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The World Bank**

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**PROJECT APPRAISAL DOCUMENT**  
**ON A**  
**PROPOSED PROJECT FOR US\$15.2 MILLION, INCLUDING A**  
**GRANT FROM THE**  
**GLOBAL ENVIRONMENT FACILITY TRUST FUND**  
**IN THE AMOUNT OF US\$11.0 MILLION EQUIVALENT**  
**TO THE**  
**CENTRAL AMERICAN COMMISSION ON ENVIRONMENT AND**  
**DEVELOPMENT**  
**FOR A REGIONAL PROJECT FOR THE**  
**CONSERVATION AND SUSTAINABLE USE OF THE**  
**MESOAMERICAN BARRIER REEF SYSTEM (MBRS)**  
**April 26, 2001**

Environmentally and Socially Sustainable Development  
Central American Department  
Latin America and the Caribbean Regional Office

## CURRENCY EQUIVALENTS

Currency Unit = US\$

## ABBREVIATIONS AND ACRONYMS

CARICOMP	Caribbean Coastal Marine Productivity Program
CAS	Country Assistance Strategy
CBD	Convention on Biological Diversity
CCAD	Central American Commission on Environment and Development ( <i>Comisión Centroamericana de Ambiente y Desarrollo</i> )
CEP	Caribbean Environment Program
CFRAMP	Caribbean Fisheries Resource Assessment and Management Project
CITES	Convention on International Trade in Endangered Species
CPACC	Caribbean Planning for Adaptation to Climate Change
DANIDA	Danish International Development Agency
EA	Environmental Assessment
EMP	Environmental Management Plan
EIS	Environmental Information System
FAO	UN Food and Agriculture Organization
GCRMN	Global Coral Reef Monitoring Network
GEF	Global Environment Facility
GTZ	German Agency for Technical Cooperation ( <i>Gesellschaft für Technische Zusammenarbeit</i> )
IDB	Inter-American Development Bank
IUCN	World Conservation Union
LBSP	Land-Based Sources of Pollution
LME	Large Marine Ecosystem
MARPOL	International Convention for the Prevention of Marine Pollution
MBC	Mesoamerican Biological Corridor
MBRS	Mesoamerican Barrier Reef System
MPA	Marine Protected Area
NGO	Non-governmental Organization
PA	Protected Area
PCU	Project Coordination Unit
PY	Project Year
RSC	Regional Steering Committee
SAS	Spawning Aggregation Sites
SICA	System for Central American Integration ( <i>Sistema para la Integración Centroamericana</i> )
SPAW	Protocol Concerning Specially Protected Areas and Wildlife (Cartagena Convention)
TAC	Technical Advisory Committee
TBDA	Transboundary Diagnostic Analysis
TNC	The Nature Conservancy
TRCA	Threat and Root Cause Analysis
TWG	Regional Technical Working Groups
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
URI/CRC	University of Rhode Island/Coastal Resources Center
USAID	United States Agency for International Development
WWF	World Wide Fund for Nature

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**Central American Commission on Environment and Development**  
**Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**  
**(MBRS)**

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**Conservation and Sustainable Use of the Mesoamerican Barrier Reef System (MBRS)**  
**Central American Commission on Environment and Development**  
**Project Appraisal Document**

**Latin America and the Caribbean Regional Office, LCC2C**

Date: November 4, 2000 Country Manager/Director: Donna Dowsett-Coirolo Project ID: GE-P053349    Sector: Environment	Task Team Leader/Task Manager: Marea E. Hatzios Sector Manager/Director: John Redwood Program Objective Category: Environmentally Sustainable Development Focal Area: Coastal, Marine, and Freshwater Ecosystems (Operational Program: No. 2) and Integrated Land and Water Multiple Focal Area Operational Program (Operational Program: No. 9) Program of Targeted Intervention: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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<b>Project Financing Data</b>	<input type="checkbox"/> Loan	<input type="checkbox"/> Credit	<input type="checkbox"/> Guarantee	<input checked="" type="checkbox"/> Grant	<input type="checkbox"/> Other [Specify]	
<b>For Loans/Credits/Others:</b>						
Amount (US\$m/SDRm): US\$11.0 million						
Source	Local	Foreign	Total			
Government of Belize	0.9	0.9	1.8			
Government of Guatemala	0.3	0.3	0.6			
Government of Honduras	0.3	0.3	0.6			
Government of Mexico	0.4	0.3	0.7			
GEF	4.4	6.6	11.0			
Beneficiaries	0.2	0.3	0.5			
Sub-total	6.5	8.7	15.2			
Other Co-financing <sup>1</sup>						
WWF			2.5			
Government of Canada			0.5			
Oak Foundation			5.0			
University of Miami			1.0			
<b>Total</b>			<b>24.2</b>			
Recipient: Central American Commission on Environment and Development (CCAD)						
Responsible agency: Central American Commission on Environment and Development (CCAD)						
Estimated disbursements (Bank FY/US\$m):	FY02	FY03	FY04	FY05	FY06	Total
Annual	1.5	3.0	2.8	2.3	1.4	11.0
Cumulative	1.5	4.5	7.3	9.6	11.0	11.0
Project implementation period: 5 yrs; Expected effectiveness date: June 1, 2001; Expected closing date: June 2006						

<sup>1</sup>The allocation of these co-financing resources to individual subcomponents will be determined through annual programming. Therefore, the detailed distribution over project subcomponents cannot be shown in project cost tables within this document.

## **A: Project Development Objective**

### *1. Project development objective and key performance indicators (see Annex 1):*

The Project development objective is to assist the countries of Belize, Guatemala, Honduras and Mexico to manage the Mesoamerican Barrier Reef System (MBRS) as a shared, regional ecosystem; safeguard its biodiversity values and functional integrity; and create a framework for its sustainable use.

### *2. Project global objectives and key performance indicators (see Annex 1):*

The global objective of the Mesoamerican Barrier Reef Project is to enhance protection of the ecologically unique and vulnerable marine ecosystems comprising the MBRS, by assisting the littoral states to strengthen and coordinate national policies, regulations and institutional arrangements for the conservation and sustainable use of this global public good.

The Mesoamerican Barrier Reef System, extending from the southern half of the Yucatan Peninsula to the Bay Islands of Honduras, includes the second longest barrier reef in the world. The MBRS is unique in the Western hemisphere on account of its size, its array of reef types, and the luxuriance of corals it contains. The MBRS stabilizes and protects coastal landscapes; maintains coastal water quality; sustains species of commercial importance; serves as breeding and feeding grounds for marine mammals, reptiles, fish and invertebrates; and offers employment alternatives and incomes to approximately one million people living in coastal zones adjacent to the reefs. Associated with the coral reefs of the MBRS are extensive areas of relatively pristine coastal wetlands, lagoons, seagrass beds and mangrove forests; these sustain exceptionally high biodiversity and provide critical habitat for threatened species. The outstanding ecological and cultural significance of the MBRS has resulted in its designation as a World Heritage site.

The Project would seek to conserve this globally important resource by providing support to strengthen existing--and create a variety of new--mechanisms to safeguard its integrity and continued productivity. These include: (i) facilitating the: harmonization of relevant policies and regulations related to sustainable management of shared/transboundary resources, including reaching agreement on the establishment of environmental standards for monitoring coastal water quality and other indicators of coral reef ecosystem health; best practice and regional environmental certification programs for sustainable tourism development, and harmonizing regulations governing harvesting and conservation of shared fish stocks; (ii) strengthening the system of Marine Protected Areas (MPAs) within the MBRS to maintain vital ecological processes and increase representativeness in the existing system; and (iii) building capacity through training, environmental education and improved information systems to enhance public and private participation in the conservation of the MBRS and the benefits from its sustainable use.

Key performance indicators include:

- Regional frameworks in place for management of diverse resources of the MBRS
- Biological representation and ecological interconnectivity maintained in coastal and marine ecosystems throughout the MBRS
- Ecoregional approach to MBRS management incorporated into conservation planning at local, national and regional levels
- Heightened awareness of the value of the MBRS and of the benefits from its conservation
- Steps towards harmonization of relevant policies and legislation regarding MPA management in transboundary areas, sustainable fisheries management; sustainable tourism development; and protection of coastal water quality agreed and initiated in all four countries

- Fora for regional cooperation at technical and policy levels operational

## **B: Strategic Context**

*1 (a). Sector-related Country Assistance Strategy (CAS) goal supported by the Project (see Annex 1):*

(i) Mexico	CAS document number: 19289	Date of latest CAS: May 13, 1999
(ii) Belize	CAS document number: 20708	Date of latest CAS: September 5, 2000
(iii) Guatemala	CAS document number: 18036	Date of latest CAS: June 19, 1998
(iv) Honduras	CAS document number: 19893	Date of latest CAS: November 19, 1999

*Common Sector Goals among MBRS Countries:* Reduce poverty; increase environmental security, accelerate economic growth in rural areas, and increase effectiveness of the public sector and its policies.

The Country Assistance Strategy (CAS) for Mexico identifies three core themes for World Bank Group assistance to Mexico: social sustainability, removing obstacles to sustainable growth, and effective public governance. Within this broad framework, the CAS identifies a few priority areas for Bank involvement in the Environment Sector, including institutional development and decentralization of environmental management, better management of natural resources (e.g., forests, water and biodiversity), and assistance in the design of sector policies.

Guatemala, Honduras and Belize share similar CAS goals of reducing rural poverty through improved environmental security and better management of natural resources. Building social capital through information networking, training and broader participation of local stakeholders in the management of resources is identified as a complementary goal among the three countries. The Project would support these goals by first promoting a regional vision of ecosystem sustainability and productivity. It would support public awareness about the importance of the MBRS as a world-class resource, its importance to the cultural and economic future of the region, as well as its role as a vital component of the biosphere. The Project would further seek to reduce fragmentation at the national and regional levels in the governance of the MBRS by improving regional information systems for decision-making and harmonizing policy frameworks across the four countries in line with principles of environmental and social sustainability.

Such policy cohesion would lay the groundwork for regional cooperation in the adoption of agreed protocols for conservation and sustainable use—particularly in productive sectors such as tourism and fisheries. In line with this, the Project would promote region-wide adoption of best practice in sustainable marine tourism through disseminating codes of conduct, providing training and resources for their application and establishing regional environmental certification systems. This, coupled with opportunities for coastal communities to engage in small and medium enterprise and alternative livelihood schemes linked to ecotourism, should lead to higher incomes, sustainable economic growth and reduction in rural poverty—CAS goals in all four countries.

*1 (b). Global operational strategy/program objective addressed by the Project:*

The proposed Project supports the objectives of the GEF Operational Strategy and the Operational Program for Biodiversity for Coastal, Marine, and Freshwater Ecosystems (O.P. No. 2). It also supports a number of Articles of the Convention on Biological Diversity and its provision for conservation of marine biodiversity under the Jakarta Mandate. These include Article 8 (*in-situ conservation*), and Article 10 (*sustainable use of components of biodiversity*). The Project does this by promoting an ecosystem approach to the conservation and management of a transboundary aquatic ecosystem of global importance. It aims to facilitate regional cooperation and coordination in the design and imple-

mentation of measures to ensure the ecological integrity and continued productivity of a Large Marine Ecosystem (LME), which includes both World Heritage and Ramsar sites within its boundaries.

In addition, the Project encourages cooperation between governmental authorities and the private sector in developing methods for sustainable uses of biological resources. It would build partnerships at the local, national and transnational levels through support for non-governmental organizations (NGOs), professional associations and cooperatives (e.g., in the tourism and fisheries sectors) and governmental institutions (e.g., sectoral ministries, coastal authorities and intergovernmental bodies such as the Central American Commission on Environment and Development). At the local level, the Project would strengthen the involvement of civil society in conservation efforts through environmental education and measures to enhance benefit sharing by local communities. These efforts include support for training in new livelihood skills, increased capture of resource rents, (e.g., user fees, tourist and green taxes) and co-management arrangements for protected areas (PA).

This Project also responds to objectives of the Integrated Land and Water Multiple Focal Area Operational Program for International Waters (O P 9). It does so by addressing resource management issues at the interface of land/water systems through an integrated approach that includes a broad range of interventions. These include establishing a uniform protocol for monitoring water quality along the coast, with special emphasis on pollution hot spots in transboundary areas; improving regional data collection to assess productivity of commercially important stocks and status of threatened species; and harmonizing regulations related to the harvesting and protection of these species and regulations to minimize the loss of critical breeding and nursery habitats.

## *2. Main sector issues and Government strategy:*

A Threat and Root Cause Analysis (TRCA) was completed during Project preparation, which revealed the following major threats to the sustainability of the Mesoamerican Barrier Reef System (See Annex 13):

- Coastal/island development and rapidly expanding tourism
- Inappropriate upstream land and resource use, and industrial development
- Overfishing and unregulated aquaculture development
- Uncontrolled port, shipping and navigation practices
- Climato-meteorological phenomena associated with changes in ocean currents, sea surface temperatures, storm intensity, precipitation, and vulnerability to disease, in all probability linked to climate change.

The cumulative impact of these combined threats—both anthropogenic and “natural”—is a growing cause for alarm. That these threats are common to the four countries bordering the MBRS emphasizes the transboundary nature of factors that influence habitats and resources, and the dynamic nature of the processes (e.g., recruitment, predation, nutrient transport and disease) that determine the system’s resilience and sustainability.

Associated with these threats are underlying conditions that may be regarded as root causes or constraints that prevent governments from adequately addressing the immediate threats to the health of the MBRS. These include the following:

- Lack of information on the status of the MBRS and on economic, environmental and social trade-offs associated with various use regimes
- At the regional level, absence of system wide mechanisms or legal frameworks to manage the ecosystem as a whole; at the sub-national and local levels, sectoral fragmentation in the management of habitats and resources of the MBRS
- Lack of public awareness of the value of the MBRS
- Lack of coherent policies; inconsistency in environmental standards and in the application of existing standards related to EIA, land use planning/zoning, water quality, polluter pays principle
- Inadequate protection of critical elements and ecological processes essential to the integrity and continued productivity of the MBRS
- Lack of trained personnel.

### *Issues and Gaps*

*Information Gaps:* Undermining management efforts in all four countries is the basic lack of information on the status of the MBRS. Although monitoring efforts are underway in selected areas, reliable information is required to provide a synoptic view of the system as a whole, determine the origin and scope of common threats, and form a basis for regional cooperation in the management of a shared resource. A prime example of this information gap exists with regard to fisheries. Inadequate information on commercially important stocks has led to the issuing of quotas and user permits on a fragmented basis, without regard for total system yields or allowable harvest. Intense fishing pressure by individual nations is threatening the viability of economically important stocks like lobster and conch, once plentiful in the waters of the MBRS. Another serious constraint is the absence of water quality data for the principal coastal drainages of the MBRS. The production of citrus fruits and banana in the Rio Hondo watershed, between Mexico and Belize, is thought to be a major source of non-point pollution in the Bay of Chetumal. This, along with point sources from industry and expanding human settlements, have made Chetumal a major pollution hot spot in the transboundary area between Mexico and Belize. Quantification of this pollution will be essential to identifying its source and mitigating its effects.

*Policy Gaps and Fragmentation.* At the national level, fragmentation in coastal resource management is manifested in the lack of an integrated approach to economic development within coastal areas (e.g., tourism, fisheries, agriculture, infrastructure) and the failure to incorporate environmental and social costs into economic decision-making. This is particularly true in the tourism industry, manifested by rapid and chaotic growth along the corridor from Cancun to Chetumal in Quintana Roo, in the Bay Islands of Honduras, and on many of the cays along the Belize Barrier Reef (Map 1). Examples include conversion of coastal habitat for large tourist installations, dredging of channels and bays for the expanding cruise ship industry, and inadequate waste management facilities in tourist centers and ports. The latter increases the stress on already over-extended municipal services for wastewater and sanitation. Tourism has also contributed to the local demise of conch, lobster and finfish populations. Of special concern is the overexploitation of breeding aggregations of Nassau Grouper, an important predator on the reef. Once virtually unknown, these aggregation sites have become increasingly vulnerable to harvesting by artisanal fishers, leading to significant changes in biological community structure and ecology of reefs within the system. Lack of information on sources and sites of development impacts downstream contributes to the absence of uniform standards with regard to effluent and receiving water quality, lack of rigor and consistency in the application of environmental impact

assessment to coastal development projects, and in the permitting and enforcement regime governing resource harvests. This had led to distortions in the distribution of MBRS benefits and costs, thereby eliminating disincentives for unsustainable use.

*Lack of Public Awareness:* Contributing to the fragmented approach to coastal resource management and to unsustainable use practices is the lack of public awareness of the intrinsic value of the MBRS and of the costs of inadequate protection in terms of loss of goods and services it provides. Creating this awareness will be essential to building and maintaining a constituency of support for national and regional level actions required to ensure the sustainability of the MBRS.

*Inadequate Protection of Marine Biodiversity:* Despite efforts by the four countries to expand the system of marine reserves within their national waters, protection of the key habitats and biological communities that comprise the MBRS and of the processes that ensure its integrity and productivity—and contribute to its resilience—is still inadequate. Knowledge of system boundaries, of the locations and linkages between source reefs and sink reefs (often in different countries) and the factors that affect them, is limited. Coordination between countries in the management of adjacent or transboundary habitats is *ad hoc* or non-existent. Finally, the availability of trained personnel in coral reef monitoring and in the essential tools of marine protected area management is uneven, hindering coordination across countries and severely limiting management effectiveness within several MBRS countries.

#### *Governments' strategy*

Recognizing, on the one hand, the importance of the MBRS to the economy of the region and to the natural and cultural heritage of its people, and the increasing threats to its overall health on the other, the leaders of the four countries bordering the MBRS convened in Tulum, Mexico in June 1997 to pledge their commitment to protecting this outstanding resource. The Tulum Declaration called on the four littoral states of the MBRS and its partners in the region to join in developing an Action Plan for its Conservation and Sustainable Use. The Central American Commission on Environment and Development (known hereafter by its Spanish initials, CCAD), comprised of the Ministers of Environment of the seven Central American countries and Mexico (as an observer), approached the GEF through the World Bank to request support for the design of the Plan and a strategy for its implementation. With PDF Block A and Block B funds from the GEF and technical support from the World Bank, IUCN, and WWF, CCAD convened a multi-stakeholder workshop and subsequent working groups of scientists, managers, governmental and non-governmental representatives from the four participating countries to draft an Action Plan for management of the MBRS.

The Action Plan, which provides the basis for a comprehensive, 15-year program of regional and national level activities aimed at safeguarding the integrity and productivity of the MBRS, was adopted in June 1999. Regional activities outlined in the Action Plan focus on four thematic areas: (1) Research and Monitoring, (2) Legislation, (3) Capacity Building, and (4) Regional Coordination. Specific regional activities include the establishment of a regional system of Marine Protected Areas to ensure the representativeness of MBRS ecosystems and the overall functionality of the barrier reef system within a protected area framework; the design and implementation of a regional program to monitor MBRS health; the mapping of coastal environments using GIS; monitoring of MBRS 'indicator species' such as the Nassau Grouper; the exploration of more sustainable alternatives to fishing; design and establishment of a regional database on MBRS resources and dissemination of information; development of a tourism Environmental Certification Program for the MBRS region; the establishment of bi-national and tri-national commissions to facilitate policy dialogue, harmonization of legislation and the management of natural resources in trans-border areas; training for personnel and infrastructure support to institutions along the MBRS; development of a communication strategy; and stimulation of participation by local communities and ethnic groups in issues related to the management of MBRS resources.

At the national level, activities are also dispersed across four thematic areas: (1) Monitoring and Research, (2) Sustainable Use, (3) Capacity Building of National Institutions, and (4) Inter-sectoral Coordination. National activities outlined in the Plan are not the same in all MBRS countries, depending on the need and capacities within each country in the context of a particular area. Specific national activities include the development of a bio-physical and socio-economic inventory of MBRS resources; assessment of the dependence of tourism and fisheries on MBRS resources; designation of new Marine Protected Areas to increase ecosystem representation; creation of legal instruments to facilitate the co-management of Marine Protected Areas; implementation of actions to protect key species such as manatees, turtles and crocodiles; creation of the legal and institutional framework to ensure sustainable management of fisheries and tourism, including enforcement mechanisms for existing laws; identification, control and monitoring of sources of pollution of the MBRS, including liquid and solid waste; implementation of international Conventions relating to biodiversity and sustainable use of natural resources; and design and implementation of pilot projects in Integrated Coastal Zone Management. To promote these activities and facilitate coordination in the implementation of regional elements of the Action Plan, National Barrier Reef Committees were established in each country.

It is the regional aspects of this plan that form the basis of the current proposal to the GEF. The four countries' commitment to jointly develop an Action Plan for management of the MBRS and their willingness to collaborate in addressing regional threats and common problems, signal a shift in attitude toward a collective strategy to safeguard the sustainability of this shared public good.

### *3. Sector issues to be addressed by the Project and strategic choices:*

In light of this commitment, and the existing gap in mechanisms and resources to promote such regional cooperation, the Project will focus on transboundary threats to the MBRS and the coordinated actions required to address these. A review of the key sector issues and underlying constraints suggested strategic investments in the following areas:

- Establishment and consolidation of a system of Marine Protected Areas that is representative of the biological diversity of the MBRS and which safeguards the processes and conditions required to maintain ecological linkages between components of the MBRS and their continued productivity
- Training and capacity building in agreed protocols for marine ecosystem monitoring and management, and dissemination of information to inform decision-making
- Steps towards the harmonization of policies and legislation governing the use of shared coastal and marine resources.

Supporting these actions requires parallel investments in environmental education and public awareness, and in the institutional arrangements to ensure regional coordination and sustainability in their implementation.

The GEF Project will, therefore, assist the four countries bordering the MBRS to: (i) strengthen existing MPAs in transboundary locations and other key sites; (ii) develop and implement a standardized regional monitoring and environmental information system for the MBRS; (iii) promote measures to reduce non-sustainable patterns of resource use in the MBRS, focusing initially on the fisheries and tourism sectors; (iv) increase local and national capacity for environmental management through education, information sharing and training; and (v) strengthen and coordinate national policies, regulations, and institutional arrangements for marine ecosystem conservation and sustainable use.

In light of the long-term nature of the goals and objectives implied in the MBRS Action Plan and supported under this project, a second strategic choice was made to design the initiative within the context

of a long-term regional program, involving a range of potential partners and stakeholders in a phased approach. This project, therefore, represents Phase 1 of a proposed 15-year Program to achieve the objective of the MBRS Action Plan. Although the Project has been designed as the first phase of a long-term program to achieve a series of ecosystem management, capacity building and regional policy objectives, this proposal requests financing from the GEF for the initial phase only.

These will likely target upstream linkages related to land-based sources of degradation of the MBRS, including strengthening links to the terrestrial MBC Program and longer term measures required to bring relevant legislation and enforcement in each of the four countries in line with agreed regional norms.

### C: Project Description Summary

<u>Project Component</u>	<u>Sector</u>	<u>Cost Incl. Contingencies* (US\$M)</u>	<u>% of Total</u>	<u>GEF Financing (US\$M)</u>	<u>% of GEF- financing</u>
Marine Protected Areas	Environment	5.0	33	2.7	24
Regional Environmental Information System	Environment	4.4	29	2.8	26
Promoting Sustainable Use	ESSD	1.9	12	1.7	16
Public Awareness & Environmental Education	Environment	1.5	10	1.4	12
Regional Coordination/Project Management	Environment	2.4	16	2.4	22
Total		15.2	100	11.0	100

\*Costs only include GEF and country counterpart contributions. They do not include \$9 m in parallel co-financing from other donors which will be programmed across Project components annually. See cover sheet.

The proposed GEF initiative responds to the countries' expressed need for a more holistic approach to managing a shared coastal ecosystem. The Project will create an enabling environment for harmonization of relevant policies and standards governing the use of shared resources. It will disseminate knowledge about the status and value of the MBRS and ensure adequate technical skills across the four countries to support implementation of agreed conservation and management interventions. These regional measures would also be in line with national commitments of the four countries to international Conventions such as the Cartagena Convention and its protocols (SPAW and LBSP), MARPOL, the FAO Code of Conduct for Responsible Fisheries and the Convention on Biological Diversity, and the enforcement of existing national legislation and policies in support of conservation of the MBRS.

#### 1. Project components:

##### **Component 1. Marine Protected Areas (US\$5.0 million)**

*Sub-component A. Planning, Management, and Monitoring of Marine Protected Areas (MPA)*

*Sub-component B. Institutional Strengthening*

Many MPAs in the MBRS exist only on paper and have little or no on-site management. Moreover, a significant number of MPAs lack up-to-date Master and Operational plans and the associated basic infrastructure and equipment needed for their implementation. Even where management plans are in place, there are rarely the monitoring programs needed to detect changes in biodiversity status and other indicators of the effectiveness of protected area management. Also there is almost a universal absence of sound social and economic analysis, financial strategies and fundamental skills required of staff to carry out their core responsibilities. In some countries in the MBRS, given the lack of capacity and trained personnel, public authorities have delegated primary responsibility for MPA management



to NGOs. The project seeks to enhance the capacity of those public sector and non-governmental entities charged with managing marine protected areas through training and technical assistance in the development of MPA management plans, and to assess management effectiveness through an MPA monitoring program. The monitoring program will include, in addition to assessment of biophysical indicators related to environmental health and conservation, evaluation of socio-economic objectives of MPA management in line with the improving livelihoods of surrounding communities.

Support under the MPA component will focus on investments geared toward immediate improvements in MPA protection and management. These include:

- Establishment of MPA Data Baselines and Monitoring Programs
- Development of Management Plans for MPAs
- Basic Equipment and Infrastructure for MPA Plan Implementation
- Transboundary Cooperation in Policy, Protection, and Management of MPAs.

Support will be limited to a total of fifteen MPAs. Eleven of these are already legally established in the MBRS region, while four proposed MPA sites remain to be designated. Criteria for selection of these 15 sites to receive project support, were based on the significance of the protected area in contributing to MBRS ecosystem characteristics, diversity and processes, and their potential importance as demonstration models for effective protected area management and transboundary cooperation. (See Annex 2 for a table and map of these sites.) . The majority of the MPAs (9) are located in the two transboundary areas of the MBRS, the Bay of Chetumal and Gulf of Honduras. In the transboundary areas themselves, there are several MPAs that are separated by national boundaries and managed as separate units. Two of these bi-national MPA complexes, (Xcalak/Bacalar Chico, and Sarstoon-Temash/Sarstún ) situated in the Mexico-Belize and Belize-Guatemala transboundary areas, respectively, will be assisted through the Project with the additional objective of promoting a bi-national approach to their management. Support for development of Management Plans will be selective and based on need. Since long-term management plans exist or are already being developed in 11 of the 15 MPAs, assistance to these sites will be for development of 2 year operational plans (see Annex 2) for a detailed discussion. Only the four sites with no management plans will receive support for the development of 10 year management plans as well as 2 year operational plans, thereby focusing resources where they are needed most. All of these MPAs have or will be established within a framework of multiple use. This includes a core, no-take zone designed to protect the most sensitive and vulnerable biodiversity and ecological processes essential to ecosystem sustainability, surrounded by areas of different but compatible use, including, *inter alia*, low-impact tourism, prescribed fishing, and various forms of reef based aquaculture consistent with local resources and conditions, demand and assessed carrying capacity. Management regimes established under these proposed MPAs sites will serve as regional models for replication and expansion to other protected areas during the Program's future phases. Parallel co-financing of this component from WWF, through their Mesoamerican Ecoregional Project is being targeted toward determination of sub-system boundaries, resource inventories, priorities for MPA management, and evaluation of management effectiveness.

To address the substantial institution building needs in MPA management, regional training courses and workshops for protected area directors, technical staff, rangers, and key collaborators from local and national government agencies, collaborating NGOs and local communities, will be supported under a second sub-component for institutional strengthening. This sub-component will also provide support for a basic standardized training library to all MPA headquarters and ranger stations throughout the MBRS region (approximately fifty offices). This would facilitate continual professional improvement for MPA field staff, who often lack even minimal access to training manuals, natural history publications, and other books on themes relevant to MPA management programs.

## ***Component 2. Regional Environmental Information System (US\$4.4 million)***

*Sub-component A. Creation and Implementation of a Distributed, Web-based EIS*

*Sub-component B. Establishment of a Synoptic MBRS Monitoring Program*

A principal objective of the component is to develop a reliable base of data for the MBRS eco-region and an information system that can be used to support more informed management decisions. The establishment of a regional environmental information system (EIS) will provide an essential tool to organize and manage data in support of improved decision-making. In the Program's initial phase, the objective of the EIS component will be to provide the basic framework to guide the collection, processing, distribution and utilization of data, both bio-physical and socio-economic. This EIS will be linked to Component 4, Public Awareness and Environmental Education. Specifically, the component will assist in the design and implementation of a bi-lingual EIS whose architecture will allow broad access to policy makers, technicians, and the public at large. Significant collaboration has been achieved with WWF, the ICZM Authority in Belize, Amigos de Sian Ka'an, Mexico and the University of Miami, Rosenstiel School of Marine and Atmospheric Studies, in consolidating data into a regional GIS for production of digitized maps and overall contribution to the proposed regional EIS. This collaboration will continue during Project implementation. Data from NOAA and USGS on vulnerability mapping related to climate change will also be obtained for inclusion in the EIS.

To feed into the EIS, this component will also support the establishment of a regional and issue-specific monitoring program that will generate information on the region's oceanographic current regime and its influence on the status and processes of MBRS reefs and other critical ecosystems. Data will be collected on reproduction, larval dispersal, and recruitment of corals, fish, and other important reef components to further our understanding of ecological linkages between reefs and other marine environments, and processes which influence reef integrity. Substantial parallel co-financing from WWF, the Government of Canada and University of Miami has been earmarked for investigators working in the region to expand the scope of this research. The Canadian grant is dependent on approval of the GEF grant.

## ***Component 3. Promoting Sustainable Use of the MBRS (US\$1.9 million)***

*Sub-component A. Promotion of Sustainable Fisheries Management*

*Sub-component B. Facilitation of Sustainable Coastal and Marine Tourism*

There is growing evidence that non-sustainable resource use practices in aggregate are beginning to affect the overall health of the MBRS. The objective of this component is to support the introduction of new policy frameworks and management tools to increase institutional capacity, disseminate key information and create the necessary incentives for stakeholders to shift toward patterns of sustainable use of MBRS resources. This component will initially focus on the two most important and potentially harmful economic sectors dependent on the MBRS, fishing and tourism.

The fisheries sub-component will address some of the causes of overfishing by supporting: (i) monitoring and management of spawning aggregation sites, (ii) improved institutional capacity in sustainable fisheries management, and (iii) promotion of alternative livelihood systems. The last includes training fishermen in kayaking, catch and release fly-fishing, SCUBA and recreational water sports and tour guide operations associated with Marine Protected Areas and other tourist destinations. These tour operations have been successfully piloted in fishing communities in Southern Belize with the support of local NGOs. This component and the one below will be closely linked to mitigation of economic displacement (as defined under the Bank's safeguard Policy OD 4.3 on Involuntary Resettlement) that may occur in the context of MPA establishment and enforcement (see Annex 16). This sub-component will be complemented by parallel financing from the Oak Foundation (US\$600K) for fisheries co-management arrangements in relation to MPAs and for related policy reform.

The objective of the tourism sub-component is to formulate and facilitate the application of policy guidelines and best practice models for sustainable coastal and marine tourism in the four countries of the MBRS. Adoption of industry codes of conduct may then lead to regionally recognized certification schemes for tourist operations and eventually entire destinations within the MBRS. Activities under this sub-component include: Regional Policy Dialogue and Cooperative Action Forum; Catalogue of Exemplary Practices;<sup>1</sup> a Regional Environmental Certification Program; and a Marine Tourism Exemplary Practices Study Tour.

***Component 4. Public Awareness and Environmental Education (US\$1.5 million)***

*Sub-component A. Development of an Environmental Awareness Campaign*

*Sub-component B. Formal and Informal Education*

A critical element in developing the political will and policies required to manage the MBRS sustainably will be building the necessary public support to catalyze change. The objective of this component is to create a constituency for conservation of the MBRS in the region. This will be done by increasing awareness of the value of the MBRS and fostering an understanding among the general public of the impacts of development on this world-class resource. Through information networking and discussion fora, it will seek to introduce environmental and social sustainability criteria into decision-making. Activities under this component include establishment of an MBRS database and information clearinghouse (linked to Components 2 and 3), production and dissemination of education materials, and regional workshops and conferences for professionals in the industrial and tourism sectors that directly affect MBRS resources. It will also provide training for community leaders who exert strong influence on MBRS stakeholders.

***Regional Coordination and Project Management (US\$2.4 million)***

The MBRS Program will be coordinated under an organizational framework that balances regional and national representation across the four participating countries. At the policy level, the Program will be coordinated by the MBRS **Regional Steering Committee (RSC)**, made up of representatives from CCAD and the participating National Barrier Reef Committees. The RSC will provide overall policy guidance on objectives of the Program, and coordinate the participation of national, regional, and international government and NGO counterpart organizations in its implementation. The RSC will liaise with other potential partners within and outside the region to attract additional co-financing for the program over the long term. It will review and approve annual work plans and resolve coordination issues that may arise between countries. The RSC will be supported by a **Technical Advisory Committee (TAC)** composed of internationally recognized experts in the fields relevant to MBRS Program objectives. The TAC will be responsible for advising the PCU on technical matters which may arise during the implementation of the Program. Members will provide technical input for the design and review of annual work programs and serve as information gateways to state of the art management, good practice, and professional networks in the areas of MPA management, sustainable coastal tourism, regional fisheries management, coral reef ecosystem monitoring and EIS, and environmental education and outreach. The TAC will also serve as an “honest-broker” to the PCU with respect to resolution of technical issues under the Project that may be particularly contentious. The TAC will provide advice on an as-needed basis and will convene electronically to provide timely input to annual work plans. A **Program Coordination Unit (PCU)** will be responsible for direct implementation of the Program, with technical support provided by **Regional Technical Working Groups (TWG)** made up of appropriately selected representatives from the National Barrier Reef Committees

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<sup>1</sup> “Exemplary” refers to those practices that have been shown to produce superior results; elected by a systematic process; and judged as exemplary, good, or successfully demonstrated. The practices then need to be adapted to fit a particular organization and are practiced by exemplary operators.

and supporting local institutions. These will be complemented by regional/international consultants on an "as-needed" basis.

