

15916

Caribbean
Planning for Adaptation to Global Climate Change
Project

Project Document
January 1997



THE WORLD BANK

Public Disclosure Authorized

Public Disclosure Authorized

GEF Documentation

The Global Environment Facility (GEF) assists developing countries to protect the global environment in four areas: global warming, pollution of international waters, destruction of biodiversity, and depletion of the ozone layer. The GEF is jointly implemented by the United Nations Development Programme, the United Nations Environment Programme, and the World Bank.

GEF Project Documents --identified by a green band - provide extended project-specific information. The implementing agency responsible for each project is identified by its logo on the cover of the document.

Global Environment Division
Environment Department
World Bank
1818 H Street, NW
Washington, DC 20433
Telephone: (202) 473-1816
Fax: (202) 522-3256

Caribbean
Planning for Adaptation to Global Climate Change Project

Project Document
January 1997

Natural Resources Management and Rural Poverty Division
Country Department III
Latin America and the Caribbean Regional Office

CURRENCY EQUIVALENTS

Currency Unit = US Dollar

WEIGHTS AND MEASURES

The metric system is used throughout the report

FISCAL YEAR

January 1 - December 31

GLOSSARY

CARICOM	Caribbean Community
CCA	Caribbean Conservation Association
CEP	Caribbean Environment Programme (UNEP)
CMI	Caribbean Meteorological Institute
CPACC	Caribbean: Planning for Adaptation to Global Climate Change
FCCC	Framework Convention on Climate Change
GCC	Global Climate Change
GEF	Global Environment Facility
GHG	Green House Gases
GIS	Geographic Information System
GLOSS	Global Sea Level Observing System
GS/OAS	General Secretariat of the OAS
ICZM	Integrated Coastal Zone Management
IMA	Institute of Marine Affairs
INC/FCCC	Intergovernmental Negotiating Committee for FCCC
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IPCC	Intergovernmental Panel on Climate Change
ICZM	Integrated Coastal Zone Management
LIB	Limited International Bidding
NEAP	National Environment Action Plans
NFP	National Focal Points
NICU	National Implementation Coordinating Unit
NOAA	National Oceanic and Atmospheric Administration
OAS	Organization of American States
OECS	Organization of Eastern Caribbean States
PAC	Project Advisory Committee
RPIU	Regional Project Implementation Unit
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USAID	U.S. Agency for International Development
USDE/OAS	OAS Unit of Sustainable Development and Environment
UWI	University of the West Indies
UWICED	UWI Centre for Environment and Development

Vice President:	Mr. Gobind T. Nankani (Acting), LACVP
Director:	Mr. Paul Isenman, LA3DR
Division Chief:	Mr. Jonathan W. Parker (Acting), LA3NR
Staff:	Ms. Claudia L. Alderman, LA3NR

CARIBBEAN
PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT

Table of Contents

PART I: PROJECT SUMMARY

	Page No.
GRANT AND PROJECT SUMMARY	i
1. BACKGROUND	1
Region/Sector Background	1
Legal Framework	1
Regional and National Environmental Initiatives	2
Project Origin and History	4
2. THE PROJECT	5
Project Objectives	5
Project Description	5
3. PROJECT COSTS AND FINANCING	8
Project Costs and Financing	8
Incremental Costs	8
Procurement	8
Disbursement	9
Accounts and Auditing	10
4. PROJECT ORGANIZATION AND IMPLEMENTATION	10
Project Organization	10
Project Implementation	11
Project Supervision	11
Monitoring and Evaluation	12
Reporting Requirements	12
Mid-Term Review	12
Implementation Completion Report	12
Environmental Aspects	12
5. PROJECT JUSTIFICATION	13
Rationale for GEF Funding	13
Lessons Learned from Bank/OAS Experience	13
Linkage with Other Programs	14
Project Sustainability	14
Participatory Approach	14
Project Benefits	15
Project Risks	15
6. AGREED ACTIONS	15
SCHEDULE A: ESTIMATED PROJECT COSTS BY COMPONENT	16
SCHEDULE B: SUMMARY OF PROCUREMENT ARRANGEMENTS	17
SCHEDULE C: TIMETABLE OF KEY PROCESSING EVENTS	18

PART II: TECHNICAL ANNEXES

	Page No.
ANNEX 1: DESIGN AND ESTABLISHMENT OF SEA LEVEL/CLIMATE MONITORING NETWORK	19
ANNEX 2: ESTABLISHMENT OF DATABASES AND INFORMATION SYSTEMS	22
ANNEX 3: INVENTORY OF COASTAL RESOURCES AND USE	25
ANNEX 4: FORMULATION OF A POLICY FRAMEWORK FOR INTEGRATED COASTAL AND MARINE MANAGEMENT	29
ANNEX 5: CORAL REEF MONITORING FOR CLIMATE CHANGE	32
ANNEX 6: COASTAL VULNERABILITY AND RISK ASSESSMENT	35
ANNEX 7: ECONOMIC VALUATION OF COASTAL AND MARINE RESOURCES	37
ANNEX 8: FORMULATION OF ECONOMIC/REGULATORY PROPOSALS	39
ANNEX 9: GLOBAL TIMELINE AND COMPONENT INTERCONNECTIONS	41
ANNEX 10: PILOT PROJECTS BY PARTICIPATING COUNTRY	42
ANNEX 11: TERMS OF REFERENCE FOR PROJECT MANAGEMENT ACTIVITIES	43
ANNEX 12: MONITORING AND EVALUATION PLAN	58
ANNEX 13: REPORTS AND DOCUMENTS IN PROJECT FILES	69
ANNEX 14: DETAILED PROJECT COST TABLES	70

MAP: IBRD # 27994

PART I: Project Summary

CARIBBEAN

PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT

GRANT AND PROJECT SUMMARY

Source of Grant:	Global Environment Facility Trust Fund
Grant Recipient/Executing Agency:	The General Secretariat of the Organization of American States (GS/OAS)
Beneficiaries:	CARICOM Parties to the Climate Change Convention: Antigua and Barbuda - Feb. 2, 1993 Commonwealth of the Bahamas - June 27, 1994 Barbados - March 23, 1994 Belize - October 31, 1994 Commonwealth of Dominica - June 21, 1993 Grenada - August 11, 1994 Guyana - August 29, 1994 Jamaica - January 6, 1995 St. Kitts and Nevis - January 7, 1993 St. Lucia - June 14, 1993 Republic of Trinidad and Tobago - June 24, 1994
Total Project Cost:	SDR 4.4 million (US\$6.3 million equivalent)
Terms:	Grant
Financing Plan:	
GEF Grant	SDR 4.4 million (US\$6.3 million equivalent)
Economic Rate of Return:	Not applicable
Map:	IBRD # 27994
Project ID Number:	GO-GE-40739

**ESTIMATED GRANT DISBURSEMENTS BY YEAR
(US\$ Million)**

Fiscal Year	Year 1	Year 2	Year 3	Year 4
Annual	1.9	1.5	1.6	1.3
Cumulative	1.9	3.4	5.0	6.3

CARIBBEAN

PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT

1. BACKGROUND

Region/Sector Background

1. The members of the Caribbean Community (CARICOM) are primarily small island states with fragile coastal ecosystems. Agriculture and tourism are their principal sources of employment and foreign exchange earnings. Coastal areas, holding the vast majority of the population and economic activity, are vital to the prosperity of these countries. Coastal areas are usually the most biologically productive areas, supporting a wealth of living marine resources and characterized by high biological diversity. In recent years, these resources have come under increasing stress: intensification of human population and activities; concentration of tourism-related infrastructure; inadequate disposal of liquid and solid wastes; decaying drainage infrastructure; uncontrolled and often ill-conceived development schemes; severe weather events which have brought about record losses and a reinsurance industry crisis; and mismanagement of coral reefs, sea grass beds, mangroves, and wetlands. In addition, the lack of comprehensive information systems and a coordinated institutional structure prevent an integrated management of those resources.

2. Anticipated global warming and consequent changes in sea level, sea surface temperature, and wind and ocean currents may seriously compound these problems. Sea level rise, in particular, would likely affect freshwater supply, increase beach and coastal erosion, increase permanent coastal inundation, and aggravate the impact of tropical storms. It also threatens the disproportionate share of industrial, tourism, energy, transport, and communications infrastructure concentrated in the coastal zone. The Intergovernmental Panel on Climate Change (IPCC) has calculated first order costs for protection of Caribbean shorelines from future sea level rise, including low coasts, cities, harbors, island elevations, and beach nourishment, but excluding unprotected dry lands or ecosystems that may be lost, and the impacts of saline intrusion and increased storm frequency. For Caribbean island territories, the projected cost of new construction for protection alone would be US\$11.1 billion, which is well beyond the combined investment capacity of their economies. Other more cost-effective adaptation measures are therefore needed.

Legal Framework

3. Global climate change has emerged in the past few years as one of the world's major long-term challenges. The IPCC, established in 1988 under the auspices of the United Nations, verified the high probability of global climate change if greenhouse gas (GHG) emissions keep increasing. The IPCC has concluded that the urgency of implementing strategies for adapting to sea level rise is greater than previously thought and that for many coastal states the cost of adapting to a rise in sea level could be large compared to the size of their economies. The IPCC recommended first in 1990 and again in 1992¹ that coastal nations should begin adapting to climate change urgently because there are now opportunities to avoid adverse impacts, opportunities that may be lost if action is delayed. It also recommended that small island developing countries undertake measures to reduce vulnerability to sea level rise through improved coastal zone management.

¹In IPCC Global Climate Change and the Rising Challenge of Sea. Report of the Coastal Zone Management Sub-group, May 1992.

4. Global concern about accelerated climate change and its repercussions prompted the international community to begin negotiating a United Nations sponsored Framework Convention on Climate Change (FCCC) in 1991. The Convention establishes a legal framework for responding to global climate change through the promotion of measures aimed at mitigating emissions of GHG and preparing for adaptation to the adverse effects of climate change. The Intergovernmental Negotiating Committee (INC/FCCC) agreed at its Tenth Session² that adaptation to these adverse effects would require short, medium, and long-term strategies which should be cost effective, should take into account important socio-economic implications, and should be implemented on a stage-by-stage basis in developing countries that are Parties to the Convention. In the short term, the following sequence of activities was envisaged:

- Stage I: Planning, including studies of possible impacts of climate change to identify particularly vulnerable countries or regions and policy options for adaptation and appropriate capacity building. In the medium and long-term, two additional stages were envisaged for countries or regions identified in Stage I as being particularly vulnerable.
- Stage II: Measures, including further capacity building, which may be taken to prepare for adaptation.
- Stage III: Measures to facilitate adaptation (e.g., insurance).

5. INC/FCCC further agreed that for Stage I, the Conference of the Parties would entrust the Global Environment Facility (GEF) to meet the agreed costs of the activities required by Article 12.1 of the Convention. Such activities may include studies of the possible impacts of climate change, identification of options for implementing the adaptation provisions (especially the obligations contained in Articles 4.1(b) and 4.1(e) of the Convention), and relevant capacity building.

6. A potentially useful framework for addressing the stresses of climate change is Integrated Coastal Zone Management (ICZM). The IPCC has already stressed the important role that ICZM can play in providing the planning, policy, and management context for the national efforts to reduce coastal vulnerability. To this end, the IPCC has identified under the general rubric of ICZM a detailed series of response measures ranging from preparatory activities (e.g., vulnerability assessments) to adaptive responses (e.g., retreat, accommodation, and protection).

Regional and National Environmental Initiatives

7. The FCCC has been ratified by most Caribbean countries. More significantly, the Caribbean region, along with other small island and low-lying states, has been effective in drawing the attention of the international community to the potential adverse impacts of climate change on their economies. The region has also been active in the work of the IPCC, including the Coastal Zone Management Subgroup of the Response Strategies Working Group. As part of that subgroup's work, preliminary case studies were undertaken for Antigua and Nevis. Results of the studies were presented at the Group's Island Workshop convened in Margarita Island, Venezuela in 1992.

²INC/FCC. Conclusions of Working Group II, Draft Report. INC/FCCC, Tenth Session 22 August - 2 September, 1994.

8. The region's concerns were also articulated during the United Nations Conference on Environment and Development (UNCED) and reflected in Agenda 21, as well as in the Programme of Action resulting from the First United Nations Conference on the Sustainable Development of Small Island Developing States. At the regional level, the Caribbean Environment Programme (CEP) as part of a broader UNEP Regional Sea Initiative has undertaken studies to assess ecosystem and socio-economic response to future climate change in marine and coastal areas of the Caribbean Region. In addition, UNEP/CEP has undertaken the following initiatives: (i) the Global Sea Level Observing System's (GLOSS) tide gauge network for the wider Caribbean under the Intergovernmental Oceanographic Commission's Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) of UNESCO; (ii) the Regional Programme on Assessment and Control of Marine Pollution; and (iii) the assessment of socio-economic impacts of climate change in St. Lucia and guidelines for integrating planning and management of coastal and marine areas in the Caribbean region. The project will draw heavily on the experience gained by the region through participation in UNEP/CEP programs.³

9. IOCARIBE initiated a project in 1991 on "Global Change and Coastal Land Loss: the Caribbean and Adjacent Regions."⁴ The project seeks to develop essential skills in decision-making for appropriate intervention in coastal stability problems through sequential training programs, site-specific case studies, workshops, and publications. Stability of coasts and beaches is a regional issue that has attracted a number of responses.

10. With funding of US\$5 million from the USAID Office of Foreign Disaster Assistance, the GS/OAS is implementing a five-year Caribbean Disaster Mitigation Project. As part of this project, GS/OAS has developed a state-of-the-art numerical model to analyze the effects of tropical storms on Caribbean island states. Their potential for destruction from coastal flooding and extreme winds are analyzed in the context of sea level rise and increasingly dense coastal development.

11. Marine parks and conservation areas, which may have an important role in any strategy for vulnerability reduction and adaptation to global climate change, have had a long history in the Caribbean region. Numerous regional organizations have undertaken initiatives to improve the situation of marine protected areas. The most recent example is the Caribbean Conservation Association (CCA) Marine Parks and Protected Areas Management Programme which seeks to enhance the region's capacity to manage coastal and marine resources by institutional strengthening, demonstration projects, improvement of management capabilities, and the promotion of heritage tourism. In reviewing these initiatives, however, it is evident that a disproportionate share of resources has been invested in planning, and relatively little in implementation.

12. In 1979 the Government of Trinidad and Tobago under the auspices of UNDP established the Institute of Marine Affairs (IMA). The Institute, a statutory body of the Government of Trinidad and Tobago, is funded by that Government. It has recently been designated as a regional oceanographic data center by CARICOM.

³UNEP. *Ecosystem and Socioeconomic Response to Future Climatic Conditions in the Marine and Coastal Regions of the Caribbean Sea, Gulf of Mexico, Bahamas, and the Northeast Coast of South America*, CEP Technical Report, No. 22, 1993.

⁴IOCARIBE. *Global Change and Coastal Land Loss: Management and Decision-Making in Support of Sustainable Development within the Caribbean and Adjacent Areas*, 1991.

Project Origin and History

13. The Caribbean: Planning for Adaptation to Global Climate Change (CPACC) Project has its origin in the Global Conference on the Sustainable Development of Small Island Developing States which took place in Barbados in April/May 1994. During this conference, the small island developing states of the Caribbean requested GS/OAS assistance in developing a project on adaptation to climate change for submission to the GEF. A regional technical consultation took place in Barbados in September 1994, with the active participation of the countries and CARICOM. The written inputs received from the various countries and the comments made at the Barbados meeting were incorporated into a revised project document which was subsequently submitted to all the member states of the GEF Caribbean Constituency for consideration and approval. Once this process was completed, the project was submitted to the Council of CARICOM Ministers of Foreign Affairs for consideration. The Ministers of Foreign Affairs endorsed the project and mandated that it should be transmitted to the GEF.

14. The GEF Council approved the project as part of its Work Program in May 1995. The countries and CARICOM have maintained an active level of participation throughout the project preparation phase. A Project National Focal Point (NFP) has been designated for each country. During the project preparation phase, two regional workshops and a national consultation workshop took place in each of the eleven participating countries. A third regional workshop on the project was held as part of the pre-appraisal review of the project document.

15. After appraisal of the project in May 1996, the Second Session of the Conference of the Parties (COP2) issued guidelines for national communications (July 1996). Given that the CPACC project design was finalized prior to the issuance of this guidance, it was decided to remove the national communications component from the project in response to requests from most CPACC participating countries that indicated their wish to apply for separate national communications enabling grants.

2. THE PROJECT

Project Objectives

16. The project's overall objective is to support Caribbean countries in preparing to cope with the adverse effects of global climate change (GCC), particularly sea level rise, in coastal and marine areas through vulnerability assessment, adaptation planning, and capacity building linked to adaptation planning. More specifically, the project will assist national governments and the University of the West Indies Centre for Environment and Development (UWICED) to: (i) strengthen the regional capability for monitoring and analyzing climate and sea level dynamics and trends, seeking to determine the immediate and potential impacts of GCC; (ii) identify areas particularly vulnerable to the adverse effects of climate change and sea level rise; (iii) develop an integrated management and planning framework for cost-effective response and adaptation to the impacts of GCC on coastal and marine areas; (iv) enhance regional and national capabilities for preparing for the advent of GCC through institutional strengthening and human resource development; and (v) identify and assess policy options and instruments that may help initiate the implementation of a long-term program of adaptation to GCC in vulnerable coastal areas.

Project Description

17. The project will follow a regional approach; it will be executed through the cooperative effort of all eleven participating countries and through a combination of national pilot/demonstration actions and regional training and technology transfer linked to adaptation planning (see Annex 10 for information on pilot project distribution among participating countries). This approach seeks to strengthen regional cooperation and institutions, and to provide cost-effective means for adaptation planning, data collection, and sharing of information, skills, and project benefits. The project will seek to build on existing institutions and experiences, and to liaise with other important regional initiatives and programs underway in the Caribbean. Project activities will focus on planning for adaptation to GCC in vulnerable areas, including regional sea/climate data collection and management, impact and vulnerability studies, and the assessment of policy options through a series of regional activities and pilot studies. These enabling activities will be complemented by selective capacity-building activities, aimed at creating or strengthening endogenous conditions and capabilities necessary to prepare a long-term program for adaptation to GCC. The project will execute a comprehensive program of human resource development for upgrading the skills of technicians and officials from participating countries in areas relevant to GCC and adaptation planning. (See Annexes 1-8 for additional information on each component.) Project execution will take four years and involve both regional and pilot-based components. The four *regional* components include the following:

(a) Design and Establishment of Sea Level/Climate Monitoring Network (US\$823,900). The sea level/climate observation network proposed for installation in each of the eleven participating countries will include a standardized set of instruments to measure water level, vertical land motion (which affects the relative relationship between sea surface and land interface), air and sea temperature, wind velocity, precipitation, and other site-specific ancillary variables. The network will be composed of 18 state-of-the-art gauges generating digitized data available in near real time by satellite telemetry or telephone. In addition, each tide gauge bench mark will be fixed in geocentric coordinates so that the vertical movement of the land can be distinguished from sea level changes (local tide gauges measure a combination of the two). The U.S. National Ocean Service of the National Oceanographic and Atmospheric Administration (NOAA) has been involved in the installation of tidal gauges around

the world as part of the Global Sea Level Observing System (GLOSS), and will act as lead agency in the installation of the proposed network. Each participating country will be directly involved in the selection of sites, and designated national agencies, such as the National Weather Service, will manage their individual observatories. The Caribbean Meteorological Institute (CMI) will be the lead regional agency, and will take on the responsibility of overseeing the network after project completion. To assure long-term financing for this activity, the project will establish the Tidal Gauge Replacement Fund (US\$50,000) as an earmarked account within CMI for the maintenance and replacement, as needed, of the sea level tidal gauges. It is expected that the Tidal Gauge Replacement Fund would be supplemented or replenished through the collection of data user fees, where appropriate, and other related contributions. (See Annex 1 for additional information on expected outputs, timing, implementing institutions, and related programs.)

(b) Establishment of Databases and Information Systems (US\$392,000). The data bases and information system to be established under this component will form the backbone for the participating countries in their efforts to plan for adaptation to climate change. The information system will allow key regional and national institutions to acquire, analyze, store, and disseminate data on climate change and the impact on natural and manmade systems. It will facilitate access to the information on a wide range of public and private sector users and researchers, and will also serve to facilitate project management and monitoring and evaluation by linking Regional Archiving Centers with the data bases of the National Implementation Coordinating Units (NICUs) and the Regional Project Implementation Unit (RPIU). Each one of these nodes will be provided with the necessary software for data base management, data visualization and display, INTERNET communication, and web browsing. Appropriate training will be provided upon installation of the system, as well as ongoing technical support. (See Annex 2.)

