatory Forest Management; Improving policy and institutional capacity for development"*.

This Initiative is being implemented under the National Forest Programme Facility in partnership with the Caribbean Natural Resources Institute (CANARI) and will be conducted in the following countries: Barbados, Dominica, Saint Christopher and Nevis, Grenada, St Lucia, St. Vincent and the Grenadines and Trinidad and Tobago until July 2008. We would like the co-financing to be allocated equally among the 5 OECS countries.

The Food and Agriculture Organization sends its assurances of the highest commitment.

Best regards,

Yours sincerely

L. Barbara Graham
Sub-Regional Representative for the Caribbean

Mrs. Monique Barbut
CEO and Chairperson
GEF Secretariat
1818 H Street, NW
Washington, DC 20433
USA
Fax: (202) 522-3240/3245
E-mail: gef@gefweb.org

Annex A Total Budget and Work Plan

Award ID:	00040957
Award Title:	PIMS **3408 Barbados - Capacity building and Mainstreaming of Sustainable in Barbados**
Business Unit:	BRB10
Project Title:	PIMS **3408 Barbados - Capacity building and Mainstreaming of Sustainable Land Management in Barbados**
Project ID:	00046566
Implementing Partner (Executing Agency)	**MINistry of HOUSING, LANDS AND THE ENVIRONMENT**

GEF Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Total (USD)	See Budget Note:
OUTCOME 1: Policy/Regulatory Frameworks and Resource Mobilization for SLM integrated into national development policies and legislative / regulatory frameworks governing land use planning and management. (*i.e. mainstreaming)*	Gov		GEF	71200	International Consultants	3,000	0	0	3,000	
				71300	Local Consultants	10,000	18,000	9,000	37,000	d1; d2
				72100	Contractual services - Company	3,933	5,484	1,500	10,917	f
				72500	Supplies	2,000	1,750	783	4,533	g
				73100	Rental& Maintenance-premises	6,250	9,500	1000	16,750	j
				74100	Professional Services	1,500	1,750	500	3,750	k
				74200	Audio Visual&Print prod costs	5,500	9,000	1000	15,500	l
					Total Outcome 1	**32,183**	**45,484**	**13,783**	**91,450**	
OUTCOME 2: Institutional strengthening and coordination for SLM achieved through routine consistent coordination and collaboration among all relevant planning and land management agencies	Gov			71200	International Consultants	6,000	4,000	3,000	13,000	d3
				71300	Local Consultants	20,000	22,300	5,000	47,300	d3;d4
				72100	Contractual services - Company	8,750	6,500	500	15,750	d5;d6
				72500	Supplies	4,500	2,000	534	7,034	g
				73100	Rental& Maintenance-premises	6,100	8,500	2950	17,550	j
				74100	Professional Services	1,750	3,483	0	5,233	k
				74200	Audio Visual&Print prod costs	8,883	11,350	3550	23,783	l
					Total Outcome 2	**55,983**	**58,133**	**15,534**	**129,650**	