## *2. Key policy and institutional reforms supported by the Project:*

The key policy reforms promoted by the Project will be agreement on and initiation of steps toward regional harmonization of the policy and regulatory framework surrounding the use of shared resources of the MBRS and the protection of vital elements and processes essential to its health and productivity. These steps include institutional arrangements (such as creation of regional fora for technical and policy dialogue, dispute resolution, local governance initiatives, including participatory management by local communities of resources associated with adjacent MPAs), an informed public and political constituency, regional codes of conduct, and draft regulations in support of harmonized policies and legislation related to:

- Establishment, management and enforcement of Marine Protected Areas
- Sustainable harvesting of commercially valuable species of shellfish and finfish and protection of threatened and endangered species, (e.g., sea turtles, manatees, black coral)
- Consistency in scope and application of environmental impact assessment; land use planning and zoning in coastal areas, particularly as they relate to tourism
- Adoption of best practice and a regional environmental certification system for the tourism industry
- Standards and maintenance of coastal water quality and a region-wide reporting system.

A Policy Working Group will support reforms in these key areas by assisting the regional TWGs to formulate policy recommendations related to these issues and ensuring that these are raised through the CCAD for consideration at the highest levels of decision-making.

Institutional reforms supported by the Project include creation of a mechanism for regional dialogue and coordination in the management and monitoring of the MBRS as a shared, transboundary public good; the establishment and maintenance of multi-stakeholder coral reef committees, which reflect diversity in culture and gender in each country to promote integrated sectoral planning and management of the barrier reef; and a formal process of consultation and ownership in the design and implementation of a long-term program to conserve the MBRS. These reforms will help build institutional capacity in the region and enhance the sustainability of efforts to protect and manage the marine elements of the Mesoamerican Biological Corridor (MBC).

## *3. Benefits and target population:*

Project benefits mainly revolve around conservation outcomes and opportunities for sustainable use of the MBRS and its resources. These are the result of a system-wide approach to coastal and marine resource management that enhances regional cooperation, uniform and high performance standards and sustainability of outcomes. The Project's transboundary focus fills a gap created by historically national and sector specific management interventions. Beneficiaries of the Project include:

- The region and the global environment, through protection of important biodiversity and other vital environmental goods and services

- The four countries bordering the MBRS (e.g., Belize, Honduras, Guatemala and Mexico), which may use environmental diplomacy to advance regional economic integration objectives under the Central American System of Integration (Sistema de Integración Centroamericano-SICA), of which CCAD is a part.
- Local populations currently dependent on the resources of the MBRS, or those whose livelihoods may be affected by the creation of Marine Protected Areas, and which could be improved through access to new opportunities for sustainable enterprises based on the resources of the MBRS. These beneficiaries include indigenous groups, such as Garífuna communities along the coasts of Belize, Honduras and Guatemala; Mayan communities in frontier areas between southern Belize and Guatemala; Miskito communities along the southernmost margins of the MBRS; and Ladino populations who have moved in more recently to coastal areas and tourism destinations in search of employment, who may be in conflict with more traditional MBRS resource users. Women in all these groups represent a subset of beneficiaries who will be targeted under the Project. While traditional use has focused primarily on fishing and coastal agriculture, many of the communities, and particularly women, have expressed interest in becoming involved in tourism—either cultural or nature-based—in association with Marine Protected Areas. Training in alternative livelihood schemes would be both gender and culturally oriented.
- Fishing cooperatives (such as the Belize Fishermen Cooperative Association, the National Fishermen Cooperative, the Placencia Cooperative, and Asociación de Pescadores de Manabique), which would benefit from improved information on resource states and non-destructive fishing methods, and consistency in the timing and enforcement of closed seasons and no-take reserves in transboundary areas of the MBRS.
- NGOs (such as TIDES, Belize Audubon Society, Green Reef, BELPO, Fundación Mario Dary, FUNDAECO, Honduras Coral Reef Fund, PROLANSTATE, BICA, Amigos de Sian Ka'an, ECOSUR as recipients of equipment, information and training, etc.); the scientific community, which will benefit from the information within the EIS; etc.
- Private sector, including the tourism industry (through study tours in best practice, a regional environmental certification program, discussion fora with industry counterparts in the region), fisheries and cruise ship industries, etc.
- Donor community, through strategic programming of resources and improved coordination in project/program implementation to achieve greater regional impacts
- Regional institutions, like CCAD, which will be strengthened through increased synergy among projects implemented under the MBC umbrella, decentralized project coordination units, and improved information access and outreach.

Specific Project benefits include the following:

- Improvements in MPA networks, monitoring and management with emphasis on sustainability of efforts (includes basic equipment and infrastructure to implement management plans)
- Enhanced capacity in the region to monitor health of the MBRS and make information available to decision-makers/policy-makers and to stakeholders at the local level
- Improved livelihoods for local communities through better environmental management, skills and entrepreneurship training, education and technologies for sustainable income generation

- A regional constituency for conservation of the Mesoamerican Barrier Reef System as part of the MBC
- Mechanisms for sustained regional cooperation in managing the MBRS at the policy, information and technical levels
- Improvements in the overall health of the MBRS environment, as measured through proxies like water quality, biological community stability, biological productivity, local recovery from periodic disturbances, etc.).

*4. Institutional and implementation arrangements: (See Annex 2 for a more detailed discussion of these arrangements)*

CCAD will be the implementing agency for the MBRS Program and will oversee execution by the PCU of the five year Project proposed during Phase 1 (see Figure 1). Additional resources have been allocated toward strengthening the technical and supervisory capacity of CCAD HQ in San Salvador in the administration of this project. This includes the hiring of a technical staff member to oversee project execution and to liaise with Senior Management on policy issues requiring the attention of CCAD members (e.g., the Council of Environment Ministers). As part of this liaison role, closer integration with the terrestrial regional Mesoamerican Biological Corridor Program implemented by CCAD will be sought, as well as links to Bank implemented MBC projects at the national level, where relevant. To assist CCAD in integrating environmental concerns into the larger development context of the region, the Bank in its dialogue with clients will highlight the role of CCAD in mainstreaming environment and the need to ensure CCAD's institutional sustainability. At the policy level, the Project will be coordinated by a Regional Steering Committee (the RSC) made up of the Executive Secretary of CCAD or his delegate, and the National Coordinator for the MBRS Project in each country. The regional PCU, based in Belize, will be responsible for direct implementation of the five year Project during the Program's first phase. The participating countries will be responsible for implementation of existing laws and regulations related to the use of MBRS resources, including frameworks for their conservation, (e.g., Marine Protected Areas, bans on harvesting of threatened and endangered species, zoning of coastal landscapes, and creation of fishery reserves, closed seasons and permitting systems). The PCU will be supported by the Technical Advisory Committee (TAC), a roster of internationally recognized experts in the technical areas of project assistance, who have agreed to serve as advisors to the PCU and may be called on, as needed.

Given the perspective of the Action Plan's 15-year implementation period, the ultimate objective is to transform the PCU into a technical center of excellence for coastal and marine resources management in the region, under the mantle of CCAD. Institutional strengthening will be achieved over time, through the hiring of skilled technical specialists to coordinate the program in its various phases, and through networking with research institutions and other organizations working with state of the art methods for coral reef ecosystem management. During the project's first phase, technical support will be provided to the PCU by the Regional TWGs, complemented by regional/international consultants on an "as-needed" basis.<sup>2</sup> The TWGs will be supported by the Policy Working Group (see below under Project Rationale). Program activities under each of the four proposed components: Marine Protected Areas; Regional Environmental Information System (EIS); Promoting Sustainable Use of the MBRS; and Public Awareness and Environmental Education, will be executed by a mix of local and regional entities. Administrative support to the PCU will be provided by UNDP in the form of international procurement and management and disbursement of project funds (see Annex 6).

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<sup>2</sup> Costs of consultants have been budgeted for under the respective components.

## **D: Project Rationale**

### *1. Justification for Project design and alternatives considered and reasons for rejection:*

The MBRS Program objectives are ambitious and institutionally complex. In light of this and the longer-term time frames required to achieve goals related to environmental quality and policy reform, a gradualist approach was incorporated into Project design. The time frame was shifted from an initial 5 year Project to a proposed 15 year Program. The current Project represents the first phase of a 3-phase Program whose design will be ongoing and will depend in part on the results of the initial 5 year effort. Phase 1 will focus on institutional coordination and strategic interventions in capacity building, public awareness and policy reform to lay the groundwork for future interventions. Rather than seek to achieve lasting impact on the ground in Phase 1, this incremental approach provides the basis for a sustained effort with the opportunity to build and expand on successful activities initiated in the first phase, leading to a scaling up of Project scope and impact over the life of the Program.

Achieving institutional change is a long-term proposition, particularly when it entails strengthening and harmonizing national policies, regulations, and institutional arrangements over four countries. During the Program's initial phase, institutional and policy objectives will be identified by TWGs in each thematic area with the help of a Policy Working Group composed of experts in environmental law and natural resources management policy from the region. The role of the Policy Working Group will be to assist the TWGs in the identification of priority "soft" policy objectives, achievable in the short term, which would be required to harmonize national regulatory frameworks with agreed regional frameworks governing the use of the MBRS. These might include standards for coastal water quality, application of EIA and zoning requirements for coastal tourism development, waste management in tourist facilities, construction and setbacks along the coast, permitting for recreational use of MBRS resources, and regulations governing the seasonality, minimum size, gender and maximum harvest of commercial fish stocks, and the establishment of port state control in major ports of the MBRS. In addition, support for the introduction and adoption of best practices among small hotel and dive tour operators, cruise ship and live-aboards in the region will be promoted. The Project would support compliance with these standards through facilitating transparency in their application and monitoring, and the use of economic instruments as incentives for their adoption. The Policy Working Group will liaise closely with CCAD and its legal office to ensure that policy objectives under this phase of the Project are raised to the highest levels for consideration within the System for Central American Integration (SICA). Performance benchmarks to indicate progress toward policy harmonization will be agreed during PY1. A performance indicator of overall progress in policy harmonization has been included in Annex.

To help guide the direction of the overall Program in the medium to long term, an analysis of various development scenarios for the MBRS region, based on national economic development plans and data from the Sistema de Integración Centroamericana (SICA) will be undertaken at the beginning of PY2. The study will look at likely sectors of economic growth, such as tourism, fisheries and agriculture, demographic trends, and their impacts on the coastal zone. These growth scenarios will be examined in light of current national policies and legislation governing use of shared resources of the MBRS, and the environmental policy agenda of CCAD. Areas of convergence between high impact scenarios and CCAD's environmental agenda will identify synergies which the Project can help promote over the medium to longer term. Where unsustainable growth scenarios signal the need for major policy shifts or closure of gaps in existing legislation, the MBRS Project can focus attention on those with direct impact on the health of the MBRS during subsequent phases and work with CCAD to put these issues on the Agenda of SICA to bring regional development agendas in line with environmental policies objectives. Investments and technical assistance required to support shifts in policy to offset unsustainable development trends, will be identified and designed into subsequent phases of the Program.

to ensure that follow on phases are consistent with projected development outcomes in the region. External funding will be sought for this study.

A second consideration in Project design was geographic focus. An early proposal by other coral reef countries in the region to be included in the Project was rejected because of the difficulty in coordinating activities over such a wide area. The decision to include only Mexico, Belize, Honduras and Guatemala in this initial phase was a result of the high level of political commitment manifested in the Tulum Declaration and subsequent agreements among the four countries, and their common stake in a shared resource. Furthermore, because it was not deemed possible to implement activities equally across an area as large as the MBRS, a phasing of Project focal areas was also adopted:

- In the first phase, many of the field-based interventions are concentrated in the MBRS's two trans-boundary areas: Chetumal Bay to the north (involving Mexico and Belize) and Gulf of Honduras to the South (where the frontier areas between Belize, Guatemala, and Honduras overlap). This is also consistent with the regional orientation of Phase 1, in which the incremental (or supra-national) aspects of marine ecosystem conservation and management are being supported.
- The geographic scope of the Program may be expanded in subsequent phases to include source reefs for recruiting larvae outside the MBRS—as far as Brazil, in the case of lobster and other highly dispersing species. Parallel initiatives recently underway or planned, e.g., in San Andres, Colombia under Coralina, and in Nicaragua and other parts of Central America, may be linked to achieve critical mass and economies of scale in, for instance, MPA training and environmental education.

Conservation of terrestrial and aquatic systems upstream in watersheds emptying into the MBRS are likely to be the focus of subsequent phases of the Program, in light of the clear linkages between these systems and the coastal zone. The impact of sedimentation and nutrient runoff from poor land use and agricultural practices on coral reefs is well documented. In light of anticipated increases in demographic pressure in the watersheds and coastal plains of the MBRS over the next 10-15 years, a strategic shift in focus landward will be required in subsequent phases of the project to offset major land-based threats to the sustainability of the MBRS. Riverbasin modeling of the impacts of climate change and land use in Caribbean watershed on habitats and processes downstream, along with economic models of the value and use of MBRS resources over the next decade, referred to earlier, are among the analytical tools that will be applied in the design of follow-on phases.

The environmental information system, sustainable use, and MPA components of the Project have been designed incrementally, with the intent of expanding these in subsequent phases of the Program. Support for pilot activities in MPA monitoring, tourism and alternative livelihoods has been designed to test the feasibility of specific enterprises and policies. This can be scaled up during later years of the Program to launch successful initiatives throughout the MBRS and other parts of the MBC.

Finally, although maritime pollution and habitat degradation related to shipping (including impacts from cruise ships) and inadequate port reception facilities were identified as a significant trans-boundary threats, the Project will not address these issues. These are currently being addressed by other donors, such as WWF and USAID, and will form the basis for a complementary regional project, currently under preparation in the Gulf of Honduras, to be executed by the IDB with GEF support.



2. Major related Projects financed by the Bank and/or other development agencies (completed, ongoing and planned):

Sector issue	Project	Latest Supervision (Form 590) Ratings (Bank-financed Projects only)	
Bank-Financed		Implementation Progress (IP)	Development Objective (DO)
Other development agencies	Mexico Mesoamerican Biological Corridor Project (World Bank/United Mexican States)		
	Conservation of Sarstoon-Temash Protected Area (World Bank/GEF MSP and Government of Belize)		
	Honduras Sustainable Coastal Tourism Project (World Bank/IDA; Honduras Institute of Tourism)		
	Biodiversity in Priority Areas Project (World Bank/UNDP/GEF/Gov. of Honduras)	U	S (GO)
	Social Investment Fund (Gov. of Honduras/World Bank)		
	Honduras Natural Disaster Mitigation		
	CCAD MBC Imp. Communications Strategy (IDF regional)		
	Costa Rica Biodiversity	HS	HS
	Costa Rica Ecomarkets		
	National Environmental Management Project		
	Nicaragua Atlantic Biodiversity Corridor	S	HS (GO)
	Panama Mesoamerican Biological Corridor	S	S (GO)
	Regional Project for the Conservation of the Mesoamerican Biological Corridor (UNDP/GEF; CCAD)		
	Conservation of the Mesoamerican Caribbean Reef Ecoregion (WWF)		
	PROARCA COSTAS (Co-financed between USAID and the Nature Conservancy (TNC), WWF, University of Rhode Island/Coastal Resources Center (URI/CRC)		
	Caribbean Coastal Marine Productivity Program (CARICOMP)		
	Global Coral Reef Monitoring Network (GCRMN) (Intergovernmental Oceanographic Commission/Subcommission for the Caribbean)		
	Quintana Roo Integrated Coastal Zone Management Project (Amigos de Sian Ka'an, University of Quintana Roo; USAID)		
	Conservation of the Barrier Reef Complex of Belize (Coastal Zone Management Authority and Institute, UNDP/GEF)		
	Trinational Alliance for Conservation of the Gulf of Honduras (PROARCA/COSTAS)		
	Bay Islands Natural Resources Management Project (Honduran Institute of Tourism, IDB)		
	Secondary Cities Project (Gov. of Honduras/IADB)		
	Laughing Bird Caye National Park (GEF)		
	Slackchwe Habitat Enhancement Project (GEF)		
	Land Administration Project # 1 and #2 in Belize (IDB)		
	Sustainable Tourism Strategy for Belize (IDB)		

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

Of direct importance to the current MBRS Program are several regional and national initiatives dealing with the MBRS and with natural resources management in the western Caribbean (a comprehensive list of regional projects is listed in Annex 13, Matrix 3). Activities totaling US\$40 million related to coastal and marine resources management are currently ongoing in the region, and others are in preparation. Still others, such as the regional UNDP/GEF project for consolidation of the MBC being implemented by CCAD, and the complementary suite of national MBC projects (including corridor projects in Mexico, Honduras and Belize) under implementation with GEF, Bank, UNDP and UNEP support, focus on terrestrial biodiversity conservation, but with potential downstream linkages to coastal and offshore processes. CCAD's role as implementing agency for both the terrestrial and marine regional programs to consolidate the MBC will ensure in-house coordination between the two, realize efficiencies in project implementation and reporting/outreach, and maximize policy objectives under the two programs where they are mutually reinforcing.

At the regional level, the coastal resources management component of the regional environmental project for Central America, PROARCA-COSTAS, is co-financed by USAID with matching funds provided by international NGOs: The Nature Conservancy (TNC), World Wide Fund for Nature (WWF) and the University of Rhode Island/Coastal Resources Center (URI/CRC). The Project supports capacity building and empowerment of local communities in the development of strategies for the sustainable use of coastal resources focusing on pilot areas in Belize, Guatemala and Honduras. WWF's regional initiative, Conservation of the Mesoamerican Caribbean Reef Ecoregion, is being designed in coordination with the GEF MBRS Project, and is intimately linked to the Phase 1 Project. It focuses on biological assessment of the MBRS region, mapping and determining priority interventions to address root causes of resource degradation from a biodiversity conservation perspective.

There are numerous ongoing international and regional programs providing technical assistance in coastal resources assessment, monitoring and capacity building. These include the Caribbean Coastal Marine Productivity Program (CARICOMP) and the UNEP-coordinated Caribbean Environment Program (CEP). Also, the Global Coral Reef Monitoring Network (GCRMN), operating through its Caribbean sub-node, is supported by various international and regional organizations with local coral reef monitoring carried out with government and NGO staffs in all four MBRS countries. The Intergovernmental Oceanographic Commission/Subcommission for the Caribbean is coordinating support to countries in the wider Caribbean region to ratify and adopt actions under the protocols of the Cartagena Convention; it supports scientific research, training and monitoring of oceanographic, fisheries and biological diversity parameters. There are also various projects under preparation with financing from, *inter alia*, the GEF, IDB, UNDP, GTZ, USAID, DANIDA, and other bi- and multilaterals in support of conservation of coastal and marine resources. There is currently a GEF Block B proposal being prepared by the IDB, with the Bank as implementing agency, to address maritime pollution and other port related environmental issues in the Gulf of Honduras. Port and ship based pollution were identified as major threats to the MBRS in the Threat and Root Cause Analysis.

At the national level, several projects stand out due to their direct relevance to the MBRS. Among these, the Conservation of the Barrier Reef Complex of Belize (Coastal Zone Management Authority and Institute, UNDP/GEF) has provided a strong foundation for Integrated Coastal Zone Management in Belize, an essential component of any long-term strategy to conserve the Belize Barrier Reef, a major constituent of the MBRS. The WB/GEF Regional Project builds on the national project as a critical baseline for addressing transboundary issues related to the sustainability of the MBRS on Belize's northern and southern frontiers. These include the identification and monitoring of non-point source pollution from the Rio Hondo into the Bay of Chetumal and similar run-off and water quality issues in the Gulf of Honduras in the tri-national border between Belize, Guatemala and Honduras—issues that the national project cannot address in isolation.

The regional project also provides support for the establishment of bi- and tri-national protected areas in these transboundary areas, building on the existing national MPAs in Belize, to increase capacity for management of upstream/downstream impacts and ecological connectivity between adjacent elements of the same larger ecosystems. Bi- and tri-national MPA working groups will be established in these areas to ensure coordination in the development and implementation of strategic management plans that are consistent with principles of transboundary management and are harmonized in terms of regulations and enforcement. Strategic support for protected area management planning of MPAs located outside the transboundary areas in Belize will target those MPAs that do not have long-term strategic management plans or operational plans. MPA management training and TA in coral reef monitoring will be provided on a regional basis to countries in the MBRS according to assessed needs. Similarly, the regional Coral Reef Monitoring and EIS to be established under the MBRS Project will build on existing data bases, mapping and GIS capacity that currently exist within Belize, as determined through extensive analysis carried out during Project preparation.

Coordination with UNDP and synergies between the national and regional initiatives will be ensured by close technical cooperation between the implementing agencies and joint representation on Project Advisory Committees. This is further reinforced by virtue of the Director of the Executing Agency (the ICZM Authority) for the UNDP/GEF Project also serving as Belize's National Coordinator of the MBRS GEF Regional Project. The PCU for the WB/GEF MBRS project and PIU for the UNDP/GEF Project will be housed in the same building that will house the Coastal Zone Management Authority and Institute and Caribbean Fisheries Resource Assessment and Management Project (CFRAMP) on the grounds of the Department of Fisheries in Belize City.

Another important national initiative in Mexico involves the southern Quintana Roo Integrated Coastal Zone Management Project (Amigos de Sian Ka'an, University of Quintana Roo, USAID). This Project has resulted recently in the successful designation of Xcalak Marine Park in the northern transboundary area between the state of Quintana Roo, Mexico and northern Belize. This is one of the fifteen MPAs that will be strengthened under the GEF MBRS Project through design of protected area management plans and training.

Other initiatives contributing to implementation of the MBRS Action Plan include the Trinational Alliance for Conservation of the Gulf of Honduras (currently developing new project initiatives) supported by PROARCA/COSTAS, and several small projects related to protected area management of both coastal and near-coastal protected areas, supported by local and international NGOs, private entities, national and state governments, bilaterals and IFIs. Two projects in Honduras, the Bay Islands Natural Resources Management Project, a US\$24 million project to protect the terrestrial and marine environment of the Bays Islands, being implemented by the Honduran Institute of Tourism (IHT) with financing from IDB, and the Honduras Sustainable Coastal Tourism Project (a World Bank/IDA financed LIL being prepared in parallel with the MBRS GEF project), are baseline and related co-financing activities designed to support marine protected area management and sustainable tourism in this portion of the MBRS. Opportunities exist to link another Bank financed project in Honduras, Disaster Mitigation, and its early warning system, with the environmental monitoring and regional EIS being established for the MBRS under component 2.

A major challenge for countries and partners in the region will be to organize these and future efforts into a comprehensive framework that supports implementation of the Action Plan for Conservation and Sustainable Use of the MBRS. The Threat and Root Cause Analysis prepared under this Project provides a useful reference point and tool for such an approach. Members from the international and NGO communities, and possibly the private sector will form a Consultative Group to liaise with other donors and to secure and consolidate investments in the MBRS that address priority needs and resource gaps over the course of the 15 year Program.

### *3. Lessons learned and reflected in proposed Project design:*

Experience with regional seas programs elsewhere has taught that creating a common stake in the future of a shared resource and a sense of ownership in the management process is essential to the sustainability of any collaborative effort. Gaining the commitment of stakeholders to regional cooperation to solve system-wide, transboundary issues requires consultation and consensus and a reaffirmation of the benefits of regionalism vs. a more fragmented, nationalist approach. This in turn requires public awareness and dialogue to create a strong constituency for the harmonization of policies and enforcement of legislation that will sustain such a regional approach. Aligned with this must be adequate resources to absorb the incremental costs of conservation and economic tradeoffs in the interests of the regional, public good. The current Project has been designed with significant consultation at the policy and technical levels. An ongoing social assessment will help ensure ownership at the local level for actions that will generate conservation and socio-economic benefits to local communities. Continuous policy dialogue will be an important element of the regional Project and program. Implementation of Phase 1 by CCAD will promote cross-country dialogue on MBRS issues of regional importance, and help elevate policy concerns to the highest political levels. CCAD's implementation of the complementary regional MBC project with assistance from the GEF and UNDP will promote integration between terrestrial and coastal/marine objectives to safeguard the MBC, and harmonization of sectoral policies (e.g., in agriculture, water, tourism and infrastructure) among the countries concerned to support these objectives.

Another important lesson learned from natural resource and environmental projects around the world is that these are necessarily long-term efforts, requiring sustained commitments of political will and resources. This is even truer of regional initiatives, whose scope and implementation are more complex and thus require more time to achieve stated goals. Bearing this in mind, the current Project has been designed as part of a 15 year Program. A phased approach will allow for steady progress toward realistic objectives in the near to medium term, building toward achievement of program goals in the longer term. A commitment in principle to the longer-term goals and the resources required to achieve them, based on interim performance and outcomes, should create the incentives for success at each stage. This in turn should attract more resources from partners and other potential donors, and a better integration of investments in the region, reinforcing the success of the long-term effort.

### *4. Indications of recipient commitment and ownership:*

The program aims to build on the foundation established in June 1997, through the Tulum Declaration, in which the Presidents of Mexico, Guatemala, and Honduras and the Prime Minister of Belize publicly affirmed the global biological, economic and cultural importance of this shared resource to their nations' future. At the same time, they acknowledged serious threats to the sustainability of this unique system, and the urgent need to initiate actions to counteract them. The four leaders committed themselves to initiate a process of active collaboration in the preparation and implementation of an Action Plan for Conservation of the MBRS.

The Plan was endorsed by the four countries in June 1999, and GEF PDF support for the preparation of a program to implement regional elements of the Action Plan was successfully leveraged at a ratio of nearly 3:1. Reaffirmation of the Action Plan and commitment to the Tulum Declaration was witnessed at two recent ministerial level events that took place in March and April 2000. Both were held in Tulum, to commemorate the initial event: the Gift to the Earth ceremony sponsored by WWF, in which the four countries pledged their support to protect the MBRS, and the third MBRS regional consultation to review Project preparation under the current Bank/GEF initiative. Both resulted in the necessary political commitment and counterpart financing to undertake a regional Project of this complexity.

The four countries are also signatories to a number of key conventions at the regional and global level. These legal agreements will be used as the basis for harmonization of policies and legislation required to implement a region-wide plan for the conservation of a unique transboundary ecosystem, and for the equitable and sustainable use of its resources. Support for these legal agreements includes the following: Belize ratified the Convention on Biological Diversity (CBD) on December 30, 1993, and is a signatory to CITES, the Convention on the Law of the Sea, Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention 1972) and the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). Guatemala ratified the Convention on Biological Diversity on July 10, 1995, and is a signatory to the Ramsar Convention, CITES, Law of the Sea, and London Convention 1972. Honduras ratified the Convention on Biological Diversity on July 31, 1995, and is a signatory to Ramsar, CITES, Law of the Sea, and London 1972. Mexico ratified the Convention on Biological Diversity on March 11, 1993. In May 1996, the Government of Mexico published its program on Natural Protected Areas 1995-2000, outlining a strategy and action plan for effective protected area management.

##### *5. Value added of Bank and global support in this Project:*

The GEF's role in this Project is essential. The majority of issues being addressed under this Project are transboundary in character, thus the incremental cost aspects can only be adequately addressed through grant support.

The World Bank brings to this Project its considerable capacity to address marine-related environmental issues and its ability to convene governments around issues of common concern. The Bank has extensive experience in the design and implementation of regional seas programs around the world, and has been a long-standing member and active supporter of the International Coral Reef Initiative, with a growing portfolio of coral reef related operations currently valued at nearly US\$100 million.

More specifically, the Bank, through an IDA credit to the Government of Honduras, is considering investing in baseline costs related to the establishment of a framework for sustainable tourism along Honduras's northern Caribbean coast. This area includes the mainland coast from Puerto Cortez to Trujillo and the offshore Bay Islands—the southeastern-most extension of the MBRS. The US\$5.0 million credit is being designed as a Learning and Innovation Loan (LIL), in parallel with the GEF regional MBRS Project. The objectives of the LIL are to create an enabling environment—through policy dialogue, capacity building at the municipal and local community level, and support for innovative public-private partnerships—for the sustainable development of tourism within the coastal zone of the MBRS. The Project would pilot the establishment of environment and tourism technical units within each participating municipality to oversee environmental assessment requirements in relation to tourism development proposals; specialized training in tourism related services to local stakeholder groups; dissemination of best practice in the coastal tourism industry and a regional environmental certification program to encourage its adoption; and an innovation marketplace to promote new ideas and opportunities for small-to-medium enterprise development in the coastal tourism sector. These activities are being designed to serve as demonstrations for sustainable tourism development in other parts of the MBRS. Through its work with indigenous groups in the coastal zone, the LIL would also inform the community based management activities under the MPA and sustainable use components of the MBRS regional Project.

In addition to the IDA credit, the Bank has partnered extensively with the GEF in investments to consolidate and conserve the terrestrial portion of the MBC. The Bank has been successful in leveraging additional financing for these investments from bilaterals, such as the Netherlands and the United States, the EU, the IDB and from the countries involved. Together these investments form a critical mass of support for regional cooperation in the conservation of globally important transboundary ecosystems, and in building the capacity—institutional, financial and human—to achieve these objectives.

## **E: Summary Project Analyses**

### *1. Economic (supported by Annex 4 Incremental Cost):*

☐ Cost-Benefit Analysis: NPV=US\$ million; ERR= % ☐ Cost Effectiveness Analysis:

☒ Incremental Cost ☐ Other

The IC Annex compares the baseline scenario with the GEF Alternative, identifying an incremental cost of US\$11.0 million to achieve global benefits.

### *2. Financial: NPV=US\$ million; FRR= %*

Fiscal impact:

The anticipated fiscal impact of the Project on the participating countries is expected to be modest. Counterpart contributions are largely in kind, in terms of staff, or one-time investments (in terms of construction of office space). The recurrent costs for fuel, equipment maintenance and some consumables are already absorbed into the existing budgets of the implementing agencies, and should therefore prove manageable in the future.

In the case of MPAs, cost recovery schemes for management and monitoring activities will be integrated into the management and operational plans that are to be developed under Component 1 of the Project (e.g., via user fees, permits, fines, trust funds). The allocation of staff for the four new MPA sites to be supported under the Project will be absorbed under annual operating budgets of the agencies involved and not pose a significant burden on central treasuries now or in the future.

### *3. Technical:*

These include country level differences in capacity to manage resources and to assess the state of these resources; differences in data collection methodologies which make comparisons across countries difficult; and communication difficulties in sharing information, compounded by language differences. The Project would address data issues by developing and implementing agreed protocols for collection, processing and dissemination information.

To minimize language barriers, the regional Project coordinator would be completely bilingual in Spanish and English, and all Project documents would be prepared in both languages.

### *4. Institutional: (see Annex 2)*

To enhance coordination between countries at the regional level and to promote multi-sectoral participation at the national level, each country has established a National Barrier Reef Committee. These committees are comprised of representatives of the concerned ministries, the NGO community, research institutions and the private sector. They serve as a clearinghouse for information on programs and policies affecting the MBRS in each country. A National Coordinator has been selected from each of the country committees to serve as the principal liaison with the Project preparation team in the design and implementation of Phase 1 of the GEF regional program. Regional Technical Working Groups will be established under each Project component, drawn from the ranks of the National Barrier Reef Committees in each country.

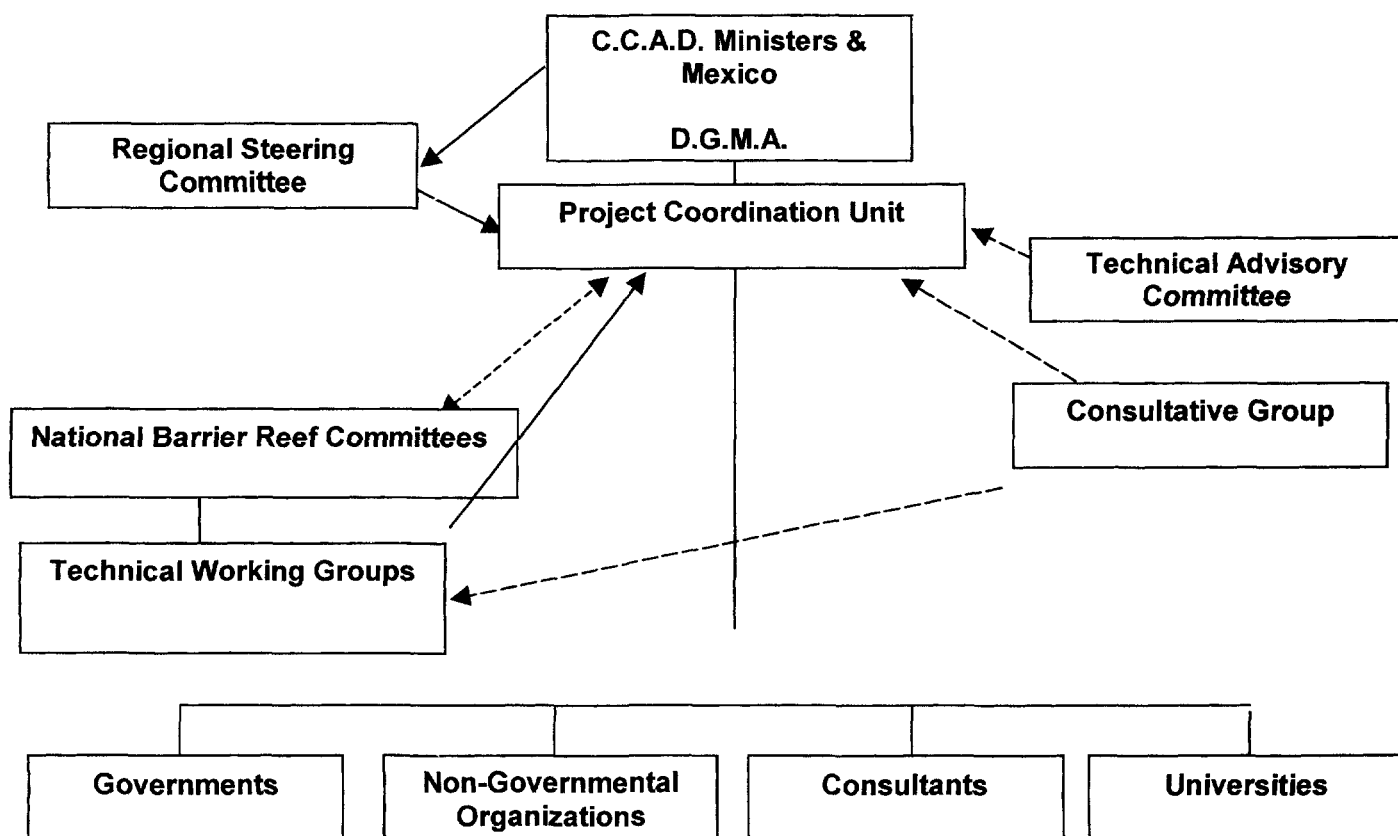
#### 4.1. Executing agencies:

CCAD, which is comprised of the Council of Ministers of the Environment in Central America, with Mexico as an observer, will serve as implementing agency, operating through its secretariat, the Directorate General for Environment (DIGEMA) of the System for Central American Integration (SICA), based in San Salvador.