(c) Inventory of Coastal Resources and Use (US\$690,100). The objective of this component is to further develop each participating country's inventory of coastal resources so as to provide the necessary baseline data for the execution of other project activities. Coastal resource data needed for the proposed project include coastal physical characteristics, natural environments, and information on the use of coastal areas and resources. The inventory takes into consideration the widely varying coastal zone resources, existing inventories, and analysis capabilities in the region. Under this component, all eleven participating countries will acquire a Geographic Information System (GIS) capability, and existing data will be collated and computerized. A regional training course will be provided in resource inventory preparation. (See Annex 3 for more details on this component.)

(d) Formulation of a Policy Framework for Integrated Coastal and Marine Management (US\$299,700). This component will support the development of a generic policy framework for the preparation of ICZM legislation throughout the region. The framework will incorporate mechanisms for planning for adaptation to climate change, including specific tools such as land use guidelines and disaster contingency planning. A draft framework will be presented at a regional meeting of CPACC representatives for review and training, and in-country consultations will be conducted to assist in adapting the framework to meet specific country needs. Countries requesting special support (zoning, building controls, etc.) will be offered direct assistance. A public awareness and education program will also be conducted. (See Annex 4.)

The *pilot-based components* include the following:

(e) Coral Reef Monitoring for Climate Change (US\$405,900). This component is designed to increase existing knowledge about the extent and sources of coral reef degradation in three

countries (the Commonwealth of the Bahamas, Belize, and Jamaica). Building upon ongoing work on coral reef monitoring throughout the region, this component will establish a long-term monitoring program which over time will show the effects of global warming factors (temperature stress, sea level rise, and hurricanes) on coral reefs (see Annex 5, Table 5.3 for information on related programs). Under this component, a subregional forum of specialists from government, NGO, and CARICOM institutions, as well as experts from the scientific community, will identify the methodologies to adjust and extend current monitoring efforts of global warming impacts on Caribbean reefs. The activities will depend heavily on the inventory work of Component (c) above, and will consolidate information from past inventories with that extracted from the current monitoring efforts. In addition, specific activities will be dedicated to public awareness, education, and transfer of technology. Regional meetings will take place to review the monitoring program and to train country specialists from other countries on monitoring methodologies and lessons learned. (See Annex 5 for additional information.)

(f) Coastal Vulnerability and Risk Assessment (US\$433,400). Three countries (Barbados, Grenada, and Guyana) have agreed to participate in the development of vulnerability and risk assessments for their coastal areas. The component will begin with a review of coastal vulnerability assessment models and the application of the IPCC common methodology in these three countries and throughout the region. With the execution of the three vulnerability and risk assessments, representatives from these three countries will receive special training, and information will be transferred throughout all the agencies dealing with coastal zone management issues. A regional workshop will be held to present the results of the three case studies to the entire region. Manuals will be prepared for the execution of coastal vulnerability and risk assessments, and a public awareness and education program will be conducted to raise the level of public consciousness concerning the vulnerability of coastal areas. (See Annex 6.)

(g) Economic Valuation of Coastal and Marine Resources (US\$312,300). This component will include the design and implementation of pilot studies in the Commonwealth of Dominica, Saint Lucia, and the Republic of Trinidad and Tobago on the economic valuation of resources in selected coastal ecosystems at risk from sea level rise. Each of the three pilot studies will focus on an ecosystem and associated economic activities. Using existing information and input from other project components, the pilot studies will identify resources of significance, resource uses, and threats from sea level rise. Each pilot study will then use alternative approaches to estimate market and non-market values of resources at risk. The pilot studies will illustrate the use of valuation data, in some cases by demonstrating the development of environmental accounts with linkages to national accounting frameworks, in others by demonstrating cost-benefit and other decision-making frameworks for selecting among environmental management approaches. Capacity-building activities under this component will include the training of regional and local personnel in the use of alternative resource valuation strategies, the development of environmental accounts, and cost-benefit analysis. In addition, the results of the pilot studies will be used to develop and disseminate appropriate techniques for use throughout the region. (See Annex 7.)

(h) Formulation of Economic/Regulatory Proposals (US\$ 189,000). This component will implement two pilot studies in Antigua and Barbuda and Saint Kitts and Nevis to demonstrate the design and use of economic and regulatory approaches to environmental protection in response to threats from sea level rise. The component will demonstrate how innovative approaches to environmental regulation, such as the use of economic incentives, can provide flexible, cost-effective alternatives to traditional "command and control" regulatory policies. In addition, the two pilot studies will address methods for generating funds to finance other programs aimed at mitigating the impacts of global climate change. Under this component, local and regional personnel will be trained

in the design of economic-based regulations and other innovative approaches for coastal and marine management, as well as in program finance for environmental management. The results of the pilot studies will be used to develop training materials for use in regional workshops and will serve as input for the development of a region-wide policy framework. (See Annex 8 for details.)

3. PROJECT COSTS AND FINANCING

Project Costs and Financing

18. Project costs are estimated at US\$6.3 million. Adaptation planning activities are estimated to cost US\$3.5 million (56% of total cost), of which US\$2.2 million (35% of total cost) will be generated by the four regional components and US\$1.3 million (21% of total cost) by the four national pilot components. Regional project implementation/capacity building activities will cost US\$2.1 million (33% of total cost). Executing Agency costs are estimated at US\$670,000 (11% of total cost). The project will be financed by a GEF Trust Fund grant of US\$6.3 million. (See Annex 14 for detailed project cost tables.)

Incremental Costs

19. As the project constitutes an "enabling activity" under Article 12 of the FCCC and would implement Stage I adaptation and related capacity building activities, as defined by the INC/FCCC at its Tenth Session, total project and executing agency costs, amounting to US\$6.3 million, are considered as agreed full incremental costs and would be eligible for GEF funding. Consequently, an incremental cost analysis has not been prepared. The incremental costs of the Executing Agency will terminate at the end of the project.

Procurement

20. Procurement for the project will include consultant services, computers, scientific equipment, one vehicle, and general office equipment, materials, and supplies. The project will also provide funding to the CMI for the establishment of an earmarked account, the Tidal Gauge Replacement Fund, to assure long-term financing for the maintenance and replacement, as needed, of sea level tidal gauges. The GS/OAS will be reimbursed for its costs as Executing Agency under this project (including remuneration for GS/OAS project core staff, communications, and travel and per diem). The selection and appointment of consultants will be made in accordance with the August 1981 *Guidelines for the Use of Consultants by World Bank Borrowers*, while the procurement of goods will be processed in accordance with the January 1995 *Guidelines for Procurement under IBRD Loans and IDA Credits* (revised January and August 1996). Procurement arrangements are presented in the Summary of Procurement Arrangements Table, Schedule B and summarized below:

(i) *Consultant Services:* The project will finance technical assistance and training (including travel and per diem). The selection of consultant firms for services valued at US\$75,000 or more will be subject to prior Bank review (Terms of Reference, budgets, letters of invitation, evaluation, and proposed contracts). For individual consultants, prior Bank review (TOR, qualifications, and conditions of employment) will be required for contracts valued at US\$50,000 or more. Below these limits, Bank prior review would apply only to TORs. The GS/OAS standard "Performance Contract" will be used to hire project staff and individual consultants, including staff based at GS/OAS headquarters and UWICED. In the case of consulting firms, the GS/OAS contract

form would be used, but it would be adjusted to include the Bank's standard clauses on, inter alia, confidentiality, conflicting activities, sub-contracting, and the law governing contracts and language.

(ii) *Goods*: Computers and remote sensing images in packages valued at more than US\$100,000 will be procured under Limited International Bidding (LIB), due to small aggregate contract values for these items. Specialized scientific equipment (i.e., sea level tidal gauges and telemetry equipment) valued at US\$350,000 will be purchased through direct contracting. Because of the highly specialized nature of this equipment, it is obtainable from only one source. Office supplies/materials/ communications and one project vehicle in packages valued less than US\$100,000 will be procured under national or international shopping. All LIB contracts and direct contracting documentation will be subject to the Bank's prior review. Documentation related to shopping procedures will be subject to *ex post* review by the Bank during field supervisions. The prior review arrangements will result in *ex ante* review by the Bank of approximately 50% of all Bank-financed items by value. As the project Executing Agency, the GS/OAS will also assume a major role in the review of procurement arrangements.

Disbursement

21. Disbursements of the proposed grant over four years are estimated to be US\$1.9 million, US\$1.5 million, US\$1.6 million, and US\$1.3 million for each year, respectively. They are presented in the Summary of Disbursement Arrangements Table, Schedule B, the Disbursements by Category Table (below), and summarized as follows: (i) 100% of the expenditures for goods (for all computers, scientific equipment, one vehicle); (ii) 100% of the expenditures for consultant services and training; (iii) 100% of the CMI subgrant for tidal gauge replacement; (iv) 100% of operating costs (including office supplies, communications, travel and per diem, and staff remuneration incurred by the Grant Recipient/Executing Agency in coordinating and supervising project activities); and (v) Regional Project Implementation Unit (RPIU) operating costs (including communications, office supplies, maintenance, and utilities). Disbursements will be made on the basis of Statements of Expenditure (SOEs) for all expenditures for: (i) contracts for consultant services by firms whose contract value is below US\$75,000; (ii) contracts for consultant services by individuals whose contract value is below US\$50,000; (iii) contracts for goods valued below US\$100,000; and (iv) contracts for training, Grant Recipient/Executing Agency operating costs, and RPIU operating costs. Supporting documentation will be retained for review by Bank supervision missions. All other disbursements will be made against fully documented withdrawal applications.

DISBURSEMENTS BY CATEGORY

Disbursement Category	Amount of Grant Allocated (US\$ 000)	% Financing
1. Goods	1,158.6	100%
2. Consultants' Services and Training	4,326.2	100%
3. CMI Subgrant for Tidal Gauge Replacement	50.0	100%
4. RPIU Operating Costs	95.3	100%
5. Grant Recipient/Executing Agency Operating Costs	669.9	100%
Total for All Categories	6,300.0	

Accounts and Auditing

22. The General Secretariat of the Organization of American States (GS/OAS) will maintain separate accounting for project expenditures. To facilitate project implementation and expedite disbursements, GS/OAS will open and operate a sub-account within the OAS Treasury Fund, an existing omnibus account of the GS/OAS in a commercial bank acceptable to the World Bank. The authorized allocation to the Special Account will be US\$500,000. An amount equivalent to 90 days of anticipated expenditures will be advanced from the Special Account to an account established by the Regional Project Implementation Unit (RPIU) within the University of the West Indies Centre for Environment and Development (UWICED). The advance will be used to meet expenditures in the regions where project activities will take place—namely, Antigua and Barbuda, Commonwealth of the Bahamas, Barbados, Belize, Commonwealth of Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, and Republic of Trinidad and Tobago. Subsequent advances to the RPIU within UWICED would be given only upon their accounting for the advances previously received. The GS/OAS will be responsible for the preparation and submission of regular replenishment requests with appropriate supporting documents for expenditures incurred. Such requests should normally be submitted on a quarterly basis. The documents that accompany replenishment applications should include the following: a reconciliation statement for the Special Account showing deposits received from the Bank; the amount advanced to the RPIU within UWICED; the date on which this advance was made; and the amount awaiting documentation from the RPIU with an explanation for the delay.

23. All project accounts will be audited annually by independent auditors acceptable to the Bank in accordance with generally accepted accounting procedures. The auditors will review the project's financial records to determine if the expenditures match the approved work program and if satisfactory procedures of record-keeping are being used. Copies of the audited statements will be sent to the Bank within four months of the end of the fiscal year. The auditor's report will include an opinion on the quality and accuracy of the methods employed in compiling the statements of expenditures, the relevance of supporting documents, and the standards of record-keeping and internal controls.

4. PROJECT ORGANIZATION AND IMPLEMENTATION

Project Organization

24. The *General Secretariat of the Organization of American States (GS/OAS)* will be the Grant Recipient/Executing Agency for the project. The GS/OAS will execute the project under the supervision of the Bank as GEF Implementing Agency, and under the guidance of a Project Advisory Committee (PAC). The GS/OAS will be responsible for disbursements to the regional project office, technical supervision, and overall project quality assurance (see Annex 11 for detailed Terms of Reference).

25. The *Project Advisory Committee (PAC)* will provide policy guidance, review implementation progress and work programs, and evaluate project results. The PAC will be comprised of one representative from CARICOM, who will chair the PAC; the region's representative from the GEF Council; two representatives of the NICUs; and one representative each from UWICED, the UNEP's Caribbean Environment Programme, the UNDP, and the regional/local NGO community. The Regional Project Implementation Unit (RPIU) will act as technical secretariat to the PAC on behalf of the GS/OAS. A CARICOM representative will serve as the Chairman of this committee, and a

UWICED representative will serve as the Deputy Chairman. The PAC will meet at least annually, at the invitation of the GS/OAS.

26. The *Regional Project Implementation Unit (RPIU)* will be established to ensure effective coordination and management of project activities at the regional level, as assigned by the GS/OAS. The RPIU will be established in the Centre for Environment and Development of the University of the West Indies (UWICED), a regional institution with a mandate suitably related to the project. For this purpose, UWICED will establish an office on the Barbados campus of the University of the West Indies. The RPIU will be a unit within UWICED Barbados, and will be under day-to-day administrative control of UWICED.

27. As a prerequisite to participation in the project, each country will be required to designate a national institution to serve as a *National Implementation Coordinating Unit (NICU)*. The NICUs, working in close collaboration with the RPIU and the GS/OAS, will facilitate project implementation at the national level. The institutional location of the RPIU and the NICUs in existing regional and national institutions will constitute the main vehicle for strengthening those institutions and creating effective information networks. During project execution, the functions of the RPIU and the NICUs will be progressively integrated into the regular programs of their respective host institutions.

Project Implementation

28. Project components will be carried out on both a region-wide basis and on a pilot scale. The regional activities will be carried out in all eleven participating countries, while the pilot activities will take place in selected island states. During the project preparation phase, each participating country, assisted by the executing agency, selected one pilot activity for implementation in their country. This selection process took into account national priorities, stakeholder interest, existing institutional capacity, and readiness to commit the necessary local support. (See Annex 9 for a project timeline and Annex 10 for pilot project distribution among participating countries.)

29. The RPIU will be staffed by a Regional Project Manager, with expertise in environmental management and planning; a Deputy Project Manager/Human Resources Development specialist; an Information Systems Coordinator/GIS specialist; a Coastal Zone Management specialist; an accountant/financial controller; and support and administrative staff. A Regional Network Coordinator with expertise in climate and sea level monitoring will be located in the Caribbean Meteorological Institute, responsible for coordination and technical support to the network of tidal and climate gauges. RPIU staff will provide direct technical support to the NICUs to be designated by each participating country. (See Annex 11 for a more detailed discussion of RPIU responsibilities.)

30. Project implementation arrangements between the RPIU and the NICU will take the form of standard Technical Cooperation Agreements between the GS/OAS and agencies of participating governments. The agreements will state responsibilities and privileges of each party, and describe the products and services to be provided under the agreement.

Project Supervision

31. The GS/OAS as Executing Agency will be responsible for ensuring project quality and timely implementation. The Bank, as Implementing Agency, will be accountable to the GEF Council for consistency of project implementation with authorized activities and agreed objectives. Bank supervision is expected to require six staff weeks per year. Missions are planned for six-month

intervals to supervise progress. A Mid-Term Review will take place at the end of the second year of effectiveness to assess project implementation and monitoring and evaluation procedures, and to introduce necessary adjustments.

Monitoring and Evaluation

32. A monitoring and evaluation program has been developed to provide information on the success of the project in meeting its objectives, and on operational and cost efficiency. A set of key indicators will be used to assess project performance in these areas and to facilitate the introduction of adjustments when necessary. The key indicators are based on the list of expected project outputs. An initial workshop, a mid-term review, and a final meeting will be an integral part of the review and evaluation process, as well as the inputs from the PAC. (See Annex 12 for the project monitoring and evaluation plan. Annexes 1-8 also detail the expected project outputs by component.)

Reporting Requirements

33. The RPIU will prepare detailed Quarterly Activity and Financial Reports documenting the execution of project components in each participating country as measured against the key performance indicators. These will be supplemented by periodic Technical Reports submitted by consultants and external M&E reviewers. Semiannual Progress Reports will be prepared by the GS/OAS in a format satisfactory to the Bank. The semiannual reports will integrate information from the detailed quarterly reports and periodic technical reports to assess the progress made towards the achievement of objective level results. See Annex 12 for a detailed description of the reporting requirements.

Mid-Term Review

34. The GS/OAS and the Bank will conduct a Mid-Term Review at the end of the second year to evaluate project implementation arrangements. This review would serve to assist the GS/OAS and the Bank in the identification of both positive experiences and implementation problems and bottlenecks in order to fine-tune the project and determine any needed modifications during the second half of the project implementation period. The Mid-Term Review will evaluate the efficiency and impact of the different components, monitoring and evaluation procedures, and the effectiveness of regional and national institutional development activities. It will be carried out by independent consultants under terms of reference and contracting procedures agreed with the Bank. Inputs to the Mid-Term Review will include semiannual progress reports, recommendations from project external and internal audit reports, and additional reviews or studies contracted by the GS/OAS. A regional workshop to discuss the findings of the review will be held at this time.

Implementation Completion Report

35. The GS/OAS will prepare an Implementation Completion Report within three months of the end of the Bank's supervision period. This report will evaluate the implementation effectiveness of each component, and the ultimate success of the project in meeting its stated objectives.

Environmental Aspects

36. The project is classified as "C." The project will have important positive environmental effects in the long term by: (i) promoting the protection of coastal and marine resources through appropriate

adaptation planning; and (ii) strengthening the regional and in-country capability to manage coastal and marine resources under the adverse conditions created by GCC.

5. PROJECT JUSTIFICATION

Rationale for GEF Funding

37. The Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC/FCCC) agreed at its tenth session that adaptation to the adverse effects of climate change will require short, medium, and long-term strategies which should be cost effective, take into account important socioeconomic implications, and be implemented on a stage-by-stage basis in developing countries that are Parties to the Convention. INC/FCCC further agreed that the Conference of the Parties would entrust the GEF to meet the agreed costs of short-term (Stage I) activities required by Article 12.1 of the Convention. Such activities may include studies of the possible impacts of climate change, identification of options for implementing the adaptation provisions (especially the obligations contained in Articles 4.1(b) and 4.1(e) of the Convention), and relevant capacity building. Proposed project activities are fully consistent with this guidance from the Convention and are therefore eligible for GEF funding.

38. Beyond the issue of strict eligibility and the desirability of assisting Caribbean countries to fulfill their commitments under the FCCC, a number of factors makes GEF support to this project desirable. The project will: (i) promote the protection of coastal areas and international waters from the effects of both ongoing expansion of human activities and impending global climate change (GCC); (ii) encourage a regional cooperative effort for addressing the issues of adaptation to GCC; (iii) generate sea level/climate information for worldwide use and benefit; (iv) initiate a planning process for making future economic development viable in an area of the world heavily dependent on its coastal zone and seriously threatened by the prospect of sea level rise; (v) provide an appropriate vehicle for assisting those countries of the world which, while contributing very little to global warming, are the most affected by its consequences; (vi) develop new options and means for dealing with GCC; (vii) apply innovative technology for the assessment of coastal vulnerability; and (viii) serve as a model for other countries of the Caribbean basin and other regions with comparable needs and means.

Lessons Learned from Bank/OAS Experience

39. The management of regional projects with participation by a large number of beneficiary countries poses special challenges to the implementing agencies. The Bank/OAS experience in executing regional projects has demonstrated how different national priorities and capacities must be taken into consideration when designing individual country participation in project activities. The project is designed to respond to this requirement with two general types of activities: (i) pilot studies in one or more carefully selected countries, aimed at producing relevant information and experience for all beneficiaries, and (ii) regional activities, including technical meetings, training workshops, capacity building activities, and the establishment of data bases and networks, which will be open to all beneficiary countries. Important project implementation instruments will include: (i) technical cooperation agreements with country governments to set the conditions and responsibilities governing country participation in the project; (ii) performance contracts with consultants and non-governmental institutions to acquire technical services for the project; and (iii) Cooperation Agreements or Memoranda of Understanding with regional and multilateral institutions to establish participation of

other agencies in the project. Experience in preparing the GEF/World Bank-financed Organization of Eastern Caribbean States (OECS) Waste Management Project and the Wider Caribbean Initiative Project identified the need for a strong and autonomous region-based project coordination unit with the necessary authority to ensure effective project implementation. These lessons and those learned from OAS projects have been integrated into the design of the CPACC project.