OUTCOME 3: An efficient Information Management System to support SLM decision-making developed	**Gov**		**GEF**	71200	International Consultants	8,000	4,000	4,000	16,000	d8;d9
				71300	Local Consultants	4,000	8,300	8,300	20,600	d7;d8;d9
				72100	Contractual services - Company	2,000	900	383	3,283	f
				72500	Supplies	600	750	200	1,550	g
				72800	Information Technology Equipment	5,284	1,200	0	6,484	h
				73100	Rental& Maintenance-premises	500	500	500	1,500	i
				73300	Rental & Maint of Info Tech Equip	1,300	583	0	1,883	j
				74100	Professional Services	750	500	0	1,250	k
				74200	Audio Visual&Print prod costs	1,000	500	500	2,000	l
					Total Outcome 3	**23,434**	**17,233**	**13,883**	**54,550**	
OUTCOME 4: Human resource capacity for SLM developed at all levels	**GoG**		**GEF**	71200	International Consultants	6,000	6,000	6,000	18,000	d10
				71300	Local Consultants	2,000	10,000	8,000	20,000	d 10
				72100	Contractual services - Company	12,050	2,083	2,250	16,383	f
				72500	Supplies	3,500	500	1,500	5,500	g
				73100	Rental& Maintenance-premises	16,625	7500	500	24,625	h
				74100	Professional Services	3,683	500	584	4,767	k
				74200	Audio Visual&Print prod costs	16,625	7500	1,950	26,075	l
					Total Outcome 4	**60,483**	**34,083**	**20,784**	**115,350**	
OUTCOME 5: Monitoring and Evaluation.			**GEF**	72100	Contractual services - Company	3,750	16,250	24,000	44,000	f
					Total Outcome 5	**3,750**	**16,250**	**24,000**	**44,000**	
Project management unit (This is not a to appear as an Outcome in the Logframe)	**Gov**		**GEF**	71400	Contractual services - Indiv. (PMU staff)	16,666	16,667	16,667	50,000	e
					Total Management	**16,666**	**16,667**	**16,667**	**50,000**	
					PROJECT TOTAL	**192,499**	**187,850**	**104,651**	**485,000**	

Budget Notes

a. **Locally recruited consultants** will provide support for project management.
b. **Travel:** No separate budget lines are anticipated. Travel expenses associated with external consultants will be accounted for within consultant fees.
c. **Office expenditures:** These will be in-kind contribution by the GOV. The PMU will be established within the Environmental Unit of the Ministry of Housing, Lands and the Environment
d. **Consultants:** contracted both individually and through existing technical organizations and NGOs, include:
    1. ***Policy and legal specialist*** (local) - Outcome 1: Policy mainstreaming
    2. ***Finance policy specialists*** (local and international) – Outcome 1: Development of SLM investment plans
    3. ***Institutional analyst*** (local and international) - Outcome 2: Institutional analysis to determine best institutional arrangements to support SLM
    4. ***Legal specialist*** (local) - Outcome 2: Legal mechanism for stakeholder involvement in sustainable land management
    5. ***IT/Database Management Specialist*** (local) – Outcome 3: Development and appropriate information management systems for data archival and information dissemination
    6. ***Land Information Systems Specialist*** (local and international) – Outcome 3: Development of the functional basis for the land information system
    7. ***SLM Technical specialists/trainers*** (local and international): - Outcome 4: Capacity building for best practices in SLM (including use of land information system)
    8. ***Communications specialist*** (local) – Outcome 4: Awareness-raising strategy development and execution
    9. ***Production services*** (local) – Outcome 4: Awareness-raising materials production
    10. ***Auditor*** (local) – Outcome 5: Carry out audits of the project
    11. ***Project Evaluator*** (international) – Outcome 5: evaluation project execution; mid-term progress, final evaluation