#### 4.2. Project management: (see Figure 1 below)

The main institutional issues to be addressed are: (i) no established precedent for regional collaboration in addressing environmental issues, apart from the efforts of CCAD; and (ii) inconsistencies and gaps in national legislation related to coastal and marine resource use among the four countries, which are obstacles to implementation of regional management regimes to safeguard the health of the MBRS. The Project would support measures to harmonize policies and regulations in line with best practice and agreed principles for conservation and sustainable use of the MBRS. Initially, harmonization would focus on normalizing regulations related to establishment and enforcement of MPAs, and on the fisheries and tourism sectors, setting and enforcing standards for coastal water quality, tourism zoning and environmental impact assessment.

*Mesoamerican Barrier Reef System Project  
Organizational Structure of the Project*



#### *4.3 Procurement issues*

A CPAR for Belize, the country where procurement actions will take place, is not available.

The PCU, which will be based in Belize City, is in the process of being established, and a director, accountant and procurement officer have been hired. Additional staff, including an administrative assistant to help with document filing and monitoring of procurement actions, will also be hired. A third party, UNDP, will be contracted to assist the PCU with international procurement, local procurement and oversight of minor civil works in Mexico, Honduras, and Guatemala, and with the management and disbursement of Project funds (see Annex 6). UNDP/Belize will be equipped with the requisite procurement staff to carry out these functions. Technical assistance and training of procurement staff in both UNDP/Belize and in the MBRS PCU will be undertaken by UNDP/El Salvador to ensure that capacity in international procurement is built within the Project Coordination Unit. PCU staff will also be trained in Bank procurement and reporting procedures to ensure that project demands are met. A Procurement and Contract Management System will be set up for PMR reporting.

A Procurement Plan for goods, works and consultant services for the life of the Project has been prepared. (see Annex 6).

#### *4.4 Financial management issues:*

**Financial Management System:** The PCU will maintain an adequate financial management system, compatible with Project Management Reporting (PMR) as required by the Bank under the Loan Administration Change Initiative (LACI). The financial management system will include internal control systems, reliable records and report of Project assets, accounting, financial reporting, reconciliation of the PCU's Project records with the GEF statements on disbursements of Project funds, monitoring of physical progress of agreed Project indicators, procurement management, and auditing systems—to ensure the provision of accurate and timely information to the World Bank regarding Project resources and expenditures, in accordance with: (i) the Financial Accounting, Reporting, and Auditing Handbook (World Bank, 1995); (ii) the Bank's Operational Policy (OP) and Bank Procedure (BP) 10.02 dated July 1996; and (iii) the revised Bank financial management standards to comply with OP and BP 10.02, dated August 1997. Project assistance for the establishment of the PCU will be provided. The Government of Belize will provide in-kind office support.

A World Bank accredited financial management consultant performed a financial management assessment of the Project Preparation Unit in July 2000. At the time of the assessment, a financial management system had not been implemented. Guidelines and technical assistance were provided to the PPU to ensure that an adequate financial management system, internal controls, monitoring systems, and staffing of the Project Coordination Unit for the implementation phase will be in place to achieve the certification of the project's financial management system PMR compliant, under the Bank's Loan Administration Change Initiative (LAC). The action plan agreed upon includes key actions to: (a) design and implement a financial management system that meets PMR requirements; (b) hire the staff for procurement and financial management; (c) develop administrative procedures; and (d) hiring of external auditors. It was agreed that a PRM compatible, Financial Management System (FMS) acceptable to the Bank would be operational prior to project effectiveness.

**Reporting and Audits:** The PCU will produce PMRs on a quarterly basis. These reports will be prepared 45 days after the end of each quarter. In addition, annual financial statements (to be included in the audit report) will be required. The fiscal year of the Project will match PCU's fiscal year. In addi-



tion to submission of quarterly PMRs, the PCU will contract an independent public accounting firm, prior to the beginning of the fiscal year to be audited.

**Flow of Funds/Disbursement:** CCAD has decided to contract the services of UNDP as the disbursement agent, who will be in charge of channeling the GEF grant funds and making the payments for Project disbursements, with the requests and approvals from the PCU in Belize. The PCU will be responsible for preparing withdrawal applications and the related SOEs, or PMRs, as applicable, with funds being channeled through a third party agent (see Annex 6).

**Project Monitoring and Evaluation:** The Project will be guided by bi-annual reviews of results, on which basis CCAD and the World Bank supervision mission will identify specific measures to: (i) address any areas of implementation weaknesses; and (ii) accommodate changes in priorities. These measures for improvement will be reflected in the PCU proposal for the forthcoming year's Project budget.

## 5. Environmental:

Environmental Category: B

5.1 Summarize the steps undertaken for environmental assessment and environmental management plan (EMP) preparation (including consultation and disclosure) and the significant issues and their treatment emerging from this analysis.

The Environmental Assessment (EA) was based in large part on the Threat and Root Cause Analysis and Transboundary Diagnostic Analysis (TBDA) prepared in the early stages of Project design. Because the Project is designed to address many of the fundamental threats to the ecological health of the MBRS, as identified in the TRCA and TBDA, negative environmental impacts are expected to be few and minor. In light of the Project's objectives to conserve the integrity and continued productivity of the MBRS, and to promote opportunities for its sustainable use, stakeholders consulted in the preparation of the EA were of the opinion that the MBRS Project would have important overall positive environmental and social impacts for the MBRS region. The Project will make important contributions to the body of knowledge concerning the status of the MBRS and its resources, and the real and potential negative impacts of anthropogenic activities as these are manifested on its habitats and resources. The Project seeks synergistic linkages with ongoing and future local, national and, regional initiatives dealing with conservation and sustainable use of the MBRS. It would achieve this by promoting a regional view of ecosystem boundaries and issues, a long-term program of investment and monitoring, and mechanisms for regional coordination in program design and implementation.

The Category B rating reflects the potential for some negative environmental impacts associated with minor civil works in the construction of MPA infrastructure. To mitigate these risks, environmental management guidelines for construction of minor civil works associated with MPA infrastructure will be prepared by the Natural Resources Management Specialist within the Regional PCU, and applied prior to the contracting of civil works .. These guidelines will be incorporated into the design specifications for the civil works. Their execution will be supervised by MPA management staff and compliance monitored by the PCU.

5.2 *What are the main features of the EMP and are they adequate?*

The main features of the EMP are implementation of a simple environmental impact assessment procedure to mitigate the impacts of minor civil works associated with construction of MPA infrastructure. General guidelines and an annotated checklist (*Ficha Ambiental*) will be prepared by the PCU Natural Resources Management Specialist, for the siting and design of each structure. This checklist should be applied in the field by personnel of each respective MPA, or the organization charged with

management of the MPA. MPA personnel will be trained in the use of the checklist in a two-day workshop to be organized by the Specialist, who will then also monitor compliance with the procedure. The procedure should be compliant with any and all applicable regulations and norms in each of the respective countries as may be stipulated in local or national laws and codes. As appropriate, the procedure and checklist should be adapted to local environmental and socioeconomic conditions.

### *5.3 For Category A and B projects*

Timeline and status of EA:	Completed March 16, 2000
Date of receipt of final draft:	March 16, 2000
Translation of Document into Spanish:	July 2000

### *5.4 How have stakeholders been consulted at the stage of (a) environmental screening and (b) draft EA report on the environmental impacts and proposed environment management plan? Describe mechanisms of consultation that were used and which groups were consulted?*

Regional workshops involving a broad range of stakeholders and representatives from all four countries served as discussion fora for the EA and overall Project design throughout Project preparation. National and local level workshops carried out during preparation of the TRCA and TBDA also informed the EA process. Once completed, the EA was circulated in Spanish and in English to National Coordinators of the Project in the four participating countries. These were then distributed to the National Barrier Reef Committees in each country for dissemination to other stakeholders and interest groups.

### *5.5 What mechanisms have been established to monitor and evaluate the impact of the project on the environment? Do the indicators reflect the objectives and results of the EMP?*

The PCU Natural Resources Management Specialist will be responsible for monitoring compliance with the EMP. Project audits will also serve to evaluate compliance with the mitigation guidelines and environmental impact assessment checklist.

## *6. Social:*

### *6.1 Summarize key social issues relevant to the project objectives, and specify the project's social development outcomes.*

The key social issues identified in the Social Assessment:

- Decline in traditional economic activities, e.g., fisheries and agriculture, due to inappropriate land use, increasing urbanization and tourism development
- Environmental degradation due to inadequate environmental management (affecting water quality/fisheries productivity and land productivity) associated with uncontrolled human settlements, urbanization and tourism development along the coast
- Lack of education and information about environmental issues, cultural values and history of the region's ethnic (leads to low awareness about the importance of the environment and limits the possibilities for alternative employment)
- Concern over the brand of tourism developing along major sections of the MBRs coast (mass tourism, culturally and economically inequitable, and environmentally unsustainable)
- Along with insecure land tenure this creates uncertainty about benefits of tourism development that would accrue to local and economically disadvantage populations
- Strong desire for alternative income generating opportunities, especially in ecotourism and fisheries value-added industries
- Discrimination against women in nearly all aspects of economic activity, and to a large degree social activity.

### *6.2 Participatory Approach: How are key stakeholders participating in the project?*

The main Project stakeholders and beneficiaries are: (a) the governments of Mexico, Belize, Guatemala and Honduras, including national, departmental and municipal authorities; (b) local communities, including indigenous and ethnic groups inhabiting the coastal fringe, their organizations and traditional leaders; (c) non-governmental environmental organizations; (d) international and regional organizations; (e) the scientific community; and (f) private entrepreneurs, (g) the donor community (bi-laterals and multi-laterals, IFIs).

Consultations with stakeholders representing all these groups were carried out through a series of regional and national workshops and via local level meetings throughout Project preparation. Workshops permitted interchange of ideas and interests concerning the values placed on MBRs resources and current economic and cultural uses. Wide participation of stakeholders in work groups and plenary sessions enriched the design process and helped focus regional priorities. Extensive consultations with local communities were carried out during the Social Assessment. These included field visits, surveys and open-ended interviews with representatives from all key ethnic and indigenous groups in the four participating countries, and focus groups and discussions with local experts (see Methodology in the Social Assessment, Annex 12). A matrix of activities designed to address issues specific to these groups and to be supported by the Project is presented in the Indigenous People's Participation and Development Plan of the Social Assessment (see Executive Summary of the Social Assessment, Annex 12).

Participation by all key stakeholders in project implementation and monitoring will be assured by the following institutional arrangements:

(i) National Barrier Reef Committees: These committees are comprised of representatives of the concerned ministries, the NGO community, research institutions and the private sector. The Project will promote representation by ethnic groups and women on these committees to ensure the broadest inclusion of stakeholders at the national and local levels;

(ii) Technical Working Groups: Technical working groups allied with particular themes to be addressed under the Project will be set up during Project implementation. These working groups will be structured to ensure participation of specialized sectors and affected groups in the design of annual work programs incorporating activities under these project components and transparency in the process of implementation;

(iii) Regional Steering Committee: This will be comprised of the Executive Secretary of CCAD<sup>3</sup> or his delegate, and the National Coordinators of each of the four National Barrier Reef Committees. The committee will also include a panel of ex-officio members representing donor organizations and partner institutions working in the region on issues related to MBRS Program objectives (see Section 4 above on Institutional Issues and Annex 2 on Project Management Arrangements).

#### *6.3 How does the project involve consultations or collaboration with NGOs or other civil society organizations?*

The Project includes consultative bodies in its management structure and implementation arrangements. NGOs and other civil society organizations are not only involved through these administrative committees and technical working groups, but may also participate as executing agents during Project implementation.

#### *6.4 What institutional arrangements have been provided to ensure the project achieves its social development outcomes?*

The results of the Social Assessment are being disseminated in consultations with the National Barrier Reef Committees in each country and through local channels to promote broad ownership of the results. An adequate budget has been allocated to finance implementation of the Indigenous Peoples' Participation and Development Plan (US\$2.8 million). A Social Scientist will be hired as a member of the Project Coordination Unit, responsible for day-to-day implementation of the Project. One of the roles of the Social Scientist will be to liaise with representatives of local communities and stakeholder interest groups, particularly indigenous groups, to ensure that their voices are heard in the course of Project implementation and that benefits and information are being channeled to target groups. Through the Regional Steering Committee and the National Barrier Reef Committees, the PCU can bring issues and concerns to the attention of decision-makers at the country level if they cannot be adequately addressed locally.

#### *6.5 How will the project monitor performance in terms of social development outcomes?*

Participation in Project decision-making and implementation by key stakeholders will be achieved through the institutional arrangements described above in 6.2. Regular monitoring of Project Performance Indicators by PCU staff, supervision missions and annual evaluations during meetings of the RSC and the Regional TWGs will provide ongoing assessment of Project progress in achieving specific development outcomes.

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<sup>3</sup> The Executive Director of the CCAD also acts as the Director General of the General Environmental Directorate (Dirección General de Medio Ambiente, DGMA) of the Secretariat of Central American Integration (Sistema de Integración Centroamericana, SICA), headquartered in El Salvador.

## 7. Safeguard Policies:

### 7.1 Do any of the following safeguard policies apply to the project?

Policy	Applicability (yes or no)
Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)	Y
Natural habitats (OP 4.04, BP 4.04, GP 4.04)	Y
Forestry (OP 4.36, GP 4.36)	N
Pest Management (OP 4.09)	N
Cultural Property (OPN 11.03)	N
Indigenous Peoples (OD 4.20)	Y
Involuntary Resettlement (OD. 4.3)	Possibly
Safety of Dams (OP 4.37, BP 4.37)	N
Projects in International Waters (OP 7.50, BP 7.50, GP 7.50)	N
Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)	N

### 7.2 Describe provisions made by the project to ensure compliance with applicable safeguard policies.

An EA was carried out during Project preparation. Recommendations as to how to mitigate any potential adverse impacts from the Project, related primarily to small-scale infrastructure for MPAs, are presented in the form of an Environmental Management Plan, including preparation of guidelines for siting of construction and operation of MPA infrastructure. These have been incorporated into the Project design.

A Social Assessment, involving extensive consultations, was carried out during Project preparation. The results and recommendations have been incorporated into an Indigenous People's Participation and Development Plan, which will be implemented under the Project (see Section E 6 above.)

In the event that OD 4.3 on Involuntary Resettlement is invoked in the context of economic displacement resulting from restricted access to fishing grounds incorporated into fishery reserves Marine Protected Areas, a process framework to mitigate the impacts of such displacement, has been developed (Annex 16). The process framework is tied closely to the development of Management Plans for each of the MPAs to be supported under the Project as the basis for community participation in the design of the resource management regime, establishment of eligibility of affected parties for compensation under the safeguard policy, and options for such compensation. The latter could include access to alternative fishing grounds, support for alternative livelihoods in aquaculture, fisheries processing or other value added techniques, eco-tourism, marine protected area interpretation and enforcement, and training under the sustainable use component of the project.

Protection of natural habitats and international waters are key objectives of this regional Project for conservation and sustainable use of the MBRS. The Project is designed to enhance capacity for better protection of ecologically sensitive and globally important marine ecosystems, through the establishment of MPAs in priority sites set aside for conservation, and through the introduction of tools, including technical (information systems, environmental education and monitoring) and policy and regulatory measures, to improve the management of these systems. With assistance from the Policy Working Group and intervention by the Council of Environment Ministers who comprise the CCAD, legal and policy reforms to ensure compliance with international Conventions to which all four countries are party, and the harmonization of regulatory frameworks affecting transboundary resources, will be promoted.

## **F: Sustainability and Risks**

### *1. Sustainability:*

Sustainability in the context of this Project must be defined in terms of both (i) ecological sustainability—that is maintaining the biological communities and ecological processes that comprise the MBRS and are responsible for the goods and services it produces; and (ii) program sustainability—establishing the institutional arrangements, financial commitments, and economic and social incentives to maintain a strategic set of well coordinated activities that will create the conditions for the first. The Project design recognizes the need to account for interconnectedness of ecological processes and environmental impacts within the MBRS, many of which are transboundary in nature (i.e., cross political frontiers) or are the result of development activities upstream (within national boundaries). To do this requires comprehension of the system's true boundaries, the forces that drive the system (e.g., recruitment, predation, competition, nutrient cycling, and physical factors including climate, temperature and pH), and how they operate to keep the system intact. This is the role of science—of research and monitoring, and of information dissemination.

Related to this is the interpretation of relevant information for the public and for decision-makers. Exchange of information and public debate is essential to creating a constituency for the political and financial support, and the economic and social tradeoffs in some cases, that will be required to initiate and sustain conservation efforts over time. This is a major focus of the current Project.

In the case of transboundary aquatic systems like the MBRS, sustaining measures to conserve its ecological values and economic productivity will depend on regional cooperation in adopting an ecosystem perspective that transcends both national interests and geographic frontiers. Traditionally, such international cooperation is rare, despite a shared stake in the future of the resources among riparians, and the economic and ecological implications of failure to do so in the long term. A similar pattern is usually evident among the array of donors in a region, whose interventions are targeted but generally fragmented in terms of coordination with one another and often not sustained over the long term.

The MBRS Program is designed to address the need for regionalism in the perspective of the countries involved, and for coordination of activities within a long-term, strategic framework. The concept behind the MBRS Program has been endorsed at the highest political levels, with the signing of the Tulum Declaration by the presidents and prime minister of the four countries sharing the MBRS. Subsequent ministerial level endorsement by ministers of Finance and Environment during various stages of Project preparation have reinforced these countries commitment to the objectives of the MBRS Action Plan and the regional GEF Progra.

The first phase of the Program focuses on system-wide threats and interventions required to address these. It will seek to facilitate coordination at the technical and policy levels among the four countries through establishment of the Regional Technical Working Groups and support for their operation. Country counterpart contributions of staff to participate in Technical Working Groups, training, and coordination of project activities at the national level, will help ensure that these activities are sustained beyond the life of project. Regional monitoring and information systems will help bind the countries together through shared knowledge and provide the basis for informed policies and decision-making at the regional level. Design of the regional EIS as a decentralized, Web-based System, housed in the sponsoring institution of each country, has been developed with sustainability in mind. Alternative livelihood components involving recreational fisheries, diving, tourism and other small scale enterprise, should be income generating and self sustaining by end of project.

Sustainability of interventions over the long term will be enhanced through human resource development and institutional capacity building, and through the commitment of donors and stakeholders in

the region to a program rather than a project approach. Financial sustainability will be enhanced through efforts to leverage GEF financing in Phase 1 toward new investments by co-financiers in Phases 2 and 3, by expanding the partnership, identifying synergies and demonstrating technical and financial efficiencies of scale. The MBRS Project has already attracted donor interest beyond that reflected in Project co-financing. The MBRS Regional Action Plan, developed as a result of the Tulum Declaration, in consultation with governments, NGOs, donors, research institutions and other segments of civil society in the four countries, serves as a road map for the future. The MBRSP, in conjunction with WWF, IUCN, TNC, CCAD and others, have successfully catalyzed the interests of these groups into a momentum that is building at all levels--from regional to local. It is envisioned that once the Phase 1 Project gets off the ground and early results demonstrated, there will be increased interest on the part of donors and other players in the region to become a part of this effort. Systematic outreach and information campaigns are planned early in Phase 1, with help from WWF to help capture this potential. A donor's consultative group with links to the broader MBC Program is also envisioned as part of the governance structure of the Project. This would help line up future funding and coordinate interest in specific actions in support of the Tulum Declaration and Action Plan under the MBRS Program.

Cost recovery for training, MPA management, environmental information systems, environmental certification and other fee-based services to be supported under the Project will be introduced at the end of Phase 1, to promote continuity beyond the life of Project. Criteria for replicability and scaling up of sustainable use activities in subsequent phases of the Program will include profitability, ease of adoption and dissemination and demonstration value. With respect to recurrent costs for fuel, equipment maintenance and some consumables, these in-kind contributions have already been absorbed into the existing budgets of the implementing agencies, and should therefore prove manageable in the future.

By institutionalizing policy reforms, increasing the collection and flow of information, strengthening institutions and collaborating with a broad array of stakeholders, the MBRS Program will build a strong base of support that is likely to transcend changes in administration and personnel, and help ensure continuity in the commitment of partners and the flow of resources over the life of the Program.

2. Critical risks (reflecting assumptions in the fourth column of Annex 1):

<u>Risk</u>	<u>Risk Rating</u>	<u>Risk Mitigation Measure</u>
<i>Annex 1, "from Outputs to Objective"</i> Commitment to regional approach for MBRS management undermined by national interests.	M	All four countries have reiterated commitments to conserving the MBRS, and to the necessary regional cooperation, at the highest levels. --CCAD's implementation of both the MBRS and the MBC regional projects will promote a regional view in the policy context. --Environmental education and public awareness campaigns will build support for conservation of the ecosystem as a whole.
Coordination of activities at regional level difficult to operationalize on the ground. Weak institutional arrangements for regional cooperation.	S	Regional TWGs and workshops for each Project component and theme will foster communication and good working relations across countries; PCU and national Project coordinators ensure coordination in implementation of annual work plans. --Program Technical Advisory Committee will interface with other donors to coordinate activities, attract new partners and consolidate investments in MBRS consistent with the Action Plan and TRCA.
Human resources and capacity not uniform across countries—obstacle to collaboration and achievement of program objectives.	S	Project aims to build capacity to a minimum uniform standard for MPA management, ecosystem monitoring, fisheries data collection and management through training and joint research, fostering intra-regional and north-south partnerships between technical institutions.
<i>Annex 1, "from Components to Outputs"</i> Establishment of MPAs in trans-boundary areas difficult, particularly enforcement.	M	Development of 10 year Management plans and 2 year Operational plans, along with resources for basic equipment and infrastructure to implement plans will facilitate MPA establishment in T-BAs. Joint workshops and training for MPA staff in T-BAs will foster collaboration in management, surveillance and enforcement.
Economic displacement of traditional users occurs in the context of MPA strengthening	N	A participatory process in the development of MPA management plans involving local advisory committees and a Process Framework to mitigate economic displacement, should it occur, will greatly reduce impacts associated with this.
Regional ecosystem monitoring and information system difficult to sustain.	S	Requirement of Government counterpart contribution of staff to participate in monitoring and maintain data base according to agreed protocols; support for equipment, training and travel tied to data collection and sharing.
Information collected is not interpreted and made available to decision-makers, and general public.	M	Substantial TA provided to set up robust monitoring system to detect trends in status of MBRS; applied research on physical and biological factors (including human disturbance) affecting overall health and productivity of MBRS supported through co-financing and cooperative arrangements with MBRS partners; data interpreted and made available to the public and decision-makers.
Overall Risk Rating	S	The risk is significant but manageable.
Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N (Negligible or Low Risk)		

3. Possible controversial aspects:

Harmonizing policies across sectors and across countries is an ambitious undertaking. Countries are normally conservative about giving up exclusive sovereignty over resources they control. This may



prove problematic in trying to reach regional accords on fisheries management issues. However, all countries have expressed their support for the FAO Code of Conduct on Straddling Stocks and Migratory Species and are signatories to the Cartagena Convention and its SPAW protocol on Species Conservation. The Project will help articulate key policy issues in different sectors and facilitate dialogue on how to resolve these issues, as well as promote concrete steps toward policy harmonization, through revising regulations, amending legislation, or drafting new laws where necessary to create consistency across the four countries.

The Social Assessment has revealed issues at the local level related to urban and tourism development, the decline of traditional livelihoods and insecure land tenure, as being of concern to indigenous groups and other ethnic communities dependent on coastal resources. Some controversy also exists over fishing grounds in transboundary areas between Mexico and Belize in the north and in the tri-national border area in the Gulf of Honduras to the south. The absence of adequate governance arrangements in these areas has resulted in poaching, which threatens international cooperation and compliance with existing management structures. While policy and regulatory concerns can be taken up at higher levels (e.g., inter-ministerial and steering committee/policy advisory groups, and bi- and tri-national commissions to be supported under the Project), it will be necessary to set up conflict management fora at the local level to deal with some of these issues. The MPA component incorporates a provision for conflict management within the Management Planning process, and the Fisheries TWG will promote a continuous dialogue between MBRS countries for joint management of transboundary fish stocks, and the possible establishment of international commissions for regional fisheries management.

## **G: Main Grant Conditions**

### *1. Effectiveness conditions:*

There are seven conditions for Project Effectiveness: (a) that the Project Implementation Manual has been issued and put into effect; (b) that the PCU has been established and is functional, with at least the following personnel already hired and in place: the director, the account/finance officer, the procurement officer, the natural resources management specialist and one administrative assistant; (c) that the National Barrier Reef Committee in each country has been formally established and its composition documented through an official act or letter; (d) that the contract between CCAD and UNDP for the latter to provide procurement and disbursement services to CCAD during Project implementation has been entered into, and (e) that an adequate financial management system for the Project has been implemented within the PCU which is acceptable to the World Bank. This would include procedures for FMS operation and maintenance during project implementation (See Section C.4: Institutional and Implementation Arrangements); (f) that a host country agreement has been entered into between Belize and CCAD; and (g) that all requisite legal opinions on the Project's legal documentation have been obtained. If, by project effectiveness, the PCU has not implemented a financial management system with PMR capabilities, but one which meets minimum Bank requirements, the traditional disbursement mechanisms (Statement of Expenditures, SOEs) will be used for the first two quarters of Project implementation.

Many of these conditions for Project effectiveness are well advanced, including the hiring of PCU staff and the preparation of the PIM. A contract to develop a financial management system acceptable to the Bank is in place, and agreement on the basic elements of the contract between CCAD and UNDP to provide procurement and disbursement services has been reached. A short list of auditors acceptable to the Bank has been identified, and the formal documentation establishing the National Barrier Reef Committees is under preparation in each country.

2. Other [classify according to covenant types used in the Legal Agreements.]

### H: Readiness for Implementation

- |    |   |
|----|---|
| No | 1. (a) The engineering design documents for the first year's activities are complete and ready for the start of project implementation. |
|    | 1. (b) Not applicable.  |

2. The procurement documents for the first year's activities are complete and ready for the start of project implementation.

Nearly completed.

3. The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.

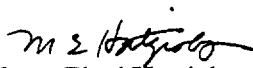
PIP has been completed. A Project Implementation Manual has been completed.

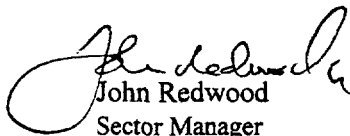
4. The following items are lacking and are discussed under loan conditions (Section G):

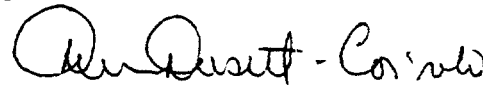
None.

### I: Compliance with Bank Policies

- |     |  |
|-----|--|
| Yes | 1. This project complies with all applicable Bank policies.  |
|     | 2. The following exceptions to Bank policies are recommended for approval. The project complies with all other applicable Bank policies. |

  
Marea Eleni Hatzios  
Team Leader

  
John Redwood  
Sector Manager

  
Donna Dowsett-Coirolo  
Country Manager

**Central America Commission on Environment and Development**  
**Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**

**Annex 1**

**Project Design Summary**

<b>Hierarchy of Objectives</b>	<b>Key Performance Indicators</b>	<b>Monitoring and Evaluation</b>	<b>Critical Assumptions</b>
<p><b>a. Sector-related CAS Goal:</b> Reduced rural poverty and improved environmental security through sustainable management of natural resources.</p> <p><b>b. GEF Operational Program:</b> To enhance protection of ecologically unique and vulnerable marine ecosystems through introduction of an ecosystem approach to conservation and sustainable use.</p>	<p><b>Sector Indicators:</b> More rational use of coastal and marine resources to balance economic development and conservation needs.</p> <p>Increased human and institutional capacity for environmental management.</p> <p>Maintenance of ecological integrity, resilience to natural disturbance and continued productivity of MBRS.</p>	<p><b>Sector/country reports</b> National surveys, sector work in environment and social policy</p> <p>Regional Monitoring and EIS reports, MBRS Atlas, and targeted research reports.</p>	<p><b>(Goal to Bank Mission)</b></p> <ul style="list-style-type: none"> <li>Other externalities do not undermine social and economic benefits from integrated management of the coastal zone.</li> <li>Climate change related phenomena do not swamp natural resilience of coastal and marine ecosystems to moderate levels of stress and periodic disturbance nor generate unanticipated social response.</li> </ul>
<b>Global Objective</b>	<b>Outcome/Impact Indicators</b>	<b>Project reports</b>	<b>(Objective to Goal)</b>
<p>To assist the countries of Belize, Guatemala, Honduras and Mexico to manage the MBRS as a shared, regional ecosystem; safeguard its biodiversity values and functional integrity; and create a framework for its sustainable use.</p> <p><b>Global Objectives</b> To enhance protection of the ecologically unique and vulnerable marine ecosystems comprising the MBRS by assisting riparian nations to strengthen and coordinate national policies, regulations, and institutional arrangements for the conservation and sustainable use of this global public good.</p>	<ul style="list-style-type: none"> <li>Biological representation and ecological interconnectivity maintained in coastal and marine ecosystems throughout MBRS.</li> <li>Ecoregional approach to MBRS management incorporated into conservation planning at local, national and regional levels.</li> <li>Steps towards harmonization of relevant policies and legislation regarding MPA management in transboundary areas, sustainable fisheries management; sustainable tourism development; and protection of coastal water quality agreed and initiated in all four countries.</li> <li>Fora for regional cooperation at technical and policy levels operational.</li> </ul>	<p>(a) Annual reports of CCAD, SEMERNAP (MX), CZMA-I (BZ), CONAMA/Secretariat on the Environment (GT), and SERNA (HN).</p> <p>(b) Changes in policies or operating guidelines in relevant sectors (or in standards and regulations, e.g., use of EIA and land use planning governing resource use).</p> <p>(c) Surveys of donors, multilateral projects, and academia.</p> <p>(d) Investment trends in tourism sector.</p> <p>(e) Regional coastal development plans (in Honduras, Belize, and Mexico).</p>	<ul style="list-style-type: none"> <li>National interests do not undermine incentives for regional approaches to management of transboundary systems/resources.</li> <li>CCAD is successful in raising awareness of MBRS policy issues and in prioritizing harmonization of policies and legislation on SICA agenda.</li> <li>Lack of precedents for regional cooperation at the technical level do not act as a barrier to creation of new institutional arrangements for such collaboration on the ground.</li> <li>Appropriate measures are being implemented at local and national levels to mitigate land-based sources of pollution.</li> </ul>

Hierarchy of Objectives	Key Performance Indicators	Monitoring and Evaluation	Critical Assumptions
<i>Outputs from each component:</i>	<i>Output Indicators</i>	<i>Project Reports</i>	<i>(Outputs to Objective)</i>
Regional network of MPAs ensuring geographical and ecosystem representation established and/or strengthened throughout the MBRS.	<ul style="list-style-type: none"> <li>• MPA data baseline established and monitoring programs implemented by PY4.</li> <li>• 10-year management plans developed for 4 MPAs by PY3.</li> <li>• 2-year operational plans/updates developed for 15 MPAs by PY4.</li> <li>• 160 persons trained in MPA management by PY5.</li> <li>• Infrastructure and equipment provided to two regional MPA complexes by EOP</li> <li>• Basic equipment provided to 11 MPAs by EOP.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Review of completed management plans.</li> <li>(b) Project bi-annual reviews and supervision reports.</li> <li>(c) Technical reports of monitoring activities</li> <li>(d) Course evaluations completed by trainees.</li> </ul>	<ul style="list-style-type: none"> <li>• There is sustained political and budgetary commitment to management of MPAs.</li> </ul>
Increased knowledge and dissemination of information relating to coastal and marine ecosystem health in the MBRS.	<ul style="list-style-type: none"> <li>• Synoptic monitoring program designed and under implementation by PY2.</li> <li>• Web-based, distributed regional EIS established and operational by PY3.</li> <li>• 15 baseline reports on MBRS ecosystem health produced and disseminated by PY5.</li> <li>• 32 persons trained in operation and management of EIS by PY5.</li> <li>• Basic equipment and infrastructure provided to four national nodes of EIS by PY2.</li> <li>• Basic field monitoring equipment provided to implementing organizations by PY2.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Monitoring reports and technical papers incorporated into EIS.</li> <li>(b) Project bi-annual reviews and supervision reports.</li> <li>(c) International access to knowledge generated regarding MBRS via Web-based EIS</li> </ul>	<ul style="list-style-type: none"> <li>• Sufficient supply of technical assistance specialized in sustainable management of coastal and marine resources is available.</li> <li>• MBRS stakeholders are willing to harmonize data access agreements for use of information in EIS.</li> <li>• Required counterpart funding is available on a timely basis to support participation of technical working groups and maintaining EIS nodes.</li> </ul>