Linkage with Other Programs

40. The project will seek to build on existing institutions, experiences, and initiatives. It will liaise with regional intergovernmental bodies, such as the IPCC, and other programs in the region, such as UNEP's CEP and USAID's Coral Reef Initiative and Caribbean Disaster Mitigation Project. The RPIU will establish exchange mechanisms (workshops, committees, and technical meetings) and sign Cooperation Agreements or Memoranda of Understanding with multilateral and regional organizations in order to ensure their participation in project activities. Collaboration with UNEP during the final phase of preparation and implementation will be particularly important in view of its expertise and existing projects in the region in the areas of impact and vulnerability assessment, development of adaptation options, ICZM, and establishment of monitoring networks. UNDP's participation in the PAC will facilitate coordination of capacity building activities, as necessary. (See Table 3 of Annexes 1-8 for information on relevant national and regional programs.)

Project Sustainability

41. The Caribbean region's active involvement in GCC initiatives to date provides a solid foundation for initiating proposed project activities. Continued country commitment to FCCC objectives and the creation of regional and national institutional capacity to plan for adaptation to climate change will be the determining factors in long-term project success and sustainability. Project activities and implementation arrangements will be designed to enhance the likelihood of sustainability over the long-term. Specifically: (i) the project will not create a separate organization to plan for GCC, but rather will strengthen existing regional and government institutions; (ii) the project will support and further develop international and intergovernmental programs, networks, and organizations aimed at addressing the issues of GCC and sustainable development; (iii) the development of a permanent nucleus of expertise and regional capability for adaptation planning will allow the countries to sustain the planning process initiated with the project; (iv) the project will be linked to the National Environment Action Plans and existing National Development Plans of all participating countries; (v) all recurrent functions of the regional and national implementing units will be fully integrated during the course of project execution into their host institutions' regular programs; and (vi) cost recovery and revenue instruments from both the public and private sectors will be identified for the purpose of financing recurrent costs.

42. The CPACC project is intended as the first stage of a comprehensive, long-term program of adaptation to GCC, and will serve as the basis for further capacity building, implementation of minimum-cost measures identified by the CPACC project, the preparation of long-term adaptation plans within an ICZM framework, and the formulation of technical assistance and investment projects.

Participatory Approach

43. CARICOM countries participating in the project have been actively involved in project preparation. In September 1995, all designated CPACC National Focal Points (NFP) convened in Barbados for the first regional project preparation workshop. Between November 1995 and January

1996, each country held a national consultation on the project. These consultations, which were attended by various stakeholder groups, were decisive in defining the nature of each country's participation. Following the consultations, each country submitted a national report that delineated, among other elements, their diverse needs and priorities for adapting to climate change and linkages with ongoing projects and programs. As a first step towards consolidating the region's "ownership" of the projects, these reports were also instrumental in determining the locations of the pilot projects, national and regional institutional capacity, and areas for human resource development. A second regional workshop was held in Dominica in January 1996, during which the CPACC National Focal Points agreed on the basic elements of the project's workplan and management structure. During the third regional workshop held in St. Kitts and Nevis in May 1996, participating country representatives had the opportunity to comment extensively on the pre-appraisal draft of the project document, and to suggest changes and clarifications for discussion during project appraisal.

Project Benefits

44. *Global benefits* will include: (i) long-term protection provided by appropriate adaptation planning for coastal and marine resources and ecosystems and international waters; (ii) generation of information related to sea level, climate, vulnerability, and economic matters for worldwide use; and (iii) development of vulnerability assessment technologies, policy options, and a regional approach for dealing with GCC. *Regional benefits* will result from the project's contribution to: (i) strengthening a regional network of GCC-involved institutions, building the region's adaptation planning capability, and supporting GCC-related international and intergovernmental programs in the region; and (ii) providing the basis for CARICOM member governments to agree on a regional strategy for dealing with the GCC threat.

Project Risks

45. The main risk of the project is related to the difficulty of ensuring effective and efficient implementation due to the multiplicity of countries and institutions involved. Assigning project execution to the GS/OAS will minimize this risk because of its considerable experience in the management of regional projects in the Caribbean and other regions of the hemisphere. Another important risk concerns existing uncertainties about the expected degree of GCC-induced sea level rise. The project's generation of information on climate, sea level, vulnerability, and economic information, however, will contribute greatly to reducing such uncertainty and to rationalizing future adaptation planning and the management of the GCC threat.

6. AGREED ACTIONS

46. Prior to effectiveness, it was agreed that (i) at least six participating countries will have signed Cooperative Agreements with the GS/OAS; (ii) the Cooperative Agreement between the GS/OAS and UWI will be signed; and (iii) the GS/OAS will prepare and submit an Operating Plan satisfactory to the Bank for the first three months of project implementation.

47. Dated Covenants: (i) the RPIU will be established within 60 days of project effectiveness; (ii) the PAC will be established within 90 days of project effectiveness; (iii) no later than 36 months after the date of project effectiveness, the CMI will establish the Tidal Gauge Replacement Fund.

CARIBBEAN
GLOBAL ENVIRONMENT FACILITY
PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE

Estimated Project Costs by Component

(US\$ '000)

For Years 1-4 of the Project

Caribbean
 Planning for Adaptation to Global Climate Change
 Project Components by Year – Totals Including Contingencies
 (US\$ '000)

	Totals Including Contingencies				
	Year 1	Year 2	Year 3	Year 4	Total
A. Project Costs					
1. Regional Activities					
Sea Level/Climate Monitoring Network	611.1	72.3	50.6	89.9	823.9
Databases & Information Systems	249.4	56.5	42.7	43.4	392.0
Inventory of Coastal Resources	285.7	404.4	-	-	690.1
Policy Framework for Coastal & Marine Management	-	92.8	37.4	169.4	299.7
Subtotal Regional Activities	1,146.2	626.0	130.7	302.7	2,205.6
2. Pilot Activities					
Coral Reef Monitoring Network	26.6	146.3	159.7	73.3	405.9
Coastal Vulnerability & Risk Assessments	-	42.5	212.0	178.8	433.4
Economic Valuation Coastal & Marine Resources	-	18.5	225.6	68.2	312.3
Economic & Regulatory Proposals	-	18.5	170.5	-	189.0
Subtotal Pilot Activities	26.6	225.8	767.8	320.4	1,340.5
3. Regional Project Implementation/Capacity Building	557.9	494.8	513.7	517.4	2,083.9
Subtotal Project Costs	1,730.7	1,346.7	1,412.2	1,140.5	5,630.1
B. Executing Agency Costs	163.2	165.8	169.2	171.8	669.9
Total PROJECT COSTS	1,893.9	1,512.5	1,581.3	1,312.3	6,300.0

CARIBBEAN

PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT

Summary of Procurement Arrangements

Caribbean
 Planning for Adaptation to Global Climate Change
 Procurement Arrangements - Non-ICB/NCB Aggregated as Other
 (US\$ '000)

	Procurement Method				Total
	International Competitive Bidding	NCB	Other	NBF	
A. Goods ^a	—	—	1,253.9 (1,253.9)	—	1,253.9 (1,253.9)
B. Technical Assistance ^b	—	—	2,655.1 (2,655.1)	—	2,655.1 (2,655.1)
C. Training	—	—	1,671.1 (1,671.1)	—	1,671.1 (1,671.1)
D. CMI Subgrant for Tidal Gauge Replacement	—	—	50.0 (50.0)	—	50.0 (50.0)
E. Executing Agency Costs	—	—	669.9 (669.9)	—	669.9 (669.9)
Total	—	—	6,300.0 (6,300.0)	—	6,300.0 (6,300.0)

Note: Figures in parentheses are the respective amounts financed by the Global Environment Facility.

^a Includes scientific equipment.

^b Selection of consultants in accordance with "Guidelines for the Use of Consultants by World Bank Borrowers and by the World Bank as Executing Agency," August 1981.

Summary of Disbursement Arrangements

Estimated Schedule of Disbursement of GEF Grant
 (US\$ Million)

Fiscal Year	Year 1	Year 2	Year 3	Year 4
Annual	1.9	1.5	1.6	1.3
Cumulative	1.9	3.4	5.0	6.3

CARIBBEAN

PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE PROJECT

TIMETABLE OF KEY PROCESSING EVENTS

Time Taken to Prepare:	14 months (February 1995 to April 1996)
Prepared By:	General Secretariat of the Organization of American States (GS/OAS), with the support of CPACC National Focal Points in the eleven participating countries.
	GS/OAS Team: Jan Vermeiren, Zoila Giron, Alfredo Recalde (USDE); Cesaire F. Granger (CARICOM); Mark Griffith, Rasleigh Jackson, Gillian Chambers (Consultants).
	World Bank Team: Claudia Alderman, Loretta Sprissler (LA3NR), Ellen Newfield (OPRIS), Robert Chronowsky, Matthew Mendes (Consultants).
First Bank Mission:	September 1995
Appraisal Mission Departure:	May 1996
Date of Negotiations:	December 1996
Planned Date of Effectiveness:	April 1997
Summary Supervision Plan:	<p>The GS/OAS as Executing Agency will be responsible for ensuring project quality and timely implementation. The Bank, as Implementing Agency, will be accountable to the GEF Council for consistency of project implementation with authorized activities and agreed objectives. Bank supervision is expected to require 6 staff weeks per year. Missions are planned for 6-month intervals to supervise progress. A Mid-Term Review will take place at the end of the second year of effectiveness to assess project implementation and monitoring and evaluation procedures and introduce necessary adjustments.</p> <p><i>Technical expertise:</i> climate change specialist, integrated coastal zone management specialist, and natural resources economist.</p>

PART II: Technical Annexes

ANNEX 1: DESIGN AND ESTABLISHMENT OF SEA LEVEL/CLIMATE MONITORING NETWORK (REGIONAL)

The sea level/climate observation network proposed for installation in each of the eleven participating countries will include a standardized set of instruments to measure water level, vertical land motion (which affects the relative relationship between sea surface and land interface), air and sea temperature, wind velocity, precipitation, and other site-specific ancillary variables. The network will be composed of 18 state-of-the-art gauges generating digitized data available in near real time by satellite telemetry or telephone. In addition, each tide gauge bench mark will be fixed in geocentric coordinates so that the vertical movement of the land can be distinguished from sea level changes (local tide gauges measure a combination of the two). The U.S. National Ocean Service of NOAA has been involved in the installation of tidal gauges around the world as part of the Global Sea Level Observing System (GLOSS), and will act as lead agency in the installation of the proposed network. Each participating country will be directly involved in selection of sites and designated national agencies, such as the National Weather Service, will manage their individual observatories. The Caribbean Meteorological Institute (CMI) will be the lead regional agency, and will take on the responsibility of overseeing the network after project completion. To assure long-term financing for this activity, the project will establish the Tidal Gauge Replacement Fund (US\$50,000) as an earmarked account within CMI for the maintenance and replacement, as needed, of the sea level tidal gauges. It is expected that the Tidal Gauge Replacement Fund would be supplemented or replenished through the collection of data user fees, where appropriate, and other related contributions.

**Table 1.1: Design and Establishment of Sea Level/Climate Monitoring Network
Matrix of Component Activities, Expected Outputs and Timing**

Activities	Expected Outputs	Timing of Expected Outputs
1. Appoint Regional Network Coordinator and NOAA Program Coordinator.	1. Enhancement of Caribbean sea level gauge network with the addition of 18 gauges in the eleven participating countries collecting data on sea level and other related climate variables.	By end of: 1. June 1998
2. Organize initial program workshop.	2. Institutional and human capacity strengthened at both the national and regional levels in the monitoring and analysis of sea level data.	2. March 2001
3. Select and prepare sites for network systems.	3. Action Plan involving international, national and regional cooperation for continued operation of gauges.	3. March 2001
4. Carry out station configuration and equipment procurement and installation.	4. Establishment of Regional Archiving Centre (RAC), a long-term regional data and analysis center, for sea-level network at CMI and IMA.	4. December 1997
5. Carry out geocentric fixing of tide gauge bench marks.	5. Long-term funding for maintenance of Sea Level/Climate Monitoring Network.	5. January 2000
6. Perform annual operation and maintenance, sensor calibration.		
7. Establish regional data acquisition, archiving, and dissemination system.		
8. Provide training to at least ten persons in monitoring and analysis of sea level data.		
9. Establish a Tidal Gauge Replacement Fund at the Caribbean Meteorological Institute.		

**Table 1.2: Design and Establishment of Sea Level/Climate Monitoring Network
NICUs and Institutional Responsibilities for Component by Country**

COUNTRY AND NATIONAL IMPLEMENTATION COORDINATING UNIT (NICU)	RESPONSIBLE INSTITUTION
Antigua and Barbuda Ministry of Planning	Meteorological Office
Bahamas Bahamas Environment Science and Technology Commission (BEST) and Office of the Prime Minister	Bahamas Meteorological Department Department of Lands and Surveys Water Sewage Corporation
Barbados Ministry of Health and the Environment, Environment Division	Coastal Zone Management Unit
Belize Ministry of Economic Development	National Meteorological Service
Dominica Sustainable Development Council (SDC) under the Ministry of Finance, Industry, and Planning	Dominica Meteorological Institute
Grenada Ministry of Finance, Planning, and Development	Land and Surveys Division, MET Office
Guyana Hydrometeorological Department	Hydrometeorological Department, Ministry of Agriculture
Jamaica Natural Resources Conservation Authority (NRCA)	Survey Department, Centre for Marine Sciences Meteorological Service
St. Kitts and Nevis Ministry of Tourism, Culture, and Environment	Coast Guard Meteorological Service
St. Lucia Ministry of Planning, Development, and Environment	St. Lucia Airport and Sea Port Authority, MET Services
Trinidad and Tobago Ministry of Planning and Development	Hydrographic Unit of the Ministry of Agriculture Meteorological Services Unit of the Ministry of Public Utilities

Table 1.3: Design and Establishment of Sea Level/Climate Monitoring Network Relevant National and Regional Programs and Institutions

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>Global Sea Level System (GLOSS) Regional Component</p> <ul style="list-style-type: none"> • Commenced in 1984, on-going. • Maintains a network of 28 stations in the wider Caribbean Region, including the Bahamas, Jamaica, St. Kitts, and Trinidad and Tobago. <p>* CPACC will complement the existing GLOSS network.</p>	<p>Coordinated by the Secretariats of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, Subcommission for the Caribbean and Adjacent Regions (IOCARIBE).</p>
<p>IOCARIBE Group of Experts on Climate and Ocean Processes</p> <ul style="list-style-type: none"> • Related to GLOSS and the Cooperative Investigation of the Caribbean and Adjacent Regions (CICAR). • Coordinate and conduct ocean climate research with observations, data analysis, and modeling. • Train graduate students in research and teaching, and forecast ocean circulation for climate, fisheries, and safety. <p>* Could play important role in implementation phase of CPACC.</p>	<p>Supported by the Secretariats of IOC and IOCARIBE.</p>
<p>Global Absolute Sea Level Monitoring Programme</p> <ul style="list-style-type: none"> • Facilitates the collection, use, analysis, and distribution of global data on sea level change. • Although there are no projects in the region at this time, data collected as part of their monitoring program does include the Caribbean region. <p>* NOS is playing a supervisory role in this component.</p>	<p>Funded and implemented by National Ocean Service (NOS), Office of Global Programs of the National Oceanic and Atmospheric Administration (NOAA).</p>

**ANNEX 2: ESTABLISHMENT OF DATA BASES AND INFORMATION SYSTEMS
(REGIONAL)**

The data bases and information system to be established under this component will form the backbone for the participating countries in their efforts to plan for adaptation to climate change. The information system will allow key regional and national institutions to acquire, analyze, store, and disseminate data on climate change and the impact on natural and manmade systems. It will facilitate access to the information on a wide range of public and private sector users and researchers, and will also serve to facilitate project management and monitoring and evaluation by linking Regional Archiving Centers with the data bases of the National Implementation Coordinating Units (NICUs) and the Regional Project Implementation Unit (RPIU). Each one of these nodes will be provided with the necessary software for data base management, data visualization and display, INTERNET communication, and web browsing. Appropriate training will be provided upon installation of the system, as well as ongoing technical support.

**Table 2.1: Establishment of Databases and Information Systems
Matrix of Component Activities, Expected Outputs and Timing**

Activities	Expected Outputs	Timing of Expected Outputs
<ol style="list-style-type: none"> 1. Assess current situation and needs by reviewing existing hardware, software, Internet access, and human resources and skills in each institution to function as nodes in information system. 2. Prepare detailed design of systems and sub-systems to be developed, including expected outputs, major data bases, expected sizes, and volume of queries. 3. Procure systems components. 4. Design and implement regional and national training courses in conjunction with systems installation. 5. Develop and implement data management and communications procedures, install hardware and software, perform necessary operational testing. 6. Develop and implement technical support and maintenance plan; formulate criteria for system upgrading. 	<ol style="list-style-type: none"> 1. Establishment of computer based network linking the main institutions involved in project implementation, especially the RPIU and the NICUs. 2. Creation of data bases using the data/information generated by the project activities, and establishment of linkages with other data bases and information systems. 3. Technical and human capacity for data management and analysis strengthened. 4. Availability of data related to climate systems as a means to further the understanding and reduce the remaining uncertainties regarding the causes, effects, magnitude, and timing of climate change. 	<p align="center">By end of:</p> <ol style="list-style-type: none"> 1. August 1997 2. March 2001 3. March 2001 4. Progressive

**Table 2.2: Establishment of Data Bases and Information Systems
NICUs and Institutional Responsibilities for Component by Country**

COUNTRY AND NATIONAL IMPLEMENTATION COORDINATING UNIT (NICU)	RESPONSIBLE INSTITUTION
Antigua and Barbuda Ministry of Planning	Ministry of Planning
Bahamas Bahamas Environment Science and Technology Commission (BEST) and Office of the Prime Minister	BEST
Barbados Ministry of Health and the Environment, Environment Division	Ministry of Health and the Environment, Environment Division
Belize Ministry of Economic Development	National Meteorological Service
Dominica Sustainable Development Council (SDC) under the Ministry of Finance, Industry, and Planning	SDC
Grenada Ministry of Finance, Planning, and Development	National Science and Technological Council
Guyana Hydrometeorological Department	Hydrometeorological Department, Ministry of Agriculture
Jamaica Natural Resources Conservation Authority (NRCA)	Natural Resources Conservation Authority
St. Kitts and Nevis Ministry of Tourism, Culture, and Environment	Department of the Environment
St. Lucia Ministry of Planning, Development, and Environment	Ministry of Planning, Development, and Environment
Trinidad and Tobago Ministry of Planning and Development	Environmental Management Authority

**Table 2.3: Establishment of Data Bases and Information Systems
Relevant National and Regional Programs and Institutions**

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>Strengthening the Capabilities for Managing Coastal and Marine Resources in the Wider Caribbean Region - Regional Program on Information Systems for the Management of Marine and Coastal Resources (CPNET)</p> <ul style="list-style-type: none"> • Enhance the development process by strengthening national environmental monitoring and assessment capabilities • Develop pilot information networks for six national and three regional agencies through provision of equipment and technical/ managerial training. <p>* CPACC Component (b) and this program are highly compatible, efforts should be made to rationalize the format of data for easy transfer between the two systems.</p>	<p>Executed by Caribbean Environment Programme (CEP) of the UN Environment Programme (UNEP). Funded by UNEP-CEP together with the Inter-American Development Bank.</p>
<p>Climate Diagnostics Center (CDC): Climate Monitoring and Diagnostics Program</p> <ul style="list-style-type: none"> • Designed to develop, collect, and provide quality control for worldwide data on precipitation, temperature, sea-surface temperature, etc. • CDC also is involved in archiving, training, and vulnerability assessments. <p>* Extensive expertise in database management and coastal vulnerability assessment suggests the importance of collaboration with CDC.</p>	<p>Operated under the framework of NOAA.</p>

ANNEX 3: INVENTORY OF COASTAL RESOURCES AND USE (REGIONAL)

The objective of this component is to further develop each participating country's inventory of coastal resources so as to provide the necessary baseline data for the execution of other project activities. Coastal resource data needed for the proposed project include coastal physical characteristics, natural environments, and information on the use of coastal areas and resources. The inventory takes into consideration the widely varying coastal zone resources, existing inventories, and analysis capabilities in the region. Under this component, all eleven participating countries will acquire or upgrade existing GIS capability, and existing data will be collated and computerized. A regional training course will be provided in resource inventory preparation.