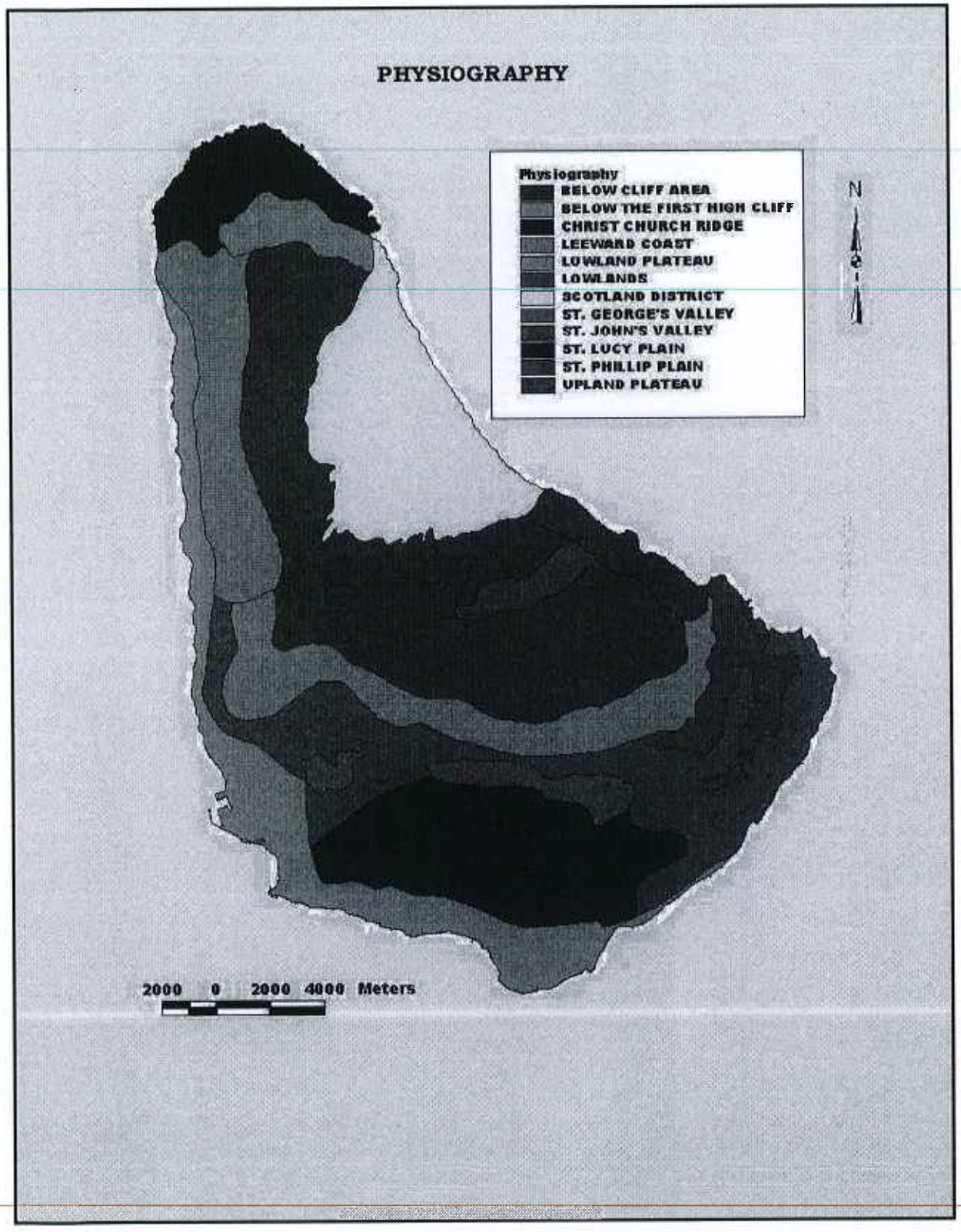
    NOTE: the international consultant fees account for **22.3%** of the overall GEF allocation (US$500,000). This is due to the fact that the expertise required, particularly with respect to capacity-building (Outcome 2), development of knowledge management systems (Outcome 3) and formulation of payment for environmental services schemes (Outcome 4), is largely resident outside of the country. It must be noted however that local consultancy services will be employed as far as local expertise is available.
e. **Contractual services – individual:** These are additional short-term services provided by individuals in support of main activities either by consultants or by the PCU. Such services will include, but not limited to, conduct of surveys, conduct of research, preparation of documentation, etc.
f. **Contractual services – Company:** These are additional services rendered by specialized organizations. These services will include, but not limited to, conduct of surveys, conduct of research, preparation of documentation, equipment installation and service, evaluations.
g. **Supplies:** Materials and other consumables
h. **Information technology equipment:** Costs associated with procurement and installation
i. **Rental & Maintenance-premises:** It is anticipated that several meetings and training workshops will be held across the country and the budget is reflective of the costs associated with hosting of these meetings. This includes the venue rental and catering for participants.
j. **Rental of information technology equipment:**
k. **Professional services:** These services will include but not limited to media production, advisory, facilitation, etc.
l. **Audio, visual and printing production costs:** Costs associated with multiplication of resource materials.
m. The amount shown is only for GEF funding as the Total Budget and Work Plan is an internal UNDP document and only reflects GEF funds or funds that are administered by UNDP. Co-financing in the amount of $311,517 is also available for project management and will include the hiring of a small project staff and maintaining operation of an office dedicated to the project