Hierarchy of Objectives	Key Performance Indicators	Monitoring and Evaluation	Critical Assumptions
Increased opportunities for sustainable use of coastal and marine resources developed.	<ul style="list-style-type: none"> <li>• Formulation of draft regional strategy for management of spawning aggregation sites completed by PY5.</li> <li>• 168 persons trained in sustainable fisheries management and alternative income-generating activities by PY5.</li> <li>• Catalogue of exemplary practices for coastal and marine tourism industry developed by PY2.</li> <li>• Regional environmental certification program designed and implemented by PY5.</li> <li>• Marine tourism exemplary practices study tour designed and executed for "emerging" marine tour operators by PY2.</li> <li>• Analysis of tools for voluntary compliance with harmonized policies related to use of MBRS resources</li> <li>• 236 persons trained in sustainable tourism-related activities by PY5.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Technical reports of fisheries monitoring activities.</li> <li>(b) Review of draft regional strategy.</li> <li>(c) Project bi-annual reviews and supervision reports.</li> <li>(d) Course evaluations completed by trainees.</li> <li>(e) Review of technical reports relating to sustainable tourism, including catalogue of exemplary practices and regional certification program.</li> </ul>	<ul style="list-style-type: none"> <li>• Political will exists on the part of national-level authorities to adopt a regional strategy for sustainable fisheries management.</li> </ul>
Increased public awareness of the importance of and demand for the conservation of the MBRS at regional and international levels.	<ul style="list-style-type: none"> <li>• 160 schoolteachers, community leaders, and business leaders trained in MBRS concepts by PY5.</li> <li>• 10,000 copies of training materials distributed by community leaders throughout MBRS by PY5.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Project bi-annual reviews and supervision reports.</li> <li>(b) Course evaluations completed by trainees.</li> <li>(c) Stakeholder surveys.</li> </ul>	<ul style="list-style-type: none"> <li>• Public sector and civil society are committed to incorporating project lessons into broader initiatives for coastal resources management.</li> <li>• Management staff of regional and national environmental authorities and non-governmental stakeholders within civil society adopt good practice and lessons learned through training.</li> </ul>

Hierarchy of Objectives	Key Performance Indicators	Monitoring and Evaluation	Critical Assumptions
<p>Increased regional coordination and sustained collaboration among MBRS countries in management of a shared transboundary ecosystem</p> <p>CCAD effectively integrates regional environmental concerns into SICA economic agenda</p>	<ul style="list-style-type: none"> <li>1 MBRS Regional Steering Committee, 1 Technical Advisory Committee and 5 Technical Working Groups established and operational by PY2.</li> <li>Analysis of economic development scenarios in the region to inform Program development and guide design of subsequent phases PY 2</li> <li>Subset of policies in at least three critical areas of shared MBRS resources management (e.g., fisheries, tourism, MPA enforcement, water quality standards, EIA protocols, etc.) harmonized by EOP</li> <li>CCAD regularly engages finance and other sectoral ministries represented under SICA in development dialogue</li> <li>Regional environmental concerns are reflected in SICA's economic agenda</li> </ul>	<p>(a) Project bi-annual reviews and supervision reports.</p> <p>(b) Minutes of meetings of Steering Committee and technical committees.</p> <p>(c) Review of annual work program.</p> <p>(d) Project annual reviews</p> <p>(d) public records of laws and regulations in concerned ministries</p> <p>(a) CCAD and SICA Annual Reports</p>	<ul style="list-style-type: none"> <li>There is sustained political commitment to MBRS principles.</li> <li>MBRS Regional Steering Committee reaches consensus on annual work program design and implementation.</li> <li>Appropriate expertise and political authority is represented on MBRS Regional Steering Committee and Technical Working Groups</li> <li>Other donors and partners agree to cooperate in design and implementation of activities within long-term programmatic framework.</li> </ul>
<i>Project Components/ Sub-components: (see Annex 2 for description)</i>	<i>Inputs: (budget for each component)</i>	<i>Project reports</i>	<i>(Components to Outputs)</i>
1. Marine Protected Areas	US\$5.0 million	<p>(a) Annual and quarterly reports</p> <p>(b) Procurement records</p> <p>(c) Evaluation reports</p> <p>(d) Copies of contracts</p> <p>(e) Bank supervision reports</p> <p>(f) Field management reports</p>	<ul style="list-style-type: none"> <li>Required counterpart funding is available on a timely basis.</li> <li>There is continued political support for regional cooperation and national-level implementation.</li> <li>Civil society supports the principles behind and implementation of specific project activities.</li> <li>Competent staff is appointed and maintained to coordinate project activities on a timely basis.</li> <li>PCU has sufficient autonomy and authority to implement project activities.</li> </ul>
2. Regional Environmental Information System (EIS)	US\$4.4 million		
3. Promotion of Sustainable Use of the MBRS	US\$1.9 million		
4. Public Awareness and Environmental Education	US\$1.5 million		
5. Regional Coordination and Project Management	US\$2.4 million		

**Central America Commission on Environment and Development  
Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**

**Annex 2**

**Detailed Project Description**

**OVERVIEW**

1. The Mesoamerican Barrier Reef System (MBRS), extending from the southern half of the Yucatan Peninsula to the Bay Islands of Honduras, includes the second longest barrier reef in the world. It is unique in the Western hemisphere due to its length, composition of reef types, and diverse assemblage of corals and related species. The MBRS contributes to the stabilization and protection of coastal landscapes, maintenance of coastal water quality, and serves as breeding and feeding grounds for marine mammals, reptiles, fish and invertebrates, many of which are of commercial importance. The MBRS is also of immense socio-economic significance providing employment and a source of income to an estimated one million people living in adjacent coastal areas.
2. Despite its significance in both ecological and socio-economic terms, the MBRS is increasingly at risk from a number of threats. The principal anthropogenic threats to the ecological integrity and continued productivity of the MBRS include: dredging and construction activities related to the expanding coastal tourism industry; growing and unplanned human settlements located along the coast and cays of the MBRS; and water-borne pollutants originating from untreated wastewater, industrial effluent and non-point sources of pollution, the latter principally in the form of agricultural runoff (see Map 1).
3. Natural disturbances, associated with changes in regional and global oceanic and atmospheric processes (which may be related to human induced climate change), also pose a growing threat due to their increased frequency and amplitude. An intense El Niño episode in the fall of 1998 led to extensive bleaching of coral reefs, followed by massive damage to corals on exposed portions of the MBRS as a result of Hurricane Mitch.
4. Existing institutional arrangements in the region do not appear adequate to address many of these threats. Institutional fragmentation at the national level is manifested in the sectoral approach to resource development (e.g., tourism, fisheries, agriculture, infrastructure). Such sector-specific approaches not only fail to take into account linkages between sectors but have been similarly ineffective in addressing upstream, downstream, and coastal resource use conflicts, often at significant environmental and social costs. The challenge to manage the MBRS is complicated by the transboundary nature of the System and the lack of an effective mechanism to facilitate the regional cooperation needed to achieve a comprehensive management approach. Any effort that purports to tackle the existing threats to the MBRS and to promote its future sustainable use, will have to address both the prevalent sector-based approach to managing natural resources in the MBRS region and the establishment of an effective institutional and policy framework which supports a regional approach to management of this globally-significant resource. The Program described below reflects the aforementioned needs and the realities of the region and has attempted to address them through incorporating a realistic, gradualist approach into its design, one which will lead to the conservation and sustainable use of the MBRS.

## PROGRAM GOAL, OBJECTIVES, AND APPROACH

5. The goal of the Mesoamerican Barrier Reef System Project<sup>1</sup> is to enhance protection of the unique and vulnerable marine ecosystems comprising the MBRS, and to assist the countries of Mexico, Belize, Guatemala and Honduras to strengthen and coordinate national policies, regulations, and institutional arrangements for the conservation and sustainable use of this global public good. The Project is part of a long-term Program to safeguard the integrity and continued productivity of the MBRS. The MBRS initiative is being actively promoted by a variety of donors and partners in the region and within the context of the Mesoamerican Biological Corridor Program.
6. The regional objectives of the GEF/Bank supported MBRS Program, agreed to by the four participating countries, are to: (a) strengthen Marine Protected Areas (MPAs); (b) develop and implement a standardized data management system of ecosystem monitoring and facilitate the dissemination of its outputs throughout the region; (c) promote measures which will serve to reduce non-sustainable patterns of economic exploitation of MBRS, focusing initially on the fisheries and tourism sectors; (d) increase local and national capacity for environmental management through education, information sharing and training; and (e) facilitate the strengthening and coordinating of national policies, regulations, and institutional arrangements for marine ecosystem conservation and sustainable use.
7. The MBRS Program objectives are ambitious, and institutionally complex. In light of this, a gradualist approach was incorporated into Project design. The time frame was shifted from an initial 5 year Project to a 15 year Program, to be implemented in three phases. The three phased approach provides the opportunity to build and expand on successful activities initiated in the first phase, leading to a scaling up of Project scope and impact over the life of the Program.
8. A second consideration involves the geographical focus of the Program. Because it is not possible to support the implementation of all component activities across an area as large as the MBRS, a phasing of Project focal areas has also been adopted. In the initial phase, many of the field-based interventions are concentrated in the MBRS's two transboundary areas: Chetumal Bay (Mexico and Belize) and Gulf of Honduras (Belize, Guatemala, and Honduras). However, activities such as capacity building and policy harmonization are designed to include the entire MBRS. Ecosystem monitoring and research, sustainable use, and MPA management initiatives have been designed to expand as needed in subsequent phases of the Program. The Program has already attracted the support of other partners, like WWF, who have pledged some \$2.5 million over the next five years to implement complementary activities in support of the MBRS Action Plan. With additional assistance from the Governments of the Netherlands, U.S., Canada and the EU, the Program is poised to expand to other areas of identified need.
9. Finally, achieving institutional change is a long-term proposition, particularly when it entails strengthening and coordinating national policies, regulations, and institutional arrangements in a four country region. As such, during the Program's initial phase, institutional and policy issues are addressed through activities that are integrated into the other components, and which are designed to provide the basis for a broader and more in-depth treatment in the Program's subsequent phases. See Table 1 below.

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<sup>1</sup> "The Project" refers to the Activities to be carried out during Phase 1 of a proposed 15 year Program for the Conservation and Sustainable Use of the Mesoamerican Barrier Reef.



**Table 1. Proposed Activities for Policy Objectives under the Project**

Selected Policy / Institutional Issues Addressed by MBRS Program	MBRS Program Action (s) Supported which Address the Issue	Eventual Desired Institutional Outcome
Absence of broad public and decision-maker support for the conservation and sustainable management of the MBRS	<ul style="list-style-type: none"> <li>• MBRS public awareness campaign and information dissemination</li> <li>• Establishment of an information clearing house facilitating public access to MBRS-related information</li> <li>• Updating of educational materials in primary and secondary schools</li> <li>• Dissemination of MBRS material to target groups through workshops</li> <li>• Provision of a forum for policy makers and MBRS stakeholders to conduct a dialogue and develop consensus on a agreed set of actions to promote sustainable use of the MBRS (ecotourism and fisheries exploitation).</li> <li>• Increasing public participation in MPA planning and management activities</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of an influential constituency among civil society and the private sector to promote the required institutional and policy changes to conserve and sustainably manage the MBRS</li> </ul>
Absence of a coordinated, regional approach to MBRS data collection, management, and dissemination	<ul style="list-style-type: none"> <li>• Establishment of a regional EIS supported by national data nodes and procedures to share information and facilitate increased public access to information on the significance and status of the MBRS</li> <li>• Developing a monitoring program which assesses the status and "health" of the MBRS</li> <li>• Establishing a monitoring program of a regional network of MPAs to assess status and the effectiveness of management measures</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of a reliable region-wide MBRS data base to support informed decision-making and promote the development of public consensus on regional actions in support of the conservation and sustainable management of the MBRS</li> </ul>
Policy and institutional failures contributing to non-sustainable resource use practices	<ul style="list-style-type: none"> <li>• Develop the required technical basis to modify existing/formulate new policies</li> <li>• Formulate and promote the adoption of new policy (on use of fish aggregation sites, closed seasons, minimum sizes, fishing techniques and monitoring and surveillance)</li> <li>• Establish an environmental certification program; support exposure to examples of "best practices" in the MBRS region.</li> </ul>	<ul style="list-style-type: none"> <li>• Repeat and expand the process to include other sector and multi-sector issues affecting the sustainable use of the MBRS</li> </ul>
Absence of a regional approach to the conservation of coastal and marine biodiversity of global importance	<ul style="list-style-type: none"> <li>• Provision of support for achieving the effective management of a minimal number of MPAs to ensure adequate representation of regional ecosystems and geographic coverage</li> <li>• Policy analysis in MPA plan preparation</li> <li>• Development of financial modules in management plan</li> <li>• Training of Customs Officials in the implementation of CITES Regulations</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of bi-national MPA management commissions</li> <li>• Establishment of a Regional MPA System</li> </ul>
Absence of a regional institutional framework to promote the formulation of policies, regulations, and an institutional approach to manage the MBRS as a comprehensive system.	<ul style="list-style-type: none"> <li>• Promotion of regional TWG for MBRS components, including a TWG dedicated specifically to Policy and Regulations</li> <li>• Support for bi-national and tri-national MPA consultative meetings</li> </ul>	<ul style="list-style-type: none"> <li>• Formalize regional coordination arrangements on sectoral lines</li> <li>• Harmonization of sectoral-based policies affecting the MBRS</li> <li>• Improved policy formulation</li> <li>• Achieving financial sustainability including attracting outside sources of investment</li> </ul>

## PROGRAM COMPONENTS, PHASE 1

### Component 1. Marine Protected Areas (US\$5.0 million)

- Many of the MBRS's more than sixty existing and proposed coastal and marine protected areas exist only on paper and have little or no on-site management. Moreover, a significant

number of MPAs lack up to date master and operational plans and the associated basic infrastructure and equipment needed for their implementation. This includes ranger stations, patrol boats, interpretation infrastructure such as trails and signage, and computers and communications equipment. Of equal significance is the absence of sound financial strategies in most of these areas, a prerequisite to achieving greater self-sufficiency and attracting additional outside investment. Finally, even in those areas that have on the ground management presence and the required infrastructure and equipment, staff often lack the skills needed to carry out their core responsibilities.

11. Support under this component will be limited to a total of 15 MPAs (see Table 2 below), eleven of which already have some legal protection, and four others which are in different stages of the process leading to their legal creation (Map 2). Criteria for MPA selection were based on the significance of the protected area with respect to contributing to MBRS ecosystem characteristics, diversity and processes. The majority of the MPAs (9) are located in the two transboundary areas of the MBRS, Chetumal Bay and the Gulf of Honduras, respectively. In the transboundary areas themselves, there are several MPAs which are separated by national boundaries and are managed as separate units. Two of these bi-national MPA complexes, (the Xcalak/Bacalar Chico, and Sarstoon-Temash/Sarstún ) situated in the Mexico-Belize and Belize-Guatemala transboundary areas respectively, will be assisted through the Program with the additional objective of promoting a regional approach to their management. Selection of the remaining MPAs, in addition to the aforementioned criteria, was made with the intent to ensure a spatially dispersed pattern of protected areas loosely connecting the Program's two transboundary areas (Map 1). By the end of the Program's first phase, this strategy for MPA selection and support is expected to result in a minimally acceptable number and geographic coverage of well managed MPAs in the MBRS region. These MPAs will serve as regional models from which expansion and replication could occur to other protected areas in the Program's future phases. The component consists of the following two sub-components

**Table 2. Marine and Coastal Protected Areas to be Support through the MBRS MPA Component**

	Protected Area	Predominant Ecosystems	Legal Status	Status of Planning	Support to be Provided
1	Banco Chinchorro	Seagrass, reef, cays	Existing	Management plan	OP, modest management
2	Santuario del Manati	Mangroves and seagrass	Existing	Management plan	OP, modest management
3	Corozal Bay	Mangroves and seagrass	Existing	No plan	MP/OP, modest management
4	Xcalak <sup>1</sup>	Seagrass, mangrove, reef	Existing	Plan being prepared <sup>3</sup>	Expand MP, OP, major management
5	Bacalar Chico <sup>1</sup>	Seagrass, mangrove, reef	Existing	Management plan	OP, major management
6	South Water Caye	Seagrass, mangrove, reef	Existing	Management plan	OP, modest management
7	Glover's Reef	Cays, reef, seagrass	Existing	Management plan	OP, modest management
8	Port Honduras	Cays, reef, seagrass	Existing	Plan being prepared	OP, modest management
9	Gladden Spit	Reef (spawning aggregations)	Existing	No plan	MP/OP, modest management
10	Sapodilla Cays	Reef, cays, seagrass	Existing	Management plan	OP, modest management
11	Sarstoon-Temash <sup>2</sup>	Mangroves and estuaries	Existing	No plan	MP/OP, major management
12	Sarstún <sup>2</sup>	Mangroves and estuaries	Proposed	Plan being prepared	OP, major management
13	Punta de Manabique	Swamp forest, mangrove	Proposed	Plan being prepared	OP, modest management
14	Omoa-Baracoa	Coastal wetlands, mangroves, swamp forests	Proposed	No plan	MP/OP, modest management
15	Utila/Turtle Harbor	Swamp forest, reefs, seagrass, lagoons	Existing	Plan nearly finished <sup>4</sup>	Expand MP/OP, major management

1 Consists of one of the two MPAs forming the MPA complex in the *Bahia de Chetumal*.

2 Consists of one of the two MPAs forming the MPA complex in the *Golfo de Honduras*.

3 Plan does not include the Bacalar Chico portion of the transboundary MPA.

4 Plan only covers Turtle Harbor.

***Sub-component A - Planning, Management, and Monitoring of Marine Protected Areas (\$4.45 million)***

12. The emphasis of the sub-component will be to support immediate improvements in MPA protection and management while increasing the sustainability of management efforts. Specific activities include:
- *Establishment of MPA Data Baselines and Monitoring Programs.* Rapid evaluations of basic ecological and socio-economic factors and conditions, including legal and policy analyses and land tenure issues, will be carried out for each MPA included in the Program's first phase. A methodological approach to establishing a baseline will be designed through support for a meeting of regional experts supported by an international consultant with expertise in the field. Together with local scientists, the team will carry out a rapid assessment of baseline conditions for each MPA. A second regional expert meeting will be held to review the initial results of these assessments and devise a monitoring methodology appropriate for park staff to periodically monitor the status of their respective MPA. The periodic monitoring of selected indicators of MPA ecosystems "health" will provide a means to gauge the effectiveness of Program-supported management efforts.
  - *Development of Management Plans for MPAs.* New, 10-year master management plans will be prepared for four MPAs (Corozal Bay, Gladden Spit, Sarstoon-Temash, and Omoa-Baracoa). In each management plan, financial strategies will be formulated specifying existing and potential revenue generation alternatives and including identification of local and international funding sources. For these and for the remaining 11 MPAs, which already have long-term management plans, two year operational plans will be prepared, providing greater detail and specific budgets for activities identified in the master plans. These will be updated annually. Under this activity, funds will be provided for local and international consultants; participatory workshops; preparation, publication and dissemination of management and operational plans; and the publication of documents appropriate for broader public distribution such as executive summaries of management plans, MPA maps, and posters. Short-term technical assistance will be provided to evaluate the success to date of plan implementation, review and harmonize planning methodologies, and periodically evaluate the efficacy of plan implementation.
  - *Basic Equipment and Infrastructure for MPA Plan Implementation.* This activity will support the purchase of basic equipment and infrastructure needed in each MPA to facilitate the planning process, enhance administrative capacity, and allow MPA staff to rapidly implement the priority measures outlined in the aforementioned operational plans. Likely equipment and infrastructure for the two regional MPA complexes (the Xcalak/Bacalar Chico, and Sarstoon-Temash/Sarstún ) and Utila Island (Honduras)<sup>2</sup> will include: boats, motors, and motorcycles; dive equipment; mooring and marker buoys; ranger stations; and public use facilities (visitor centers, signage, trails, and composting toilets). For the remaining 10 MPAs, a basic package of computer hardware, software and peripherals as well as communications equipment (base and mobile radios, batteries and chargers); GPS units; and basic office furniture will be provided.
  - *Transboundary Cooperation in Policy, Protection, and Management of MPAs.* Most of the MPAs selected to receive support under the Program are located adjacent or in proximity to international borders. Current issues in need of effective bi- and tri-national management responses include management of migratory fish and wildlife stocks, addressing cross-border infractions of existing

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<sup>2</sup> While Utila is not a transboundary area *per se*, it includes regionally important fish spawning aggregations, serves as a potential source of recruitment to adjacent MBRS systems, and is ecologically closely linked to nearby protected areas in neighboring countries due to dominant currents.

laws, and the conservation and management of trans-frontier parks. Under this activity, funds will be provided to facilitate regular meetings of the field and supervisory staff of MPA management agencies in Chetumal Bay and the Gulf of Honduras transboundary areas. It is expected that these meetings and the resulting dialogue and decisions will provide the eventual basis for formalizing the process leading to the joint (i.e., bilateral) management of these and other MPAs in the trans-boundary areas.

***Sub-component B - Institutional Strengthening of MPAs (\$550 million)***

13. Capacity building for MPA management will be supported under this sub-component and will focus on regional training courses and workshops for protected area directors, technical staff, rangers, and key collaborators from local and national government agencies, collaborating NGOs, and local communities, will be supported under this sub-component.
  - *Marine Park and Tourism Resource Development Program.* Training events will be provided for senior and mid-level MPA managerial staff, para-professional staff of MPA agencies; senior government, university and NGO staff; rangers; supervisory staff at relevant government agencies and NGOs; tourism institution staff; community leaders, municipal representatives, local entrepreneurs and community association representatives. Events include the following: management planning for MPAs; principles of MPA management; development of MPA financial strategies; administration of MPAs; basic training for MPA rangers; community relations; MPA public use and tourism programs. Most training will take place in two to three week sessions.
  - *Training Library Development.* In addition to supporting regional training events, the Program will also provide a basic standardized training library to all MPA headquarters and ranger stations throughout the MBRS region (approximately fifty offices). This would facilitate continual professional improvement for MPA field staff who often lack even minimal access to training manuals, natural history publications, and other books on themes relevant to MPA management programs.

**Component 2. Regional Environmental Monitoring and Information System (US\$4.4 million)**

14. The establishment of a regional environmental information system (EIS) will provide an essential tool to organize and manage data to support improved decision-making. Moreover, a regional EIS can be used interactively with other Program components, serving both as a recipient of and source for data. In the Program's initial phase, the objective of the EIS component will be to provide the basic framework to guide the collection, processing, distribution and utilization of data to promote improved management of the MBRS. Specifically, the component will support the design and implementation of a bilingual EIS whose architecture will allow broad access to policy makers, technicians, and the public at large. While the establishment of an EIS will be a major product of the initial phase of the MBRS Program, it nevertheless should be viewed as a "living" system that will grow in complexity and value as new data are developed and made accessible.
15. A second objective of the component is to develop a *reliable* base of data which can be used to support more informed management decisions. Ecological linkages between reefs, other marine environments, and coastal watersheds, are mediated, partially or entirely, by water flow. However, despite the importance of water currents in transporting nutrients, pollutants, and reproductive products across ecosystem and national boundaries, there is a dearth of data on the region's current regime and its influence on the status and processes of MBRS reefs and other critical ecosystems. The component will support collection of oceanographic information and data on reproduction, larval dispersal, and recruitment of corals, fish, and other important reef components, to further our understanding of links between reefs and other ma-

rine environments, and processes which influence reef integrity. This sub-component will benefit from considerable parallel co-financing to be provided by the Government of Canada and University of Miami.

***Sub-component A - Creation and Implementation of a Distributed, Web-based EIS (\$1.70 million)***

16. A web-based EIS will be established which will provide a tool to organize and disseminate basic environmental data for reefs and other ecosystems and adjacent waters in the MBRS region, outflows from selected watersheds, and secondary data obtained from other local and regional data sources including relevant broader-scale monitoring programs such as CARICOMP and CPACC. Specific activities to be supported through this sub-component are:

- *EIS Design and Implementation.* Through this activity, the sub-component will support the design, purchase of equipment, and provision of technical support required to implement a distributed, web-based, bilingual EIS. The EIS will consist of two tiers, a primary, technical tier accessible to all participating data nodes, and a secondary, publicly accessible tier providing information on the MBRS; the latter in support of the Program's public education and other components. Equipment purchased under this activity consists of high end work stations and computers for a regional office (see below) and national node offices established in the four participating countries.

A series of intensive, in-country training workshops to build node agency skills in GIS and data management will include (a) the design of monitoring programs that support improved decision-making, (b) interpretation of remotely sensed data, and (c) statistical analysis of monitoring data including "reference condition" and other advanced techniques. All participating agencies will have a role in the development of the training program to target their respective institution's needs.

- *Meta-database.* A critical component of the EIS, will be the establishment of a comprehensive meta-database, a regional bibliography, and a core of legacy databases which will be maintained by the aforementioned regional office. At minimum, baseline geo-referenced maps, and first-cut distributions of major watersheds, coastal water masses, and broad habitat types in shallow waters will be included in the EIS. Much of these data will have to be generated by appropriate node agencies and/or the regional office.
- *Information Dissemination.* Provision of information (electronically and in print) stemming from monitoring and other activities being undertaken to gauge and manage the environmental "health" of the MBRS will be supported through the Program's website. An MBRS atlas on both CD ROM and hard copy media will be prepared in PY 4, which can be updated periodically as new data become available.

***Sub-component B - Establishment of a Synoptic MBRS Monitoring Program (\$2.65 million)***

17. Under this sub-component, a regional monitoring program for the collection of synoptic data on physical oceanography (surface currents and temperatures), and ecological connections among and between reefs and adjacent ecosystems (including coastal watersheds) will be implemented. Monitoring activities will be planned and designed in association with the MBRS MPA monitoring activity described above, to ensure technical coherence and operational efficiency between the two activities. Specific activities to be supported under this sub-component include:
- *Baseline Assessment and Monitoring Program.* This activity will support the preparation of an MBRS environmental baseline, based on available information on current regime, areas of high pollution risk, community structure and dynamics, and linkages between key ecosystems to assess

vulnerability and connectivity. The results of the study will be presented at an initial planning workshop of the component's Technical Working Group (TWG) in PY 1. It will be the TWG's task to develop a detailed proposal for a regional monitoring program to include surface current patterns, sources of pollution and water quality, and reef community dynamics including coral and fish recruitment.

In the initial phase of the Program, the geographic emphasis of the monitoring activities will be in the two transboundary areas of the MBRS. Selection criteria will likely include: presence of biodiversity-rich ecosystems; importance of the areas as sources or sinks for recruitment of corals, fish, and other important community components; and presence and degree of threat associated with pollution stemming from onshore activities. An additional five or six sites at strategic locations between the northern and southern transboundary areas will be established to contribute to a more complete understanding of the ecological processes that characterize the MBRS.

- *Targeted Research.* The monitoring study will be supported by ancillary field studies. These will include:
- Characterization of presence, composition, and status of specific biotic communities in proximity to monitoring stations.
  - A module which will monitor the flow and water quality at stations in proximity to Rio Hondo, New River, Motagua River, Chamelecon River and Uluá Rivers to include an assessment of their importance as outlets for agro-chemicals and other bioactive compounds that may affect the "health" of the reefs. This will include support for development of a set of bio-monitoring indicators that would allow more simple and cost effective monitoring of water quality, and which could be applied routinely to coral reef sites throughout the region, including MPAs.
  - A risk analysis using satellite imagery of river flood plumes, and/or analysis of offshore sediments derived from terrigenous materials, to identify those reef communities that are most at risk to river-borne pollutants.
  - Development of a hydrodynamic surface flow model for the region, a key output scheduled near the end of the Program's first phase.

The monitoring program and targeted research will be supported through the purchase of sampling equipment, logistical support for data collection, funding for laboratory analyses, and specialized technical assistance. This research will be complemented by proposed research on oceanographic and other factors affecting recruitment from source reefs to sink reefs within or adjacent to the MBRS, information vital to the strategic siting or expansion of MPAs in the region. The latter research on reef connectivity will be funded through co-financing provided by the Government of Canada and University of Miami.

### **Component 3. Promoting Sustainable Use of the MBRS (US\$1.9 million)**

18. There is growing evidence that non-sustainable resource use practices are in aggregate beginning to affect the overall "health" of the MBRS. The objective of this component is to support the introduction of new policy frameworks and management tools to increase institutional capacity, disseminate key information and create the necessary incentives for stakeholders to shift toward patterns of sustainable use of MBRS resources. This component will initially focus on the two most significantly important and potentially harmful economic sectors dependent on the MBRS, fishing and tourism. These have been combined in successful pilots activi-

ties in Belize with the conversion of reef fishermen to recreational (fly-fishing) and sea kayaking tour operators. Other opportunities involving women, such as tour guides in adjacent coastal protected areas, in value added processing of fish catch, in marketing of cultural amenities and as small hotel or pension operators, will also be explored and promising approaches scaled up in subsequent phases. WWF, in the meantime, has identified this area as one in which significant co-financing resources will be placed.

***Sub-component A - Promotion of Sustainable Fisheries Management (\$1.04 million)***

19. Several commercial species of finfish, crustacea and mollusks are either fully or over-exploited throughout the MBRS region. Not only do these species represent an important economic resource to coastal communities, many of them play key functional roles in the reef ecosystem. Despite the importance of the resource, sustainable management objectives for most of these species have rarely been achieved in the region; a situation attributed largely to a lack of awareness (among policy makers, resource managers and fishers, alike); poor education; conflicts among coastal-based resource user groups; and minimum research capacity in the MBRS region. This sub-component will address some of the causes of overfishing by supporting: (a) monitoring and management of spawning aggregation sites, (b) improved institutional capacity in sustainable fisheries management, (c) promotion of alternative livelihood systems, and (d) support dialogue aimed at developing a Regional Fisheries Policy.
- *Monitoring and Management of Spawning Aggregation Sites.* A key stage in the reproductive cycle of many of the commercially important reef-based fish species in the MBRS is the periodic aggregation of spawning populations in geographically-specific areas. Knowledgeable fishers exploit these resources without restriction. To date there are few data to assess the consequences of these fishing practices on either the fish populations or the MBRS at large. Nor are there consistent national or regional policies to manage the practice. The objective of this activity is to support the collection and analysis of scientific and anecdotal information: (a) documenting the location of these sites, (b) ascertaining their ecological and socio-economic importance, and (c) estimating the degree of exploitation (by fishing and other activities), with priority given to commercially important species, and (d) assessing the impact on population demographics. A key output from this activity will be the formulation of a draft regional policy to control the exploitation of these sites. This policy will form part of a broader Regional Fisheries Policy, which will focus on the harmonization of closed seasons, minimum sizes, fishing techniques, and joint monitoring and surveillance.
- *Institutional Strengthening.* This activity will identify and test new approaches to the sustainable management of fisheries that could be expanded and replicated in possible future Program phases. These are:
- Design and implementation of a regional fisheries data collection and management system. This activity will review existing fisheries data collection systems in the region, determine the feasibility of modifying them to suit MBRS needs, and produce a common fisheries data collection and management system for the MBRS, in the form of software and a users manual. This system will be compatible with the EIS. Copies of the software, users manual, computers and printers will be provided, together with training, to the four countries respective fisheries' agencies in an effort to promote immediate use of the new data collection system.
  - Training in and provision of existing computer-based management models (ECOPATH and ECOSIM) to the four countries to support, on a pilot basis, the adoption of an ecosystem-based approach to fisheries management.

- Regional and national training for fishers, government officials and members of NGOs in fisheries co-management techniques.
  - A study addressing the socio-economic interrelationships between fishing and other user groups (particularly tourism) within the coastal zone of the MBRS. This assessment will include a cost-benefit analysis of fisheries relative to other sectors; identify positive relationships and conflicts between fishers and other user groups and will recommend guidelines for enhancing positive relationships as well as conflict resolution measures between fishers and competing sectors in the coastal zone; and identify opportunities for multiple use.
  - Support for professional peer exchange and hands-on training in specific skills for technicians working in fisheries issues in the MBRS region. This activity will allow for the comparison and joint analysis of fisheries data, as part of the basis upon which a Regional Fisheries Policy will be developed.
- *Promotion of Sustainable Livelihoods.* Training of fishers from the transboundary areas in alternative income generating activities will be conducted in PY2 and PY3. This activity will give fishers the capacity needed to diversify from fishing into more sustainable income-generating activities, based on other successful initiatives in the region. Training will include, but not be limited to, kayaking, sport-fishing, SCUBA, leading nature tours, etc. After training, the equipment used for training (kayaks, rods and reels, paddles, life-vests, fly kits, etc.) would be housed within the training institution and rented to trained fishers at a low cost.

***Sub-component B - Facilitation of Sustainable Coastal and Marine Tourism (\$.85 million)***

20. Tourism is the world's fastest growing industry. Tourist arrivals to the Central America sub-region represented the highest average annual percentage growth increase within the Americas region over the past 3 years. A large part of this growth is in nature-based tourism, relying on the amenities or attractions of the Caribbean Basin's unique marine environment. The MBRS still boasts some of the least spoiled coastal profiles and some of the most outstanding underwater experiences in the Caribbean. However, in the absence of adequate environmental management guidelines or regulatory regimes, proliferation of traditional sea and sun tourism in parts of the region has occurred, putting many of these amenities at risk. There is a critical need to stimulate an on-going policy dialogue and take specific steps to ensure that sustainable tourism principles and practices are implemented through regional cooperation in fast growing tourism destinations within the MBRS.
21. The objective of this sub-component is to formulate and apply policy guidelines and best practice models for sustainable coastal and marine tourism in the four countries of the MBRS. The desired outcome is to provide and disseminate examples that demonstrate how to minimize the adverse impacts of tourism and enhance its potential beneficial effects on coastal/marine habitats and resources and on human communities located near tourism destinations. The following activities are planned over the initial five-year phase of the Program :
- *Regional Policy Dialogue and Cooperative Action Forum.* To facilitate a tourism policy that is consistent with marine conservation objectives enshrined in the Tulum Declaration and other international conventions, senior government officials, MPA managers and their tourism industry counterparts need to be better informed about critical coastal and marine tourism issues and problems. Priority issues include support for rigorous environmental impact assessment, inspection and enforcement systems for coastal resource development; guidance on the design of innovative regional trip circuits which "package" and market marine parks and other tourist destinations; selec-



tion of at least one specific priority issue each year requiring regional cooperation and development of an agreed action agenda to address it.