**Table 3.1: Inventory of Coastal Resources and Use
Matrix of Component Activities, Expected Outputs and Timing**

Activities	Expected Outputs	Timing of Expected Outputs
<ol style="list-style-type: none"> 1. Procure and install equipment to create or upgrade existing GIS capability. 2. Consolidate, evaluate, and computerize (GIS) existing information in each participating country; provide necessary GIS training. 3. Carry out two-week regional training course on available techniques for resource inventory preparation. 4. Design coastal resource inventories for each participating country to provide base line data for project activities, such as vulnerability assessments, coral reef monitoring, economic valuations, etc. 5. Prepare coastal resource inventories. 	<ol style="list-style-type: none"> 1. Institutional framework, technical capacity, and equipment in place for the inventory and analysis of coastal zone resources, their conditions and use. 2. Inventory of physical and biological resources in Caribbean coastal areas, their current use and users. 3. Country-specific mapped outputs for use in Integrated Coastal Zone Management (ICZM) and planning. 	<p>By end of:</p> <ol style="list-style-type: none"> 1. December 1997 2. October 1998 3. December 1998

**Table 3.2: Inventory of Coastal Resources and Use
NICUs and Institutional Responsibilities for Component by Country**

COUNTRY AND NATIONAL IMPLEMENTATION COORDINATING UNIT (NICU)	RESPONSIBLE INSTITUTION
Antigua and Barbuda Ministry of Planning	Ministry of Planning
Bahamas Bahamas Environment Science and Technology Commission (BEST) and Office of the Prime Minister	BEST
Barbados Ministry of Health and the Environment, Environment Division	Ministry of Health and the Environment
Belize Ministry of Economic Development	Ministry of the Environment
Dominica Sustainable Development Council (SDC) under the Ministry of Finance, Industry, and Planning	Forestry Division
Grenada Ministry of Finance, Planning, and Development	Physical Planning Unit, Ministry of Finance, Planning, and Development
Guyana Hydrometeorological Department	Hydrometeorological Department, Ministry of Agriculture
Jamaica Natural Resources Conservation Authority (NRCA)	Natural Resources Conservation Authority
St. Kitts and Nevis Ministry of Tourism, Culture, and Environment	Ministry of Tourism, Culture, and Environment Ministry of Agriculture, Lands, Housing, and Development
St. Lucia Ministry of Planning, Development, and Environment	Ministry of Planning, Development, and Environment
Trinidad and Tobago Ministry of Planning and Development	Environmental Management Authority

**Table 3.3: Inventory of Coastal Resources and Use
Relevant National and Regional Programs and Institutions**

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>Remote Sensing Habitat-Based Assessment of Fish Production and Ciguatoxity</p> <ul style="list-style-type: none"> • Ultimate goal is to estimate the potential fisheries yield of the three countries' shelves based on accurate mapping and extrapolation of production zones. This would be achieved by the use of remote sensed images. • Promotes the conservation and management of fish resources in the CARICOM region. Antigua and Barbuda and St. Kitts and Nevis have been chosen for two of the three pilot projects. <p>* These activities directly complement Component (c), collaboration is suggested.</p>	<p>CARICOM Fisheries Resource Assessment and Management Program (CFRAMP).</p>
<p>Conservation of Threatened and Endangered Species and Management Guidelines for Species - SPAW Regional Program</p> <ul style="list-style-type: none"> • Sea Turtle Recovery Action Plans (STRAPS) have been prepared for the majority of CARICOM countries, Antigua and Barbuda, Belize, St. Kitts and Nevis, and Trinidad and Tobago. • Assessments for conservation of the West Indian Manatee are being undertaken in Belize, Trinidad and Tobago, and Jamaica. <p>* CPACC's inventory may be complemented by this program; collaboration should be defined so as to ensure the interests of both parties are served.</p>	<p>UNEP-CEP would act as executing agency for this project under their IPID Regional Program.</p>
<p>Coast and Beach Stability in the Lesser Antilles (COSALC I)</p> <ul style="list-style-type: none"> • Help develop the in-country ability of islands to measure, assess, and manage their beach systems, coastal stability and beach erosion, within an Integrated Coastal Zone Management framework. • Beach monitoring programs have been established, with training provided to staff in the focal point agencies. • The CPACC participants with COSALC I monitoring sites are: Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, and St. Lucia. <p>* Analysis is recommended of the specific way in which CPACC and COSALC I can complement one another since they share many common objectives.</p>	<p>Executed by the University of Puerto Rico Sea Grant College Program. Funded by the British Development Division, UNESCO, and the University of Puerto Rico Sea Grant College Program.</p>

**Table 3.3: Inventory of Coastal Resources and Use
Relevant National and Regional Programs and Institutions (cont'd)**

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>Climate Change and Integrated Coastal Zone Management Support System</p> <ul style="list-style-type: none"> • Main objective is to develop a decision-making tool for integrated coastal zone management incorporating, among other areas, characterization of natural resources, including interaction and conflicts. * Activities will most likely be complementary since the decision-making tool is intended to provide information on a number of coastal zone management issues. 	<p>UNEP-CEP will execute the project when it begins in January 1997.</p>
<p>Global Change and Coastal Land Loss, IOCARIBE</p> <ul style="list-style-type: none"> • Create a management framework to develop the essential skills in decision making for appropriate intervention in coastal stability problems. • Improve the regional capability to respond to issues and problems emerging from global climate change. * There are common areas to the CPACC project and an effort should be made to find specific fields of collaboration between the two. 	<p>IOCARIBE is the implementing agency for the project in the Caribbean region.</p>
<p>USAID Environment and Coastal Resources (ENCORE) Project</p> <ul style="list-style-type: none"> • To demonstrate that sound environmental management makes good economic sense and that public participation and community empowerment in environmental management is good governance. • Goals will be achieved through two components: a Regional Environment Management component, and a Local Site Management component. • There are on-going pilot studies at the Local Site Management level in St. Lucia and Dominica, although they are agriculturally based. * While most of the activities currently being undertaken are agricultural, institutional strengthening and increasing public awareness is important to CPACC and ENCORE. In addition, future areas of ENCORE will focus on coastal resource management, opening the possibilities for working together. 	<p>Executed by OECS Natural Resources Management Unit.</p>

ANNEX 4: FORMULATION OF A POLICY FRAMEWORK FOR INTEGRATED COASTAL AND MARINE MANAGEMENT (REGIONAL)

This component will support the development of a generic policy framework for the preparation of Integrated Coastal Zone Management (ICZM) legislation throughout the region. The framework will incorporate mechanisms for planning for adaptation to climate change, including specific tools such as land use guidelines, disaster contingency planning, and sea defense costing and responsibility. A draft framework will be presented at a regional meeting of CPACC representatives for review and training, and in-country consultations will be conducted to assist in adapting the framework to meet specific country needs. This component will be executed in conjunction with Component (h): Formulation of Economic/Regulatory Proposals. The results of the pilot studies under Component (h) will provide inputs into the formulation of the legislative and regulatory framework for ICZM. Countries requesting special support (zoning, building controls, etc.) will be offered direct assistance. A public awareness and education program will also be conducted.

Table 4.1: Formulation of a Policy Framework for Integrated Coastal and Marine Mgt. Matrix of Component Activities, Expected Outputs and Timing

Activities	Expected Outputs	Timing of Expected Outputs
<ol style="list-style-type: none"> 1. Following review and analysis of current policies and legislation, develop generic approach to planning for adaptation to climate change through, <i>inter alia</i>, development of zoning policies, building control guidelines, review of disaster contingency planning and sea defense costing and responsibility. 2. Conduct regional workshop to present generic framework for adaptation planning and to discuss draft versions of framework for preparation of ICZM legislation. 3. Conduct in-country consultations to present generic framework and adapt it to individual country needs. 4. Revise generic framework. 5. Provide specific country assistance in adaptation planning. 6. Conduct public awareness and education programs. 	<ol style="list-style-type: none"> 1. Review and analysis of existing institutional and legal mechanisms, including regulatory framework, for integrated coastal and marine management. 2. Framework legislation for addressing issues in the coastal and marine areas, particularly adaptation to climate change. 3. Country-specific regulatory mechanisms for ICZM. 4. Increased regional and national-level capacity in ICZM policy formulation through regional workshops and public awareness and education programs. 	<p>By end of:</p> <ol style="list-style-type: none"> 1. August 1998 2. September 1999 3. September 1999 4. November 1999

Table 4.2: Formulation of a Policy Framework for Integrated Coastal and Marine Mgt. NICUs and Institutional Responsibilities for Component by Country

COUNTRY AND NATIONAL IMPLEMENTATION COORDINATING UNIT (NICU)	RESPONSIBLE INSTITUTION
Antigua and Barbuda Ministry of Planning	Ministry of Planning
Bahamas Bahamas Environment Science and Technology Commission (BEST) and Office of the Prime Minister	BEST
Barbados Ministry of Health and the Environment, Environment Division	Coast Conservation Unit, Ministry of Health and the Environment
Belize Ministry of Economic Development	Fisheries Department, Coastal Zone Management Unit
Dominica Sustainable Development Council (SDC) under the Ministry of Finance, Industry, and Planning	Physical Planning Division, Ministry of Finance, Industry, and Planning
Grenada Ministry of Finance, Planning, and Development	Physical Planning Unit, Ministry of Finance Planning, and Development
Guyana Hydrometeorological Department	Environment Protection Agency
Jamaica Natural Resources Conservation Authority (NRCA)	Natural Resources Conservation Authority, Coastal Zone Management Unit
St. Kitts and Nevis Ministry of Tourism, Culture, and Environment	Ministry of Tourism, Culture, and Environment
St. Lucia Ministry of Planning, Development, and Environment	Ministry of Planning, Development, and Environment
Trinidad and Tobago Ministry of Planning and Development	Ministry of Planning and Development

Table 4.3: Formulation of a Policy Framework for Integrated Coastal and Marine Mgt. Relevant National and Regional Programs and Institutions

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>OECS Coastal Resources Management Initiative (CRMI)</p> <ul style="list-style-type: none"> • Goal is to achieve sustainable economic development for natural resources through integrated Coastal Resources Management (CRM). • Objectives of this initiative include: improvement of national management/ administrative/technical capacities, strengthen the NRMU to lead and coordinate environmental initiatives, prepare projects/programs to address CRM problems, and facilitate CRM in member states through policy changes. <p>* As this is more of a framework within which projects and activities that address coastal and marine resources can take place, it seems CPACC activities may help advance the initiative.</p>	<p>Executed by the OECS Natural Resources Management Unit (NRMU).</p>
<p>Development of Pilot Integrated Management Plans for Small Islands and Coastal Areas - IPID (Regional)</p> <ul style="list-style-type: none"> • Main aim is to assist governments with the development of integrated coastal zone management plans. Some of the objectives are: apply a regional methodological framework for integrated planning and management and improve regional capacities for technical assistance and training of coastal areas and small islands. <p>* St. Lucia is participating in this program, providing a means for collaboration in the area of inventory of coastal resources.</p>	<p>UNEP-CEP will act as executing agency under their Integrated Planning and Institutional Development Program.</p>

ANNEX 5: CORAL REEF MONITORING FOR CLIMATE CHANGE (PILOT)

This component is designed to increase existing knowledge about the extent and sources of coral reef degradation in three countries (the Bahamas, Belize, and Jamaica). Building upon ongoing work on coral reef monitoring throughout the region, this component will establish a long-term monitoring program which over time will show the effects of global warming factors (temperature stress, sea level rise, and hurricanes) on coral reefs (see Table 5.3 for information on related programs). Under this component, a subregional forum of specialists from government, NGO, and CARICOM institutions, as well as experts from the scientific community, will identify the methodologies to adjust and extend current monitoring efforts of global warming impacts on Caribbean reefs. The activities will depend heavily on the inventory work of Component (c): Inventory of Coastal Resources and Use, and will consolidate information from past inventories with that extracted from the current monitoring efforts. In addition, specific activities will be dedicated to public awareness, education, and transfer of technology. Regional meetings will take place to review the monitoring program and to train country specialists from other countries on monitoring methodologies and lessons learned.

**Table 5.1: Coral Reef Monitoring for Climate Change
Matrix of Component Activities, Expected Outputs and Timing**

Activities	Expected Outputs	Timing of Expected Outputs
<ol style="list-style-type: none"> 1. Hold sub-regional meeting to (a) review existing status of coral reef monitoring and research in the three participating countries; (b) review institutional capacities; (c) design monitoring program to determine potential impacts of climate change on coral reefs; (d) determine needs of monitoring program beyond life of project. 2. Determine institutional responsibility for coral reef monitoring. 3. Consolidate existing information on extent and condition of coral reefs, including information from coastal resource inventories. 4. Carry out public awareness programs on coral reefs and climate change in three participating countries. 5. Select sites and methodologies, depending on each country's resources, capabilities, and ongoing projects. 6. Strengthen monitoring activities of biological and physical indicators; provide training in field data collection and data analysis techniques. 7. Disseminate information and methodology to all participating countries through two-week regional workshop and training course. 8. Review monitoring program with assistance of regional experts. 	<ol style="list-style-type: none"> 1. A methodology for coral reef monitoring to determine over time the effects of global warming on Caribbean reef ecosystems. 2. Long-term reef monitoring systems established throughout Caribbean region. 3. Reef monitoring data gathered, analyzed and disseminated, resulting in better comprehension of causal relationships between factors of global warming and the health of Caribbean reefs. 4. Public awareness and education programs on coral reef conditions and management throughout the eleven participating countries. 5. Improvement of regional institutional capacity for long-term monitoring of Caribbean reef systems. 	<p>By end of:</p> <ol style="list-style-type: none"> 1. March 2001 2. March 2001 3. July 1999 4. June 2000 5. December 1999

**Table 5.2: Coral Reef Monitoring for Climate Change
NICUs and Institutional Responsibilities for Component by Country**

COUNTRY AND NATIONAL IMPLEMENTATION COORDINATING UNIT (NICU)	RESPONSIBLE INSTITUTION
Bahamas Bahamas Environment Science and Technology Commission (BEST) and Office of the Prime Minister	BEST CARICOM Bahamian Field Station in San Salvador
Belize Ministry of Economic Development	Coastal Zone Management Unit, Fisheries Department CARICOM Carrie Bow Caye and the Holchan Reserve
Jamaica Natural Resources Conservation Authority (NRCA)	Natural Resources Conservation Authority Discovery Bay Marine Laboratory, University of the West Indies

**Table 5.3: Coral Reef Monitoring for Climate Change
Relevant National and Regional Programs and Institutions**

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
International Coral Reef Initiative (ICRI) <ul style="list-style-type: none"> • Designed to create a base for a comprehensive international effort aiming at the conservation and effective management of coral reefs and related fragile ecosystems. • Among the initiatives are: an effort to build capacity for effective management of coral reef systems, encourage the development of national, regional, and local coral reef initiatives, and establish a Global Coral Reef Monitoring Network through the Intergovernmental Oceanographic Commission (IOC) of UNESCO. • These initiatives will be implemented through a number of strategies including partnerships, coordination, integration, and capacity-building. <p>* CPACC offers a valuable framework within which ICRI projects could take place.</p>	Launched by the United States, Japan, Australia, Jamaica, France, the United Kingdom, the Philippines, and Sweden in partnership with other nations around the world, NGOs, international organizations, multilateral development banks, and private sector businesses.

**Table 5.3: Coral Reef Monitoring for Climate Change
Relevant National and Regional Programs and Institutions (cont'd)**

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>Caribbean Conservation Association (CCA) Marine Parks and Protected Areas Program</p> <ul style="list-style-type: none"> • Promotes conservation of living marine resources by establishing a facility to coordinate the development and management of marine parks and protected areas in the Caribbean. • There are five main project components: pilot projects, training, technical assistance, information, and public education. • CPACC participants who are also part of this program: Barbados, Dominica, Grenada, Jamaica, St. Kitts and Nevis, St. Lucia, Trinidad and Tobago. <p>* Established marine parks could become coral reef monitoring sites. CPACC information could benefit the CCA in their own management program for the marine parks.</p>	<p>The Caribbean Conservation Association (CCA) executes, with funding from the Canadian International Development Agency (CIDA).</p>
<p>Regional Program on Assessment & Control of Marine Pollution (CEPPOL)</p> <ul style="list-style-type: none"> • Implemented along with regional institutions. • Site specific studies of damaged ecosystems, primarily coral reefs, done by CEP/RCU. • Supported by the International Coral Reef Initiative. <p>* Help should be sought from the ICRI and UNEP-CEP/RCU in developing the Coral Reef Network, especially in areas where monitoring does not currently take place.</p>	<p>UNEP-CEP will act as executing agency for this project under their Integrated Planning and Institutional Development Program.</p>
<p>Caribbean Coastal and Marine Productivity (CARICOMP) Network of Caribbean Marine Laboratories, Parks, and Reserves</p> <ul style="list-style-type: none"> • Network of marine parks, reserves, and laboratories that collect data on the biodiversity of coral reefs, seagrasses, and mangroves. • Established a Data Management Centre (DMC) at the University of the West Indies, Kingston, Jamaica to coordinate regional investigations of transient oceanographic, biological, and meteorological phenomena. <p>* CARICOMP could provide support, data, and/or technical expertise in the design and monitoring of the CPACC Coral Reef Network. Significant areas of collaboration exist.</p>	<p>A cooperative network of Caribbean marine laboratories, parks, and reserves, under the guidance of an International Steering Committee.</p>

ANNEX 6: COASTAL VULNERABILITY AND RISK ASSESSMENT (PILOT)

Three countries (Barbados, Grenada, and Guyana) have agreed to participate in the development of vulnerability and risk assessments for their coastal areas. The component will begin with a review of coastal vulnerability assessment models and the adaptation of the Intergovernmental Panel on Climate Change (IPCC) common methodology in these three countries and throughout the region. With the execution of the three vulnerability and risk assessments, representatives from these three countries will receive special training to assure transfer of information throughout all the agencies dealing with coastal zone management issues. A regional workshop will be held to present the results of the three case studies to the entire region. Manuals will be prepared for the execution of coastal vulnerability and risk assessments, and a public awareness and education program will be conducted to raise the level of public consciousness concerning the vulnerability of coastal areas.

**Table 6.1: Coastal Vulnerability and Risk Assessment
Matrix of Component Activities, Expected Outputs and Timing**

Activities	Expected Outputs	Timing of Expected Outputs
1. Evaluate models and techniques for vulnerability analysis and risk assessment and develop appropriate model.	1. Adaptation of the IPCC common methodology for application to Caribbean region.	By end of: 1. May 1998
2. Collect information for vulnerability assessment.	2. Coastal vulnerability and risk assessments for three countries.	2. July 2000
3. Conduct training workshops in each participating country to incorporate vulnerability information in land use planning and investment decision making.	3. Capacity in coastal vulnerability and risk assessment at the national and regional levels.	3. February 2000
4. Conduct regional workshop to disseminate results and provide training in methodology to other countries.	4. Draft adaptation strategy for addressing coastal vulnerability in pilot countries.	4. July 2000
5. Prepare draft adaptation strategy for pilot countries.	5. Enhanced methodology for assessing coastal vulnerability and risk.	5. July 2000
6. Prepare and conduct awareness and education program to inform general public about the vulnerability of coastal areas and the need to plan for climate change.	6. General public informed and educated about coastal vulnerability and the need to plan for climate change.	6. Ongoing

**Table 6.2: Coastal Vulnerability and Risk Assessment
NICUs and Institutional Responsibilities for Component by Country**

COUNTRY AND NATIONAL IMPLEMENTATION COORDINATING UNIT (NICU)	RESPONSIBLE INSTITUTION
Barbados Ministry of Health and the Environment, Environment Division	Coast Conservation Unit
Grenada Ministry of Finance, Planning, and Development	National Science and Technological Council
Guyana Hydrometeorological Department	Hydrometeorological Department, Ministry of Agriculture

**Table 6.3: Coastal Vulnerability and Risk Assessment
Relevant National and Regional Programs and Institutions**

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>Study of the Socio-Economic Implications of Climate Change in the Wider Caribbean - IPID (Regional)</p> <ul style="list-style-type: none"> Gather and build database on sea level rise and temperature rise; assess the socio-economic impact that sea level may have upon small islands and coastal areas; investigate the causes of climatic and other environmental changes and contribute to improving the regional capacity to manage the future changes and their impacts. <p>* Clear areas for collaboration exist.</p>	<p>Coordinated by Regional Coordinating Unit of UNEP-CEP as part of the Integrated Planning and Institutional Development (IPID) Program. Implemented in collaboration with the Corporate Institute for Marine and Atmospheric Sciences (CIMAS) at the University of Miami.</p>
<p>Country Case Study on Climate Change Impacts and Adaptation Assessment</p> <ul style="list-style-type: none"> Antigua and Barbuda has been selected as a pilot site for this project that will: assist in developing and improving methodologies for assessing climate change, examine effects on coastal systems and socio-economic systems, determine vulnerable areas, examine possible effects on terrestrial and aquatic ecosystems of temperature elevations. <p>* Clear areas for collaboration exist.</p>	<p>UNEP will act as executing agency.</p>

ANNEX 7: ECONOMIC VALUATION OF COASTAL AND MARINE RESOURCES (PILOT)

This component will include the design and implementation of pilot studies in Dominica, Saint Lucia, and Trinidad and Tobago on the economic valuation of resources in selected coastal ecosystems at risk from sea-level rise. Each of the three pilot studies will focus on an ecosystem and associated economic activities. Using existing information and input from other project components, the pilot studies will identify resources of significance, resource uses, and threats from sea-level rise. Each pilot study will then use alternative approaches to estimate market and non-market values of resources at risk. The pilot studies will illustrate the use of valuation data, in some cases by demonstrating the development of environmental accounts with linkages to national accounting frameworks, in others by demonstrating cost-benefit and other decision-making frameworks for selecting among environmental management approaches. Capacity-building activities under this component will include the training of regional and local personnel in the use of alternative resource valuation strategies, the development of environmental accounts, and cost-benefit analysis. In addition, the results of the pilot studies will be used to develop and disseminate appropriate techniques for use throughout the region.