Summary of Funds: [11]

SOURCE	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Total (USD)
GEF	104,651	104,651	104,651	485,000
Donor in-kind: Gov	181,239	181,239	181,239	543,717
Donor Cash: GM	53,200	53,200	53,200	159,600
Donor Cash: FAO	16,633	16,734	16,633	50,000
TOTAL	443,571	439,023	355,723	1,238,317

[11] Summary table should include all financing of all kinds: GEF financing, cofinancing, cash, in-kind, etc. etc

ANNEX B: Physiographic Regions of Barbados



ANNEX C: Soil Classification and Land Capability Classification for Barbados

Soil Classification

The soils of Barbados are broadly classified as the soils of the coral (limestone) region and the soils of the Scotland District. Within each these two broad groups Vernon and Carroll (1965) have developed a series of soil associations as follows:

Coral Region: There are nine (9) associations in this group:

1. Red-Brown Association
2. Yellow-Brown Association
3. Grey-Brown Association
4. Black Association
5. St. John's Valley Association
6. St. George's Valley Association
7. St. Philip Association
8. Red Sand Association
9. Coastal Association

Scotland District Region:

1. *Oceanic Formation* soils are of four types:
   - Grey-Brown subgroup
   - Brown subgroup
   - Red-Brown subgroup
   - Bissex Hill subgroup
2. Soils from the *Joe River Muds*:
   - dark coloured sandy clays of mixed mineralogy
3. Soils from Scotland Sandstones
   - acid and light textured with shallow and poorly structured profiles
4. Soils from Scotland Clays
5. Colluvial Soils
   - soil formation due to gravity and wash
6. Alluvial Soils
   - loamy fine sand

Land Capability Classification

Class I – gentle slopes of good soils suitable for cultivation with no limitations

Class II – steeper slopes of good soils suitable for moderate cultivation with moderate limitations

Class III – moderately steep slopes and gentler slopes of less favourable soils. Suitable for tillage with strong limitations

Class IV – steep slopes, suitable for tree crops, grasses and limited tillage

Class V – very steep slopes – not good for tillage but suitable for planted forest, tree crops or improved grass

Class VI – steep rocky land or dry climate. These areas are of little or no productive use. Natural vegetation should never be cleared.

Source: Vernon, K.C. 1965. *Soil and Land Use Surveys No. 18. Barbados*. The Regional Research Centre, Imperial College of Tropical Agriculture. University of the West Indies.