- *Catalogue of Exemplary Practices.* Voluntary codes of conduct in critical segments of the coastal and marine tourism industry need to be considered and adopted by tourism-related businesses. This activity will support an extensive literature search and interviews with sustainable tourism experts, from which “good practices” will be identified and adapted for use in the MBRS region. A catalogue of “exemplary practices” for sustainable coastal tourism will be developed and disseminated widely in the region through print and the Program’s website.<sup>3</sup>
- *Regional Environmental Certification and Voluntary Compliance Program.* Under this activity, a region-wide, independent environmental certification program will be established for coastal and marine tourism operations in key sub-sectors (e.g., hotel/resort facilities, diving operations, yachting and live aboard, ecolodges, cruise ship tours on land). This regional program will include: (a) agreement on a strategy and road map for certification, including performance based standards for environmental certification/ecolabeling; (b) formulation and adoption of an independent certification and marketing system that positions the MBRS region as one of the world’s leading sustainable tourism destinations; (c) provision of resources for establishment of the program on a pilot basis in high priority transboundary tourism destinations linked to one or more MPAs; and (d) development and adoption of a plan for expanding and financing the certification system (e.g., fee for service, cooperative marketing to the green market). Efforts will be made to create cost effective linkages and cooperative activities with other on-going certification programs (such as those sponsored by Caribbean Action for Sustainable Tourism). Complementing this will be a study (e), to explore with the private sector and other non-public sector stakeholders, the efficiency of various tools in promoting voluntary compliance, such as negotiated sectoral compliance, performance rating mechanisms and information disclosure.
- *Marine Tourism Exemplary Practices Study Tour.* A two-week marine tourism exemplary practices study tour will be designed for “emerging” marine tour operators in the MBRS to network and share ideas with 5 or 6 established and leading adventure travel, marine travel and ecotourism operators in Central America. Throughout the Tour, experts will conduct seminars on a number of topics, including product development, marketing strategies, partnering with the travel trade, packaging, and market research. Materials will be prepared on environmental practices, community involvement, conservation financing and interpretation. A technical report will also be drafted and widely disseminated to the tourism industry, interested NGOs and government officials through print and the Program website in order to share lessons learned, case examples and pitfalls to avoid.
- *Marine Park and Tourism Resource Development Program.* A marine park and tourism resource development training program will be offered, based upon the model training program being designed for the Honduras Sustainable Coastal Tourism Project. The following content will be covered: (a) setting objectives necessary for the successful future of the MPAs, (b) techniques for creating and developing a market position for the MPAs (individually and as a group) and establishing this position in relevant marketplaces, such as with travel wholesalers and in tourism magazines, (c) concessions and outsourcing mechanisms for managing ancillary services offered in and around the MPAs, such as food, lodging, and guide services, as well as security, maintenance, parking, transportation and a host of other services, (d) fund raising, accounting, financial man-

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<sup>3</sup> “Exemplary” refers to those practices that have been shown to produce superior results; are elected by a systematic process; and judged as exemplary, good, or successfully demonstrated. The practices then need to be adapted to fit a particular organization and practiced by exemplary operators.

agement and reporting, to provide better accountability to donors and improve ability to negotiate joint ventures and investment projects with tour operators, hoteliers and other tourism organizations; (e) environmental education in tourism and natural resources in order to meet the management objectives for protected areas, (f) park interpretation to improve environmental outreach to tourists and the general public; and (g) community participation, to encourage ownership of park objectives and facilitate access to conservation and tourism-related benefits by communities living in the buffer zones surrounding protected areas. Priority emphasis will be placed on identifying economic instruments in the marine tourism industry that could be used to enhance compliance with sustainable tourism policies and regulations, capitalize local trust funds for environmental management in the coastal zone, and create social funds for community development and income generation in areas impacted by tourism. A survey of tour operators, hotel owners and reef recreation-related businesses at selected MPAs and municipalities will be conducted to clarify their preferences relative to economic instruments and revenue generating mechanisms. The results will be used in the training program and disseminated widely in the region.

#### **Component 4. Public Awareness and Environmental Education (US\$1.5 million)**

22. A major underlying cause of threats identified in the Threat and Root Cause Analysis completed in support of MBRS Program preparation was the lack of public education on and awareness of the significance of the System and the issues that need to be addressed to ensure its sustainability. A critical element to developing the political will and policies required to manage the MBRS will be building the necessary public support to catalyze change. The objective of the component is to increase environmental awareness among a variety of stakeholders and develop the human capital necessary to plan and manage the diverse resources of the MBRS within a proven framework of conservation and sustainable use. The component consists of the following two sub-components: (a) development of an environmental awareness campaign, and (b) formal and informal education.

##### ***Sub-component A - Development of an Environmental Awareness Campaign (\$ .93 million)***

23. Under this sub-component, the general public's awareness of the importance of the MBRS as a "world class" resource and the need to promote its conservation and sustainable use will be increased. This will be carried out through support for the development of a broad-based public awareness campaign based on the use of printed and audio-visual materials. Specific activities supported under the campaign include:
- *Public Awareness Campaign Strategy.* This will be developed through a series of meetings and interviews with key stakeholders in the four MBRS countries. It will be implemented on a national basis and focus on the value and need for conservation of the shared resources of the MBRS. The strategy will include the following elements:
    - Establishment of a Database and Information Clearinghouse. MBRS-relevant materials and resources located within and beyond the region will be entered into a database which will be made accessible through the MBRS Program Website. A catalog of MBRS reference materials, to include all printed and audio-visual materials produced by Program components, will be compiled and made available to the public. This will also include information on environmental regulations and emissions/water quality standards, EIA permitting, zoning for multiple use, and environmental certification related to the MBRS to increase transparency and monitoring of compliance with these regulations
    - Development and Dissemination of Information Materials. In support of the campaign, printed and audio-visual materials (e.g., best practices guides and public education teaching materi-

als), will also be reproduced and distributed to target audiences. All materials will be produced in English, Spanish and, in some cases, Garífuna .

- Two, one-day seminars for National Barrier Reef Committees and mass media representatives will be held in each of the four countries to promote the Program and disseminate the printed and audio-visual materials.

***Sub-component B - Formal and Informal Education (\$.55 million)***

24. The objective of this sub-component will be to increase knowledge and promote changes in attitudes and behavior towards the conservation and sustainable use of the MBRS through the strengthening of formal and informal environmental education programs, with particular focus on the two MBRS transboundary areas. Specific activities which will be supported under this sub-component are:

- *Production and Dissemination of Education Materials.* Students at primary and secondary school levels will be educated about the significance of MBRS and the need to promote sustainable management practices. Assistance will be provided through creation and/or adaptation of curriculum materials for students, as well as teachers' guides and teacher training to ensure successful use. Specifically, this activity will support the production of primary school level curriculum materials for students and associated teaching guides, and two regional, 6-day training workshops for teachers. Secondary school level curriculum materials for students and associated teaching guides will also be produced. Two regional, 6-day training workshops for teachers of primary and secondary schools will complement the development of educational materials. An annual coastal resources fair and contest will be established for secondary school level students to exhibit and award projects that most successfully incorporate MBRS conservation and sustainable use themes.
- *Regional Workshops and Conferences.* Non-formal education will be provided for professionals in the industrial and tourism sectors which directly affect MBRS resources and for community leaders who exert strong influence on MBRS stakeholders. These will be coordinated with workshops and training materials developed under the sustainable tourism sub-component to expose participants to best practices in tourism and other sectors with direct impacts on MBRS resources. Awards to publicly recognize those who demonstrate their commitments to conservation and sustainable use of MBRS resources will also be supported.

***Regional Coordination and Project Management (US\$2.4 million)***

25. CCAD will be the implementing agency for the MBRS Program and will oversee execution by the Program Coordination Unit of the five year Project proposed during Phase 1 (see below). At the policy level, the Program will be coordinated by the MBRS Regional Steering Committee (RSC) made up of representatives of CCAD and each of the existing National Barrier Reef Committees in the four MBRS countries; ex-officio members will include those representing donor organizations and partner institutions working on related issues in the region. An MBRS Liaison Officer will be contracted within CCAD to facilitate coordination and to expedite feedback between CCAD in San Salvador and the PCU in Belize. The RSC will be supported by a Technical Advisory Committee (TAC) composed of internationally recognized experts in the technical areas of project assistance. A regional Program Coordination Unit (PCU) based in Belize will be responsible for direct implementation of the five year Project during the Program's first phase. Technical support will be provided to the PCU by Regional Technical Work Groups (TWG) made up of appropriately selected representatives from the National Barrier Reef Committees complemented by regional/international consultants on an

“as-needed” basis.<sup>4</sup> The TWGs will be supported by a Policy Working Group that will help articulate and raise to appropriate levels for consideration, the priority policy objectives and actions required to harmonize frameworks governing the use of MBRS resources in the region. Program activities under each of the four proposed components—Marine Protected Areas; Regional Environmental Information System (EIS); Promotion of Sustainable Use of the MBRS; and Public Awareness and Environmental Education—will be executed by a mix of local and regional execution entities. A more detailed description of the organizational framework and responsibilities at each level is provided below:

- *MBRS Regional Steering Committee.* Membership of the RSC will be comprised of the Executive Secretary of the CCAD<sup>5</sup> or his delegate, and the National Coordinators of each of the four National Barrier Reef Committees. The Director of the PCU will serve as a non-voting member and act as secretary for the Steering Committee. The RSC will provide overall policy guidance within the general and intermediate objectives of the Program, and will coordinate the participation of national, regional and international governmental and non-governmental counterpart organizations<sup>6</sup> in the implementation of the Program. It will review and approve annual work plans and resolve coordination issues that may arise between countries. The RSC will meet twice annually: (a) in early December to evaluate Program activities for the outgoing year presented in the form of an annual report, and to review and approve proposed activities for the subsequent year in the form of an aggregated annual work plan; and (b) in mid July to monitor progress in the implementation of activities proposed in annual work plans. Both of these meetings will also be used to analyze and resolve any regional policy and coordination issues that may be affecting Program implementation.
- *Consultative Group.* A Consultative Group consisting of representatives from donor organizations and partner institutions working in the region on issues related to the MBRS will liaise with the RSC through the PCU to identify synergies for Program development and attract additional co-financing over the long term. In this way, the RSC will facilitate coordination between the GEF Regional Project and other efforts which, collectively, constitute the larger, sustained Program of Actions in support of Conservation and Sustainable Use of the MBRS.
- *Program Coordination Unit.* The PCU will coordinate day-to-day implementation of the Program among each and all components. It will be responsible for contracting and logistical support of respective component implementing entities and consultants, procurement of Program-related equipment and supplies and overall planning, monitoring and evaluation of Program activities and quality control of Program execution. In addition, the PCU will also be responsible for the establishment and maintenance of the MBRS Environmental Information System (EIS), including its meta-database and webpage. CCAD and the RSC will delegate administrative authority to the PCU to directly manage financial resources provided under the GEF grant. However, the PCU will be accountable to CCAD, which will have ultimate responsibility for Project implementation and which will be directly accountable to the four participating countries and to the Bank/GEF in complying with the Grant Agreement for the Conservation and Sustainable Use of the Mesoamerican Barrier Reef System Project. The PCU will consist of the following staff:
  - Director
  - Accountant/Finance Officer

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<sup>4</sup> Costs of consultants have been budgeted for under the respective components.

<sup>5</sup> The Executive Director of the CCAD also acts as the Director General of the General Environmental Directorate (Dirección General de Medio Ambiente, DGMA) of the Secretariat of Central American Integration (Sistema de Integración Centroamericana, SICA), headquartered in El Salvador.

- Procurement Officer
  - Information Management Specialist
  - Environmental Monitoring Specialist
  - Natural Resources Management Specialist
  - Sociologist
  - Administrative Assistant
  - Driver/Office Assistant
- *Technical Advisory Committee.* The TAC will be responsible for advising the PCU on technical matters which may arise during the implementation of the Program. It will be composed of internationally-recognized experts in the fields relevant to MBRS Program objectives. Members will provide technical input for the design and review of annual work programs and serve as information gateways to state of the art management, good practice, and professional networks in the areas of MPA management, sustainable coastal tourism, regional fisheries management, coral reef ecosystem monitoring and EIS, and environmental education and outreach. The Technical Advisory Committee will also serve as an “honest-broker” to the PCU with respect to resolution of technical issues under the Project that may be particularly contentious. The TAC will be consulted on an as needed basis by the PCU, and will convene through an electronic forum to provide timely input to the deliberations of the RSC in the review of annual workplans.
- *National Barrier Reef Committees.* The National Barrier Reef Committees will be multi-sectoral in nature and will be made up of representatives of Government Institutions, local Government, non-governmental organizations, sectoral groups (such as fishing and tourism), academic institutions, indigenous groups living in the area of influence of the MBRS Project, and by other representatives that may be deemed necessary by the respective MBRS country. Among their tasks and responsibilities will be to: (i) assist their respective National Coordinators in defining policies for the national implementation of activities by the MBRS Project; (ii) assist the National Coordinator in preparing National Annual Reports of MBRS Project activities in the respective countries; (iii) participate in *ad-hoc* committees that may be formed to evaluate and pre-select consultants (individuals or firms) that may be contracted by the MBRS Project to implement activities at the national level; (iv) identify representative to participate in the sessions of the Technical Working Groups (TWGs), in accordance with their technical expertise; (v) provide technical advice, via the National Coordinator, to the Project Coordinating Unit (PCU); and (vi) collaborate to the extent possible, with Officers of the PCU, consultants or groups of consultants, who may visit the country on official business for the MBRS Project (see Project Implementation Manual for further detail).
- *Regional Technical Working Groups.* Regional Technical Working Groups (TWG) will be established to support each of the Program’s four components. Separate TWGs will be established for sub-components dealing with fisheries and with tourism under the Sustainable Use Component, and with ecosystem monitoring and environmental information systems under Component 2. The TWGs will include two technical representatives from each National Barrier Reef Committee appropriately selected based on their affiliation with the technical subject area, preferably one representative from a government institution and one representative from a non-governmental or resource user organization. TWG composition will be complemented by consultants on an “as needed” basis. Component specific tasks for each TWG would include:

- *TWG on Marine Protected Areas* will be responsible for: (a) participating in and coordinating development of a methodology for establishment of a baseline and monitoring program for MBRS-supported MPAs, (b) promoting the use of this methodology in other non-participating MPAs, (c) reviewing and commenting on MPA management and operational plans, (d) promoting needed policy change/formulation identified in MPA specific management plans through their respective governments to ensure future sustainability of the protected area system, and (e) reviewing training course content and lists of participants to ensure sub-component objectives are achieved.
- *TWG on Environmental Monitoring and Information System*
  - The sub-group for the environmental information system sub-component will be responsible for: (a) developing data-sharing agreements and other procedures required to ensure the successful establishment and operation of the EIS, (b) coordinating and integrating national node agencies' efforts, and (c) promoting development of additional nodes and the growth and broader use of the EIS.<sup>6</sup>
  - The sub-group on the environmental monitoring sub-component will be responsible for coordinating and implementing the monitoring program. Specifically, it will be responsible for: (a) reviewing and commenting on the draft baseline assessment document, (b) advising on the selection of sites and design of the monitoring program, (c) advising on the ancillary studies in support of the monitoring program.
- *TWG on Sustainable Use of the MBRS*
  - The sub-group on sustainable fisheries will be responsible for: (a) coordinating and participating in development of a methodology for establishment of a data baseline and monitoring program for fish aggregation sites; (b) participating in the drafting, promotion, and adoption of a regional policy to conserve and manage the fishery resources at these sites; (c) participating in the design and adoption of a standardized fisheries data collection system; (d) introducing measures to harmonize policies regulating the exploitation of shared stocks (e.g., through agreement on quotas, closed seasons, fishery no-take zones), and protection of threatened and endangered species; and (e) coordination of training and activities.
  - The sub-group on sustainable coastal and marine tourism will be responsible for: (a) coordinating and participating in the regional cooperative action forum, (b) monitoring the implementation and follow-up of agreed actions stemming from forum meetings, and (c) coordinating and participating in the development and promotion of the regional environmental certification program.
- *TWG on Public Awareness and Environmental Education* will be responsible for: (a) facilitating the identification and accessing of data and information in support of the component, (b) providing input to, reviewing and commenting on the public awareness strategy, (c) promoting the mass media campaign through available national channels, and (d) reviewing and commenting on educational materials in support of the formal and informal educational sub-component.

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<sup>6</sup> In addition to representation from the National Coral Reef Committees, where representatives are not from the participating national node agency, the latter will also participate in the EIS sub group.

26. Supporting all of the TWGs will be a separate “Policy Working Group” composed of experts in environmental law and natural resources management policy from the region. The role of the Policy Working Group will be to assist the TWGs in the identification of priority policy objectives and actions required to harmonize national frameworks governing the use of MBRS resources in each country with agreed regional frameworks, e.g., for fisheries, water quality, coastal tourism development, EIA and establishment of protected areas. The Policy Working Group will liaise closely with CCAD and its legal office to ensure that policy objectives under the MBRS are raised to the highest levels for consideration within the System for Central American Integration (SICA), and to establish performance benchmarks for policy harmonization during the near, medium and long term. These benchmarks will form the basis for the design of policy actions during Phases 2 and 3 of the Program. Complementing this, a scenario analysis of different economic policies, development schemes and demographic trends in the sub-region will be prepared in PY2 to create a strategic context for design of the longer term MBRS Program and to identify the priority environmental policies and investments to be supported in subsequent phases of the Program.
27. After the first year, TWGs will meet annually at the end of each calendar year, scheduled to coincide with the RSC’s meeting, in order to assess program progress related to each group’s technical interest area and provide input to the annual planning process for the ensuing year’s activities. Meetings of the TWGs will be structured such that cross-fertilization between the Policy Working Group and the TWGs is maximized. This will ensure that actions included in the Annual Work Plans are closely linked to specific policy objectives. These groups will also communicate on a continuous basis via Internet, telephone, fax and/or informally during training events and seminars throughout the year to coordinate their respective National Committee’s support for regional Program implementation.
- *Component Execution Entities.* The PCU, with RSC approval and consistent with Bank procurement policies and guidelines, will select a series of qualified national and international and non-governmental organizations and consultants to carry out proposed Program activities. Selection of these entities will be based on their unique geographic position in proximity to Program outreach areas and/or technical areas of expertise to implement such activities under a competitive process. The PCU will sign and manage cooperative agreements and/or contracts with these entities and supervise their execution. Specific activities to be carried out by these entities are described under the respective Program components and terms of the MBRS Program Implementation Manual (PIM).

## PROGRAM IMPLEMENTATION

28. Much of PY1 will be devoted to establishing the necessary institutional arrangements to ensure efficient Program implementation. Facilitated by the Project Implementation Manual (PIM), these arrangements include: (a) staffing and equipping the PCU; and (b) forming the Program’s RSC, TAC and TWGs. A major milestone for the PCU will be to prepare an interim work plan to be submitted to the RSC at the mid-point of PY1. Prior to that, the PCU Coordinator and staff will be working under previously prepared TORs submitted and approved by the RSC as part of the PIM. Much of the remainder of PY1 will be devoted to planning and design of specific components and their respective activities and completing contracting arrangements with the various executing entities.
29. Under the MPA component, following the establishment of the TWG, MPA baseline assessments will be phased in over the first three Program years beginning with an initial six assessments proposed for PY1. These will “drive” the schedule of the subsequent steps of plan

development and implementation, which have been sequenced over PY2 - PY4. MPA monitoring activities will commence approximately one year after the completion of the baseline and continued to the end of the Program's first phase. Training activities will begin in PY1 but will be mostly concentrated in PY2 and PY3.

30. Under the Regional EIS component, the design of the EIS, establishment of national data nodes, and purchase of equipment are projected for PY1. These activities will be followed by the establishment of the meta-database and production of the atlas in PY2 and PY4, respectively. Under the environmental monitoring sub-component, the completion of the initial assessment of baseline conditions and monitoring program design are scheduled for the end of PY1. Equipment purchase and deployment and the initiation of field monitoring will commence in PY 2.
31. Under the Sustainable Fisheries Management sub-component, the initial assessment of aggregations of fish populations is projected for the end of PY1, followed by a 3 year monitoring program beginning in PY 2 and continuing through PY4. The design and purchase of equipment related to the fishery data management system will also be completed in PY1 though training will not commence until PY2. Most of the remaining activities under this sub-component are scheduled to commence in PY2 and some will continue until the end of the Program's first phase.
32. Under the Tourism sub-component, the initiation of the action forum and the certification program activities will commence in PY1 and continue through the life of the first phase. The publication of the exemplary practices catalogue and support for the exemplary practices study tour is scheduled for PY2 and PY3, respectively.
33. Finally, under the Public Awareness and Environmental Education component, the establishment of the clearing house, design of the public awareness campaign, and publication of materials are projected for PY1. The implementation of the campaign, distribution of materials, and most of the workshops and conferences are scheduled for PY2-PY5.



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**Annex 3**

**Estimated Project Costs**

<b>Project Cost By Component</b>	<b>Local US\$million</b>	<b>Foreign US\$million</b>	<b>Total US\$million</b>
1. Marine Protected Areas	2.1	2.5	4.6
2. Regional Environmental Information System (EIS)	1.6	2.5	4.1
3. Promotion of Sustainable Use of the MBRS	0.8	1.0	1.8
4. Public Awareness and Environmental Education	0.5	0.9	1.4
5. Regional Coordination and Project Management	0.8	1.4	2.2
<b>Total Baseline Cost</b>	<b>5.8</b>	<b>8.3</b>	<b>14.1</b>
<b>Physical Contingencies</b>	<b>0.0</b>	<b>0.2</b>	<b>0.2</b>
<b>Price Contingencies</b>	<b>0.4</b>	<b>0.5</b>	<b>0.9</b>
<b>Total Project Costs</b>	<b>6.2</b>	<b>9.0</b>	<b>15.2</b>
 <b>Total Financing Required</b>	 <b>6.2</b>	 <b>9.0</b>	 <b>15.2</b>
<b>Project Cost By Category</b>	<b>Local US\$million</b>	<b>Foreign US\$million</b>	<b>Total US\$million</b>
<b>Goods</b>	<b>0.2</b>	<b>2.2</b>	<b>2.4</b>
<b>Works</b>	<b>0.2</b>	<b>0.2</b>	<b>0.4</b>
<b>Services</b>	<b>2.0</b>	<b>3.0</b>	<b>5.0</b>
<b>Training</b>	<b>1.5</b>	<b>1.0</b>	<b>2.5</b>
<b>Recurrent Costs</b>	<b>1.9</b>	<b>1.9</b>	<b>3.8</b>
<b>Contingencies</b>	<b>0.4</b>	<b>0.7</b>	<b>1.1</b>
<b>Total Project Costs</b>	<b>6.2</b>	<b>9.0</b>	<b>15.2</b>

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**Annex 4**

**Incremental Costs and Global Environmental Benefits**

**Overview**

1. The global objectives of the Mesoamerican Barrier Reef System Project are to enhance protection of ecologically unique and vulnerable marine ecosystems of the second longest barrier reef in the world and to assist the countries of Mexico, Belize, Guatemala and Honduras to strengthen and coordinate national policies, regulations, and institutional arrangements for marine ecosystem conservation and sustainable use of this global public good. The Project's specific objectives are to: (a) strengthen existing and create new marine protected areas; (b) develop and implement a standardized data management system of ecosystem monitoring and facilitate the dissemination of its outputs throughout the region; (c) promote measures that will serve to reduce non-sustainable patterns of economic exploitation of the MBRS, focusing initially on the fisheries and tourism sectors; (d) increase local and national capacity for environmental management through education, information sharing and training; and (e) facilitate the strengthening and coordinating of national policies, regulations, and institutional arrangements for marine ecosystem conservation and sustainable use.
2. The GEF Alternative intends to achieve these objectives at a total *incremental cost* of US\$11.0 million through the implementation of components entailing improved planning, management, and monitoring of marine protected areas; strengthening technical capacity of protected areas staff; creation and implementation of a distributed, Web-based environmental information system; establishment of a synoptic monitoring system; promotion of sustainable tourism and sustainable fisheries management in coastal communities; development of an environmental awareness campaign; support for formal and informal education; and Project management.

**Context: Threats and Root Causes**

3. Coral reefs support the most diverse forms of life on earth. The framework built by corals and algae supports a fantastic variety of flora and fauna, including invertebrates, such as hard and soft corals, mollusks, sponges, anemones, sea whips, tube worms, shrimps, crabs, lobsters, clams, starfish, sea urchins and tunicates. Megafauna inhabiting this underwater rain forest include over 4000 species of fish, marine reptiles, and an array of marine mammals that migrate through their waters. The MBRS, extending from Mexico to Honduras in the Western Caribbean, is the second longest barrier reef in the world, serving as a habitat for tremendous marine biodiversity. The MBRS is unique in the Western Hemisphere on account of its size, its array of reef types, and the luxuriance of corals that it contains. Unusual geophysical features include the complex maze of patch reefs and faroes in a relatively deep shelf lagoon; the great diversity of reef types in a small geographical area; and the large offshore mangrove cays that have a marine origin. In southern Belize, the mangrove cays of Port Honduras-Payne Creek and the Sarstoon-Temash system along the border with Guatemala constitute the largest stand of mangroves in all of Belize and the Caribbean coast of Guatemala. They provide nutrients and critical habitat in the juvenile stages for much of the invertebrate and vertebrate fauna that inhabit the southern portion of the MBRS in the Gulf of Honduras. The MBRS is also unique in featuring three oceanic atolls, of which Glovers Atoll is considered to be the best example of an atoll in the Caribbean basin.

4. Associated with the MBRS ecosystem are extensive areas of relatively pristine coastal wetlands, lagoons, seagrass beds and mangrove forests that provide critical habitat for a number of threatened species and many species of birds. The species diversity of plants within the Glovers Atoll alone has been found to be higher, by a factor of two, than that of other Caribbean and Gulf of Mexico reef island groups. The MBRS stabilizes and protects coastal landscapes, maintains coastal water quality, sustains species of commercial importance, serving as breeding and feeding grounds for fish and invertebrates, and offers employment alternatives and incomes to approximately one million people living in coastal zones facing the reefs. In view of its exceptional character, a number of sites in the MBRS have been designated as World Heritage sites. Five of these lie within the Belize Barrier Reef.
5. Despite its renown as an important habitat for coastal and marine biodiversity, the MBRS is under severe threat. Particular threatened species include: N. American manatee; Loggerhead Turtle; Green Turtle; Hawksbill Turtle; Olive Ridley Turtle; black corals; queen conch; and spotted spiny lobster and Nassau Grouper in parts of their range. A Threat and Root Cause Analysis (TRCA) carried out during Project preparation indicated that the principal threats to the MBRS include:
  - *Coastal/Island Development and Unsustainable Tourism*, which includes urban, hotel and resort development and related infrastructure, together with all the direct and indirect impacts that these bring to bear on the MBRS (e.g., pollution/contamination, nutrification, sedimentation, physical reef damage, impacts to estuary and lagoons and mangrove destruction, beach erosion, habitat change, etc.).

**Box 1. Existing Threats and Root Causes:  
Coastal/Island Development and Unsustainable Tourism**

*The City of Chetumal discharges 200 cubic meters of untreated sewage into Chetumal Bay each day. Volumes of raw or poorly treated sewage of similar or greater magnitude are discharged from urban centers directly into coastal waters of the MBRS coast from Belize City, Puerto Cortes, Tela, La Ceiba and Trujillo. Excess nutrients can result in blue-green algal blooms that smother coral reefs. Repeated fish kills in the vicinity of Belize City are attributed to effluent from an industrial galvanizing plant. Similarly, ever-increasing cruise ship and live aboard tourism, which is predicted to add an additional 20 ships and 2,000,000 passengers to the Caribbean in the year 2000, can likewise produce serious impacts if not regulated. Pulses of high numbers of tourists can overtax public services, reduce local food stocks, and generate vast amounts of solid and liquid wastes that must be accommodated by municipalities in the MBRS. If these ships visit offshore island and coral reef sites, waste management problems may become acute, and inexperienced and/or unsupervised divers and snorkelers may lead to coral breakage, predation and uncontrolled fishing.*

*The intermediate causes of threats from inappropriate coastal development and unsustainable tourism are linked primarily to the inability, or lack of will, to enforce compliance of existing laws and regulations regarding environmental impact assessment and land-use zoning. In some cases, regulations and land-use plans are non-existent. There is a notable lack of land-use/integrated coastal management plans and zoning related to basic environmental and engineering principles. Another intermediate cause is failure to control settlement and inappropriate land use in marginal areas not environmentally fit for habitation, especially national and municipal properties, including mangroves, beaches, wetlands and near lagoons. Behind these intermediate causes stands a series of structural root causes, including a lack of awareness of the impacts of development actions in the coastal environment at all levels, from local resource users up to national government policy makers. Likewise, weak land tenure policies favor large landowners and restrict access of the poor to land needed, in most cases, for subsistence agriculture. This is further complicated by poverty in rural areas due to lack of employment opportunities, the failing natural resource base, and lack of basic social services. As these conditions worsen, the rural poor set out in search of other opportunities, with an increasing number heading to coastal areas.*

- *Inappropriate Inland Resource/Land Use and Industrial Development*, encompassing a broad range of agricultural, urban and industrial development in inland watersheds that drain into coastal areas;

contamination of wetlands, lagoons and estuaries, whether directly or indirectly impacting the MBRS (e.g., sedimentation, pollution/contamination, eutrophication, habitat and species/abundance changes, mass kills of organisms, etc.).

**Box 2. Existing Threats and Root Causes:  
Inappropriate Inland Resource/Land Use and Industrial Development**

*Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) represent the two greatest pollutant loads entering the Wider Caribbean Region and MBRS, with TSS loads from rivers being one order of magnitude higher than loads from industrial and urban/domestic sources discharged directly into coastal waters. It is estimated that approximately 90 percent of all pesticides applied in the region do not reach their targeted species, much of this lost to runoff into streams and eventually manifested in marine biota in coastal waters. Likewise, approximately 2,500 gallons of liquid wastes are discharged from sugar refining and rum distilling operations on the New River in Belize, contributing large organic loads and spent lubricants to the Chetumal Bay. Of the 380 industries registered in the Sula Valley, the most industrialized area adjacent to the MBRS and drained primarily by the Río Chamelecón, 150 are reported to have environmentally problematic effluents.*

*The intermediate and root causes of the threats associated with inappropriate resources and land use and industrial development in areas inland from the coasts can be distributed into two principal groups: (a) lack of land-use and watershed management plans to guide environmentally-sound development, compounded by limited regulations and local capacity to assess environmental impacts of development projects, especially industrial enterprises and transport infrastructure, and subsidies favoring industrial development without investments in environmental protection; and (b) lack of secure access to land, basic human services and technical assistance to facilitate practice of appropriate land and resource-use techniques, leaving the rural poor to migrate to upland watersheds and other areas incapable of supporting agricultural uses.*

- *Overfishing and Aquaculture Development*, including industrial, artisanal, subsistence and recreational fishing, and aquaculture in coastal areas and the real and potential impacts of species and abundance change, local *overfishing* of selected species (e.g., grouper, jack, mackerel, snapper and snook); and poaching of selected species (e.g., manatee and sea turtles); habitat change/symbiosis imbalances; reduced subsistence and revenues from fisheries.

### **Box 3. Existing Threats and Root Causes: Overfishing and Aquaculture Development**

Based on the results of FAO's 1994 Survey of the Wider Caribbean, 70 percent of the pelagic stocks and 60 percent of the demersal stocks were considered over-exploited. The over-dimensioned fishing fleets, especially in Honduras where the number of industrial ships was 360 in 1996, places great fishing pressure on the primary commercial species, especially as the ships now use more advanced navigation and fish-finding equipment and some pull as many as four trawling nets.<sup>1</sup> Species under the greatest pressure are lobster, conch, shrimp and certain species of finfish (esp. grouper and large grazers), for which overall harvests have been reduced by 60-75 percent based on catch-per-unit-effort since 1979 in Honduras and Belize, with similar reductions noted in the rest of the MBRS. Utilization of illegal equipment and fishing methods, including use of SCUBA for lobster and conch fishing, has led to excessive local depredation and reduction in stocks of key commercial species.

Intermediate causes of the threats associated with overfishing can be found in large part in the lack of compliance with existing national fisheries regulations and standards upheld in international conventions and treaties. This can be attributed in part to lack of awareness of the impacts of overfishing and of the content of the law by many artisanal fishers, and the zeal to increase catch and revenue of over-dimensioned industrial fleets. The insufficient number and capability of government staff responsible for enforcement of fisheries regulations is another intermediate cause. Furthermore, lack of valid data concerning abundance, reproduction habits, and landings/harvest of species of fishes, mollusks and crustaceans, especially those under pressure, restricts development of management plans and complicates enforcement of regulations. Regarding inappropriate aquaculture, intermediate causes are primarily those resulting in poor siting, construction and operation of ponds, due to the lack of capacity of local professionals to execute EIAs and recommend appropriate mitigating measures. Likewise, there have been few regulations promulgated to ensure environmentally sound operation of aquaculture operations. For all threats associated with overfishing and inappropriate aquaculture, the most important root cause is the lack of integrated fisheries policies and management plans at the national level, and the MBRS region as a whole.

- *Inappropriate Port, Shipping and Navigation Practices*, including intentional and accidental contamination of waters, reefs and beaches, physical reef damage, impacts to aquatic species and fisheries (including mass kills), degradation of the tourism value of reefs and related coastal environments, and related topics.

### **Box 4. Existing Threats and Root Causes: Inappropriate Port, Shipping and Navigation Practices**

More than 90 percent of commerce in the region is transported by oceangoing ships, making ports and navigation of high economic development value, but also a focal point for real and potential threats to the ecological health of the MBRS. Oil terminals in the area involve the transport of millions of gallons of petroleum and derivatives through the MBRS region each month. Port and jetty construction and dredging associated with channel and harbor maintenance results in increased sedimentation in seagrass beds and nearby coral reefs, stressing and potentially smothering them. Redeposition of sediments may result in erosion of beaches and accretion in navigation channels, estuaries and coastal lagoons, and may change flows in local currents and flushing of bays and estuaries. Changes in coastal morphology may reduce defenses against storms and actually instigate more damage from storm surge and flooding.

Inappropriate waste management practices on ships and in ports can result in nutrification and/or chemical contamination of estuaries, bays, wetlands, reefs and sea-grass beds. Most ports have limited facilities to receive solid and liquid wastes from ships, inducing many to dump their wastes directly into the sea. Wastes dumped in inadequate landfills may make their way back to the coastal waters and beaches. Such spills can cause fish kills as well as sublethal impacts. As solid and liquid wastes float ashore, they foul beaches, represent human health hazards and reduce aesthetics important to the tourism industry.