**Table 7.1: Economic Valuation of Coastal and Marine Resources
Matrix of Component Activities, Expected Outputs and Timing**

Activities	Expected Outputs	Timing of Expected Outputs
1. Assemble team of consultants and multidisciplinary local counterparts in each pilot country.	1. Methodology appropriate to the region for resource valuation, environmental accounting, and environmental decision-making for use in development of policy frameworks and economic and regulatory approaches.	By end of: 1. December 1998
2. Review region-related information on: resource valuation, environmental accounting, investment decision-making, inventories of resources and uses, and assessments of areas vulnerable to sea-level rise.	2. Valuation of natural and man-made assets in three pilot study areas for use by countries in environmental investment decision-making, environmental resource accounting, and policy formulation.	2. July 1999
3. Develop plan for methodology and work.		
4. Conduct three pilot studies to demonstrate resource valuation techniques in ecosystems with varying environmental resources and economic uses.	3. Regional and local capacity strengthened for resource valuation, environmental accounting, and environmental investment decision-making.	3. April 2000
5. Assess applicability of valuation techniques used in each pilot study and present findings in technical reports.		
6. Conduct regional workshop to discuss results of pilot studies, covering the range of valuation techniques appropriate to the region, environmental accounting for sustainable development, and environmental investment decision-making.		

**Table 7.2: Economic Valuation of Coastal and Marine Resources
NICUs and Institutional Responsibilities for Component by Country**

COUNTRY AND NATIONAL IMPLEMENTATION COORDINATING UNIT (NICU)	RESPONSIBLE INSTITUTION
Dominica Sustainable Development Council (SDC) under the Ministry of Finance, Industry, and Planning	Ministry of Finance, Industry, and Planning
St. Lucia Ministry of Planning, Development, and Environment	Ministry of Planning, Development, and Environment, Agriculture, Lands, and Fisheries Statistics Department, Ministry of Finance
Trinidad and Tobago Ministry of Planning and Development	Ministry of Planning and Development

**Table 7.3: Economic Valuation of Coastal and Marine Resources
Relevant National and Regional Programs and Institutions**

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>Environment and Economics in Integrated Planning and Management (Regional)</p> <ul style="list-style-type: none"> • The project is composed of two phases: (1) develop a regional capacity for economic valuation of environmental goods and services and of environmental impacts within a cost-benefit analysis; (2) develop a regional capacity for basic information on how coastal resources and their changes contribute towards Gross Domestic Product. * The activities of CPACC Component (g) and this UNEP-CEP program are closely related. With both projects conducting pilot studies, a standardization of methodologies would be beneficial to the region as a whole. 	<p>UNEP-CEP will act as executing agency for this project under their IPID Regional Program.</p>

ANNEX 8: FORMULATION OF ECONOMIC/REGULATORY PROPOSALS (PILOT)

This component will implement two pilot studies in Antigua and Barbuda and Saint Kitts and Nevis to demonstrate the design and use of economic and regulatory approaches to environmental protection in response to threats from sea-level rise. The component will demonstrate how innovative approaches to environmental regulation, such as the use of economic incentives, can provide flexible, cost-effective alternatives to traditional "command and control" regulatory policies. In addition, the two pilot studies will address methods for generating funds to finance other programs aimed at mitigating the impacts of global climate change. Under this component, local and regional personnel will be trained in the design of economic-based regulations and other innovative approaches for coastal and marine management, as well as in program finance for environmental management. The results of the pilot studies will be used to provide inputs to the formulation of legislative and regulatory frameworks developed in Component (d): Formulation of a Policy Framework for Integrated Coastal and Marine Management.

**Table 8.1: Formulation of Economic/Regulatory Proposals
Matrix of Component Activities, Expected Outputs and Timing**

Activities	Expected Outputs	Timing of Expected Outputs
1. Assemble team of consultants and multidisciplinary local counterparts in each pilot country.	1. Sample regulatory program, including the use of economic instruments, to achieve specific objectives in two pilot countries.	By end of 1. June 1999
2. Review existing legal and institutional mechanisms in the region, as well as information on resources at risk from sea-level rise and current use patterns, and existing economic incentives governing resource use.	2. Economic-based approaches to environmental policy appropriate to the region for use in preparation of national and regional policy frameworks.	2. March 2000
3. Conduct two pilot studies to illustrate the uses of various economic and other innovative regulatory options for coastal zone management.	3. Regional and local capacity in design, evaluation, and implementation of a range of economic-based environmental management instruments, including innovative ways of financing environmental programs.	3. February 2000
4. Present and analyze study findings in technical reports, focusing on applicability to region as a whole of regulatory approaches developed in pilot studies, and the development of suitable methodology for designing and financing economic-based programs or other regulatory approaches.	4. A regional workshop for officials from participating countries on the design and implementation of economic approaches to environmental regulation.	4. February 1999
5. Conduct workshops for participating countries to discuss pilot study findings and provide training in innovative environmental policy design, program finance, and policy implementation.		

**Table 8.2: Formulation of Economic/Regulatory Proposals
NICUs and Institutional Responsibilities for Component by Country**

COUNTRY AND NATIONAL IMPLEMENTATION COORDINATING UNIT (NICU)	RESPONSIBLE INSTITUTION
Antigua and Barbuda Ministry of Planning	Ministry of Planning
St. Kitts and Nevis Ministry of Tourism, Culture, and Environment	Ministry of Tourism, Culture, and Environment

**Table 8.3: Formulation of Economic/Regulatory Proposals
Relevant National and Regional Programs and Institutions**

RELEVANT PROGRAMS	INSTITUTION OR EXECUTING AGENCY
<p>Incentives and Disincentives for Integrated Coastal Zone Management - IPID (Regional)</p> <ul style="list-style-type: none"> • Main objective is to develop a regional capacity for the design, evaluation, and application of economic incentives and disincentives to strengthen environmental management of coastal resources. • Two case studies, with the objective of designing a framework for the development of incentives in support of sustainable environmental resource use, will be linked to the CEPPOL (Table 3.3), SPAW (Table 3.3), and IPID activities (Tables 3-7.3) mentioned earlier. <p>* The incentives and disincentives developed as part of this project could be used as part of the proposals developed for pilot sites of the CPACC component. Collaboration is essential so that duplication does not take place.</p>	<p>UNEP-CEP will act as executing agency for this project under their IPID Regional Program.</p>

ANNEX 10: PILOT PROJECTS BY PARTICIPATING COUNTRY

Country	Coral Reef Monitoring	Coastal Vulnerability	Economic Valuation	Economic and Regulatory Proposals
Antigua & Barbuda				X
Bahamas	X			
Barbados		X		
Belize	X			
Dominica			X	
Grenada		X		
Guyana		X		
Jamaica	X			
Saint Kitts/Nevis				X
Saint Lucia			X	
Trinidad & Tobago			X	

ANNEX 11: TERMS OF REFERENCE FOR PROJECT MANAGEMENT ACTIVITIES

Overall Institutional Framework

1. The project will be executed by the GS/OAS under the supervision of the World Bank as GEF Implementing Agency, and the guidance of a Project Advisory Committee (PAC). The GS/OAS, through its Unit of Sustainable Development and Environment (USDE/OAS), will be responsible for overall project management and technical supervision. The PAC will provide policy guidance, review implementation progress, and evaluate results. The PAC will be comprised of one representative from CARICOM, who will chair the PAC; the region's representative from the GEF Council; two representatives from the NICUs; and one representative each from UWICED, the UNEP's Caribbean Environment Programme, the UNDP, and the regional/local NGO community.

2. Responsible institutions in the field will include the Regional Project Implementation Unit (RPIU) to be established within UWICED and the National Implementation Coordinating Unit (NICU) designated by each participating country. The RPIU will be responsible for day to day management and overall coordination and administration of field project activities. The NICUs will be responsible for facilitating and coordinating project execution at the national level, in close cooperation with the RPIU. See Figure 11.1 for the project management institutional structure. Figure 11.2 provides a schematic overview of the institutional and operational aspects of project execution and performance reporting.

The General Secretariat of the Organization of American States (GS/OAS)

3. The GS/OAS, through its Unit of Sustainable Development and Environment (USDE/OAS), will execute the project under the supervision of the Bank as Global Environment Facility (GEF) Implementing Agency, and will be responsible for the overall project management and technical supervision, and for the funding of the RPIU with the grant from the GEF Trust Fund provided by the Bank. The GS/OAS will hire a Technical Coordinator for this purpose (see Attachment 1 for Terms of Reference). The GS/OAS will be responsible for performing the following functions:

A. Managerial

- (i) Prepare Annual Operating Plans and long term workplans for the project.
- (ii) Develop and maintain overall project management procedures.
- (iii) Establish guidelines for the RPIU quarterly activity, technical, and financial reports.
- (iv) Prepare semiannual progress reports incorporating inputs prepared by the RPIU and submit them to the Bank.
- (v) Together with the Director of the UWICED, select the core staff of the RPIU and conduct annual evaluations of their work performance.

- (vi) In consultation with UWICED's Director, undertake management or institutional changes when needed. Major changes would need to be cleared by the Bank.
- (vii) Approve terms for procurement of equipment and contracts for services of consultants to be executed by RPIU.

B. Technical

- (i) Review and approve terms of reference and selection for consultancies and other services under the responsibility of the RPIU.
- (ii) Review and approve all project documents and publications, including technical reports.
- (iii) Review consultant reports, training workshop plans, syllabi and materials, and public education materials.

C. Financial. The GS/OAS will be responsible for funding, with the proceeds from the GEF contribution, the following: (a) the costs of operating the RPIU, as detailed in Table 13 of Annex 14; (b) the costs of all consultants, procurement, and travel for activities assigned to the RPIU; (c) training and capacity building activities; and (d) project implementation and monitoring and evaluation activities. To this end, the GS/OAS will:

- (i) Establish and maintain a system for overall financial accountability for project funds.
- (ii) Review and approve quarterly disbursement plans prepared by the RPIU.
- (iii) Review all project expenditures on a quarterly basis as a condition for approving new disbursements.
- (iv) Prepare annual financial reports incorporating inputs prepared by the RPIU and submit them to the Bank.
- (v) Contract an independent auditor acceptable to the Bank to carry out annual external audits of RPIU's account and activities in accordance with generally accepted accounting principles, and correct any irregularities that may be identified in the process.

D. Monitoring and Evaluation

- (i) Prepare workplans for carrying out project monitoring and evaluation (M&E) activities in accordance with the agreed M&E plan, with assistance from the RPIU. In consultation with the UWICED, identify and select independent evaluation consultants acceptable to the Bank to participate in mid-term and final reviews.

- (ii) Review and approve the monitoring and evaluation reports submitted by the RPIU and independent consultants.
- (iii) Organize and conduct semiannual supervision missions jointly with the Bank.
- (iv) Organize and conduct, in conjunction with the Bank and the UWICED, a mid-term project review to evaluate project implementation arrangements.
- (v) Prepare, with the assistance of the UWICED, an Implementation Completion Report within three months of project completion.

The University of the West Indies Centre for Environment and Development (UWICED)

4. The UWICED will be in charge of the direct administrative control of the RPIU and will respond to the GS/OAS. The UWICED Director will provide guidance and immediate supervision to the RPIU staff. As the institution responsible for the RPIU, UWICED will be accountable for the following tasks:

A. Managerial

- (i) Together with GS/OAS, select the RPIU core staff and contract them under UWICED regulations. With GS/OAS, review their performance annually.
- (ii) Provide ongoing guidance and advice to the RPIU Project Manager as appropriate.
- (iii) Review, endorse, and submit to the GS/OAS quarterly activity and financial reports and periodic technical reports prepared by the RPIU.
- (iv) Oversee the implementation of the project management procedures by the RPIU.
- (v) Refer to the GS/OAS those implementation issues that are beyond the capacity of the RPIU, when necessary; and advise the GS/OAS on management or institutional changes, when needed.
- (vi) Provide working space and basic supporting services for the RPIU staff and contracted consultants.
- (vii) Through its Director, act as Deputy Chairman of the PAC.

B. Financial

- (i) Oversee the system for project financial accountability established and maintained by the RPIU.

- (ii) Work closely with GS/OAS, CARICOM, and the Bank in building the UWICED's human and financial capacity required to take over RPIU's functions and to fund the recurrent costs of the RPIU after the project's conclusion.
- (iii) Maintain all accounting records pertaining to RPIU transactions for at least three years after completion of the project.

The Regional Project Implementation Unit (RPIU)

5. The RPIU will be responsible for day-to-day management and coordination of all project regional and pilot activities; technical management and execution of specific project components; and financial administration of project funds assigned to the RPIU special account. As a unit within UWICED, the RPIU will discharge these responsibilities with appropriate guidance from, and in consultation with the Director of UWICED. Core staff will be hired under the project to carry out RPIU responsibilities (see Attachment 1 for Terms of Reference).

6. The RPIU will carry out its responsibilities under the technical supervision and with management support from the GS/OAS. Specifically, the RPIU will perform the following functions:

A. Managerial Functions

- (i) Assist the GS/OAS in the preparation of Annual Operating Plans and long-term workplans for the project.
- (ii) Develop norms and procedures for a cost-effective execution of all field activities consistent with the overall project management procedures.
- (iii) Assist the GS/OAS in maintaining the project tracking and information system.
- (iv) Prepare quarterly activity reports on all aspects of project management and implementation in accordance with GS/OAS guidelines, for submission to the GS/OAS through UWICED.
- (v) Assist GS/OAS in the identification and selection of international and local consultants to carry out specific tasks of the project.
- (vi) For all activities assigned to the RPIU, prepare terms of reference and contracts for consultants in accordance with regulations and procedures consistent with the August 1981 *Guidelines for the Use of Consultants by World Bank Borrowers and by the World Bank as Executing Agency* and present them to GS/OAS for approval. Supervise the execution of all performance contracts, recommend contract amendments where necessary, recommend approval of intermediate payments against review of deliverables, and prepare final evaluation as condition for final payment.

- (vii) Execute contracts for procurement of equipment in accordance with the Bank's January 1995 *Guidelines for Procurement under IBRD Loans and IDA Credits* (revised January 1996 and August 1996), previously approved by GS/OAS.
- (viii) Acting on behalf of the GS/OAS, as Secretariat of the PAC, prepare the required technical and policy documents in consultation with the Chairman of the PAC and the GS/OAS; arrange venue and logistics; prepare and distribute the Chairman's report on the proceedings of each meeting, and follow-up on the decisions taken by the committee.
- (ix) Coordinate with and provide assistance to the NICUs in respect to the implementation of project activities.
- (x) Establish guidelines for the NICUs progress reports on the management and implementation of the project activities at the national level.

B. Technical Functions

- (i) Provide technical and administrative support to project consultants working in the field, and make necessary institutional arrangements as required to facilitate their work with the national, regional, and international institutions involved.
- (ii) Liaise with national, regional, and international institutions involved in the issues addressed by the project, seeking coordination and complementarity where appropriate and beneficial to the project.
- (iii) Liaise with the NICUs and other government agencies of participating countries, NGOs, local communities, and representatives of most affected sectors in order to achieve optimal effectiveness of project operations and the widest possible participation of stakeholders in the formulation and implementation of each project component.
- (iv) In collaboration with the NICUs, develop a public awareness strategy and programs at regional and national level. Publish and disseminate throughout the Caribbean all technical and informative reports produced under the project.
- (v) Conduct or facilitate the execution of workshops, seminars, and training sessions to be undertaken as part of the project. Coordinate preparation and reproduction of training documents.
- (vi) Execute and be responsible for the technical management of selected project activities assigned by GS/OAS.
- (vii) Maintain databases on project-generated data which will interface with the NICUs and existing regional and global databases and information systems related to climate change monitoring and adaptation planning.

- (viii) Assist the GS/OAS in preparing and implementing a monitoring and evaluation plan for the project; facilitate the execution of the plan, make all field arrangements required for the successful work of the monitoring and evaluation activities, including the provision of supporting services and the arrangement of field trips and institutional contacts.
- (ix) Oversee the production of the project's Technical Reports and assist the GS/OAS with the preparation of the Implementation Completion Report.

C. Financial

- (i) Establish and maintain a project financial accounting system and administer the project's funds deposited in the RPIU special account in accordance with the guidelines provided by UWICED, the GS/OAS, and the Bank.
- (ii) Prepare a quarterly disbursement plan for all project activities in accordance with the approved work plans, and submit them to the GS/OAS for approval.
- (iii) Prepare quarterly project expenditure reports for review by the GS/OAS as a condition of the following quarter's disbursement.
- (iv) Prepare and submit annual financial reports and submit them to the GS/OAS, after approval by UWICED.

The Project Advisory Committee (PAC)

7. The PAC will provide policy guidance and review project workplans. It will be comprised of a representative from CARICOM, UNEP's Caribbean Environment Programme, the UNDP, UWICED, the region's representative on the GEF Council, two representatives from the NICUs, and one representative of the regional/local NGO Community. The RPIU will act as technical secretariat to the PAC on behalf of the GS/OAS. The CARICOM representative will serve as Chairman of the Committee with the representative from UWICED acting as Deputy Chairman.

- (i) Meet at start-up of project (within 90 days of project effectiveness) and at least annually, at the invitation of the GS/OAS, to provide policy guidance, address management issues, review implementation progress, and evaluate project results.
- (ii) Review the Annual Operating Plan for the project as prepared by the GS/OAS with support from the RPIU.
- (iii) Meet as required to address implementation problems and issues brought to their attention.
- (iv) CARICOM, as chair of the Committee, will convene the meetings, prepare the agenda, and provide the necessary supporting materials, in consultation with GS/OAS.

The National Implementation Coordinating Unit (NICU)

8. The NICU will be a national coordinating unit established by each participating country prior to initiation of project implementation. It will be composed of the CPACC National Focal Point (NFP) and selected technical and administrative personnel involved in specific project activities over the course of the project lifetime.

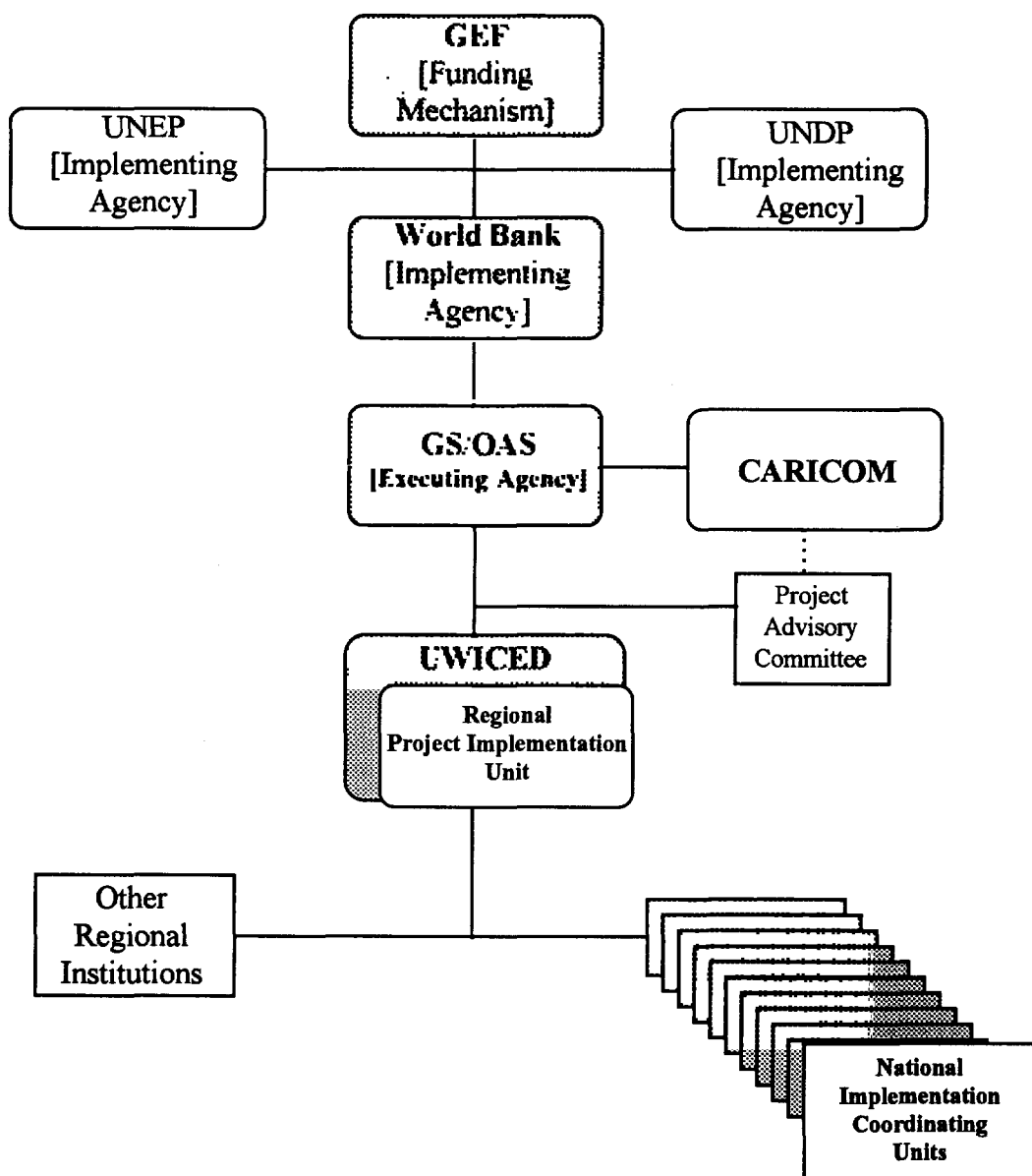
9. The NICU will act as national liaison and coordinator for the RPIU in the implementation of project activities. All direct project expenditures will be financed by the RPIU with the GEF Trust Fund grant. Government personnel for NICU activities will be provided by each participating country as part of its counterpart commitment to the CPACC project.