ANNEX D: Barbados Land Degradation Root Cause Matrix

Type of Land Degradation	Bio-Physical Impacts	Root Causes	Potential Corrective/ Mitigation Measures
1. Nutrient Loss	• Reduced plant growth • Erosion by water & wind • Crop failure • • Water contamination	• Poor soil type and structure • Poor farming practices such as inappropriate clearing of vegetation and use of chemicals • Removal of organic matter from the soil • Microbial activity • Flooding • Drought	• Retention and/or reintroduction of organic matter to the soil • Re-vegetation and maintenance of exposed surfaces • Improvement of drainage systems • Promotion of use of organic fertilizers • Irrigation • Education
2. Salinization of soil and vegetation	• Reduced food and potable water supply • Alteration of the fresh water/salt water gradient • Alteration of biodiversity	• Salt water intrusion into aquifers due to excessive withdrawal of groundwater • Inappropriate water management procedures • Deep well injection of briny waste from desalinisation plants • Removal of coastal sand dunes by sand mining • Extended drought	• Expand training and information base on the hydrogeology of Barbados • Improve management of the groundwater supply • Promote more efficient use of water • Implement rainwater harvesting practices • Develop and implement early warning systems for drought • Implementation of coastal revegetation programmes and policies for appropriate disposal of briny wastes (e.g. disposal at sea at depths of 300 metres. • Monitoring and management of sand mining operations • Planting of appropriate vegetation to buffer the impact of salt bearing winds
3. Soil erosion	• Loss of vegetative cover • Degradation of wooded and forested areas suited to (eco-) tourism • Reduced soil productivity and agricultural yields • Reduced income from agriculture • Increased flooding and runoff	• Inappropriate farming practices e.g. cross contour ploughing, inappropriate and/or uncontrolled use of agro-chemicals • Destabilisation and/or compaction of soils by construction machinery and off-road vehicles • Loss of surface shoots and sub-surface roots due to land clearance • Nutrient loss • Gravity slippage and soil wash	• Expand and intensify farmer education and training in the use of appropriate farming techniques and technologies • Increased education and awareness about soil management • Implementation of afforestation and revegetation programmes • Institutional strengthening of land management agencies including capacity building in agricultural extension programmes • Enforcement of related soil management policies and legislation • fostering of political will for effective land management
4. Land slippage	• Loss of vegetation cover resulting in soil erosion • Over-steepening of slopes	• Geological composition such as steep slopes with high runoff rates, presence of subsurface salts and hydrocarbons	• Reshaping of slopes by terracing • Application of appropriate agronomic engineering techniques such as the gabion weirs and boxes

Type of Land Degradation	Bio-Physical Impacts	Root Causes	Potential Corrective/ Mitigation Measures
	• Increased susceptibility to soil wash and removal • Loss of productive land	• Climatic conditions such as low rainfall which causes dehydration of the soil, heavy rainfall causing saturation of soils, and wind erosion. • Weakening of bedrock due to vibrations from construction activity • Increased inputs of water to slip zones resulting from expanding housing development	currently used. • Effective implementation of a maintenance programme for the above measures • Afforestation using fast growing plants with complex root structures for binding the soil • Strong enforcement of the Soil Conservation Act and the Town Planning Act
5. Expansion of settlements and hard surfaces	• Excessive runoff and removal of topsoil • Reduced infiltration and soil moisture	• Change of land use from agricultural to settlement and other urban uses • Soil removal and reallocation • Compaction of soil by use of heavy vehicles and equipment around construction sites	• Enforcement of land use zoning regulations • Development and implementation of land management guidelines for construction in agricultural areas
6. Sediment Contamination	• Reduction in agricultural productivity and in arable land acreage • Contamination of groundwater • Diversion of economic resources from production to clean-up and restoration • Increased risk to public health	• Illegal and inappropriate disposal of waste on unused land • Inadequate and inappropriate disposal of chemical waste • Leachate from agrochemicals and petrochemical wastes	• Develop and implement a national chemical management plan • Develop and implement public awareness and education programme on the management and disposal of chemical/hazardous wastes. • Development and/or enforcement of legislation on chemicals and chemical wastes management
7. Nearshore sediment loss	• Sediment removal by extreme wave action and/or by natural hazards (e.g. hurricanes) • Effluent discharges, including point and non-point discharges, into the coastal zone • Restriction of long-shore sediment transport due to erection of groynes and other coastal structures • Coral reef destruction by natural or anthropogenic actions • Destabilisation and/or removal of sediment by sand mining and other human activity	• Reduction of beach width • Loss of biodiversity and habitats • Increased susceptibility to, and/or incidence of coastal inundation • Increased vulnerability of coastal infrastructure	• Development and/or implementation of watershed management policy and plan • Development and/or implementation of flood management plan • Development and/or enforcement of relevant policies and legislation • Installation of engineering works for coastal protection
8. Conversion of land to water	• Subsidence (leading to conversion, not inundation) • Improper drainage or fluid flows	• Loss of ecosystems and biodiversity • Loss of arable or productive land	• Implementation of integrated land use planning practices