Intermediate causes of threats include lack of awareness of the impacts of ports, deficient regulations and limited local capacity to assess environmental impacts of port projects. This is compounded by the lack of baseline information on coastal resources and currents. The lack of overall integrated coastal and port-specific management plans, contingency plans for rapid responses to shipping emergencies and spills and

<sup>1</sup> The Honduras fleet consists of 128 shrimp trawlers, 181 lobster boats, 14 conch fishing boats and 37 finfish boats.

*equipment to handle them also poses threats to both shipping and the environment. The lack of waste management facilities in ports relegates ships to disposal at sea. Root causes include the lack of institutional capacity to properly manage port operations and shipping, as authority is distributed among various agencies and too little investment provided to maintain and/or upgrade port facilities and train port personnel.*

- *Natural Oceanographic and Climato-Meteorological Phenomena*, with regard to the influence of currents and winds, El Niño/La Niña events, increased frequency and amplitude of tropical storms, global warming, earthquakes and tsunamis, and their potential cumulative effect. The devastation attributed to *Hurricane Mitch*, following massive bleaching of coral reefs associated with an intense *El Niño* episode in the summer of 1998, is one such example. Bleaching affected all reefs in Belize, particularly in the lagoon area, where up to 90 percent mortality was detected.

#### **Box 5. Existing Threats: Natural Oceanographic and Climato-Meteorological Phenomena**

*Oceanographic and climato-meteorological features are permanent phenomena in nature, however their increased frequency and intensity, now thought to be associated with climate change, represent serious threats to both human and biological coastal communities. Settlements and development infrastructure are exposed to greater risk as a result of increased storm damage and flooding. More frequent and sustained increases in sea surface temperatures like those associated with recent El Niño events, also puts coral reefs—already near or at their critical thermal maxima—at much greater risk. The MBRS's increasing exposure to anthropogenic stress may lower the resilience of its communities to such "natural disturbance." Bleaching, reduced calcification rates and increased vulnerability to diseases among corals are all potential outcomes of major shifts in the periodicity and amplitude of atmospheric and oceanographic phenomena. Continuous monitoring of these phenomena and of physical and biological indicators of coral reef health, will be essential to assessing the long-term vulnerability of the MBRS to system-wide changes in oceanographic and atmospheric conditions that exceed historic levels of variation in these states.*

6. The TRCA indicated that two transboundary subregions, the Chetumal Bay – in the border region of Mexico and Belize – and the Gulf of Honduras – shared by Belize, Guatemala, and Honduras – are the principal foci of the majority of known and/or potential threats and their impacts to the ecological health of the MBRS, with most of the intermediate and root causes of the threats occurring therein. Unfortunately, not enough is known about the ecology of the reefs nor their recovery potential to adequately assess the long-term impact of these forms of stress on the viability of the ecosystem nor the costs to human populations of the potential losses associated with them.
7. The broad development goals of the four participating countries focus on economic growth, improving the effectiveness of the public sector, poverty alleviation and improved natural resource management. The Project supports these goals through promoting sustainable use of natural resources and generation of sustained benefit flows from coastal and marine resources to poor, rural communities, as well as training of government officials in improved methods for planning and management of resources.

#### **Baseline Scenario**

8. **Scope.** On June 5, 1997, the Presidents of Mexico, Guatemala, and Honduras and the Prime Minister of Belize signed the "Declaration of Tulum" in which they acknowledged the global biological, economic and cultural importance of the Mesoamerican Barrier Reef in relation to the region's future, the seriousness of the threats facing this unique system, and the urgent need to initiate actions to counter these threats. The four nations' leaders committed themselves to initiate a process of active collaboration between the four countries to prepare and implement an Action Plan for the conservation of the MBRS.

9. In June 1997, the Central American Commission on Environment and Development (CCAD), representing the three Central American countries bordering the MBRS, and which includes Mexico as an observer, approached the World Bank requesting support for the design of strategies and projects at the regional and national levels for conservation and sustainable use of the MBRS. With financial support from the Global Environment Facility and technical support from the World Bank, IUCN, and WWF, the four countries drafted an Action Plan for the management of the MBRS. The Action Plan includes the following major elements: (a) integrated land use planning; (b) research/monitoring, education and information dissemination; (c) establishment of marine protected areas; (d) promotion of sustainable tourism efforts; (e) maintenance of water quality and pollution prevention; (f) capacity building: institutional strengthening, participatory management and financial sustainability; (g) harmonization and implementation of robust legal frameworks; (h) fulfillment of international agreements; and (i) regional coordination in the implementation of the Action Plan. The Action Plan provides the basis for a comprehensive program of regional and national level activities aimed at safeguarding the integrity and productivity of the MBRS and ensuring the social and environmental sustainability of benefits derived from it now and in the future.
10. In line with the 1997 Action Plan, concerns over increasing threats to biodiversity in particular have prompted the four participating governments to carry out work on National Biodiversity and Actions Plans (BSAPs) with assistance from UNDP/GEF. These BSAPs have identified challenges to the conservation and wise use of biological resources, including the effectiveness of laws and institutions. Priority areas for work include identification of unsustainable natural resource use and the impacts of such practices on national and regional ecosystems and species threatened with extinction. Solutions to address such problems include – among others – more effective enforcement of existing laws and regulations, strengthening of existing protected areas and creation of new protected areas where necessary and resources permit, improved land management and broader participation of responsible governmental and non-governmental organizations in natural resource management.
11. Accomplishing the above-mentioned development priorities and in particular those related to the Action Plan in the four participating countries will require upgraded capacity and quality of government institutions addressing coastal and marine resource management, policy harmonization, and programs targeted towards sustainable income generation, particularly for the rural poor. The following discussion of the Baseline Scenario activities is divided as follows: (a) activities financed strictly by government resources; (b) activities financed by multilateral institutions<sup>2</sup>; (c) activities financed by bilateral donors; and (d) activities financed by NGOs.
12. ***Nationally financed activities.*** Activities at the national level in the four participating countries relating to policing of coastal and marine resources; enforcement of environmental laws; promulgation of policies regarding fisheries laws and water quality; physical sampling and monitoring of water quality related to nutrient loads and coastal and marine pollution; as well as participation in regional working groups relating to coral reef monitoring, fisheries management (e.g., CARICOM Fisheries Resource Assessment and Management Program), or other public sector activities directly related to coastal and marine resources management in the MBRS region total approximately US\$4.5 million over the next five years, including: Government of Mexico,

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2. Activities financed by the Global Environmental Facility are mentioned in this analysis to indicate the full extent of activities underway in the region; nonetheless, they are not considered as part of financing of the Baseline Scenario. Furthermore, the four participating countries are in the final stages of Enabling Activities for Biodiversity with the support from the Global Environment Facility and the United Nations Development Programme. Under the Baseline Scenario, it is expected that the four countries will complete national Biodiversity Strategies and Action Plans, assessing the status of biological resources and identifying options for managing important biodiversity.

US\$1.5 million; Government of Belize, US\$1.5 million; Government of Guatemala, US\$0.5 million; and Government of Honduras, US\$1.0 million.

13. ***Internationally financed activities: Regional.*** GEF-financed activities in the four participating countries are extensive. With assistance from the Global Environment Facility, the United Nations Development Programme and the United Nations Environment Programme, and bilateral donors, the Central American Commission on Environment and Development is executing the regional program to consolidate the MBC. Additionally, the Inter-American Development Bank has begun discussions with the Governments of Belize, Guatemala, and Honduras with respect to a project to control transboundary pollution in the Gulf of Honduras.
14. ***Internationally financed activities: Mexico.*** A project to conserve the Mesoamerican Biological Corridor in Mexico has recently been approved by the Bank's Board. The aim of the Project is to address terrestrial biodiversity concerns and to forge critical links between terrestrial and marine corridors through the protection of biological corridors linking natural habitats, increase environmental education and awareness, and improve land use in watersheds draining into the Caribbean Sea. One of the proposed corridors links Calakmul Biosphere Reserve in Chiapas with Sian Ka'an Biosphere Reserve, a priority protected area along the coast of Quintana Roo.
15. ***Internationally financed activities: Honduras.*** The Mexico MBC project is complemented by a national initiative in Honduras to conserve biodiversity in protected areas. The World Bank/UNDP/GEF/Government of Honduras: Biodiversity in Priority Areas Project is working to protect the integrity of natural systems in priority protected areas; along Honduras' north coast and southernmost region of the MBRS, the project is supporting protected areas management in four protected areas: Punta Sal, Punta Izopo, Cuero y Salado, and Pico Bonito.
16. The Government of Honduras/Inter-American Development Bank Bay Islands Project aims to promote sustainable development in the Bay Islands of Honduras, a part of the MBRS, through strengthening the capacity of local institutions responsible for natural resources management, establishing a large Marine Protected Area surrounding the Bay Islands, improving environmental quality through waste management and water quality monitoring, and supporting environmental education and outreach. The estimated contribution to the Baseline Scenario for project activities totals US\$24 million.
17. Baseline activities within the Government of Honduras/World Bank Social Investment Fund and the Government of Honduras/Inter-American Development Bank Secondary Cities Project will promote improved resource management, improved access to social services (e.g., water and sanitation) and income generation for the poor in secondary cities along the Caribbean coast of Honduras (e.g., La Ceiba, Tela, Trujillo). As part of significantly larger projects, the estimated contribution to the Baseline Scenario for activities in the above-mentioned areas totals US\$7.5 million.
18. The proposed Government of Honduras/World Bank Sustainable Tourism Project is designed to help Honduras lay the foundation for sustainable growth in the tourism sector over the next three years by: (a) developing a national strategy for sustainable tourism along the North Coast, which includes zoning and land use planning for development of sub-regional tourism development plans; (b) strengthening capacity in coastal municipalities to discharge their responsibilities in the area of environmental assessment and planning and managing the development of their coastal and marine resources for tourism and other economic activities; (c) designing and delivering training programs in good practice and international codes of conduct in the tourism industry, tailored to the needs of NGOs, small business enterprises and commercial tourism operators, as well as developing a voluntary environmental rating and certification program for private sector



businesses, tourism destinations and private nature reserves; and (d) promoting and testing innovative public-private partnerships in line with principles of environmentally and socially sustainable tourism in coastal communities throughout the project area. The latter will encourage the participation of indigenous and other economically disadvantaged groups as key beneficiaries under the project. The estimated contribution to the Baseline Scenario for project activities totals US\$4.0 million.

19. ***Internationally financed activities: Belize.*** In Belize, the second phase of the Government of Belize/UNDP/GEF Conservation of the Belize Barrier Reef Complex Project is focusing on national priorities, including improving management of fisheries, marine environment and tourism sectors through zoning and land use planning; consolidation of designated Marine Protected Areas; development of environmental policies; establishment of environmental monitoring systems; promotion of sustainable tourism and introduction of cost recovery mechanisms for marine conservation and management. While there are synergies between the national effort and the proposed MBRS Regional Project, the latter will focus almost exclusively on transboundary issues. Three mid-sized projects are serving to support terrestrial biodiversity conservation in the northern, central, and southern portions of Belize. One of these, involving the protected area at Sarstoon-Temash, will provide the basis for linking improved natural resource management in agricultural productive activities with conservation efforts by indigenous communities. The MSP focus on these terrestrial habitats will provide the opportunity to improve management of the coastal interface in this highly sensitive transboundary area. Finally, several communities have received grants through the UNDP/GEF Small Grants program to protect coastal and marine resources (e.g., Laughing Bird Caye National Park Project; Slackchwe Habitat Enhancement Project).
20. The Government of Belize/Inter-American Development Bank Tourism Development Project aims to increase employment opportunities, foreign exchange earnings, and government revenues in a manner that is environmentally and culturally sustainable. The project will develop and conserve major Mayan archaeological sites; improve access to key tourist areas; protect the barrier reef by seeking solutions to growing problems with water supply and sewage treatment on Caye Caulker; increase the quantity and quality of basic tourism services; and improve the effectiveness of key institutions in the tourism sector through institutional strengthening. The estimated contribution to the Baseline Scenario for project activities totals US\$1.8 million.
21. Additional national-level activities in the region financed with support from international financial institutions or bilateral assistance include:
  - USAID-financed activities supporting community-based management of coastal and marine resources and capacity building of local NGOs include the Mexico Coastal Program in Quintana Roo (US\$2.0 million) and the Regional Environment Program for Central America: PROARCA/COSTAS, implemented with support from WWF, The Nature Conservancy, and the University of Rhode Island Center for Coastal Resources (US\$3.5 million). Within the MBRS region, the latter supports capacity building and empowerment of local communities in the development of strategies for the sustainable use of coastal resources focusing on pilot areas in Belize, Guatemala, and Honduras.
  - Smaller bilateral initiatives include: EU financing of a CZM plan in Belize, including establishment of a Coastal Advisory Committee (US\$0.7 million); sustainable fisheries development in the Caribbean Basin, supported by the CARICOM nations, through the Caribbean Fisheries Resource Assessment and Management Project (CFRAMP) (US\$5.0 million).
22. Activities financed by international NGOs include the WWF Mesoamerican Reef System Ecoregion Project. As part of its Global 200 Ecoregions Campaign, WWF is in the process of launching a new effort for the Mesoamerican Caribbean Reef EcoRegion, which plans to focus on a biologi-

cal assessment of the broader marine ecosystem and to determine priority interventions for treating root causes of resource degradation from a biodiversity conservation perspective. These activities are being developed in close collaboration with the proposed GEF Project. WWF co-financed activities include: mobilizing a constituency and tools for conservation at the regional ecosystem level; mapping key habitats, ecosystems and biogeographic features of the ecoregion to identify hotspots and priorities for conservation; protecting key sites and wildlife populations; shaping regional development to support ecosystem conservation; and establishing long-term conditions and strengthening human resource capacity needed to sustain conservation.

23. There are numerous ongoing international and regional programs providing technical assistance in coastal resources assessment, monitoring and capacity building. These include the Caribbean Coastal Marine Productivity Programme (CARICOMP) and the UNEP-coordinated Caribbean Environment Programme (CEP). The Global Coral Reef Monitoring Network, a program of the International Coral Reef Initiative, is operating in the Caribbean through several sub-nodes. Nascent monitoring efforts along the coast of Central America have been initiated by government, academic and NGO institutions. These could be significantly enhanced, however, by the GEF supported Project under the monitoring and EIS component as a GCRMN sub-node for the Western Caribbean. The Intergovernmental Oceanographic Commission/ Sub-commission for the Caribbean is coordinating support to countries in the Wider Caribbean Region to ratify and adopt actions under the protocols of the Cartagena Convention and supports scientific research, training and monitoring of oceanographic, fisheries and biological diversity parameters.
24. Finally, the Nature Conservancy, FOCADES (the Environment Fund of Central America), RODA (Red de Organizaciones de Derecho Ambiental, Guatemala), and IUCN's Wetlands program are sponsoring an Ecoregional Study of Marine Biodiversity in an effort to set priorities for marine conservation. The Wildlife Conservation Society is financing marine environmental education, awareness, and dissemination as well as maintaining a research facility on Glovers Reef atoll in Belize. The Canadian College Partnership Program is working with the University College of Belize to develop capacity for watershed and water quality monitoring. The Mellon Foundation together with The Nature Conservancy is financing oceanographic and hydrological research to determine water circulation and material dispersion in the Gulf of Honduras.
25. Smaller, complementary initiatives which promote conservation, policy reform, public awareness and community participation in the management of coastal and marine resources in the four MBRS countries include activities carried out by: Amigos de Sian Ka'an (Southern Quintana Roo Integrated Coastal Zone Management Project; Mexico); Amigos de Isla Contoy A.C. (Mexico); Asociados Náuticos y Subacuáticos de Isla Mujeres A.C. (Mexico); communities surrounding Bacalar Chico National Park/Marine Reserve; Belize Audubon Society with The Summit Foundation (Belize); Friends of Laughing Bird Caye (Belize); FUNDAECO (Belize); Toledo Institute for Environment and Development (Belize); La Alianza Trinacional del Golfo de Honduras (Guatemala); the Bay Islands Conservation Association (Honduras); Fundación Calentura Guaymoreto (Honduras); Fundación Cuero Salado (Honduras); Fundación Parque Nacional Pico Bonito (Honduras); Fundación Parque Lanatia, Punta Sal y Texigua (Honduras), and Coral Reef Fund for Cayos Cochinos (Honduras). The total cost of activities financed by national and international NGOs identified above is approximately US\$10 million over the next five years.
26. **Costs.** The cost of Baseline Scenario investments in the four participating countries total US\$63 million. Of these resources, approximately US\$32.5 million is directed towards environmental protection in coastal and marine areas; US\$5.6 million for the establishment and/or strengthening of marine protected areas; US\$3.5 million for environmental information management; US\$16.4 million for sustainable use activities; and US\$5.0 million for environmental education and public awareness of coastal- and marine-related issues.

27. **Benefits.** Implementation of the Baseline Scenario will result in increased environmental protection in select areas, improved wastewater treatment and concomitant improvement in water quality, introduction of safeguards in select municipalities to protect important resources from over-development, increased capacity of public sector entities and NGOs to manage coastal and marine resources, increased access by local communities for sustainable generation of incomes, and increased awareness of threats to coastal and marine ecosystems in the four participating countries.

#### **GEF Alternative**

28. **Scope.** There are many potential synergies between various national efforts identified in the Baseline Scenario and this proposed regional effort. The GEF Alternative will build on the Baseline Scenario specifically by: strengthening existing and creating new marine reserves in transboundary areas which contain representative examples of coastal and/or marine ecosystems; developing and implementing a regional MBRS monitoring and environmental information system involving standardized protocols for collecting, analyzing and accessing data among the four participating countries; identifying and disseminating international best practice in sustainable tourism and shared fisheries management and promoting its adoption among the four countries to reduce non-sustainable patterns of economic exploitation of environmental resources within the MBRS; increasing local and national capacity for environmental management through education, information sharing and training; and enhancing regional cooperation in the management of a regional public good by creating an enabling environment for the harmonization of national policies and regulations related to the management of coastal and marine resources and the institutional arrangements to ensure coordination across the four countries in implementation of agreed measures for conservation and sustainable use of this transboundary marine ecosystem.
29. With respect to the Marine Protected Areas component, site selection criteria for incremental financing was based on the significance of the protected area with respect to contributing to MBRS ecosystem characteristics, diversity and processes. The majority of the MPAs are located in the two transboundary areas of the MBRS. In the transboundary areas themselves, there are several MPAs that are separated by national boundaries and managed as separate units. Two of these bi-national MPA complexes, situated in the Mexico-Belize and Belize-Guatemala transboundary areas respectively, will be assisted through the Project with the additional objective of promoting a regional approach to their management. Selection of the remaining MPAs, in addition to the aforementioned criteria, was made with the intent to ensure a spatially dispersed pattern of protected areas loosely connecting the Project's two transboundary areas.
30. Through the Regional Environmental Information System (REIS) component, the GEF Alternative will provide the basic framework to guide the collection, processing, distribution and utilization of data which will promote improved management of the MBRS, and supply incremental resources to individuals and organizations carrying out data collection. The REIS will support a reliable database that can help to inform management decisions. For instance, ecological linkages between reefs, other marine environments and coastal watersheds are mediated, partially or entirely, by water flow. However, despite the importance of water currents in transporting nutrients, pollutants, and reproductive products across ecosystem and national boundaries, there is a dearth of data on the region's current regime and its influence on the status and processes of MBRS reefs and other critical ecosystems. Nor is there sufficient information related to the complex patterns of reproduction, larval dispersal, and recruitment of corals, fish, and other important reef components; patterns which depend on the complex interaction of water flow and larval behavior. These critical data needs will be supported through the MBRS Project.
31. Furthermore, the GEF Alternative will support pilot activities, increase institutional capacity through regional training activities, and interpret and disseminate information on status and trends

in the health of the MBRS to guide policymaking. Through greater awareness of downstream impacts of development activities on the health of the MBRS, tools and mechanisms to support good practice, and alternatives livelihood options based on sound use, the Project will help create incentives for stakeholders to shift toward more sustainable use of MBRS resources. The Threat and Root Cause Analysis conducted during Project preparation indicated a lack of public awareness of the significance of the MBRS and the issues that need to be addressed to ensure its sustainability. A critical element to developing the political will and policies required to manage the MBRS will be building the necessary public support to catalyze change. The GEF Alternative will increase environmental awareness among a variety of stakeholders and promote the development of human capacity to change practices that are detrimental to the MBRS. Finally, the GEF Alternative will support regional coordination through a Project management structure that includes a Regional Steering Committee made up of representatives of CCAD, the multi-stakeholder National Barrier Reef Committees in each country and ex-officio members of donor institutions; a Technical Advisory Group to support them; and Regional Technical Working Groups that will design and oversee implementation of agreed interventions on the ground to protect the ecological integrity of the MBRS.

32. **Costs.** The total cost of the GEF Alternative is estimated at US\$78.2 million, detailed as follows: (a) increased environmental management and protection - US\$32.5 million (*GEF financing: US\$0.0 million*); (b) consolidation of a representative system of Marine Protected Areas through support for planning, management and biodiversity monitoring – US\$11.0 (*GEF financing: US\$2.7 million*); (c) development of a Regional Environmental Information System – US\$7.8 million (*GEF financing: US\$2.8 million*); (d) promotion of sustainable uses of the MBRS – US\$18.2 million (*GEF financing: US\$1.7 million*); (e) expansion of environmental education programs and increased public awareness – US\$6.6 million (*GEF financing: US\$1.4 million*); and (e) regional coordination and management – US\$2.5 million (*GEF financing: US\$2.4 million*).
33. **Benefits.** Implementation of the GEF Alternative would enhance protection of vulnerable and unique marine ecosystems of the second longest barrier reef in the world and assist the four participating countries to strengthen and coordinate national policies, regulations, and institutional arrangements for marine ecosystem conservation and sustainable use. Benefits generated from this comprehensive approach would include those classified as “national”—increased sustainability of natural resource use, greater stability in long term revenues from enhanced natural capital, and increased public awareness of environment and natural resource issues—as well as those considered “global” in nature. Global benefits include the conservation of coastal and marine biodiversity; protection of the ecological integrity of critical marine ecosystems; a regional system of marine/coastal protected areas which guarantees representation of all ecosystems present in the region, as well as functionality and stability of the MBRS; and outreach to and involvement of local communities and local governments in managing natural resources.

### Incremental Costs

34. The difference between the cost of the Baseline Scenario (US\$63.0 million) and the cost of the GEF Alternative (US\$78.2 million) is estimated at US\$15.2 million. This represents the incremental cost for achieving global environmental benefits through developing integrated management plans for the sustainable use of coastal and marine ecosystems and the diverse resources, goods and services they provide; strengthening local and national capacity for environmental management through education, information sharing and training; standardizing ecosystem monitoring and facilitating its execution and dissemination of results throughout the region; strengthening institutions and programs for maintenance of water quality and prevention of contamination, particularly in transboundary situations; and establishing transnational coordination

and cooperation mechanisms for harmonization of policies related to the conservation and sustainable use of the MBRS. A GEF grant of US\$11.0 million is proposed at this time; an additional US\$4.2 million has been committed by participating governments, NGOs and local communities in support for the Project.

### Incremental Cost Matrix

Component Sector	Cost Category	US\$ Million	Domestic Benefit	Global Benefit
<b>A. Environmental Management and Protection</b>	Baseline	32.5	Increased environmental protection in select areas. Improved water quality and wastewater treatment/sanitation in coastal communities. Reduced water pollution in coastal areas, allowing for increased uses of coastal and marine resources. Increased public sector capacity to manage natural resource base.	
	With GEF Alternative	32.5	Same as above.	
	Incremental	0		
<b>B. Planning, Management, and Monitoring of Representative MPAs</b>	Baseline	5.6	On-going management of coastal and marine protected areas. Limited support for co-management of MPAs.	Some MPAs exist but they are not sufficient to conserve coastal and marine biodiversity, particularly in trans-boundary areas.
	With GEF Alternative	11.0		Representative system of Marine Protected Areas (MPAs) supported with management plans and basic infrastructure. Increased management capacity for MPAs. Increased support for co-management of MPAs, allowing meaningful contribution from civil society. Increased transboundary cooperation in policy, protection, and management of MPAs.
	Incremental	5.0	<i>Note: Participating countries and stakeholders will provide an additional US\$2.3 million to this component beyond the US\$2.7 million financed by the GEF.</i>	
<b>C. Regional Monitoring Program and Environmental Information System</b>	Baseline	3.5	Biophysical monitoring within select marine and coastal areas of participating countries.	
	With GEF Alternative	7.8		Establishment of coordinated information system to organize and manage data in support of improved decision-making. Increased collection and analysis of information vital for conserving coastal and marine biodiversity, including monitoring of coral reef ecosystem health and factors affecting it. Increased pollution monitoring, including trans-boundary aspects of point and non-point source pollution.
	Incremental	4.3	<i>Note: Participating countries and stakeholders will provide an additional US\$1.5 million to this component beyond the US\$2.8 million financed by the GEF.</i>	

Component Sector	Cost Category	US\$ Million	Domestic Benefit	Global Benefit
D. Promotion of Sustainable Uses of the MBRS	Baseline	16.4	Support for activities targeted at promoting sustainable coastal and marine tourism in select areas. Increased opportunity for income generation for coastal communities. Increased planning and management capacity at local level for sustainable coastal and marine resource management. Increased generation of resources derived from sustainable management within tourism sector.	
	With GEF Alternative	18.0		Increased opportunities for income generation and equitable benefit sharing based upon sustainable uses of coastal and marine resources. Best practice guidelines for marine ecotourism identified and promoted. Establishment of a joint commission on regional fisheries management. Increased local involvement in transnational management of fisheries resources.
	Incremental	1.8	<i>Note: Participating countries will provide an additional US\$0.1 million to this component beyond the US\$1.7 million financed by the GEF.</i>	
E. Environmental Education and Increased Public Awareness	Baseline	5.0	Increased awareness of environmental issues. Increased capacity and empowerment of local communities regarding management of local resources.	
	With GEF Alternative	6.6		Increased public awareness of issues related to coastal and marine ecosystem conservation and management. Meaningful participation of local stakeholders and participatory schemes for sustainable natural resource management.
	Incremental	1.6	<i>Note: Participating countries and stakeholders will provide an additional US\$0.2 million to this component beyond the US\$1.4 million financed by the GEF.</i>	
F. Program Management	Baseline	0.0	Periodic regional consultations and coordination within the framework of the Tulum Declaration.	
	With GEF Alternative	2.5		Mechanism and institutional framework established for regional coordination. Increased coordination of public and private sector activities aimed at managing marine and coastal areas and globally significant biodiversity, particularly in transboundary areas. Effective management of investments aimed at long-term conservation and sustainable use of globally significant biodiversity.
	Incremental	2.5	<i>Note: Participating countries and stakeholders will provide an additional US\$0.1 million to this component beyond the US\$2.4 million financed by the GEF.</i>	
Totals	Baseline	63.0		
	With GEF Alternative	78.2		
	Total Increment	15.2		
	GEF Increment	11.0		

**Central America Commission on Environment and Development  
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**Annex 5**

**Financial Summary**

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Total</b>
<b>Total Financing Required</b>						
<b>Project Costs</b>						
<b>Investment Costs</b>	1.7	3.1	2.9	2.2	1.3	11.2
<b>Recurrent Costs</b>	0.1	0.9	1.0	1.0	1.0	4.0
<b>Total Project Costs</b>	1.8	4.0	3.9	3.2	2.3	15.2
<b>Total Financing</b>	1.8	4.0	3.9	3.2	2.3	15.2
<b>Financing</b>						
<b>GEF</b>	1.5	3.0	2.8	2.3	1.4	11.0
<b>Government of Mexico</b>	0.06	0.18	0.17	0.17	0.17	0.75
<b>Government of Belize</b>	0.07	0.41	0.41	0.4	0.41	1.7
<b>Government of Guatemala</b>	0.07	0.16	0.16	0.11	0.09	0.59
<b>Government of Honduras</b>	0.07	0.16	0.16	0.11	0.09	0.59
<b>Non-governmental Orgs.</b>	0.00	0.13	0.14	0.13	0.13	0.53
<b>Total Project Financing</b>	1.77	4.04	3.84	3.22	2.29	15.19

**Main assumptions:**



**Central America Commission on Environment and Development  
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**Annex 6**

**Procurement and Disbursement Arrangements**

**Accounting, Financial Reporting, Auditing, and Disbursement Arrangements**

**I. Procurement**

**A. Procurement Arrangements**

Procurement for the proposed project would be carried out in accordance with World Bank "Guidelines: Procurement Under IBRD Loans and IDA Credits" published in January 1995 (revised January/August 1996, September 1997 and January 1999); and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers," published in January 1997 (revised in September 1999 and January 1999), and the provisions stipulated in the Credit Agreement.

**(1) Procurement methods:** The methods to be used for the procurement described below, and the estimated amounts for each method, are summarized in Table A. The threshold contract values for the use of each method are fixed in Table B.

**(a) Procurement of Works**

The Project would finance small works for construction of warehouses, visitor's centers, living quarters and trails, which will be scattered around the region, for an approximate total amount of US\$430,000 equivalent. Most of these works would be procured under lump-sum, fixed price contracts awarded on the basis of quotations obtained from a minimum of three qualified contractors in response to a written invitation. The invitation shall include a detailed description of the works, including basic specifications, the required completion date, a basic form of agreement acceptable to IBRD, and relevant drawings, where applicable. The award shall be made to the contractor who offers the lowest price quotation for the required work, and who has the experience and resources to complete the contract successfully.

**(b) Procurement of Goods**

The Project would finance several contract packages for the purchase of boats, radio and communication equipment, lab equipment, production of videos and printing materials, photocopiers, faxes, computers and software, office furniture, and audio-visual and miscellaneous office equipment estimated to cost approximately US\$2.7 million equivalent. Contracts for the supply of goods estimated to exceed US\$100,000 equivalent shall be awarded on the basis of ICB procedures; contracts estimated to cost US\$25,000 to US\$100,000 equivalent (with an aggregate amount of US\$0.6 M ) may be awarded on the basis of NCB procedures, in accordance with applicable national laws; and contracts estimated to cost below US\$25,000 equivalent (with an aggregate amount of US\$ 0.3 M) may be awarded on the basis of local or international quotations from at least 3 firms, in accordance with paragraphs 3.5 and 3.6 of the Guidelines. Standard documents for NCB and Shopping procedures would be agreed before the first invitation is issued.

### **(c ) Consulting Services**

The project would finance consulting services to prepare Marine Protected Areas (MPA) data baselines and monitoring programs, to develop management plans for MPAs, to prepare strategies for sustainable coastal tourism, regional fisheries management, coral reef ecosystem monitoring and EIS, to design information campaigns, design and provide training programs, design and supervise civil works, etc.

#### ***Firms***

About 15 contracts for firms estimated to cost \$ 3.1 million in aggregate would be awarded following a Quality and Cost Based Selection (QCBS) process, in accordance with Section II of the Consultant Guidelines.

***Sole Source Contract*** . It is anticipated that UNDP will be contracted directly by CCAD to assist it with the management of project funds (check writing and disbursement), and with international procurement, and the procurement of minor civil works in the three participating countries outside of Belize This sole source contract is justified based on the history of UNDP involvement in the implementation and execution of a number of GEF financed projects with both CCAD and the Government of Belize-- the host country for the Project Coordination Unit--and on UNDP's presence in all four of the participating countries. Unlike private firms which may be available in Belize, UNDP has a close working relationship with governments in all four countries. This will facilitate regional coordination by the PCU in terms of procurement and disbursement of project funds, oversight of local procurement actions in each country and monitoring of physical indicators of project performance. UNDP's current role as implementing agent for a national, GEF financed project to Conserve the Biological Diversity of the Belize Barrier Reef, now in its second phase, will allow close coordination between this project and the MBRS regional Project, a concern specifically raised by the GEF. The director of the executing agency for the UNDP project--the Coastal Zone Management Authority of Belize--is also the national coordinator for the Regional MBRS Project, and the new office space to be provided by the GOB to the MBRS PCU will be adjacent to that of the UNDP Project. This will ensure exchange of technical information and facilitate training of Project procurement staff and creation of in-house capacity within the Government of Belize to carry out procurement of international projects based on best practice.

#### ***Individuals***

Individual consultants, such as Fisheries Ecologists, Oceanographers and Marine Biologists will be hired to carry out specific studies and provide technical assistance in connection with specific project activities individuals would also be hired for specialized advisory services, on an as needed basis, to the technical working groups, the Project Coordination Unit, or the Regional Steering Committee. Hiring of those individuals shall be justified and carried out in accordance with Chapter V of the Consultant Guidelines. Long-term service contracts with individuals for project administration and other activities would be advertised, and signed for the overall duration of the assignment, with exit clauses for poor performance ; the total amount of service contracts with individuals is US\$2.1 equivalent. The competitive process followed to select individual consultants would be described in further detail in the Operational Manual.

## **2) Prior Review thresholds**

The proposed thresholds for prior review are based on the procurement capacity assessment and are summarized in Table B. All contracts awarded on a single-source basis, assignments of a critical nature, and amendments raising contract values above the said thresholds would also be subject to prior review. In addition, the plan and budget for Operating Costs under the Project will be reviewed and approved by IBRD annually.