10. The NICU will be responsible for the following activities:

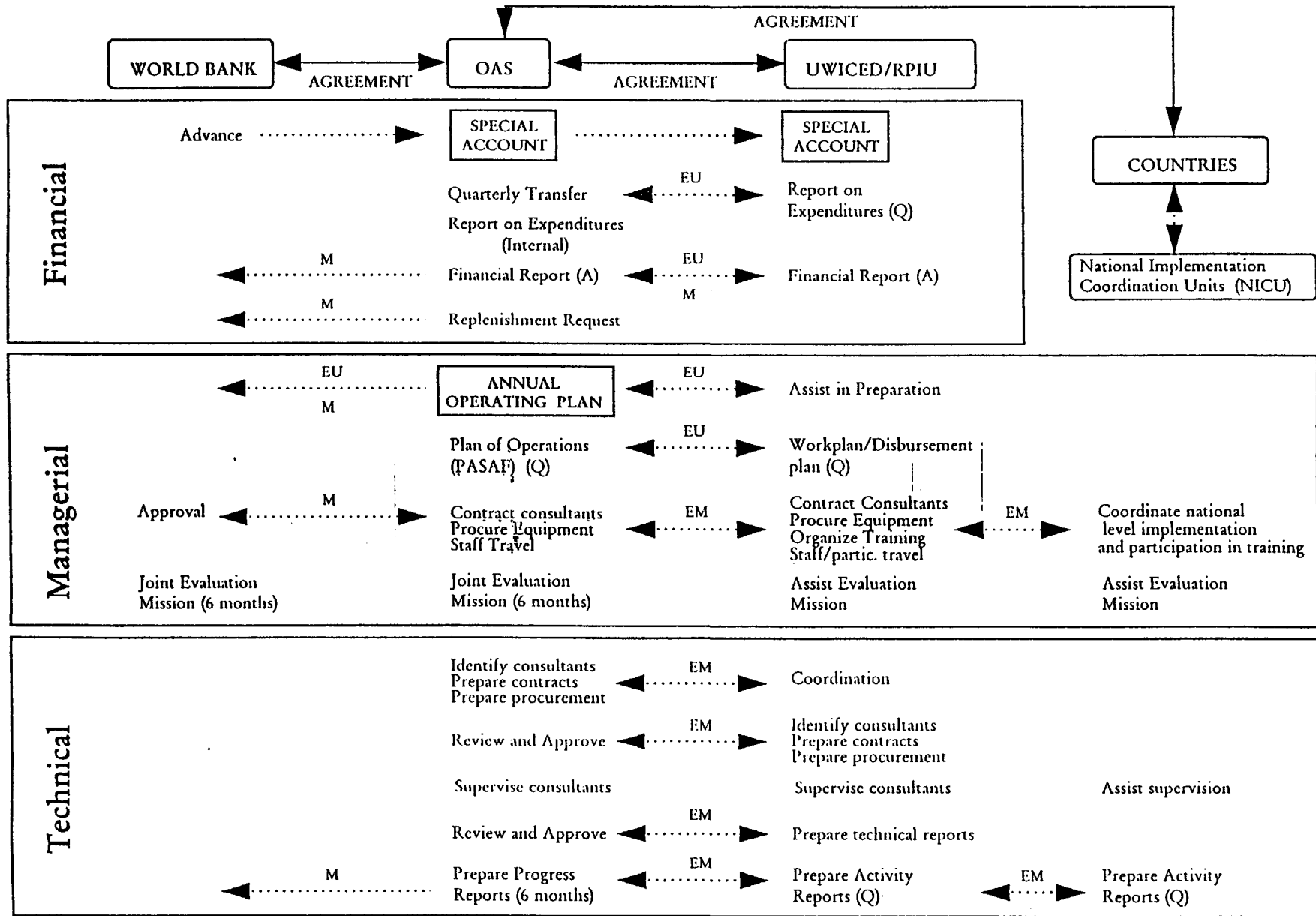
- (i) Procure the signature for the GS/OAS—Country Agreement.
- (ii) Assure effective communication, coordination and participation of national agencies and civic society groups in all aspects related to the project.
- (iii) Coordinate project activities with the RPIU and with other NICUs.
- (iv) Advise the RPIU in all matters related to the implementation of in-country project activities, including the selection of project sites and local consultancies and technical services.
- (v) Coordinate and support the execution of all project activities in which the government participates.
- (vi) Prepare quarterly progress reports on the project activities in which the government is participating for submission to the GS/OAS through the RPIU.
- (vii) Provide the RPIU with access to national information and data bases of direct relevance to the project activities in which the government participates.
- (viii) Assure the maintenance of national databases which are inventoried and generated as a result of the project.
- (ix) Assure the protection and proper use of all equipment and materials made available by the project for its government.
- (x) Assure the establishment of long-term in-country institutional mechanisms to guarantee the continuation of the resource monitoring and analysis activities established and/or enhanced by the project.
- (xi) Provide supporting services and institutional contacts for the local and international consultants contracted by the project, including the monitoring and evaluation team.

- (xii) Disseminate nationally all regional and national reports, training documents, and educational materials produced under the project.
- (xiii) Participate, whenever requested by the GS/OAS, in the semiannual reviews of project implementation.
- (xiv) Facilitate and coordinate all national project workshops, meetings, and training seminars.

Figure 11.1
Project Management Institutional Structure



CPACC- Institutional & Operational Framework



Legend: EM = Electronic Mail; EU = Electronic Update; M = Mail; (Q) = Quarterly; (A) = Annually

ATTACHMENT 1: TERMS OF REFERENCE FOR CORE STAFF***The General Secretariat of the Organization of American States (GS/OAS)***

1. The GS/OAS will employ a Technical Coordinator, based at GS/OAS headquarters in Washington, D.C. who will work under the direct supervision of the Division Chief of the Unit of Sustainable Development and Environment (USDE/OAS). As a staff member of the GS/OAS, the technical coordinator will be responsible for coordinating all tasks related to the GS/OAS responsibilities as executing agency of the project, and for technical supervision of all aspects of project implementation. He/She will maintain close contact with the RPIU project manager.

A. Managerial Activities

- (i) Coordinate the preparation of quarterly activity/budget plans, annual operating plans, and long-term workplans.
- (ii) Supervise the project's administrative and financial control processes at GS/OAS headquarters.
- (iii) Maintain the project tracking and information system.
- (iv) Develop and maintain effective communications and consultations with the RPIU and all the organizations involved in the project.
- (v) Represent the GS/OAS in PAC meetings and other international meetings, if required.
- (vi) Participate in semiannual progress implementation evaluations, mid-term project review, and project completion evaluations, and assist the project's evaluation consultant with the preparation of evaluation reports.
- (vii) Prepare semiannual progress reports, annual financial reports, and quarterly disbursement plans with inputs from the RPIU.
- (viii) Travel extensively throughout the region.

B. Technical Tasks

- (i) Prepare terms of reference for consultancies and procurement documents for equipment under the responsibility of the GS/OAS, and review and approve terms of reference for consultancies and procurement of equipment under the responsibility of the RPIU.
- (ii) In coordination with the RPIU, supervise consultants and their technical work.

- (iii) Review and approve all project documents and publications, including technical reports, as well as consultant reports, training workshop plans, syllabi and materials, and public education materials.
- (iv) As requested, advise the USDE/OAS Division Chief and the RPIU Project Manager on the technical aspects of specific project components.

The Regional Project Implementation Unit (RPIU)

2. The RPIU will be a unit within UWICED which will be established in Barbados no later than 60 days after the date of project effectiveness. It will include the following personnel funded by the project: a full time Project Manager, a Human Resources specialist, an Information Systems Coordinator, a Coastal Zone Management specialist, a Regional Network Coordinator, an Accountant/Financial Controller, and an Executive Secretary.

A. Project Manager Responsibilities

3. Management and coordination of all CPACC regional and pilot activities, including the following:

- (i) Supervise the staff assigned to the RPIU.
- (ii) Oversee the preparation and submission of the RPIU's quarterly activity reports, disbursement plans, expenditure reports, and annual financial reports in accordance with GS/OAS guidelines.
- (iii) Assist GS/OAS in the identification and selection of international and local consultants to carry out specific tasks of the project.
- (iv) Prepare terms of reference and performance contracts for consultancies under the responsibility of the RPIU in accordance with terms agreed to by the GS/OAS and UWICED. For contracts above US \$3,000 submit draft contracts for review and approval by GS/OAS.
- (v) Supervise the execution of all performance contracts, make contract amendments where necessary, approve intermediate payments against review of deliverables, and prepare final evaluation as condition for final payment. For contracts above US \$3,000 submit eventual amendments as well as final report and evaluation for review and approval.
- (vi) Act as the Secretariat of the PAC and assume corresponding responsibilities such as: preparing the required technical and policy documents in consultation with the Chairman of the PAC; arrange venue and logistics; prepare and distribute the Chairman's report on the proceedings of each meeting; and follow-up on the decisions taken by the committee.

- (vii) Assist the GS/OAS with the preparation of the Annual Operating Plan and long-term workplans.
- (viii) Advise the NICUs on all aspects of project implementation at the national level.
- (ix) Facilitate institutional arrangements that will provide support for consultants in the field as required to assist their work with the national, regional, and international institutions involved.
- (x) Liaise with national, regional, and international institutions involved in the issues addressed by the project, seeking coordination and complementarity where appropriate and beneficial to the project.
- (xi) Liaise with the NICUs and other government agencies of participating countries, non-governmental organizations, local communities, and representatives of most affected sectors in order to achieve optimal effectiveness of project operations and the widest possible participation of stakeholders in the formulation and implementation of each project component.
- (xii) Make all field arrangements required for the successful work of the monitoring and evaluation team, including the provision of support services and the arrangement of field trips and institutional contacts.
- (xiii) Assist the GS/OAS with monitoring and evaluation activities throughout the project.
- (xiv) Administer the project's funds deposited in the RPIU special account established by UWICED, in accordance with the guidelines provided by UWI, the GS/OAS, and the World Bank.
- (xv) Assist the GS/OAS with the production of the project's Technical Reports and the Implementation Completion Report.
- (xvi) Participate actively in Caribbean national and regional discussions and forums on climate change and its impact on the region.

B. Human Resources Specialist Responsibilities

- (i) Act as Deputy Project Manager when so required.
- (ii) Encourage maximum participation of personnel from participating countries and relevant regional organizations.
- (iii) Prepare terms of reference and operation plans for training programs.

- (iv) Ensure that the training and institutional strengthening activities support the various project components.
- (v) Ensure that the structure, delivery, and organization of training activities achieve their stated objectives.
- (vi) Under Project Manager guidance, conduct or facilitate the execution of workshops, seminars, and training sessions to be undertaken as part of the project.
- (vii) Organize and supervise preparation and reproduction of training documents.
- (viii) Support the Project Manager in facilitating institutional arrangements that will provide support for consultants in the field, as required.

C. Information Systems Coordinator Responsibilities

- (i) Oversee the execution of Component (b): Establishment of Databases and Information Systems.
- (ii) Participate in the execution of Component (c): Inventory of Coastal Resources and Use.
- (iii) Prepare terms of reference and operation plans for information systems and activities related to the GIS.
- (iv) Assess current situation in each institution that will function as a node in the information system. Review hardware, software, Internet access, and training needs for each institution.
- (v) Coordinate the detailed design of systems and sub-systems to be developed, including expected outputs, major databases, and volume of queries.
- (vi) Design national and regional training courses in conjunction with installation.
- (vii) Oversee the development and implementation of data management and communications procedures, installation of hardware and software, and the necessary operational testing.
- (viii) Coordinate the preparation and implementation of a technical support and maintenance plan and formulate criteria for system upgrading.
- (ix) Assist in the consolidation, evaluation, and computerization of existing GIS information in each participating country.
- (x) Coordinate the procurement and installation of GIS equipment.

- (xi) Advise the Project Manager on all aspects of data and information systems management.

D. Coastal Zone Management Specialist Responsibilities

- (i) Coordinate the design and implementation of all activities related to coastal resources.
- (ii) Prepare terms of reference and operation plans for coastal zone management activities.
- (iii) Oversee the execution of Component (c): Inventory of Coastal Resources and Use; and Component (e): Coral Reef Monitoring for Climate Change.
- (iv) Participate in the execution of Component (d): Formulation of a Policy Framework for Coastal and Marine Management; Component (f): Coastal Vulnerability and Risk Assessment; and Component (g): Economic Valuation of Coastal and Marine Resources.
- (v) Assist with all public awareness programs related to coastal zone issues.
- (vi) Evaluate models for vulnerability analysis and risk assessment.
- (vii) Advise Project Manager on all aspects of coastal zone management policy.

E. Regional Network Coordinator Responsibilities

- (i) Oversee the execution of Component (a): Design and Establishment of a Sea Level/Climate Monitoring Network
- (ii) Participate in the execution of Component (b): Establishment of Databases and Information Systems
- (iii) Prepare terms of reference and operation plans for network activities.
- (iv) Assist in the selection of sites for network systems.
- (v) Assist in the configuration, procurement, and installation of station equipment.
- (vi) Aid in the installation, maintenance, and operation of the downlink, and be responsible for daily quality assurance and quality control of the data generated.
- (vii) Coordinate the annual operation, maintenance, and sensor calibration of the stations.
- (viii) Participate in the establishment and operation of the Tidal Gauge Replacement Fund at the Caribbean Meteorological Institute.

ANNEX 12: MONITORING AND EVALUATION PLAN

Objectives

1. The objective of the monitoring and evaluation (M&E) plan is to assist all project participants in assessing project performance and impact, with a view to improving both. The general and specific objectives of the project have provided the basis for this M&E plan. The general objective is to support participating countries in preparing to cope with the adverse effects of global climate change (GCC)—particularly sea-level rise—in coastal and marine areas through vulnerability assessment, adaptation planning, and capacity building.
2. Specific project objectives are to: (i) strengthen the regional capability for monitoring and analyzing climate and sea-level dynamics and trends, seeking to determine the immediate and potential impacts of GCC; (ii) identify areas particularly vulnerable to the adverse effects of climate change and sea-level rise; (iii) develop an integrated management and planning framework for cost-effective response and adaptation to the impacts of GCC on coastal and marine areas; (iv) enhance regional and national capabilities for preparing for the advent of GCC, through institutional strengthening and human resource development; and (v) identify and assess policy options (protect, retreat, accommodate) and instruments (economic, legislative, and regulatory) that may help initiate the implementation of a long-term program of adaptation to GCC in vulnerable coastal areas.
3. The project will be evaluated on the basis of:

Execution performance. This M&E activity will concentrate on the control and supervision of project activities, seeking to increase the efficiency and effectiveness of project implementation. It is a continuous process which will collect information about the execution of activities programmed in the annual workplan, and compare accomplished with programmed tasks. This activity will be the direct responsibility of the RPIU project manager, under the supervision of the GS/OAS technical coordinator. See Table 12.1 for the execution performance indicators.

Delivered outputs. This M&E activity will assess the project's success in producing each component's outputs, both in quantity and quality. The evaluation of the delivered outputs will be carried out by an external consultant contracted by the GS/OAS. See Table 12.2 for a summary of the expected outputs by project objectives. Also, refer to Annexes 1-8 for a detailed list of project activities and corresponding outputs on a component by component basis.

Project impacts. This M&E activity will assess the project's success in strengthening the regional capability for producing GCC-related information, conducting vulnerability assessments, and preparing adaptation policies and plans. The corresponding baseline study will be prepared by the RPIU during the initial phase of project execution. The evaluation study will be prepared by an external evaluator contracted by GS/OAS. See Table 12.3 for a summary of the project impact indicators.

4. Table 12.4 summarizes the M&E responsibilities of the GS/OAS, the RPIU and the PAC, and Table 12.5 describes the reports which will track and document project implementation and performance.

Table 12.1: Indicators of Project Execution Performance

(a)	The RPIU is functioning efficiently and is staffed with qualified professionals.
(b)	The Project Advisory Committee (PAC) is providing policy guidance and reviewing implementation progress and project impact.
(c)	Quarterly activity and semiannual progress reports are prepared in a timely and satisfactory manner.
(d)	Quarterly disbursement plans and annual financial reports are prepared in a timely and satisfactory manner.
(e)	Performance targets are achieved as specified in the Annual Operating Plan.
(f)	Deviations from the annual operating plan are corrected promptly and appropriately.
(g)	Disbursements are made on a timely basis and procurement is carried out according to Bank guidelines.
(h)	Audit reports and other reviews show sound financial practices.