ANNEX E: Outcome/Activity and Responsibility Matrix

Outputs and Activities	Output Indicator	Activities and Sub-Activities	Responsibility
Outcome 1: Policy/Regulatory Frameworks and Resource Mobilization for SLM integrated into national development policies and legislative / regulatory frameworks governing land use planning and management. (*i.e. mainstreaming*)			
Outputs			
1.1. SLM fully integrated into NSP and PDP	• The National Strategic Plan and the Physical Development Plan contain specific sections that address land degradation and sustainable land management • The Ministry of Economic Affairs and the Town and Country Development Planning Office (TCDPO) use natural resource or environmental economics as a tool in decision making on land use • TCDPO guidelines for processing applications have been amended to include SLM	1.1.1 Review of the National Strategic Plan and include SLM as a fundamental principle, with SLM activities detailed in relevant areas such as agriculture and land use planning in general 1.1.2 Prepare policy papers on the use of natural resource economics in decision making on the allocation of land uses 1.1.3 Prepare policy paper to amend TCDPO guidelines to include resource economic assessments and determine the types of developments for which such assessments would be required	MAR MAR, MEE, MFA TCDPO, MEE
1.2 SLM integrated into specific sectoral plans	• Specific sections of relevant sectoral development strategies and plans incorporate SLM principles and practices	1.2.1 Review relevant existing sectoral plans and make recommendations on actions needed to integrate SLM, either into existing plans or in new plan development 1.2.2 Conduct seminars within sectoral groups on the integration of SLM into policies and plans	MAR
1.3 National legislation incorporates the principles of SLM	• SLM is included in specific relevant national laws on land management • Scotland District Authority established and gazetted	1.3.1 Review and amend existing legislation relevant to land management (detailed in the completed NAP) to incorporate SLM 1.3.2 Prepare cabinet paper to obtain drafting policy for legislation to establish the Scotland District Authority, and draft necessary legislation 1.3.3 Conduct workshop for stakeholder input 1.3.4 Direct draft legislation through approval process	MAR and Attorney General's Office MAR
1.4 SLM Investment Plan developed	• The SLM coordinating body (NCSD) use the SLM Investment Plan to coordinate and direct investments for SLM in Barbados • The SLM Investment Plan integrates priority actions identified in the NAP	1.4.1 Identify priority SLM investment needs and opportunities 1.4.2 Develop costed SLM Investment Plan including brief concept papers for priority investments 1.4.3 Source investments for SLM	PMU of the SLM and consultant working with MEE

Outputs and Activities	Output Indicator	Activities and Sub-Activities	Responsibility
1.5. NAP finalized and adopted	• The final NAP document is approved by Cabinet of Ministers and published	1.5.1 Convene national stakeholder consultation for finalization (validation) of the draft NAP 1.5.2 Guide formal adoption of NAP by Government (negotiation of allocation of national budget for NAP implementation) 1.5.3 Publication and dissemination of the NAP through awareness and media programmes	Environmental Unit of MEE and Consultant
Outcome 2: Institutional Strengthening and coordination for SLM achieved through routine and consistent coordination and collaboration among all relevant planning and land management agencies.			
Outputs			
2.1. The key SLM agencies strengthened.	• The SCU has additional and upgraded technology and equipment for slope restoration and other works • Five (5) additional trained personnel are on staff • The annual budget is increased by 70% •	2.1.1. Conduct comprehensive institutional review of the SCU to identify areas of strength and weakness 2.1.1. Execute appropriate strengthening of the unit in the areas of technology and equipment, personnel and financial resources and systems, as needed.	Consultant working with the MAR
2.2. The NCSD legally constituted and designated as coordinating mechanism for SLM.	• NCSD mandate and membership revised and gazetted as the coordinating mechanism for SLM • NCSD legislation on the statute books	2.2.1. Review and revise mandate of the National Commission on Sustainable Development (NCSD) to include proper oversight of SLM and representation from the Land Degradation Committee (LDC) chaired by the Ministry of Environment, and/or make the LDC a sub-committee of the NCSD 2.2.2. Draft legislation to establish the NCSD	Ministry of Energy and the Environment (MEE) Attorney General's Office and MEE
2.3. A legal mechanism for stakeholder involvement on SLM created and functioning	• Revised Land Degradation Committee (LDC) appointed by Cabinet and gazetted • SLM included on the work programme of the LDC	2.3.1 Review and revise membership of the Land Degradation Committee to ensure broader stakeholder participation 2.3.2 Establish SLM as part of the work Programme of the LDC 2.3.3 Draft legislation for stakeholder involvement in SLM 2.3.4.Guide draft legislation through the approval process	MEE and MAR MEE and LDC
Outcome 3: An efficient Information Management System to support SLM decision-making developed			
Outputs			
3.1 A comprehensive body of data on LD island-wide complied within the Min of Agriculture	• Studies on the status of land degradation in the limestone areas of Barbados have been conducted • The 1965 survey on soil and land use has been revised and updated • An integrated land information system has been created and is accessible by all stakeholders	3.1.1 Prepare Terms of Reference and contract consultants for a comprehensive study of soils and land in the limestone areas of Barbados and to revise the 1965 Vernon and Carroll report. 3.1.2 Identify data gaps on land degradation issues island wide and develop strategies to fill those gaps 3.1.3 Publish and disseminate study report and convene stakeholder consultations on the findings and recommendations	Consultant working with the MAR