## **B. Assessment Of The Agency's Capacity To Implement Procurement**

A procurement capacity assessment of the project office representing CCAD, was carried out in Belize in September 2000 and a procurement action plan prepared. At the time, the Project Coordination Unit had not yet been set up; only a small office to oversee project preparation and coordination among the four countries was operational. As Project preparation (PDF Block B) grants were Bank executed, procurement and accounting functions were housed within the Bank, and facilitated by the Project Preparation Coordinator, based in Belmopan. Since that time, a Project Coordination Unit consisting of a Director, an accountant and a procurement officer for the implementation phase has been set up in interim space in Belize City, provided by the Government of Belize, pending completion of a new building to house the full complement of PCU staff. The hiring of these staff notwithstanding, given the substantial procurement and training to be carried out under the Project and the complexity of working in four different countries, the procurement assessment and action plan recommended that a third party be hired to assist the Project Coordination Unit in carrying out international procurement and minor civil works in the four countries, as well as disbursement of Project funds. At the request of the four participating governments and CCAD, UNDP has been identified to carry out these services on a sole source basis (see justification above). The procurement officer within the PCU would be responsible for local procurement and for overseeing procurement processes for the entire Project in accordance with the procurement plan. He would work with the PCU accountant to prepare the PMRs and see that annual reporting requirements, as described in the Project Implementation Manual, are met. The PCU will also hire an assistant/secretary to help monitor procurement and disbursement, assist with filing of documents, etc., no later than project effectiveness. Since his hiring, the Project Procurement Officer has received training in Bank procurement. He will work closely with UNDP to build capacity within the PCU and to ensure that that Bank procurement procedures are met. A draft procurement plan has been prepared and a chapter dealing with procurement will be included in the Project Implementation Manual and adopted prior to project effectiveness. The manual will describe, at a minimum:

- Staffing of the procurement unit (PCU and UNDP).
- Organization of the procurement function including a detailed description of individual responsibilities and appropriate internal control procedures (PCU and UNDP).
- Thresholds for different types of procurement of goods and works and for selection of consultants.
- Thresholds for prior review.
- Procedural details of the various procurement methods which are going to be used for the Project.
- Procedures for planning and monitoring/supervising procurement actions.
- Reporting requirements (internally and to IBRD).

- The Project's filing system and procedures to ensure its control, security and confidentiality (for instance, one file for each process, locked file cabinets, etc.).
- Standard documents for NCB and shopping.

### ***UNDP tasks and responsibilities***

Under the MBRS Project, UNDP will not be hired to implement the Project, but rather to carry out prescribed administrative services on behalf of the PCU. These include: (i) all international procurement; (ii) procurement of minor civil works in Honduras, Guatemala and Mexico associated with the Marine Protected Areas component of the Project (civil works in Belize will be handled locally by the PCU); and (iii) handling and disbursement of Project funds. Procurement activities will be the responsibility of UNDP/Belize, while flow of funds and disbursement (and financial reporting to the PCU), will be handled by UNDP's regional office in El Salvador. The latter has extensive experience in handling funds and disbursement for Bank financed projects, consistent with international best practice.

The MBRS Project Coordination Unit (PCU) based in Belize City will undertake all local procurement for the Project, and be responsible for preparing terms of reference for consultant services, and technical specifications for procurement of civil works and goods, as necessary, and for coordinating all training activities. The PCU will also be responsible for supervising implementation of all Project procurement, ensuring cost-effectiveness and quality control at each stage of the processes, and reporting to Bank Headquarters, as outlined in the PIM. To enable the PCU to carry out its responsibilities vis a vis procurement oversight and reporting to Bank Headquarters, ) To provide timely service to the PCU and prevent delays that might otherwise arise, UNDP will carry out procurement services from their field office in Belize. The UNDP office in Belmopan will maintain a dedicated Procurement Officer, a Procurement Assistant and a Secretary on site to work on the Project. The UNDP procurement officer will be available to assist the PCU in the preparation of bidding documents on a demand basis. Consistent with this, all bids in response to RFPs will be opened and reviewed at the PCU office in Belize City.

UNDP will be responsible for further training of its own staff and that of the PCU to ensure that the requisite skills and capacity to carry out procurement in line with the Bank's procedures and international best practice, is created in house, within the PCU and locally in UNDP/Belize. UNDP will do this by either seconding UNDP/El Salvador procurement staff to Belize to provide continuous, hands on training for a prescribed period of time, or, through periodic training to UNDP and MBRS PCU staff as needed to implement the Project procurement plan.

### ***UNDP fees***

UNDP will be reimbursed at a flat rate of 3.2% of total funds disbursed under the Project, up to \$11 million. Reimbursement at this rate will cover all services contracted for under the project, including training and operating expenses. UNDP has agreed that all interest generated through the management of project funds will revert to the MBRS Project. UNDP has also agreed to advance funds to the Project on a reimbursable (interest free basis) for the salary of PCU staff between the time of negotiations and project effectiveness, once project preparation funds are exhausted. This is estimated not to exceed a period of 2-3 months. A contract between UNDP and CCAD outlining the nature of the relationship between the Project and UNDP and the services and reimbursement to be provided, will be drawn up by Project effectiveness.

## **D. Procurement Plan**

At appraisal, the Grantee developed a procurement plan for project implementation which provided the basis for the aggregate amounts for the procurement methods (per Table A). The Procurement Officer for the PPU is making final adjustments to the Procurement Plan and it will be reviewed and approved by the Bank before negotiations. At the beginning of each calendar year, the Grantee will update the Procurement Plan with a detailed procurement schedule for the coming year. The procurement plan will be kept in the project files.

## **E. Frequency of Procurement Supervision**

Procurement supervision missions should be carried out every year by a Procurement Specialist (PS) or Procurement Accredited Staff (PAS). An initial visit will be carried out during Project launch, to assist with preparation of initial bidding documents, and to work with UNDP/Belize procurement staff who will be assisting the PCU. Procurement supervision missions should include a review of (i) the procurement plan for the project, including a timetable for procurement actions anticipated during the next 12 months; (ii) the Project Coordination Unit's capacity to implement the procurement plan; (iii) the PCU monitoring system for the purposes of the Project; and (iv) complete records for one in every five contracts (for goods, works, and consulting services, respectively). The PS or PAS should perform selected physical inspections of the goods received and meet with selected suppliers/contractors, whenever possible. A consultant is working with the PCU in the preparation of a system for monitoring and reporting procurement actions which is PMR compatible and LACI compliant. However it will not be ready in time for negotiations. Consequently the PCU is INELIGIBLE for PMR-based disbursements on procurement reporting grounds at this time. The situation will be re-assessed when the consultant's work is completed nearer to the time of project effectiveness.

The hiring of UNDP as a procurement and disbursement agent is expected to mitigate the risk associated with administration of this regional project. The UNDP office in Belize will be re-assessed after the first year of implementation, and thereafter, UNDP's contract will be reviewed annually to ensure that performance is consistent with the PCU's needs and Bank procedures as a condition for contract renewal. In light of the arrangements outlined above to strengthen Project procurement capacity both in-house, as well as through the services of UNDP, the Overall Procurement Risk was assessed as "average." The Procurement Capacity/Action plan was approved for negotiations by the Regional Procurement Advisor's Office on January 11, 2001.

## **II. Disbursement and Financial Management**

### **A. Accounting and Financial Reporting**

A financial management assessment was carried out in Belize in July 2000. It was identified that a financial management system has not been implemented; therefore, an action plan was agreed with the PCU to ensure that by project effectiveness an adequate financial management PMR compliant system is in place. The necessary guidelines and technical assistance have been provided to ensure that an adequate financial management system, internal controls, monitoring systems, and staffing of the PCU, are in place to achieve the certification of the Project's finan-

cial management system under the Bank's Loan Administration Change Initiative (LACI). The PCU has initiated the process of implementing the action plan by organizing the unit, hiring the accountant and procurement specialist, and contracting a consultant for the design and implementation of a Project Management Report (PMR) compliant financial management system. The action plan agreed upon includes key actions to: (a) design and implement a financial management system that meets PMR requirements; (b) hire the staff needed to establish the PCU; (c) develop administrative procedures; and (d) hire external auditors.. Although the funds will be managed by UNDP El Salvador, the PCU will be responsible for the recording and reporting on project activities.

The PCU will implement an adequate integrated financial management system for the Project, including internal control systems that: (i) are in accordance with international accounting standards; (ii) reliably record and report all assets, liabilities and financial transactions of the Project; (iii) provide sufficient financial information for managing and monitoring Project activities; and (iv) integrate financial information, disbursements, purchasing, physical and financial progress of Project indicators, procurement, and control of contracts, to allow the generation of quarterly programmatic financial reports on the financial and physical advance of each component, as well as financial information by disbursement category. The detail of these procedures will be contained in the Project Implementation Plan.

#### **B. Auditing Arrangements**

An external auditor acceptable to the Bank will be contracted by the PCU to carry out an annual financial audit of the Project, as required by OP/BP 10.02. The auditor will be selected according to the Bank's Guidelines-Selection and Use of Consultants by World Bank Borrowers, dated January 1997, revised September 1997 and January 1999. A short list of auditing firms acceptable to the Bank has already been prepared, the TORs for the contracting of the auditors will be submitted to the Bank by effectiveness. The auditors should be hired at Project inception, and prior to commencement of each Project fiscal year thereafter, so that the interim audits can be performed throughout each year of Project implementation. The Project financial statements, the statement of transfer of funds to UNDP, SOEs (if applicable), and the PMRs will be audited at the end of each fiscal year during Project implementation. An audited report of the Project financial statements will be submitted to the Bank within 120 days of the close of the Project's financial year. The Guidelines and Terms of Reference for Audits of Projects with Financing by the World Bank in the Latin American and the Caribbean Region should be followed by the PCU when preparing the terms of reference for the audit and these guidelines should be provided to the selected auditors.

#### **C. Disbursement Procedures**

The Bank and the Borrower have agreed that if by Project effectiveness, the PCU has not implemented a PMR compliant system, but has in place a financial system that meets minimum Bank requirements, the traditional disbursement procedures will be used for the first two quarters of Project implementation, in accordance with the guidelines set in the Disbursement Procedures Handbook. SOE documentation will be maintained by the PCU for post-review and audit purposes. The authorized transfer(s) to UNDP, for Non-PMR disbursements will be set at a level sufficient to cover approximately six months of estimated expenditures eligible for financing by

the Bank. Replenishments of funds will be made on evidence of satisfactory utilization of the previous advance(s) as evidenced by the documentation submitted in support of disbursement applications. Deposits into the UNDP project account and its replenishments, up to an amount of 6 months of eligible project needs, will be made on the basis of Applications for Withdrawals (Form 1903) accompanied by the supporting and other documentation specified in the Disbursement Handbook. Withdrawal applications will be fully documented, except for expenditures under contracts costing less than US\$ 100,000 for goods (except the 1<sup>st</sup>. and 2<sup>nd</sup>. contracts under NCB and shopping procedures); US\$100,000 for consulting firm; US\$ 50,000 for individual consultants; all training expenditures; and all operating costs.

#### **D. Retroactive Financing**

UNDP has agreed to facilitate Project Coordination unit expenditures on a retroactive financing basis in the event that Project Preparation Grant (PDF) funds are inadequate to cover these costs through the period to Project effectiveness.

#### **E. Use of Project Management Report (PMRs):**

By the end of the second quarter of Project implementation, or earlier if the PCU is compliant and requests transition to a full PMR system, the PMRs would serve as disbursement requests. Transition to PMR will be subject to the satisfactory results of new financial management and procurement assessments. Once the borrower becomes PMR compliant, disbursements would be in accordance with guidelines set in the Loan Administration Change Initiative (LACI) Implementation Handbook. Each application for withdrawal should separately identify the funds requested from the GEF grant Account, and would be supported by a PMR or such other documents and evidence as the Bank may request. PMRs should be submitted within 45 days from the preceding quarter. Upon receipt of each application for withdrawal, the Bank, on behalf of the Borrower, shall withdraw from the GEF grant account and deposit into the UNDP project account an amount equal to the lesser of: (a) the amount requested; and (b) the amount the Bank has determined, based on the PMR accompanying the application, is required to be deposited in order to finance eligible expenditures during the six month period following the date of the report, but in no case should exceed 20% of the total grant funds, without prior authorization from the Loan department. The PCU would be responsible for preparing withdrawal applications and the related PMRs. All supporting documentation authenticating the expenditures reported in the PMRs would be maintained by the PCU and made available for review by independent auditors and by the Bank supervision missions. Direct Payments and Special Commitments should be clearly identified in the PMRs and the PCU shall include the documentation required for these types of payments.

#### **F. Flow Of Funds**

The Project funds will be transferred into a designated account by UNDP Headquarters, from where funds will be transferred to UNDP /El Salvador into separate bank account in US Dollars. The PCU will be responsible for submitting appropriate disbursement applications to request the transfer of funds to UNDP. Replenishments of funds under SOEs will be made on evidence of satisfactory utilization of the previous advance(s) as evidenced by the documentation submitted in support of disbursement applications. A separate special account at a local bank in Belize will

be maintained to cover operating costs of the PCU. This will be maintained through quarterly advances from the Bank's grant account, based on SOEs from the prior quarter and PCU estimates of costs for the upcoming quarter. Deposits into the Project account at UNDP Headquarters and its replenishments, up to the Authorized amounts, will be made initially on the basis of Applications for Withdrawals (Form 1903) accompanied with the supporting and other documentation specified in the Disbursement Handbook. Once the PCU is PMR compliant, and is certified as such by the Bank, and disbursements are PMR based, any subsequent disbursement from the GEF grant account would be to cover estimated eligible expenditures for the next six-months of cash forecast reported in the PMR, as described hereafter.



**Table A: Project Costs by Procurement Arrangements<sup>1</sup>**  
(in US\$ Million equivalent)

Expenditure Category	Procurement Method				Total Cost (including Contingencies)
	ICB	NCB	Other	N.B.F.	
1. Works	( )	( )	0.43 ( 0.43 )	( )	0.43 ( 0.43 )
2. Goods	1.57 (1.57)	0.57 (0.57)	0.30 ( 0.30 ) <sup>2</sup>	0.24 0	2.68 (2.44)
3. Services	( )	( )	4.70 (4.70) <sup>3</sup>	0.46	5.16 (4.70)
4. Training	( )	( )	2.30 (2.30)	0.65	2.95 (2.30)
5. Operating Costs			1.14 (1.14)	2.88	4.02 (1.14)
GEF Total	1.57	0.57	8.87	0.00	11.00
Project Total	1.57	0.57	8.87 0	4.23	15.24

Note: N.B.F. = Not Bank-financed (includes elements procured under parallel co-financing procedures, consultancies under trust funds, any reserved procurement, and any other miscellaneous items). The procurement arrangement for the items listed under "Other" and details of the items listed as "N.B.F." need to be explained in footnotes to the table or in the text.

Figures in parenthesis are the amounts to be financed by the Bank loan/IDA credit

<sup>1</sup> For details on presentation of Procurement Methods refer to OD11.02, "Procurement Arrangements for Investment Operations." Details on Consultant Services can be shown more easily in the Table A1 format (additional to Table A, where applicable).

<sup>2</sup> Shopping.

<sup>3</sup> QCBS and Chapter V of the Consultant Guidelines, as applicable.

**Annex 6, Table A1: Consultant Selection Arrangements (optional)**  
(in US\$ Million equivalent)

Consultant Services Expenditure Category	Selection Method							Total Cost (in- cluding contingencies)
	QCBS	QBS	SFB	LCS	CQ	Other*	N.B.F	
A. Firms	3.1 (3.1)	( )	( )	( )	( )	0.352 ( )	( )	3.452 (3.1)
B. Individuals	0 (0.0)	( )	( )	( )	( )	2.1 (2.1) <sup>4</sup>	( )	2.1 (2.1)
Total	3.1 (3.1)	( )	( )	( )	( )	2.1 (2.1)	( )	5.2 (5.2)

Note: QCBS = Quality- and Cost-Based Selection

QBS = Quality-based Selection

SFB = Selection under a Fixed Budget

LCS = Least-Cost Selection

CQ = Selection Based on Consultants' Qualifications

Other = Selection of individual consultants (per Section V of Consultants Guidelines), Commercial Practices, etc.

N.B.F. = Not Bank-financed.

Figures in parenthesis are the amounts to be financed by the Bank loan.

\* Other: under firms refers to UNDP's fee of 3.2%

<sup>4</sup> Selection according to Chapter V of the Consultant Guidelines. Competitive procedures detailed in the Implementation Manual.

Annex 6, Table B: Thresholds for Procurement Methods and Prior Review<sup>5</sup>

Expenditure Category	Contract Value (Threshold)	Procurement Method	Contracts Subject to Prior Review
	US\$ Thousands		US\$ Millions
1. Works	Irrespective of amount	Price comparison	First 2 contracts
2. Goods	>100,000	ICB	All (1.3)
	100,000-25,000	NCB	First 2 contracts (0.4)
	<25,000	Shopping	First 2 contracts (0.2)
3. Services			
(a) Consulting Firms	Irrespective of amount	QCBS	All contract estimated to cost more than US\$100,000 (3.2) All TORs for contracts below US\$100,000
(b) Individuals	Irrespective of amount	Sole source to UNDP Section V of the Consultant Guidelines	All All contracts estimated to cost more than US\$50,000 (2.2) All TORs for contracts below US\$50,000
Total value of contracts subject to prior review:			

**Overall Procurement Risk Assessment:**

High	<input type="checkbox"/>
Average	<input checked="" type="checkbox"/>
Low	<input type="checkbox"/>

**Frequency of procurement supervision missions proposed:** One every 12 month(s) (includes special procurement supervision for post-review/audits)

<sup>5</sup> Thresholds generally differ by country and project. Consult OD 11.04 "Review of Procurement Documentation" and contact the Regional Procurement Adviser for guidance.

**Annex 6, Table C: Allocation of Credit Proceeds**

<b>Expenditure Category</b>	<b>Amount in US\$ Million</b>	<b>Financing Percentage</b>
1. Works	0.39 (=0.32 SDR)	100% if UNDP, 85% otherwise
2. Goods	2.20 (= 1.70 SDR)	100% if UNDP, 85% otherwise
3. Consulting Services	4.23 (= 3.25 SDR)	100
4. Training	2.07 (= 1.60 SDR)	100
5. Operating Costs	1.03 (= .80 SDR)	100% if UNDP, 85% otherwise
6. Unallocated	1.08 (= .83 SDR)	N.A.
<b>Total</b>	<b>11.00 (= 8.50 SDR)</b>	

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**Annex 7**

**Project Processing Schedule**

<b>Project Schedule</b>	<b>Planned</b>	<b>Actual</b>
<b>Time taken to prepare the project (months)</b>	<b>30 months</b>	<b>36 months</b>
<b>First Bank mission (identification)</b>	<b>November 1997</b>	<b>November 1997</b>
<b>Appraisal mission departure</b>	<b>September 2000</b>	
<b>Negotiations</b>	<b>November 2000</b>	
<b>Planned Date of Effectiveness</b>	<b>March 1, 2000</b>	

**Bank staff who worked on the project included:**

<b>Name</b>	<b>Specialty</b>
<b>Marea Hatziolos, TTL</b>	<b>Coastal and Marine Resources Management</b>
<b>John Kellenberg</b>	<b>Natural Resource Economics</b>
<b>Arsenio Rodriguez</b>	<b>Environmental and Natural Resources Management</b>
<b>Juan Martinez</b>	<b>Social Science, Indigenous People</b>
<b>Luz Zeron</b>	<b>Financial Management</b>
<b>Irani Escolano</b>	<b>Procurement</b>
<b>Ferenc Molnar</b>	<b>Legal</b>
<b>Jeff Lecksell</b>	<b>Cartography</b>
<b>Katherin George Golitzen</b>	<b>Editing and Quality Control</b>
<b>Lourdes Guzzone</b>	<b>Contracting and SAP/Team Assistant</b>
<b>Bari Rabin</b>	<b>Operations Analyst</b>

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**Annex 8**

**Documents in the Project File\***

**Preliminary List**

**Studies Prepared under the Mesoamerican Barrier Reef Systems Project (MBRS) (Preparation Phase)**

1. Sale, P. et al. 1999. Conservation and Sustainable Use of the Mesoamerican Barrier Reef System – guidelines for Developing a Regional Environmental Information and Monitoring System. World Bank/Government of Canada Trust Funds
2. University of Miami/RSMAS. 1999. Atlantic and Gulf Rapid Reef Assessment (AGRRA). Mesoamerican Barrier Reef System Workshop, Final Report to the World Bank. World Bank/Netherlands Environmental Partnership Fund.
3. Kramer, P. and Kramer P. 2000. Ecological Status of the Mesoamerican Barrier Reef System – Impacts of Hurricane Mitch and 1998 Coral Bleaching. University of Miami-RSMAS/World Bank.
4. FAO. 2000. Conservation and Sustainable Use of the Mesoamerican Barrier Reef System. Threat and Root Cause Analysis (+ 4 National Reports). Investment Centre, FAO/World Bank Cooperative Program.
5. FAO. 2000. Conservation and Sustainable Use of the Mesoamerican Barrier Reef System. Institutions Study. Investment Centre, FAO/World Bank Cooperative Program.
6. Dulin, P. 2000. Environmental Assessment of the Mesoamerican Barrier Reef System Project (MBRS). World Bank/GEF PDF Block B.
7. IDEADS. 2000. Diagnóstico Sobre Armonización de Legislación, Políticas y Coordinación Institucional para el Manejo del Sistema Arrecifal Mesoamericano (SAM) (+ 4 National Reports). World Bank/GEF PDF Block B.
8. Silva, M. 2000. Análisis Social del Area de Influencia del Sistema de Arrecife Mesoamericano (SAM) (+ 4 National Reports). World Bank/PDF Block B.
9. Barborak, J. 2000. in draft. Marine Protected Areas and Public Awareness and Education – Guidelines for the Development of MBRS Project Components.

\*Including electronic files

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Annex 9

Statement of Loans and Credits

Belize

Active Projects		Original Amount in USS Millions					Difference between Expected and Actual Disbursements <sup>a/</sup>	
Project ID	Project Name	Fiscal Year	IBRD	IDA	GRANT	Cancel	Undisb. Orig.	Frm Rev'd
P040150	ROADS AND MUNICIPAL DRAINAGE PROJECT	2001	13	0	0	0	13	0
P039292	SOCIAL INVEST. FUND	1997	7	0	0	0	3.4	2.6
Result		Result	20	0	0	0	16.4	2.6

Belize Statement of IFC's Held and Disbursed Portfolio As of 8/31/00 (In US Dollars Millions)									
FY Approval	Company	Held				Disbursed			
		Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
	1993 BECOL	5	0	0	0	5	0	0	0
	1998 Nova/Ambergris	5.5	0	0	0	5.5	0	0	0
	Total Portfolio:	10.5	0	0	0	10.5	0	0	0
Approvals Pending Commitment									
		Loan	Equity	Quasi	Partic				
	2000 BAL	10000	0	0	0				
	Total Pending Commitment:	10000	0	0	0				

Statement of Loans and Credits

Guatemala

Active Projects		Fiscal Year	Original Amount in US\$ Millions				Difference Between Expected and Actual Disbursements		
Project ID	Project Name		IBRD	IDA	Expected and Actual	Cancel.	Undisb.	Orig.	Frm Rev'd
P048657	GT INTEG FIN MGMT II	1998	15.7	0	0	0	5.3	5.3	0
P047039	GT JUDICIAL REFORM	1999	33	0	0	0	29.8	7.3	0
P048654	GT TAX ADMIN. TAL	1998	28.2	0	0	0	24.5	24.5	0
P007223	GT/BASIC EDUCATION REFORM	1997	33	0	0	0	10.3	-1	0
P040198	GT/FIS II	1999	50	0	0	0	8.2	-24.1	0
P049386	GT/RECONSTRUCTION & LOCAL DEV.	1999	30	0	0	0	27.3	8.9	0
P049616	LAND ADMINISTRATION	1999	31	0	0	0	26.4	7	0
P054462	LAND FUND	1999	23	0	0	0	22.8	7.2	0
P048756	PRIV PRTCPTN INFR TA	1997	13	0	0	0	9.8	8.9	0
P035737	RURAL & MAIN ROADS	1998	66.7	0	0	0	48.9	3.8	0
Result		Result	323.6	0	0	0	213.2	47.7	0

Guatemala  
Statement of IFC's  
Held and Disbursed Portfolio  
As of 8/31/00  
(In US Dollars Millions)

FY Approval Company	Held				Disbursed			
	Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
1997 Aceros	13.5	0	0	9.33	13.5	0	0	9.33
1994 Fabrigas	2.63	0	1	0	2.63	0	1	0
2000 Frutera	7	0	0	0	7	0	0	0
1998 La Fragua	20	0	0	0	20	0	0	0
1997 Orzunil	12.91	1.17	0	14.7	12.91	1.17	0	14.7
1996 Pantaleon	12.5	0	0	0	12.5	0	0	0
1993/96 Puerto Quetzal	0	0	0	0	0	0	0	0
1993 Vigua	4.13	0	0	0	4.13	0	0	0
Total Portfolio:	72.67	1.17	1	24.03	72.67	1.17	1	24.03
<b>Approvals Pending Commitment</b>								
	Loan	Equity	Quasi	Partic				



Statement of Loans and Credits

Honduras

Active Projects			Original Amount in US\$ Millions				Difference Between Expected and Actual Disbursements <sup>a/</sup>		
Project ID	Project Name	Fiscal Year	IBRD	IDA	GRANT	Cancel.	Undisb.	Orig.	Frm Rev'd
P044343	BIODIVERSITY PROJ	1998	0	0	7	0	5.4	2.8	0
P007396	ENVIRON. DEVELOPMENT	1995	0	10.8	0	0	1	1.6	1.6
P060785	HN ECONOMIC & FIN.MANAGEMENT PROJECT	2001	0	19	0	0	18.6	0	0
P007387	HN PUB SEC MOD SAC	1996	0	115.7	0	0	26.7	1.1	36.8
P007399	HN/BASIC EDUCATION	1995	0	30	0	0	5.4	7.9	0
P048651	HN/FHIS IV	1999	0	67.5	0	0	22.9	-16.3	0
P007392	HN/NUTRITION/HEALTH	1993	0	35.4	0	0	3	-7.9	2.7
P057350	PROFUTURO	1999	0	8.3	0	0	6.4	1.1	0
P007398	RURAL LAND MGMT	1997	0	34	0	0	15.6	10	10
P007388	TRNSPRT SCTR RHB	1993	0	85	0	0	7.4	-12.9	7.3
Result		Result	0	405.7	7	0	112.3	-12.5	58.3

Honduras  
Statement of IFC's  
Held and Disbursed Portfolio  
As of 8/31/00  
(In US Dollars Millions)

FY Approval	Company	Held				Disbursed			
		Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
1998	Camino Real Plaz	10	0	0	0	8	0	0	0
1995/98	Elcosa	0	0	0	0	0	0	0	0
1986/99	Granjas Marinas	6	0	0	0	6	0	0	0
Total Portfolio:		16	0	0	0	14	0	0	0
<b>Approvals Pending Commitment</b>									
		Loan	Equity	Quasi	Partic				
	2000 Agropalma	7000	0	0	0				
	1999 Celtel Honduras	5000	0	5000	15000				
Total Pending Commitment:		12000	0	5000	15000				

# Statement of Loans and Credits

## Mexico

Active Projects			Original Amount in US\$ Millions				Difference Between Expected and Actual Disbursements <sup>a</sup>		
Project ID	Project Name	Fiscal Year	IBRD	IDA	GRANT	Cancel.	Undisb.	Orig.	Frm Rev'd
P048505	AGRICULTURAL PRODUCT	1999	444.4	0	0	0	266.3	20.3	0
P060718	ALTERNATIVE ENERGY	2000	0	0	0	0	7.5	2.6	0
P007726	AQUACULTURE	1997	0	0	0	0	0	0	0
P067491	Bank Restructuring Facility	2000	505.1	0	0	0	150	144.9	0
P007700	COMMUNITY FORESTRY	1997	15	0	0	0	7.8	2.9	0
P043163	FEDERAL ROADS MODZTN	1997	0	0	0	0	0	0	0
P007610	FOVI RESTRUCTURING	1999	505	0	0	0	462	295.3	0
P007723	HWY RHB & SAFETY	1993	480	0	0	0	0	0	0
P044531	KNOWLEDGE & INNOV.	1998	300	0	0	0	251.2	31.9	0
P007648	MEDIUM CITIES TRANSP	1993	200	0	0	23	106.8	129.8	106.8
P066938	MX GENDER (LIL)	2000	3.1	0	0	0	3.1	0	0
P007720	MX: HEALTH SYSTEM REFORM - SAL	1998	700	0	0	0	350	350	0
P040199	MX: BASIC EDUC.DEVELOPMENT PHASE I	1998	115	0	0	0	68.1	30.9	0
P007689	MX: BASIC HEALTH II	1996	310	0	0	0	90.7	78	68
P055061	MX: HEALTH SYSTEM REFORM TA	1998	25	0	0	0	14.8	10.9	0
P049895	MX: HIGHER ED. FINANCING	1998	180.2	0	0	0	164.6	36.7	0
P007725	MX: PRIMARY EDUC.II	1994	412	0	0	40	63.5	103.5	63.5
P034490	MX: TECHNICAL EDUC/TRAINING	1995	265	0	0	30	120.5	150.5	5.5
P007710	N. BORDER I ENVIRONM	1994	368	0	0	301	36.2	323.8	47.1
P007701	ON-FARM & MINOR IRRI	1994	200	0	0	30	49.5	79.5	13.7
P050429	OZONE PROTECTION III	1998	0	0	13	0	10.1	-1.9	0
P007711	RURAL DEV. MARG.AREA	1998	47	0	0	0	33.2	13.6	0
P057530	RURAL DEV.MARG.ARII	2000	55	0	0	0	51.4	0.1	0
P007732	RURAL FIN. MKTS T.A.	1997	0	0	0	0	0	0	0
P007702	SECOND DECENTRALZTN	1995	0	0	0	0	0	0	0
P007612	SOLID WASTE II	1994	200	0	0	193.1	1.5	-4.5	1.5
P007713	WATER RESOURCES MANA	1996	186.5	0	0	0	132.6	67.5	12.8
Result		Result	5516.3	0	13	617.1	2441.7	1866.6	318.9

Mexico Statement of IFC's Held and Disbursed Portfolio As of 8/31/00 (In US Dollars Millions)									
FY Approval	Company	Held				Disbursed			
		Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
1988/91/92/93/95	Apasco	12.6	0	0	50.4	12.6	0	0	50.4
	1998 Ayvi	10	0	0	0	10	0	0	0
1990/92/96	BANAMEX	96.21	0	0	45.18	96.21	0	0	45.18
	1997 Banco Bilbao MXC	70.59	0	30	0	70.59	0	30	0
	1992 Banorte-SABROZA	3	0	0	0	3	0	0	0
1995/96	Baring Mex. FMC	0	0.02	0	0	0	0.02	0	0
1995/99	Baring Venture	0	2.73	0	0	0	0	0	0
	1998 CIMA Mexico	0	4.8	0	0	0	4.8	0	0
	1998 CIMA Puebla	7	0	0	0	3.5	0	0	0
	1994 CTAPV	3.73	0	2.32	0	3.73	0	2.32	0
	0 Chiapas-Propalma	0	0.8	0	0	0	0.31	0	0
	1997 Comercializadora	3.06	0	2.19	6.25	3.06	0	2.19	6.25
	1999 Corsa	13	3	0	0	13	3	0	0
	1993 Derivados	2.2	0	0	0	2.2	0	0	0
	1997 Fondo Chiapas	0	4.2	0	0	0	0.43	0	0
	1998 Forja Monterrey	13	3	0	13	13	3	0	13
1991/96	GIBSA	21.64	0	10	72.76	21.64	0	10	72.76
	1993 GIDES A	6.25	8	0	4.25	6.25	8	0	4.25
1996/00	GIRSA	45	0	0	60	22.71	0	0	30.29
	1993 GOTM	0.82	0	0	0.22	0.82	0	0	0.22
1997/98	Gen. Hipotecaria	0	1.2	0	0	0	0	0	0
	1998 Grupo Calidra	12	6	0	10	12	6	0	10
	1989 Grupo FEMSA	0	9.43	0	0	0	9.43	0	0
	1997 Grupo Minsa	18	10	0	27	18	10	0	27
1992/93/95/96/99	Grupo Posadas	25	0	10	10	25	0	10	10
1992/96/97/98	Grupo Probursa	0	1.32	0	0	0	1.32	0	0
	1998 Grupo Sanfandila	9.58	0	0	4.7	6.25	0	0	3.03
1994/96/98/00	Heller Financial	0	0.32	0	0	0	0.32	0	0
	2000 ITR	14	0	0	4	10.9	0	0	3.1
	1994 Inter ceramic	8	0	6	3.5	8	0	6	3.5
	2000 InverCap	0	1	0	0	0	1	0	0
	1993 Masterpak	2.4	0	0	0	2.4	0	0	0
	1998 Merida III	30	0	0	73.95	27.36	0	0	67.44
1995/99	Mexplus Puertos	0	1.41	0	0	0	1.41	0	0
1996/99/00	NEMAK	0	0	0.83	0	0	0	0.83	0
	1998 Punta Langosta	2.63	1	0	4.55	2.63	1	0	4.55
	2000 Rio Bravo	50	0	0	59.5	22.83	0	0	27.17
	2000 Saltillo S.A.	35	0	0	43	0	0	0	0
	1999 Sudamerica	0	15	0	0	0	15	0	0
	1997 TMA	2.77	0	2.1	9.6	2.77	0	2.1	9.6
	1992 Toluca Toll Road	7.16	0	0	0	7.16	0	0	0
1991/92	Vitro	0	0	0	0	0	0	0	0
	1991 Vitro Flotado	4.96	0	0	2.07	4.96	0	0	2.07
	1998 ZN Mxc Eqty Fund	0	25.3	0	0	0	9.81	0	0
Total Portfolio:		529.6	98.53	63.44	503.93	432.57	74.85	63.44	389.81
Approvals Pending Commitment									
		Loan	Equity	Quasi	Partic				
	2000 Teksid Aluminio	25000	0	0	0				
	2000 Teksid Hierro	15000	0	0	30000				
	1999 BANAMEX LRF II	50000	0	0	0				
	1999 Baring BMPEF FMC	0	60	0	0				
	1998 Cima Hermosillo	7000	0	0	0				
	2000 Educacion	9700	0	0	0				
	2000 FCCM	10500	2000	0	17700				
	2000 Hospital ABC	30000	0	0	14000				
	2000 Innopack	15000	15000	0	0				
Total Pending Commitment:		162200	17060	0	61700				

**Central America Commission on Environment and Development  
Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**

**Annex 10**

**Countries at a Glance**

*Belize, Guatemala, Honduras and Mexico*

# Belize at a glance

8/25/00

## POVERTY and SOCIAL

1999

	Belize	Latin America & Carib.	Lower-middle-income
Population, mid-year (millions)	0.25	509	2,094
GNP per capita (Atlas method, US\$)	2,730	3,840	1,200
GNP (Atlas method, US\$ billions)	0.67	1,955	2,513

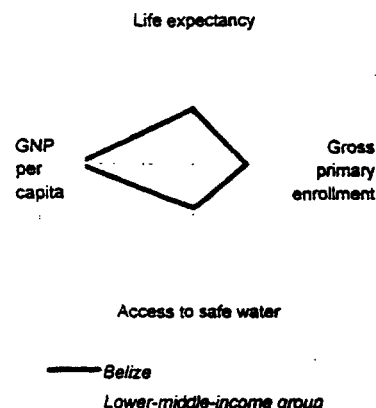
Average annual growth, 1993-99

	Belize	Latin America & Carib.	Lower-middle-income
Population (%)	3.1	1.6	1.1
Labor force (%)	4.1	2.5	1.2

Most recent estimate (latest year available, 1993-99)

Poverty (% of population below national poverty line)	..	..	..
Urban population (% of total population)	53	75	43
Life expectancy at birth (years)	75	70	69
Infant mortality (per 1,000 live births)	28	31	33
Child malnutrition (% of children under 5)	..	8	15
Access to improved water source (% of population)	73	75	86
Illiteracy (% of population age 15+)	7	12	16
Gross primary enrollment (% of school-age population)	121	113	114
Male	123	..	114
Female	119	..	116

Development diamond\*



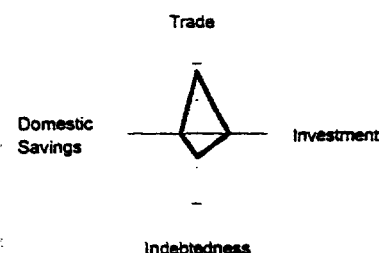
## KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1979	1989	1998	1999
GDP (US\$ billions)	0.15	0.36	0.68	0.73
Gross domestic investment/GDP	..	30.3	23.0	24.2
Exports of goods and services/GDP	..	59.7	50.0	48.8
Gross domestic savings/GDP	..	20.9	15.9	14.5
Gross national savings/GDP	..	25.1	16.9	16.2
Current account balance/GDP	..	-5.0	-6.2	-8.0
Interest payments/GDP	0.4	1.7	2.2	2.2
Total debt/GDP	47.2	39.9	50.0	49.4
Total debt service/exports	..	8.5	12.3	10.7
Present value of debt/GDP	..	..	45.0	..
Present value of debt/exports	..	..	82.2	..