Table 12.2: Description and Timing of Expected Outputs by Project Objectives

<i>OBJECTIVES</i>	<i>INPUTS</i> <i>(Resources provided for project activities)</i>	<i>OUTPUTS</i> <i>Goods and services produced by the project</i>	<i>TIMING</i>		<i>OUTCOMES AND IMPACTS</i>
			<i>Start</i>	<i>Finish</i>	
<p>Strengthen the regional capacity for monitoring and analyzing climate and sea level dynamics and trends, seeking to determine the immediate and potential impacts of global climate change (GCC)</p>	<ul style="list-style-type: none"> • Sea level/climate observation network: 18 state-of-the-art tidal gauges in the eleven Participating Countries • Technical assistance, consultant services and training. • Tidal Gauge Replacement Fund (US\$50,000) • Regional data acquisition, archiving, and dissemination system for sea level and climate related variables 	<ul style="list-style-type: none"> • 18 gauges installed in the eleven Participating Countries collecting data on sea level and other related climate variables • Trained national and regional staff in monitoring and analysis of sea level and climate data. • Geocentric fixing bench marks • Regional Archiving Center (RAC), a long-term regional data and analysis center, for sea-level network at CMI and IMA • Tidal Gauge Replacement Fund at the CMI • Action Plan for continued operation of gauges 	4/97	5/98	<ul style="list-style-type: none"> • Enhancement of Caribbean sea level gauge and related climate variables network • Improved sea level and related climate variables data available worldwide • Institutional and human capacity strengthened at both regional and national levels in the monitoring and analysis of sea level and climate data as well as in the O&M of tidal gauges. • Long-term funding for maintenance of Sea Level/ Climate Monitoring Network
			4/97	3/01	
			1/98	6/98 12/97	
				3/00 3/01	
<p>Establish databases and information systems allowing key regional and national institutions to acquire, analyze, store and disseminate data on climate change and its impact on natural and man-made systems.</p>	<ul style="list-style-type: none"> • Computer hardware and software for database management and analysis, INTERNET communication, and web browsing. • Technical assistance, consultant services and regional and national training courses 	<ul style="list-style-type: none"> • Computer based network linking the main institutions involved in project implementation, especially the RPIU and the NICUs • Databases using data/information generated by the project activities. • Training 	4/97	8/97	<ul style="list-style-type: none"> • Technical and human capacity for data management and analysis strengthened at regional and national levels. • Improved communications and data sharing between national and regional institutions. • Availability of data related to climate systems and sea level as a means to further the understanding and reduce the remaining uncertainties regarding the causes, effects, magnitude, and timing of climate change and sea level rise.
			9/97	3/01	
			6/98	3/01	

OBJECTIVES	INPUTS <i>(Resources provided for project activities)</i>	OUTPUTS <i>Goods and services produced by the project</i>	TIMING		OUTCOMES AND IMPACTS
			<i>Start</i>	<i>Finish</i>	
Further the development of each participating country's inventory of coastal resources so as to provide the necessary baseline data for the execution of other project activities	<ul style="list-style-type: none"> • Equipment to create or upgrade existing Geographic Information Systems (GIS) capability. • Training on GIS • Technical assistance, consultant services and training 	<ul style="list-style-type: none"> • Consolidate, evaluate and computerize GIS existing information in each Participating Country. • Improve base line data for other project activities. • Regional training courses on techniques for resource inventory preparation and management • Inventory of physical and biological resources in Caribbean coastal areas, their current use and users. • Country-specific mapped outputs for use in ICZM and planning. 	7/97	12/97	<ul style="list-style-type: none"> • Improved the institutional framework, technical capacity and equipment for inventory and analysis of coastal zone resources, their conditions and uses. • Increased regional and national information on coastal zone resources, their conditions and uses.
			11/97	10/98	
			7/97		
			11/97	10/98	
Develop a generic policy framework for the preparation of Integrated Coastal Zone Management (ICZM) legislation throughout the region which would incorporate mechanisms for planning for the adaptation to climate change, such as land use guidelines and disaster contingency planning.	<ul style="list-style-type: none"> • Technical assistance, consultant services and regional workshop • In-country consultations on generic framework and adaptation to individual country needs • Revised generic framework, providing specific country assistance in adaptation planning 	<ul style="list-style-type: none"> • Review and analysis of existing institutional and legal mechanisms, including regulatory framework, for integrated coastal and marine management. • Draft versions of framework for preparation of ICZM legislation. • Generic policy framework to plan adaptation to climate change and country-specific regulatory mechanisms for ICZM. • Training on policy framework • Public awareness and education program. 	5/98	8/98	<ul style="list-style-type: none"> • Framework legislation for addressing issues in the coastal and marine areas, particularly adaptation to climate change. • Support the development of a generic policy framework for the preparation of ICZM legislation throughout the region. • Increased regional and national level capacity in ICZM policy formulation through regional workshops and public awareness and education programs. • Public awareness and education programs on climate change and adaptation options.
			9/98	9/99	
			3/99	11/99	
			10/98	3/99	
			1/99		

OBJECTIVES	INPUTS <i>(Resources provided for project activities)</i>	OUTPUTS <i>Goods and services produced by the project</i>	TIMING		OUTCOMES AND IMPACTS
			<i>Start</i>	<i>Finish</i>	
Building upon ongoing coral reef monitoring throughout the region, establish a long-term monitoring program in the Bahamas, Belize and Jamaica, which over time would show the effects of global warming factors (temperature stress, sea level rise, and hurricanes) on coral reefs.	<ul style="list-style-type: none"> • Training in field data collection and data analysis techniques as well as on monitoring biological and physical indicators. • Technical assistance, consultant services and sub-regional meetings and regional workshops 	<ul style="list-style-type: none"> • Review existing status of coral reef monitoring and research in the three participating countries and their institutional capacity and responsibilities. • Monitoring program to determine potential impacts of climate change on coral reef. • Dissemination of information and methodology to all participating countries through regional workshops and study tours. 	7/97	9/97	<ul style="list-style-type: none"> • Improved public awareness and education programs on coral reefs conditions and management throughout the eleven participating countries. • Enhanced long-term coral reef monitoring systems throughout the Caribbean region. • Improved regional institutional capacity for long-term monitoring of Caribbean reef systems. • Improved methodology for coral reef monitoring to determine over time the effects of global climate change on Caribbean reef ecosystems. • Better comprehension of causal relationships between factors of global climate change and the health of Caribbean reefs.
			9/98	3/01	
			5/99	7/99	
Develop pilot coastal vulnerability and risk assessments in Barbados, Grenada, and Guyana.	<ul style="list-style-type: none"> • Technical assistance, consultant services and training and regional workshops. • Equipment for collection of information • Study tours for 22 participants • Educational material 	<ul style="list-style-type: none"> • Studies to evaluate models and techniques for vulnerability analysis and risk assessment and adaptation of the IPCC common methodology for application to Caribbean region • Draft adaptation strategy for pilot countries • Awareness and education program to inform general public about the vulnerability of coastal areas and the need to plan for climate change. • Training and study tours 	4/98	5/98	<ul style="list-style-type: none"> • Coastal vulnerability and risk assessments for three countries. • Strengthened capacity in coastal vulnerability and risk assessment at the national and regional levels. • Enhanced methodology for assessing coastal vulnerability and risk. • General public informed and educated about coastal vulnerability and the need to plan for climate change.
			3/00	7/00	
			1/00	3/01	
			1/00	2/00	

OBJECTIVES	INPUTS <i>(Resources provided for project activities)</i>	OUTPUTS <i>Goods and services produced by the project</i>	TIMING		OUTCOMES AND IMPACTS
			<i>Start</i>	<i>Finish</i>	
Design and implement pilot studies in Dominica, St. Lucia, and Trinidad and Tobago on the economic valuation of economic resources in selected coastal ecosystems at risk from sea level rise.	<ul style="list-style-type: none"> • Technical assistance, consultant services and regional workshops • Study tours 	<ul style="list-style-type: none"> • Assessment and review of resource valuation techniques • Three pilot studies using resource valuation techniques in ecosystems with varying environmental resources and economic uses. • Regional workshop to discuss and disseminate results of pilot studies. 	8/98 1/99 2/00	12/98 7/99 4/00	<ul style="list-style-type: none"> • Improved methodology appropriate to the region for resource valuation, environmental accounting, and environmental decision-making for use in development of policy frameworks and economic and regulatory approaches. • Increased awareness of valuation of natural and man-made assets in the three pilot countries as inputs in investment decision-making, environmental resource accounting and policy formulation. • Regional and local capacity strengthened for resource valuation, environmental accounting and investment decision-making.
Implement two pilot studies in Antigua and Barbuda and St. Kitts and Nevis to demonstrate the design and use of economic and regulatory approaches to environmental protection in response to threats from sea level rise.	<ul style="list-style-type: none"> • Technical assistance, consultant services and regional workshops • Study tours 	<ul style="list-style-type: none"> • Two pilot studies to illustrate the uses of various economic and other innovative regulatory options for coastal zone management • Regional workshop on the design and implementation of economic approaches to environmental regulation. • Training in innovative environmental policy design, program finance and policy implementation. 	12/98 1/99 1/99	6/99 2/99 2/99	<ul style="list-style-type: none"> • Sample regulatory program, including the use of economic instruments, to achieve specific objectives in two pilot countries. • Improved economic-based approaches to environmental policy appropriate to the region for use in preparation of national and regional policy frameworks. • Regional and local capacity strengthened in design, evaluation, and implementation of a range of economic-based environmental management instruments, including innovative ways of financing environmental programs.

Table 12.3: Indicators of Project Impact

Indicators of improved knowledge	
(a)	Systematic data observation, monitoring and collection, according to published guidelines, are effectively done.
(b)	Regular reviews are made of the adequacy of the technical models, policy frameworks, and data sets used, and appropriate procedures are adopted for improving model design and data collection.
(c)	An agreement is reached among participating countries on standards for regional archiving, access, and reporting formats.
(d)	Useful project information and data are included in global databases.
(e)	The technical soundness and validity of technical models and data used are confirmed in independent reviews.
Indicators of capacity-building	
(a)	Climate change considerations and adaptation strategies are appropriately disseminated and proposed for national institutionalization.
(b)	Technical studies, models, and data are used in regional and national environmental decision-making.
(c)	The legal, regulatory, and economic framework for integrated coastal zone management and adaptation planning are reviewed and proposed for adoption.
(d)	Researchers, policy-makers, and other stakeholders are able to access all relevant technical information, methodologies, and data in a useful format.
(e)	Technical training courses and workshops are successfully completed by appropriate staff of collaborating institutions.

Indicators of public/private involvement

- (a) Governments, public/private institutions, and other stakeholders are involved in the development and/or adaptation of methodologies and identification of options for improved adaptation planning and coastal resources management.
- (b) National resources are allocated and leveraged to carry out or continue activities of adaptation planning and integrated coastal zone management.
- (c) Interest is generated in other governments and institutions seeking to utilize the CPACC pilot project methodologies and techniques.

Indicators of project continuity/sustainability

- (a) A long-term workplan has been defined and agreed for continuation activities of each component.
- (b) Most responsibilities, technical personnel, and databases of the RPIU have been effectively transferred to UWICED and other regional institutions.
- (c) The achievements and expertise of the NICUs are integrated into the national development planning process.
- (d) Appropriate funding has been obtained for financing the continuation of CPACC activities in accordance with national and regional priorities.

Table 12.4: Monitoring and Evaluation Responsibilities

GS/OAS	RPIU	NICU PAC
<ul style="list-style-type: none"> • Carry out the agreed M&E Plan in accordance with the terms of the Grant Agreement. • Prepare terms of reference for independent M&E consultants to conduct studies and periodic technical reviews of project progress, and to participate in mid-term and final reviews. • Identify, select, and contract the external reviewers in consultation with the RPIU and subject to Bank approval. • Analyze consultant reports and disseminate results among project participants. • Organize and conduct, in conjunction with the Bank and UWICED, all M&E missions, including semiannual supervision missions and the mid-term and final project reviews. • Establish reporting guidelines for RPIU; review and approve quarterly progress reports submitted by RPIU. • Prepare semiannual progress reports, annual financial reports, midterm project review, and implementation completion report and submit for PAC and Bank review. 	<ul style="list-style-type: none"> • Assist the GS/OAS with implementation of the M&E Plan. • Prepare baseline study for project impact assessment. • Establish reporting guidelines for NICUs; review and approve quarterly progress reports submitted by NICUs. • Carry out visits to supervise activities of particular interest or importance, especially those with serious implementation problems. • Collect, analyze, and consolidate data relevant to each M&E activity. • Prepare quarterly activity and annual financial reports, and submit to the GS/OAS • Assist the GS/OAS in the preparation of the semiannual progress reports, annual financial reports, and the mid-term and final project reviews. • Use and disseminate all M&E report findings as appropriate to improve project management and enhance project impact among participants. 	<p>NICUs:</p> <ul style="list-style-type: none"> • Prepare quarterly activity reports and submit to the RPIU. <p>PAC:</p> <ul style="list-style-type: none"> • On the basis of M&E results, suggest changes in project implementation to improve performance. • Incorporate M&E conclusions in the discussion and formulation of post-project activities.

Table 12.5: Monitoring and Evaluation Reports

REPORT	CONTENT	TIMING	RESPONSIBILITY
<p><u>Activity Reports</u></p> <ul style="list-style-type: none"> • Documents the completion of planned activities and the progress made toward the achievement of desired results, as set out in the Annual Operating Plan. • Reviews any problems or decisions with an impact on performance. • Assesses the interest generated by program activities and opportunities for enhancing the impact of the project. • Provides data for semiannual progress reports and for public information purposes. 	<ul style="list-style-type: none"> • Activity name • Person reporting • Date • Accomplishments this quarter • Accomplishments prior to this period (cumulative) • Targets for next quarter • Comments/assessment of project performance, particularly regarding problems/constraints, unanticipated results or opportunities, and highlights • Budget vs. actual expense report, including counterpart contributions. 	<p>Quarterly</p>	<p>NICUs prepare country-specific quarterly activity reports and submit to RPIU</p> <p>RPIU consolidates country-specific information into comprehensive report and submits to GS/OAS</p>
<p><u>Technical Reports</u></p> <ul style="list-style-type: none"> • Provides technical and M&E data for incorporation into quarterly and semiannual progress reports. • Provides background and technical information for dissemination to participating institutions and countries. • May serve as background materials for specific CPACC training programs and public information and awareness activities. 	<ul style="list-style-type: none"> • Specific to subject area. 	<p>Periodic</p>	<p>External consultants submit to RPIU and GS/OAS.</p>

REPORT	CONTENT	TIMING	RESPONSIBILITY
<p><u>Semiannual Progress Reports</u></p> <ul style="list-style-type: none"> Provides summary reviews and assessments of detailed national activity reports, highlighting significant results and overall program progress toward the achievement of objective-level results. Serves as a general source of information on the CPACC for possible distribution to other agencies and interested parties. 	<ul style="list-style-type: none"> Project overview (brief statement of problems the project is designed to address, objectives, results, and strategy for achieving them). Summary of project highlights for the six-month period. Brief description of activities and administrative/management issues. Synthesis of progress; conclusions and recommendations regarding obstacles/constraints; modifications made to reallocate or redirect resources to improve performance. Summary matrix, including objectives; indicators; baseline/targets or performance standards; cumulative achievements; accomplishments in current quarter; and comments. Financial report. 	Every six months	GS/OAS submits to Bank and PAC .
<p><u>Financial Reports</u></p> <ul style="list-style-type: none"> Provides overview of project disbursements and expenditures. 	<ul style="list-style-type: none"> Comprehensive statement of project disbursements and expenditures and supporting documents in a format agreed to by the GS/OAS and the Bank. 	Annual	GS/OAS prepares on the basis of quarterly activity and annual financial reports submitted by the RPIU.
<p><u>Financial Audits</u></p> <ul style="list-style-type: none"> Audit of project finances in accordance with generally accepted accounting procedures. 	<ul style="list-style-type: none"> Audited financial statements. Review of the quality and accuracy of the methods employed in compiling the statements of expenditures, the relevance of supporting documents, and the standards of record-keeping and internal controls. 	Annual	GS/OAS engages independent auditor acceptable to the Bank
<p><u>Implementation Completion Report</u></p> <ul style="list-style-type: none"> Evaluates the implementation effectiveness of each project component and the ultimate success of the project in meeting its stated objectives. Provides data and information for the Bank's Implementation Completion Report. 	<ul style="list-style-type: none"> Statement/evaluation of project activities and objectives . Assessment of objective-level achievements. Analysis of major factors affecting the project. Presentation of plans for future operation. Review of implementing/executing agency performance in fulfilling respective obligations under the Grant Agreement. Analysis of costs and benefits. Discussion of key lessons learned 	Three months after end of project	GS/OAS prepares prior to Bank's final supervision mission

ANNEX 13: REPORTS AND DOCUMENTS IN PROJECT FILES

1. Caribbean: Planning for Adaptation to Global Climate Change. Detailed Project Description by Subcomponent. June 1996.
2. Summary Report of the Second Meeting of the National Focal Points for the Project "Caribbean: Planning for Adaptation to Global Climate Change," A Global Environment Facility Funded Project. Dominica, January 24-25, 1996. February 1996.
3. Assessment of the National Consultations Process. February 1996.
4. Inventory of On-Going Projects and Programs of Relevance to the "Caribbean: Planning for Adaptation to Global Climate Change." Prepared as part of the Project Preparation Phase. January 1996.
5. Regional Institutional Frameworks and Mandates for Environment and Sustainable Development and Their Relationship with the Implementation of "Caribbean: Planning for Adaptation to Global Climate Change." Prepared as part of the Project Preparation Phase. January 1996.
6. Summary Matrix of Country Proposals for Caribbean: Planning for Adaptation to Global Climate Change. January 1996.
7. Compilation of National Consultation Reports (Antigua & Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Saint Kitts & Nevis, Saint Lucia, Trinidad & Tobago). January 1996.
8. Summary Report of the First Meeting of National Focal Points for Planning for Adaptation to Global Climate Change, A Global Environment Facility Funded Project for the Caribbean. Barbados, September 20-22, 1995. September 1995.
9. Information Brochure #2: Caribbean: Planning for Adaptation to Global Climate Change, Project Preparation. October 1995.
10. Information Brochure #1: Caribbean: Planning for Adaptation to Global Climate Change. August 1995.
11. Agreement Between the General Secretariat of the Organization of American States and the University of the West Indies, Centre for Environment and Development (October 1996).
12. Agreement Between the General Secretariat of the Organization of American States and the Government of ... (October 1996).

ANNEX 14: DETAILED PROJECT COST TABLES**Summary Tables:**

Table 1	Project Components by Year -- Base Costs
Table 2	Expenditure Accounts by Years -- Base Costs
Table 3	Components Project Cost Summary

Detailed Tables by Component:

Table 4	Sea Level/Climate Monitoring Network - Detailed Costs
Table 5	Establishment of Databases and Information Systems - Detailed Costs
Table 6	Inventory of Coastal Resources and Use - Detailed Costs
Table 7	Policy Framework for Coastal and Marine Mgt. - Detailed Costs
Table 8	Coral Reef Monitoring for Climate Change - Detailed Costs
Table 9	Coastal Vulnerability and Risk Assessment - Detailed Costs
Table 10	Economic Valuation of Coastal & Marine Resources - Detailed Costs
Table 11	Economic and Regulatory Proposals - Detailed Costs
Table 12	Regional Project Implementation/Capacity Building
Table 13	Executing Agency - Detailed Costs

Caribbean
 Planning for Adaptation to Global Climate Change
 Project Components by Year – Base Costs
 (US\$ '000)

	Base Cost				Total
	1997	1998	1999	2000	
A. Project Costs					
1. Regional Activities					
Sea Level/Climate Monitoring Network	575.4	66.5	45.5	85.1	772.5
Databases & Information Systems	235.5	52.9	39.5	39.5	367.4
Inventory of Coastal Resources	279.5	378.2	-	-	657.7
Policy Framework for Coastal & Marine Management	-	88.0	34.3	159.6	281.9
Subtotal Regional Activities	1,090.4	585.6	119.3	284.2	2,079.5
2. Pilot Activities					
Coral Reef Monitoring Network	25.0	139.3	148.1	71.3	383.6
Coastal Vulnerability & Risk Assessments	-	41.7	205.5	161.1	408.3
Economic Valuation Coastal & Marine Resources	-	18.0	221.0	60.0	299.0
Economic & Regulatory Proposals	-	18.0	164.0	-	182.0
Subtotal Pilot Activities	25.0	217.0	738.6	292.4	1,272.9
3. Regional Project Implementation/Capacity Building	547.6	485.6	501.4	503.1	2,037.7
Subtotal Project Costs	1,663.0	1,288.2	1,359.2	1,079.7	5,390.1
B. Executing Agency Costs	163.2	165.8	169.2	171.8	669.9
Total BASELINE COSTS	1,826.2	1,454.0	1,528.4	1,251.4	6,060.0
Physical Contingencies	54.5	33.8	23.7	22.2	134.3
Price Contingencies	13.2	24.7	29.2	38.7	105.7
Total PROJECT COSTS	1,893.9	1,512.5	1,581.3	1,312.3	6,300.0
Taxes	-	-	-	-	-
Foreign Exchange	1,514.7	1,187.5	1,255.1	950.3	4,907.7

Caribbean
 Planning for Adaptation to Global Climate Change
 Expenditure Accounts by Years – Base Costs
 (US\$ '000)

	Base Cost				Total	Foreign Exchange	
	1997	1998	1999	2000		%	Amount
I. Investment Costs							
A. Equipment	571.6	294.0	34.0	14.0	913.6	85.0	776.6
B. Technical Assistance	573.1	612.2	884.4	585.4	2,655.1	80.0	2,124.1
C. Training	221.2	136.9	227.6	207.4	793.1	80.0	634.5
D. Travel & Per Diem	251.1	176.8	181.0	121.9	730.9	70.0	511.6
E. Supplies, Materials, Communications	22.0	64.3	28.3	97.0	211.5	10.0	21.1
F. Vehicles	24.0	4.0	4.0	4.0	36.0	-	-
G. Executing Agency	163.2	165.8	169.2	171.8	669.9	100.0	669.9
H. CMI Sub-Grant: (Tidal Gauge Replac. Fund)	-	-	-	50.0	50.0	-	-
Total BASELINE COSTS	1,826.2	1,454.0	1,528.4	1,251.4	6,060.0	78.2	4,737.8
Physical Contingencies	54.5	33.8	23.7	22.2	134.3	72.4	97.2
Price Contingencies	13.2	24.7	29.2	38.7	105.7	68.8	72.7
Total PROJECT COSTS	1,893.9	1,512.5	1,581.3	1,312.3	6,300.0	77.9	4,907.7
Taxes	-	-	-	-	-	-	-
Foreign Exchange	1,514.7	1,187.5	1,255.1	950.3	4,907.7	-	-

Caribbean
Planning for Adaptation to Global Climate Change
Components Project Cost Summary