Outputs and Activities	Output Indicator	Activities and Sub-Activities	Responsibility
		3.1.4 Prioritise recommendations relevant to SLM and develop work plan for their execution 3.1.5 Develop training plan necessary for implementing SLM priorities and integrate into Outcome 4 of this project	
3.2 An integrated and functioning LIS housed in the Ministry of Agriculture	• Centralised LIS housed in a designated agency and this information has been circulated to all stakeholders • Terms and conditions of LIS access has been circulated to all stakeholders	3.2.1. Review and assess all existing Geographic information systems (GIS) and recommend procedures for coordination and integration into a central LIS	Consultant working with MEE
		3.2.2. Identify and recommend a central entity/agencies or network for housing and managing the national LIS, that would be accessible to all stakeholders	Consultant working with MEE
		3.2.3. Develop and recommend terms and conditions of stakeholder access to the LIS	Consultant working with MEE
Outcome 4: Human Resource Capacity for SLM developed at all levels			
Outputs			
4.1 Capacity for senior and middle level technical levels in SCU and relevant sections of the MAR built up	• 4 middle level technical officers are being trained at the undergraduate level and 3 seniors have completed training at the post graduate level in relevant programmes for SLM	4.1.1 Source undergraduate and post-graduate programmes at the UWI in the following areas of need identified in the Scotland District Study (2000): • Geotechnical studies – slope analysis, design and stabilisation; soil mechanics; geomorphological interpretation	MAR
		4.1.2 Identify 4 middle and 3 senior level technical personnel from the SCU for training at the undergraduate and post graduate levels in the areas listed in 4.1.1 above	MAR/SCU
		4.1.3 Identify 5 additional personnel within the SCU and MAR in general, and in the Environmental Unit of the MHE for training in SLM supporting areas at the undergraduate and post graduate levels Specific areas include: collection and analysis of drought monitoring parameters, forestry, nursery care and management, silviculture, water conservation and management, aquaculture.	MAR/SCU, MEE
4.2. Adequate capacities among personnel in key land management agencies for the use of LIS developed and enhanced	• 12 trainers identified and trained to deliver training modules for SLM to stakeholders • At least 25 technicians from among government and non-governmental stakeholders trained in operation of the new LIS and the integration of GIS into LIS	4.2.1 Identify or develop appropriate training courses in land information systems management, including GIS analysis, image processing and data management	Consultant working with MEE and LDC
		4.2.2 Identify or develop and execute courses for the training of trainers in LIS	
		4.2.3 Identify candidates from among stakeholder groups and execute training programmes	MEE and MAR