	(US\$ '000)			%	% Total
	Local	Foreign	Total	Foreign Exchange	Base Costs
A. Project Costs					
1. Regional Activities					
Sea Level/Climate Monitoring Network	201.7	570.8	772.5	74	13
Databases & Information Systems	68.9	298.5	367.4	81	6
Inventory of Coastal Resources	147.9	509.8	657.7	78	11
Policy Framework for Coastal & Marine Management	88.9	193.0	281.9	68	5
Subtotal Regional Activities	507.5	1,572.0	2,079.5	76	34
2. Pilot Activities					
Coral Reef Monitoring Network	91.2	292.4	383.6	76	6
Coastal Vulnerability & Risk Assessments	104.4	303.9	408.3	74	7
Economic Valuation Coastal & Marine Resources	64.5	234.5	299.0	78	5
Economic & Regulatory Proposals	37.8	144.2	182.0	79	3
Subtotal Pilot Activities	298.0	975.0	1,272.9	77	21
3. Regional Project Implementation/Capacity Building	516.8	1,520.9	2,037.7	75	34
Subtotal Project Costs	1,322.2	4,067.9	5,390.1	75	89
B. Executing Agency Costs	-	669.9	669.9	100	11
Total BASELINE COSTS	1,322.2	4,737.8	6,060.0	78	100
Physical Contingencies	37.1	97.2	134.3	72	2
Price Contingencies	33.0	72.7	105.7	69	2
Total PROJECT COSTS	1,392.3	4,907.7	6,300.0	78	104

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 4. Design & Establishment of Sea Level /
 Climate Monitoring Network
 Detailed Costs
 (US\$)

	Base Cost				Total
	1997	1998	1999	2000	
I. Investment Costs					
A. Coordination & Launching Workshop					
1. Travel & Per Diem					
Regional Network Coordinator	30,000	15,000	15,000	15,000	75,000
NOAA Program Coordinator	16,000	11,500	7,000	3,500	38,000
Subtotal Travel & Per Diem	<u>46,000</u>	<u>26,500</u>	<u>22,000</u>	<u>18,500</u>	<u>113,000</u>
2. Workshop	15,500	-	-	-	15,500
Subtotal Coordination & Launching Workshop	<u>61,500</u>	<u>26,500</u>	<u>22,000</u>	<u>18,500</u>	<u>128,500</u>
B. Site Selection & Preparation					
Technical Assistance/Training	18,000	-	-	-	18,000
Travel & Per Diem	17,000	-	-	-	17,000
Subtotal Site Selection & Preparation	<u>35,000</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>35,000</u>
C. Station Configuration & Equipment Installation					
Equipment	332,600	-	-	-	332,600
Technical Assistance/Training	14,000	-	-	-	14,000
Travel & Per Diem	22,000	-	-	-	22,000
Subtotal Station Configuration & Equipment Installation	<u>368,600</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>368,600</u>
D. Operation, Maintenance & Calibration					
Technical Assistance/Training	2,000	22,000	11,000	6,200	41,200
Travel & Per Diem	10,000	18,000	12,500	10,400	50,900
CMI Sub-Grant: (Tidal Gauge Replac. Fund)	-	-	-	50,000	50,000
Subtotal Operation, Maintenance & Calibration	<u>12,000</u>	<u>40,000</u>	<u>23,500</u>	<u>66,600</u>	<u>142,100</u>
E. Data Acquisition & Archiving System					
Technical Assistance/Training	8,000	-	-	-	8,000
Travel & Per Diem	4,000	-	-	-	4,000
Subtotal Data Acquisition & Archiving System	<u>12,000</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>12,000</u>
F. Geocentric Fixing of Bench Marks					
Technical Assistance/Training	54,800	-	-	-	54,800
Travel & Per Diem	31,500	-	-	-	31,500
Subtotal Geocentric Fixing of Bench Marks	<u>86,300</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>86,300</u>
Total	<u>575,400</u>	<u>66,500</u>	<u>45,500</u>	<u>85,100</u>	<u>772,500</u>

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 5. Establish Databases & Information Systems
 Detailed Costs
 (US\$)

	Base Cost				Total
	1997	1998	1999	2000	
I. Investment Costs					
A. Information Systems Coordinator					
Travel & Per Diem	15,000	9,500	9,500	9,500	43,500
B. Assessment of Needs					
Technical Assistance	6,000	-	-	-	6,000
Travel & Per Diem	4,625	-	-	-	4,625
Subtotal Assessment of Needs	10,625	-	-	-	10,625
C. System Design					
Technical Assistance	6,000	-	-	-	6,000
D. Systems Procurement & Customization					
Technical Assistance/Training	4,000	-	-	-	4,000
Equipment	145,000	-	-	-	145,000
Subtotal Systems Procurement & Customization	149,000	-	-	-	149,000
E. Training Program					
Workshop	54,900	-	-	-	54,900
CMI/IMA Training	-	13,400	-	-	13,400
On-going Training	-	5,000	5,000	5,000	15,000
Subtotal Training Program	54,900	18,400	5,000	5,000	83,300
F. System Maintenance & Upgrading					
Technical Assistance	-	11,000	11,000	11,000	33,000
Equipment	-	14,000	14,000	14,000	42,000
Subtotal System Maintenance & Upgrading	-	25,000	25,000	25,000	75,000
Total	235,525	52,900	39,500	39,500	367,425

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 6. Inventory of Coastal Resources & Use
 Detailed Costs
 (US\$)

	Base Cost				Total
	1997	1998	1999	2000	
I. Investment Costs					
A. GIS Installation/Upgrade					
1. Equipment	54,000	-	-	-	54,000
2. Training					
Technical Assistance	12,000	-	-	-	12,000
Travel & Per Diem	14,000	-	-	-	14,000
Subtotal Training	26,000	-	-	-	26,000
Subtotal GIS Installation/Upgrade	80,000	-	-	-	80,000
B. Coastal Inventory Design					
1. Inventory Existing Information					
Technical Assistance	22,000	-	-	-	22,000
2. Regional Workshop					
Technical Assistance	8,000	-	-	-	8,000
Travel & Per Diem	32,000	-	-	-	32,000
Subtotal Regional Workshop	40,000	-	-	-	40,000
Subtotal Coastal Inventory Design	62,000	-	-	-	62,000
C. Compile/Digitize Existing Information					
1. In-Country Consultations	5,500	-	-	-	5,500
2. Compilation/Digitizing					
Technical Assistance	132,000	-	-	-	132,000
Subtotal Compile/Digitize Existing Information	137,500	-	-	-	137,500
D. Prepare Coastal Inventories					
1. Acquire Additional Information					
Remote Sensing/Spectographic Imagery	-	220,000	-	-	220,000
2. Data Analysis & Interpretation					
Technical Assistance	-	40,000	-	-	40,000
Travel & Per Diem	-	11,250	-	-	11,250
Subtotal Data Analysis & Interpretation	-	51,250	-	-	51,250
3. Country Specific Mapping & Reporting					
Technical Assistance	-	35,200	-	-	35,200
Travel & Per Diem	-	12,750	-	-	12,750
Materials/Publications	-	33,000	-	-	33,000
Subtotal Country Specific Mapping & Reporting	-	80,950	-	-	80,950
Subtotal Prepare Coastal Inventories	-	352,200	-	-	352,200
E. Study Tours					
2 week Attachments (12 days)	-	26,000	-	-	26,000
Total	279,500	378,200	-	-	657,700

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 7. Policy Framework for Coastal
 & Marine Management
 Detailed Costs
 (US\$)

	Base Cost				Total
	1997	1998	1999	2000	
I. Investment Costs					
A. Develop Methodology					
1. Evaluate existing approaches/ prepare methodology					
Technical Assistance	-	20,000	-	-	20,000
Travel & Per Diem	-	7,375	-	-	7,375
Subtotal Evaluate existing approaches/ prepare methodology	-	27,375	-	-	27,375
2. Develop framework legislation					
Technical Assistance	-	12,000	-	-	12,000
Travel & Per Diem	-	4,625	-	-	4,625
Subtotal Develop framework legislation	-	16,625	-	-	16,625
Subtotal Develop Methodology	-	44,000	-	-	44,000
B. Training					
1. Regional Workshop					
One week course for 22	-	44,000	-	-	44,000
2. Study Tours					
2 week attachments (12 days)	-	-	-	15,600	15,600
Subtotal Training	-	44,000	-	15,600	59,600
C. In-Country Consultations					
Travel & Per Diem	-	-	15,000	-	15,000
Workshop	-	-	11,000	-	11,000
Subtotal In-Country Consultations	-	-	26,000	-	26,000
D. Revision of Methodology					
Technical Assistance	-	-	6,000	-	6,000
Travel & Per Diem	-	-	2,250	-	2,250
Subtotal Revision of Methodology	-	-	8,250	-	8,250
E. Country Specific Regulatory Instruments					
Technical Assistance	-	-	-	88,000	88,000
Travel & Per Diem	-	-	-	16,000	16,000
Subtotal Country Specific Regulatory Instruments	-	-	-	104,000	104,000
F. Education & Awareness					
Materials	-	-	-	40,000	40,000
Total	-	88,000	34,250	159,600	281,850

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 8. Coral Reef Monitoring
 Detailed Costs
 (US\$)

	Base Cost				Total
	1997	1998	1999	2000	
I. Investment Costs					
A. Sub-Regional Workshop	25,000	-	-	-	25,000
B. Awareness & Education					
Materials	-	6,250	6,250	6,250	18,750
C. Site Selection & Methodology					
Travel & Per Diem	-	9,375	-	-	9,375
Technical Assistance	-	14,400	-	-	14,400
Subtotal Site Selection & Methodology	-	23,775	-	-	23,775
D. Monitoring Activities					
1. Expand On-going Monitoring					
Technical Assistance	-	40,000	40,000	40,000	120,000
Equipment	-	60,000	-	-	60,000
Supplies	-	3,000	-	-	3,000
Subtotal Expand On-going Monitoring	-	103,000	40,000	40,000	183,000
2. In-Country Training					
Travel & Per Diem	-	2,250	2,250	2,250	6,750
Technical Assistance	-	4,000	4,000	4,000	12,000
Subtotal In-Country Training	-	6,250	6,250	6,250	18,750
Subtotal Monitoring Activities	-	109,250	46,250	46,250	201,750
E. Programme Review					
Travel & Per Diem	-	-	-	6,750	6,750
Technical Assistance	-	-	-	12,000	12,000
Subtotal Programme Review	-	-	-	18,750	18,750
F. Training					
1. Regional Workshop					
(2 week, 22 participants)	-	-	80,000	-	80,000
2. Study Tours					
2 week attachments (12 days)	-	-	15,600	-	15,600
Subtotal Training	-	-	95,600	-	95,600
Total	25,000	139,275	148,100	71,250	383,625

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 9. Coastal Vulnerability & Risk Assessment
 Detailed Costs
 (US\$)

	Base Cost				Total
	1997	1998	1999	2000	
I. Investment Costs					
A. Refinement of Methodology					
Technical Assistance	-	32,000	-	-	32,000
Travel & Per Diem	-	8,200	-	-	8,200
Workshop	-	1,500	-	-	1,500
Subtotal Refinement of Methodology	-	41,700	-	-	41,700
B. Collection of Information					
Data collection	-	-	75,000	-	75,000
Equipment	-	-	15,000	-	15,000
Subtotal Collection of Information	-	-	90,000	-	90,000
C. Vulnerability Assessment					
Technical Assistance	-	-	72,000	-	72,000
Travel & Per Diem	-	-	13,500	-	13,500
Subtotal Vulnerability Assessment	-	-	85,500	-	85,500
D. Training (Pilot Countries)					
1. Utilization of Vulnerability Data					
Workshop	-	-	30,000	-	30,000
E. Training					
1. Regional Workshop (2 wk, 22 participants)	-	-	-	80,000	80,000
2. Study Tours					
a. 2 week attachments (12 days)	-	-	-	15,600	15,600
Subtotal Training	-	-	-	95,600	95,600
F. Formulation of Adaptation Strategies					
Technical Assistance	-	-	-	32,000	32,000
Travel & Per Diem	-	-	-	3,500	3,500
Subtotal Formulation of Adaptation Strategies	-	-	-	35,500	35,500
G. Education & Awareness					
Materials	-	-	-	30,000	30,000
Total	-	41,700	205,500	161,100	408,300

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 10. Economic Valuation of Coastal
 & Marine Resources
 Detailed Costs
 (US\$)

	Base Cost				
	1997	1998	1999	2000	Total
I. Investment Costs					
A. Methodology Definition					
Technical Assistance	-	12,000	-	-	12,000
Travel & Per Diem	-	6,000	-	-	6,000
Subtotal Methodology Definition	-	18,000	-	-	18,000
B. Pilot Studies					
Technical Assistance	-	-	144,000	-	144,000
Travel & Per Diem	-	-	30,000	-	30,000
Subtotal Pilot Studies	-	-	174,000	-	174,000
C. Assessment & Preparation of Findings					
Technical Assistance	-	-	36,000	-	36,000
Travel & Per Diem	-	-	11,000	-	11,000
Subtotal Assessment & Preparation of Findings	-	-	47,000	-	47,000
D. Training					
Regional Workshop	-	-	-	30,000	30,000
Study Tours	-	-	-	30,000	30,000
Total	-	18,000	221,000	60,000	299,000

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 11. Economic & Regulatory Proposals
 Detailed Costs
 (US\$)

	Base Cost				Total
	1997	1998	1999	2000	
I. Investment Costs					
A. Methodology Definition					
Technical Assistance	-	12,000	-	-	12,000
Travel & Per Diem	-	6,000	-	-	6,000
Subtotal Methodology Definition	-	18,000	-	-	18,000
B. Pilot Studies					
Technical Assistance	-	-	82,000	-	82,000
Travel & Per Diem	-	-	8,000	-	8,000
Subtotal Pilot Studies	-	-	90,000	-	90,000
C. Assessment & Preparation of Findings					
Technical Assistance	-	-	24,000	-	24,000
D. Training					
Regional Workshop	-	-	30,000	-	30,000
Study Tours	-	-	20,000	-	20,000
Total	-	18,000	164,000	-	182,000

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 12. Regional Project Implementation/Capacity Building
 Detailed Costs
 (US\$)

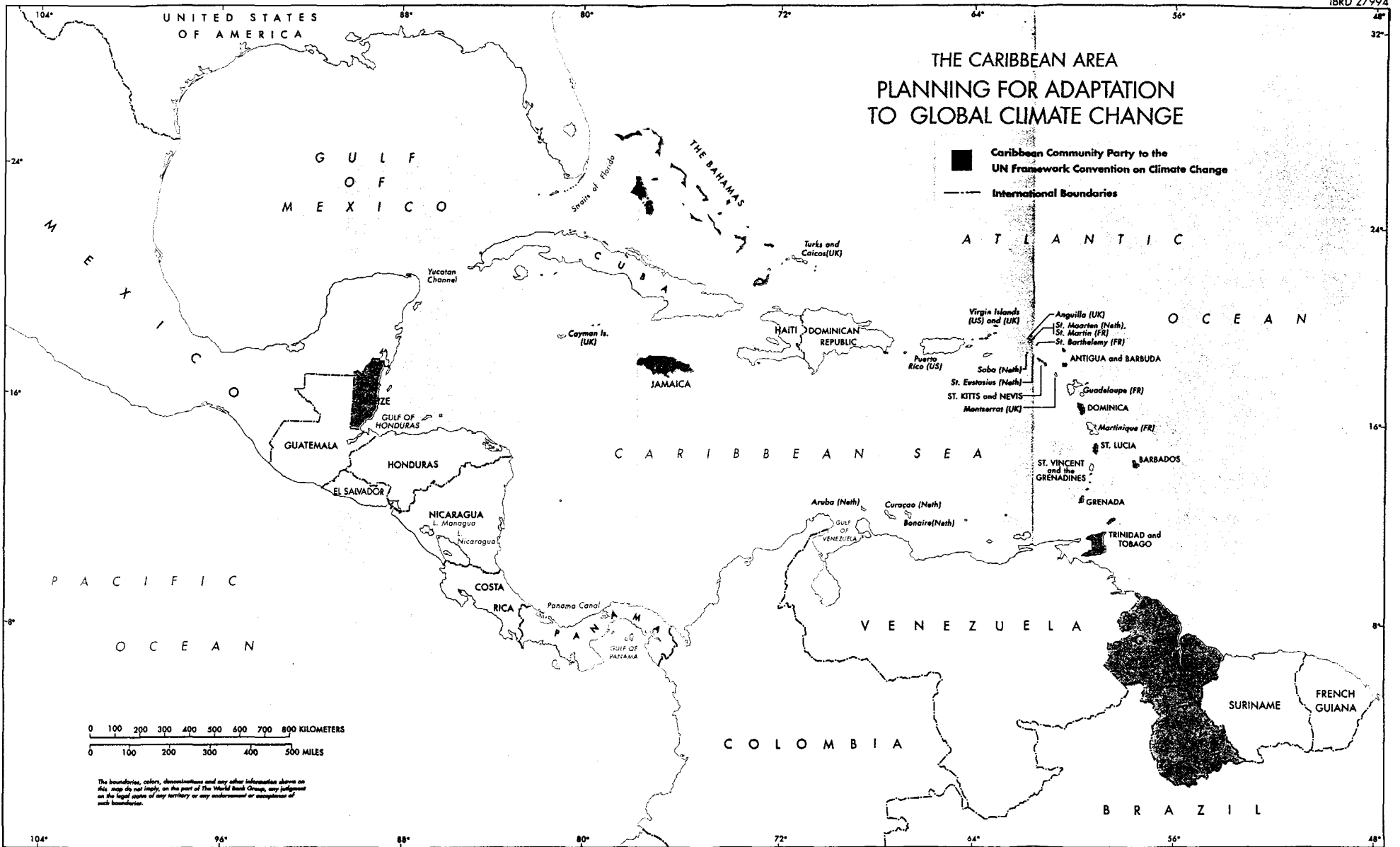
	Base Cost				Total
	1997	1998	1999	2000	
i. Investment Costs					
A. Regional Project Implementation Unit (RPIU)					
1. Staff					
Project Manager	76,800	78,720	81,280	83,200	320,000
Accountant/Controller	24,000	24,600	25,400	26,000	100,000
Executive Secretary	14,400	14,760	15,240	15,600	60,000
Driver/Clerk	9,600	9,840	10,160	10,400	40,000
Subtotal Staff	124,800	127,920	132,080	135,200	520,000
2. Operating Costs					
Equipment	40,000	-	5,000	-	45,000
Communications	12,000	12,000	12,000	12,000	48,000
Vehicles	24,000	4,000	4,000	4,000	36,000
Travel & Per Diem	20,000	20,000	20,000	20,000	80,000
Supplies, Maintenance & Utilities	10,000	10,000	10,000	8,700	38,700
Subtotal Operating Costs	106,000	46,000	51,000	44,700	247,700
Subtotal Regional Project Implementation Unit (RPIU)	230,800	173,920	183,080	179,900	767,700
B. Regional Technical Assistance Team & Capacity Building					
1. Technical Assistance Team					
Human Resources Specialist	52,800	54,120	55,880	57,200	220,000
Information Systems Coordinator	48,000	49,200	50,800	52,000	200,000
Coastal Zone Management Specialist	57,600	59,040	60,960	62,400	240,000
Regional Network Coordinator	38,400	39,360	40,640	41,600	160,000
Subtotal Technical Assistance Team	196,800	201,720	208,280	213,200	820,000
2. Training RPIU/UWICED Staff					
	20,000	20,000	20,000	20,000	80,000
3. UWI Student Internships					
	5,000	5,000	5,000	5,000	20,000
Subtotal Regional Technical Assistance Team & Capacity Building	221,800	226,720	233,280	238,200	920,000
C. Project Implementation Review & Guidance					
Monitoring & Evaluation	20,000	20,000	20,000	20,000	80,000
Project Advisory Committee (PAC)	35,000	25,000	25,000	25,000	110,000
National Implementation Coordinating Units	35,000	35,000	35,000	35,000	140,000
Annual Audits	5,000	5,000	5,000	5,000	20,000
Subtotal Project Implementation Review & Guidance	95,000	85,000	85,000	85,000	350,000
Total	547,600	485,640	501,360	503,100	2,037,700

Caribbean
 Planning for Adaptation to Global Climate Change
 Table 13. Executing Agency
 Detailed Costs
 (US\$)


	Base Cost				Total
	1997	1998	1999	2000	
I. Investment Costs					
A. Costs					
1. Technical Supervision					
a. Technical Coordinator	76,800	78,720	81,280	83,200	320,000
b. Administrative Support	20,160	20,664	21,336	21,840	84,000
c. Travel & Per Diem	20,000	20,000	20,000	20,000	80,000
d. Communications	12,000	12,000	12,000	12,000	48,000
Subtotal Technical Supervision	128,960	131,384	134,616	137,040	532,000
2. Disbursement/Transaction Functions	25,000	25,000	25,000	25,000	100,000
3. Management Oversight	9,238	9,383	9,577	9,722	37,920
Total	163,198	165,767	169,193	171,762	669,920

MAP SECTION

THE CARIBBEAN AREA PLANNING FOR ADAPTATION TO GLOBAL CLIMATE CHANGE







MICROGRAPHICS

Report No: 15916 CRG
Type: PD



Printed on recycled paper