(average annual growth)

	1979-89	1989-99	1998	1999	1999-03
GDP	3.9	4.1	4.5	4.5	5.2
GNP per capita	1.0	1.0	-0.2	1.1	2.1
Exports of goods and services	6.8	2.1	-0.6	6.9	4.8

Economic ratios\*



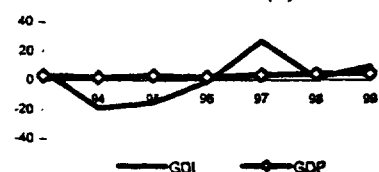
## STRUCTURE of the ECONOMY

(% of GDP)	1979	1989	1998	1999
Agriculture	30.8	20.4	18.9	18.6
Industry	21.9	26.5	25.5	25.0
Manufacturing	15.1	16.4	15.1	14.8
Services	47.3	53.1	55.6	56.3
Private consumption	..	63.9	64.2	68.0
General government consumption	..	15.2	19.9	17.5
Imports of goods and services	..	69.1	57.2	58.4

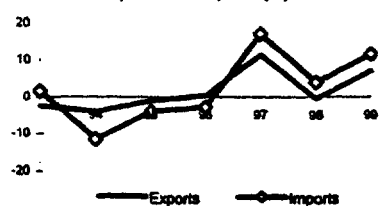
(average annual growth)

	1979-89	1989-99	1998	1999
Agriculture	2.2	6.4	-1.5	11.7
Industry	3.9	3.1	-1.0	4.6
Manufacturing	3.2	3.5	-2.9	4.8
Services	4.1	2.8	4.0	4.7
Private consumption	0.0	4.2	9.5	10.6
General government consumption	0.9	7.7	4.6	-8.4
Gross domestic investment	6.6	0.1	1.6	9.7
Imports of goods and services	2.2	1.7	3.9	11.5
Gross national product	3.7	3.9	3.8	4.6

Growth of investment and GDP (%)



Growth of exports and imports (%)



Note: 1999 data are preliminary estimates.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

# Guatemala at a glance

9/12/00

## POVERTY and SOCIAL

1999

	Guatemala	Latin America & Carib.	Lower-middle-income
Population, mid-year (millions)	11.1	509	2,094
GNP per capita (Atlas method, US\$)	1,660	3,840	1,200
GNP (Atlas method, US\$ billions)	18.4	1,955	2,513

Average annual growth, 1993-99

	Guatemala	Latin America & Carib.	Lower-middle-income
Population (%)	2.6	1.6	1.1
Labor force (%)	3.6	2.5	1.2

Most recent estimate (latest year available, 1993-99)

	Guatemala	Latin America & Carib.	Lower-middle-income
Poverty (% of population below national poverty line)	75	..	..
Urban population (% of total population)	39	75	43
Life expectancy at birth (years)	64	70	69
Infant mortality (per 1,000 live births)	37	31	33
Child malnutrition (% of children under 5)	27	8	15
Access to improved water source (% of population)	67	75	86
Illiteracy (% of population age 15+)	32	12	16
Gross primary enrollment (% of school-age population)	88	113	114
Male	93	..	114
Female	83	..	116

Development diamond\*

Life expectancy

GNP per capita

Gross primary enrollment

Access to safe water

Guatemala

Lower-middle-income group

## KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1979	1989	1998	1999
GDP (US\$ billions)	6.9	8.4	18.9	18.0
Gross domestic investment/GDP	18.7	13.5	16.0	15.7
Exports of goods and services/GDP	21.3	17.3	18.6	18.8
Gross domestic savings/GDP	14.2	8.3	7.7	8.3
Gross national savings/GDP	16.1	8.0	10.5	11.5
Current account balance/GDP	-3.0	-5.4	-5.5	-5.3
Interest payments/GDP	0.7	1.3	0.7	0.8
Total debt/GDP	15.2	31.5	20.9	22.6
Total debt service/exports	7.3	19.6	9.8	9.6
Present value of debt/GDP	..	..	22.6	..
Present value of debt/exports	..	..	105.2	..

(average annual growth)

	1979-89	1989-99	1998	1999	1999-03
GDP	0.4	4.1	5.1	3.5	5.0
GNP per capita	-2.3	1.5	2.8	0.6	2.4
Exports of goods and services	-3.7	6.5	6.0	4.8	7.9

Economic ratios\*

Trade

Domestic Savings

Investment

Indebtedness

Guatemala

Lower-middle-income group

## STRUCTURE of the ECONOMY

	1979	1989	1998	1999
(% of GDP)				
Agriculture	25.4	25.6	23.4	23.1
Industry	21.5	20.1	20.0	20.1
Manufacturing	16.3	15.2	13.5	13.4
Services	53.1	54.3	56.6	56.8
Private consumption	78.7	83.8	86.8	85.9
General government consumption	7.1	7.9	5.6	5.8
Imports of goods and services	25.9	22.5	26.9	26.2

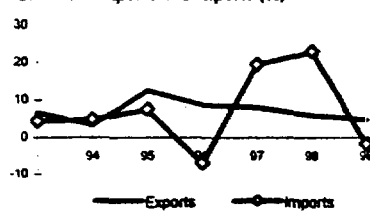
(average annual growth)

	1979-89	1989-99	1998	1999
Agriculture	0.7	2.9	3.5	2.2
Industry	-0.6	4.2	5.2	4.1
Manufacturing	-0.3	2.8	3.6	2.6
Services	0.6	4.6	5.8	3.7
Private consumption	0.8	4.3	5.5	3.0
General government consumption	2.8	4.5	10.6	4.8
Gross domestic investment	-3.3	5.2	21.9	-4.0
Imports of goods and services	-4.2	9.0	23.0	-1.7
Gross national product	0.1	4.2	5.5	3.2

Growth of investment and GDP (%)



Growth of exports and imports (%)



Note: 1999 data are preliminary estimates.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

# Honduras at a glance

9/9/00

## POVERTY and SOCIAL

1999

	Honduras	Latin America & Carib.	Lower-middle-income
Population, mid-year (millions)	6.3	509	2,094
GNP per capita (Atlas method, US\$)	760	3,840	1,200
GNP (Atlas method, US\$ billions)	4.8	1,955	2,513

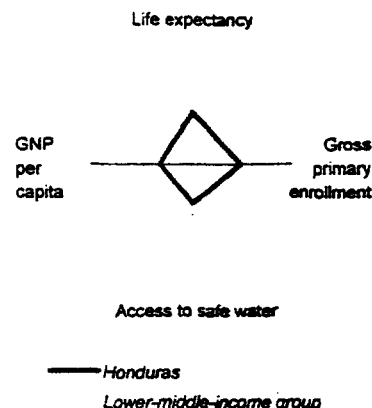
Average annual growth, 1993-99

	Honduras	Latin America & Carib.	Lower-middle-income
Population (%)	2.8	1.6	1.1
Labor force (%)	3.8	2.5	1.2

Most recent estimate (latest year available, 1993-99)

Poverty (% of population below national poverty line)	53	..	..
Urban population (% of total population)	52	75	43
Life expectancy at birth (years)	69	70	69
Infant mortality (per 1,000 live births)	36	31	33
Child malnutrition (% of children under 5)	25	8	15
Access to improved water source (% of population)	65	75	86
Illiteracy (% of population age 15+)	26	12	16
Gross primary enrollment (% of school-age population)	111	113	114
Male	110	..	114
Female	112	..	116

Development diamond\*



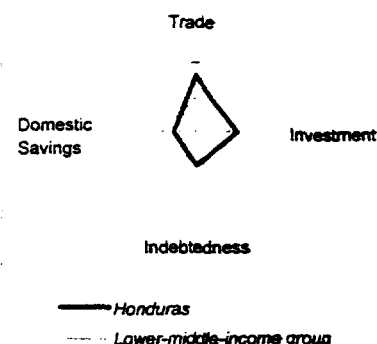
## KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1979	1989	1998	1999
GDP (US\$ billions)	2.3	5.2	5.2	5.4
Gross domestic investment/GDP	26.8	19.1	30.8	32.9
Exports of goods and services/GDP	36.6	29.0	47.2	42.9
Gross domestic savings/GDP	22.0	13.7	24.6	19.1
Gross national savings/GDP	18.0	9.9	25.3	22.9
Current account balance/GDP	-8.8	-7.9	-5.5	-10.0
Interest payments/GDP	2.7	0.9	3.5	3.2
Total debt/GDP	52.6	65.5	95.3	99.4
Total debt service/exports	20.5	12.6	18.2	13.4
Present value of debt/GDP	..	..	61.4	..
Present value of debt/exports	..	..	116.2	..

(average annual growth)

	1979-89	1989-99	1998	1999	1999-03
GDP	2.4	3.2	2.9	-1.9	5.3
GNP per capita	-0.7	0.8	0.4	-3.9	2.8
Exports of goods and services	0.5	1.5	0.3	-9.4	9.8

Economic ratios\*



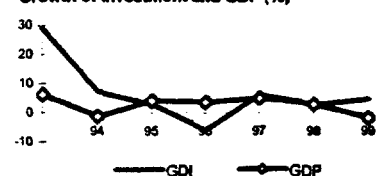
## STRUCTURE of the ECONOMY

(% of GDP)	1979	1989	1998	1999
Agriculture	25.6	21.1	19.2	16.2
Industry	24.4	24.7	30.4	31.9
Manufacturing	15.1	15.0	18.6	19.6
Services	50.0	54.2	50.4	51.9
Private consumption	67.0	72.0	65.3	69.4
General government consumption	10.9	14.3	10.1	11.4
Imports of goods and services	41.4	34.4	53.3	56.7

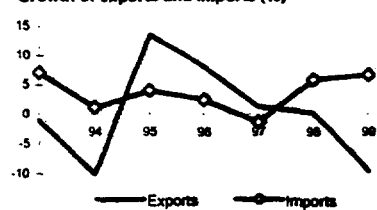
(average annual growth)

	1979-89	1989-99	1998	1999
Agriculture	2.4	2.4	-2.9	-8.7
Industry	2.9	3.5	4.2	4.0
Manufacturing	3.0	3.8	3.4	2.6
Services	2.3	3.5	5.6	-0.2
Private consumption	2.8	3.0	3.4	0.8
General government consumption	3.9	-0.6	21.7	10.9
Gross domestic investment	0.0	8.0	2.8	4.7
Imports of goods and services	0.1	3.6	5.9	6.7
Gross national product	2.5	3.7	3.3	-1.3

Growth of investment and GDP (%)



Growth of exports and imports (%)



Note: 1999 data are preliminary estimates.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

# Mexico at a glance

8/25/00

## POVERTY and SOCIAL

1999

	Mexico	Latin America & Carib.	Upper-middle-income
Population, mid-year (millions)	97.4	509	573
GNP per capita (Atlas method, US\$)	4,410	3,840	4,900
GNP (Atlas method, US\$ billions)	429.6	1,955	2,811

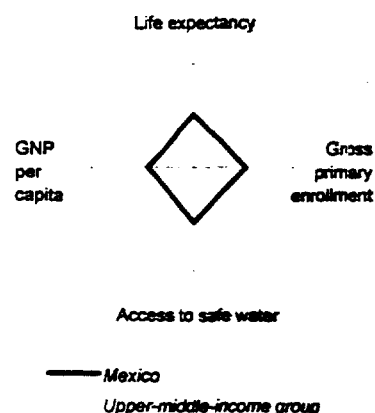
Average annual growth, 1993-99

	Mexico	Latin America & Carib.	Upper-middle-income
Population (%)	1.7	1.6	1.4
Labor force (%)	3.0	2.5	2.1

Most recent estimate (latest year available, 1993-99)

Poverty (% of population below national poverty line)	..	..	..
Urban population (% of total population)	74	75	76
Life expectancy at birth (years)	72	70	70
Infant mortality (per 1,000 live births)	30	31	27
Child malnutrition (% of children under 5)	..	8	7
Access to improved water source (% of population)	83	75	78
Illiteracy (% of population age 15+)	9	12	10
Gross primary enrollment (% of school-age population)	114	113	109
Male	116	..	..
Female	113	..	..

Development diamond\*

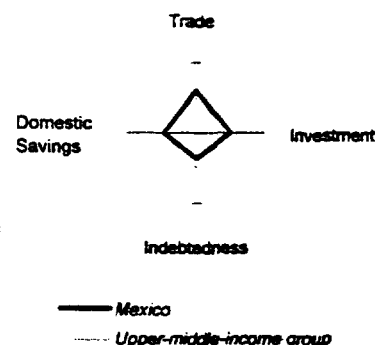


## KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1979	1989	1998	1999
GDP (US\$ billions)	134.5	223.0	416.3	483.7
Gross domestic investment/GDP	26.0	22.9	24.3	23.2
Exports of goods and services/GDP	11.2	19.0	30.8	30.8
Gross domestic savings/GDP	24.7	22.9	22.3	21.9
Gross national savings/GDP	21.7	20.3	20.5	20.6
Current account balance/GDP	-4.1	-2.6	-3.9	-2.9
Interest payments/GDP	2.5	3.5	2.4	1.7
Total debt/GDP	31.8	42.1	38.4	34.0
Total debt service/exports	72.4	32.9	19.2	24.6
Present value of debt/GDP	..	..	37.4	33.0
Present value of debt/exports	..	..	111.5	100.4

	1979-89	1989-99	1998	1999	1999-03
(average annual growth)					
GDP	1.3	2.9	4.8	3.7	4.9
GNP per capita	-0.9	1.1	3.1	2.5	3.2
Exports of goods and services	8.4	13.6	12.0	13.9	7.4

Economic ratios\*

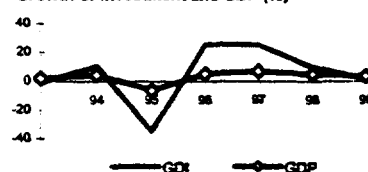


## STRUCTURE of the ECONOMY

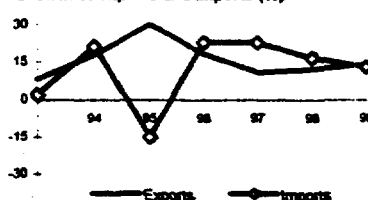
	1979	1989	1998	1999
(% of GDP)				
Agriculture	9.8	7.8	5.3	5.0
Industry	33.4	29.4	28.5	28.2
Manufacturing	22.7	21.9	21.3	21.1
Services	58.7	62.9	66.3	66.8
Private consumption	64.4	68.9	67.3	68.0
General government consumption	10.9	8.3	10.4	10.0
Imports of goods and services	12.5	19.1	32.8	32.0

	1979-89	1989-99	1998	1999
(average annual growth)				
Agriculture	1.2	1.7	0.8	3.5
Industry	0.9	3.5	6.3	3.8
Manufacturing	1.1	4.0	7.3	4.1
Services	1.8	2.7	4.5	3.8
Private consumption	1.4	2.2	5.5	4.3
General government consumption	3.1	1.7	2.2	1.0
Gross domestic investment	-4.3	4.3	9.5	1.5
Imports of goods and services	-1.1	11.9	16.5	12.8
Gross national product	1.2	2.9	4.8	4.2

Growth of investment and GDP (%)



Growth of exports and imports (%)



Note: 1999 data are preliminary estimates.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.



**Central America Commission on Environment and Development  
Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**

**Annex 11**

**Environmental Assessment<sup>1</sup>**

**I. INTRODUCTION AND BACKGROUND**

1. The main goals of the regional MBRS project are to facilitate enhanced protection of vulnerable and unique marine and coastal ecosystems and to assist the countries of Belize, Guatemala, Honduras and Mexico to strengthen and coordinate their national efforts for marine ecosystem conservation and sustainable use. The current draft Project Assistance Document (PAD) includes support for the following: (i) promote the conservation and sustainable use of the MBRS; (ii) expand environmental education and awareness; (iii) develop a regionally compatible ecosystem/biodiversity monitoring program and information system; and (iv) strengthen regional coordination. The MBRS project is envisioned as a 15-year program consisting of three project phases. The current project is proposed as the program's first five-year phase.
2. The general MBRS project area stretches from Isla de Contoy Mexico south along the coasts of Belize and Guatemala, including the barrier reef and offshore islands, to the Gulf of Honduras, and then east along the North Coast of Honduras, including the Bay Islands, to the mouth of the Aguán River (see Map 1). The MBRS includes adjacent marine ecosystems and coastal watersheds in Belize, Guatemala, Honduras and Mexico. The inland boundaries of the study area vary by country and specific locality, but are generally intended to encompass those land and water resources within the coastal plains and adjacent coastal watersheds. However, as numerous land and resource utilization and conservation activities are carried out in areas that affect ecological functions of the MBRS upstream (including agricultural, industrial and residential/urban uses, wetlands and protected areas), a broader interpretation is used to sufficiently encompass all "significant" threats and related underlying causes that could influence reef health. The ocean extension of the study area approximates the limits defined by World Wildlife Fund (WWF) for the Mesoamerican Caribbean Reef EcoRegion (Jorge, 1999). These limits vary from approximately 40 km off the northern coast of the State of Quintana Roo in Mexico, extending out some 240 km from the apex of the Gulf of Honduras, to approximately 50 km off the North Coast of Honduras at the mouth of the Aguán River and include the Bay Islands.
3. In compliance with Global Environmental Facility and World Bank policies, probable and potential positive and negative impacts of the proposed project should be assessed in order to ensure the viability of the project interventions. The project has been designated within the environmental risk category "B", implying potentially moderate risks depending on the design of project components, for which mitigation measures are readily available and applicable to control negative environmental impacts. The present document responds to GEF and World Bank requirements in its analysis of the environmental and social viability of the project design.
4. As an integral part of preparation of the project design, a *threat and root cause analysis* (TRCA) was carried out to systematically ascertain the nature, location, magnitude and inter-

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<sup>1</sup> Prepared by Paul Dulin, Environmental Specialist, as consultant to the World Bank.

mediate and root causes of current and potential problems affecting the ecological health of the MBRS.<sup>2</sup> The results of this study, including its assessment of transboundary threats, are used as the principal basis for the EA of the project, along with the analysis of the viability of project components included in the PAD as supported by relevant documentation.

## II. EXISTING STATUS AND THREATS TO THE MBRS

5. The Mesoamerican Barrier Reef System (MBRS), extending some 1,000 km from the Yucatan Peninsula to the Bay Islands of Honduras, includes the second longest barrier reef in the world. The MBRS is unique in the Western Hemisphere for its size, its array of reef types and the luxuriance of corals. The MBRS stabilizes and protects coastal landscapes, maintains coastal water quality, sustains species of commercial importance, serves as breeding and feeding grounds for marine mammals, reptiles, fish and invertebrates, and offers employment alternatives and incomes to approximately one million people living in coastal zones adjacent to the reefs. Associated with the coral reefs of the MBRS are extensive areas of relatively pristine coastal wetlands, lagoons, seagrass beds and mangrove forests that sustain exceptionally high biodiversity and provide critical habitat for threatened species. The outstanding ecological and cultural significance of the MBRS has resulted in the establishment of numerous national parks and equivalent reserves, with several of these being designated as World Heritage sites. In the last 20 years, tourism development oriented around the MBRS, especially cruise ship and diving operations, have dramatically increased foreign exchange contributions to the four nations gross national products. Other reports commissioned as part of the design phase for the MBRS project should be reviewed for more specific information concerning marine and coastal ecology, fisheries and the existence and management of marine and coastal protected areas.
6. In 1997, the Presidents of Mexico, Belize, Guatemala and Honduras signed *the Declaration of Tulum*, which recognizes the interrelated nature of the MBRS and the importance to conserve and sustainably develop its biodiversity and natural resources, and proposes a regional strategy for its management. In June of 1999, in response to the Declaration of Tulum, the Central American Commission for Environment and Development (CCAD) approved the final draft of the MBRS Action Plan. This plan proposes a series of initiatives to be carried out at regional and national levels to facilitate and coordinate actions aimed at conservation and sustainable use of MBRS resources, including: improved legislation and regulatory control, land-use planning in coastal areas, protected areas management, sustainable tourism, institutional strengthening, and investigation and monitoring.

### A. Ecological Status of the MBRS

7. The ecological status and the extent of threats to the MBRS is restricted by the lack of information across a range of themes. The ecological composition and condition of the principal estuaries, mangroves and lagoons—which are the first-line repositories and buffers of contamination entering the MBRS—are poorly understood. The same situation applies to the ecological status of reefs and seagrass beds in proximity to principal drainage outlets to the MBRS. The location of spawning aggregations and migratory and reproduction habits are poorly known, as is the status of fish stocks in coastal and open-ocean waters of the MBRS, whether territorial or international. Similarly, data on industrial, artisanal and sport fisheries catches are disparate, discontinuous and of questionable validity, since in few cases do they

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<sup>2</sup> Conservation and Sustainable Use of the Meso-American Barrier Reef System. Working Paper 1: Threat and Root Cause Analysis. FAO Investment Centre, FAO/World Bank Cooperative Programme, Rpt No. 00/008 CP-CAM, 10 Feb 2000.

include fishing locations. Also, the number of fishing boats of all sizes can only be estimated, since the permit/licensing process used in most countries is poorly controlled. Consequently, the status and tendencies of fisheries productivity is poorly understood, and only quantified in reduced harvests for selected species, especially lobster, conch, shrimp and selected finfish (especially grouper).

8. While general information is available on currents and winds in the MBRS, these are based on scanty sampling and several discontinuous studies. As currents and winds are determinants in the movement of sediments and organic and inorganic contaminants in the Caribbean, their correlation with water quality data is a critical need in order to determine the location, magnitude and impacts of contaminants entering the MBRS. Some of the more glaring gaps are those regarding water quality for principal drainages into rivers, bays, estuaries, lagoons and coastal wetlands that make up the MBRS. It is difficult to assess the static levels of contamination (baseline) to understand if the Western Caribbean is becoming more contaminated or less with time, if contamination levels are seasonal, and how these relate to the ecological health of varying elements of the MBRS (for example coral diseases and bleaching, fisheries productivity and recruitment, algal infestations). Again, the capacity of coastal wetland features, estuaries, lagoons and mangroves, as well as fringing, patch and barrier reefs, to absorb sediments and contaminants needs to be correlated with the volume of inputs of these, as can be associated with data on water quality.
9. There have been isolated water quality monitoring activities in coastal areas in Mexico and Belize, but these have restricted geographical range and are subject to interruptions depending on the availability of “soft” money from projects. Another program is proposed for the Bay Islands as part of the Environmental Management Program financed by the IDB. Also, while the general location of industries, ports, industrial agricultural areas, petroleum exploitation areas and terminals, aquaculture operations, solid waste disposal sites and sanitary sewage discharge outfalls are known, little is understood about the volume and nature of their wastes and contamination potential. Several land-use studies have been prepared for specific areas in the MBRS, and at the national level in several of the countries in the region. These, however, are outdated and are not continuously monitored to gauge changes—especially in regards to land clearing on shorelines and in mangroves, and the dynamics of deforestation in coastal and inland watersheds. The lack of a land-capability classification and zoning for terrestrial and coastal-marine areas of concern in the MBRS restricts an assessment of land-use conflicts in sensitive areas, inasmuch as their degradation may have an important influence on the health of the MBRS resources. There are few instances of monitoring the number by sites of tourists using the MBRS. While gross numbers may exist based on head-counts at airports, these are only useful at a macro-planning scale and have little use in determining carrying capacities and points of over-saturation and stress on sensitive sites in the MBRS.
10. The TRCA study shows that the ecological health of the MBRS is influenced by a broad range of phenomena, both natural and anthropogenic, and marine and land-based. However, the dearth of scientific information on even the most basic of biophysical parameters forces resource managers, policy makers and international development assistance organizations make decisions concerning the targeting of investments without an understanding of the real or potential environmental, social and economic impacts on the MBRS. Without a firm foundation for planning and monitoring of development actions—especially those embracing integrated coastal resources management, land-use planning and zoning, and sustained resource utilization strategies based on known carrying capacities—many of the national- and regional-scale investments intended to promote conservation and sustainable use of the MBRS are missing their mark.

11. The lack of quantitative information also restricts the present environmental impact assessment, especially in terms of the status and dynamics of ecosystem functions within the MBRS, as well as pinpointing the origin of certain threats and their manifestations on MBRS resources. However, the proposed project is designed to specifically address these gaps of information on a regional scale, thus contributing the pool of knowledge needed to address environmental problems affecting the MBRS at both national and regional levels.

**B. Threats to the Ecological Health of the MBRS**

12. While severely limited by the lack of scientifically-valid information, the TRCA identified a series of actions and phenomena that pose current or potential threats to the ecological health of the MBRS. The term *threat* is understood to be the agent or vehicle that represents the risk to the MBRS. Threats were determined based on: (i) *known or existing problems*, inasmuch as these represent an activity or phenomenon that is negatively impacting the ecological health and integrity of the MBRS, whether these are qualitatively or quantitatively substantiated and/or documented; and (ii) *probable or potential problems*, as activities or phenomena that pose negative impacts (risks) to the ecological health and integrity of the MBRS, as these are perceived based on best-available scientific judgment and the “worst-case scenario” principle. In the following sections, an overview is presented of the principal categories of threats to the ecological health and overall integrity of the MBRS, as determined under the TRCA. The intermediate and root causes of these threats are analyzed in the TRCA report, which should be consulted for a more integral understanding of threats to the MBRS.

***Inappropriate Coastal/Island Development and Unsustainable Tourism***

13. Land clearing and construction activities for urban, tourism and industrial developments in coastal areas involve removal of natural vegetation, dredging, filling, channelization and draining, and sand and coral rock mining in mangroves, dune communities, wetlands, shorelines and adjacent areas. These actions can cause changes in local currents and flushing in bays, onshore and offshore erosion and sedimentation of sea-grass beds, adjacent reefs and navigation channels, and result in a loss of protection from storms and hurricanes. Coral reefs grow at slower rates in areas of high sedimentation, and species changes occur in response to such conditions, with more tolerant coral species found in more highly-sedimented areas, especially on near-shore patch reefs (Hall, 1994). Similar problems occur with the disturbance of the Zooxanthellae symbiotic algae, if light restricts their photosynthesis or if impacted by herbicides (even in low concentrations), that may die or leave its host corals, resulting in bleaching or death of the latter. Construction can also result in fracturing and stress of terrestrial, riparian, coastal, estuarine and nearby reef ecosystems resulting in changes in composition of species. As the residential and tourist populations grow, increased consumption of water from surface and ground water sources (especially on islands) can induce salt intrusion and changes in ecosystem function, and decrease the availability of local and regional water supply.
14. Disposal or spills of untreated liquid organic and chemical wastes, whether domestic, industrial, agricultural runoff (including fertilizers and pesticides) or oil or formation waters from petroleum drilling locations, can cause eutrophication and/or chemical contamination of estuaries, bays, wetlands, reefs and sea-grass beds, potentially causing massive kills of, and sublethal impacts to, aquatic organisms in fresh, salt and brackish water environments, and further affect related trophic chains. Pan American Health Organization reports that only about 10% of the sewage generated in Central American and Caribbean countries is properly treated (CEPNET, 1999). The City of Chetumal, for instance, discharges 200 cubic meters of untreated sewage into the Bahía de Chetumal each day (Bezaury, 1999). Volumes of raw or poorly treated sewage of similar or greater magnitude are discharged from urban centers di-

rectly into coastal waters of the MBRS coast from Belize City, Puerto Cortes, Tela, La Ceiba and Trujillo. Excess nutrients can result in blue-green algal blooms that compete with symbiotic and coral-building alga, and smother coral reefs. Repeated fish kills in the vicinity of Belize City are attributed to effluent from an industrial galvanizing plant (UNEP, 1992). The disposal of solid wastes into coastal rivers, the sea, shorelines and estuaries, impacts fishes and reef organisms and reduces the aesthetic value of the tourism resources. The combination of nutrients and chemical contaminants is thought to exacerbate coral diseases and bleaching and/or stress their recovery.

15. Many tourist sites are over-saturated with visitors, beyond their carrying capacities, both from biophysical and management perspectives. Punta Nizuc Reef in Quintana Roo, for example, has an average of 1,500 snorklers per day arriving on 21 large tour boats and 650 two-seater jet skis (J. Bezaury, 1999). Improper diving, fishing and recreational activities by tourists and nearby residents has caused physical and biological damage to island environments, reefs and beaches. Many of the coastal and marine protected areas are under-financed and exist more "on paper" than in reality, as monitoring and enforcement actions are deficient. Immigration induced by the growing tourism service sector and availability of employment opportunities can lead to the proliferation of poorly planned residential neighborhoods without adequate basic human services. This can lead to sanitation and human disease problems, the exacerbation of social problems, and pressure on adjacent natural resources as people of limited economic means cut mangroves for fuel and building supplies and fish for subsistence and income.
16. Ever-increasing cruise ship and live aboard tourism, which is predicted to add an additional 20 ships and 2,000,000 passengers to the Caribbean in the year 2000, can produce similar impacts experienced in urban areas if not regulated. Belize has an average of 3,000 cruise ship and live-aboard visitors per day (Belize Tourist Board, personal communication, 1999). Pulses of high numbers of tourists can overtax public services, reduce local food stocks, and generate vast amounts of solid and liquid wastes that must be accommodated by municipalities in the MBRS, and present challenges for police. If these ships visit offshore island and coral reef sites, waste management problems become more acute, and inexperienced and/or unsupervised divers and snorklers may present problems of coral breakage and depredation and uncontrolled fishing.

#### ***Inappropriate Inland Resource and Land Use and Industrial Development***

17. Even where industrial and agricultural development may occur at a great distance from coastal areas, induced sedimentation, especially from the expansion of agricultural activities in upland watersheds, and contamination from agricultural runoff and the disposal of liquid and solid wastes of industrial and urban origin, make their way down-river and empty into the MBRS. The threats as manifested on the resources of the MBRS, including the impacts of sedimentation and organic and inorganic pollution, are similar to those of coastal development as indicated above, with Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS) representing the greatest pollutant loads entering the MBRS. The most important rivers contributing these contaminants are: the Río Hondo of Mexico; New River and Belize River in Belize; the Río Motagua of Guatemala and parts of Honduras; and the Chamelecón, Uluá, Lempa and Aguán Rivers on the North Coast of Honduras. Approximately 2,500 gallons of liquid wastes are discharged from sugar refining and rum distilling operations on the New River in Belize, contributing large organic loads and spent lubricants to the Corozal Bay and Bahía de Chetumal (UNEP, 1992). Of the 380 industries registered in the Sula Valley, the most industrialized area adjacent to the MBRS and drained primarily by the Río Chamelecón, 150 are reported to have environmentally problematic effluents (ESA Consultores, 1998), with 50% of these industries have a BOD concentration of

more than 1,000 mg/l and a Chemical Oxygen Demand (COD) in excess of 2,000 mg/l. In late October 1998, Hurricane Mitch scoured huge quantities of sediment from rivers and sent them into suspension into the MBRS. Chemical compounds, including chlorinated hydrocarbons (DDT, aldrin), asphalt and heavy metals, buried after years of deposition in river beds of the Chamelecón and Ulua Rivers, were washed into lagoons, estuaries and out to sea, adding to the cumulative chemicals loading of coastal waters of the MBRS.

18. Additional impacts of deforestation related to land clearing for agricultural expansion in up-land watersheds, are those of induced changes in hydrological functions as these may relate to the coast. Reduced infiltration to ground water aquifers can reduce the hydrostatic levels near coasts and induce salt intrusion on a subregional scale. Also, with less vegetative cover, surface water temperatures are increased and will contribute to warming of seawater, potentially affecting movement of currents and inducing metabolic changes in aquatic organisms in the MBRS. Construction of transport infrastructure, beyond the impacts related to land clearing and disturbance of the hydrological functions in watersheds, also improve access to fragile coastal areas, as well as upper watersheds and induce immigration, resulting in increased anthropogenic activities and spontaneous development, including land clearing, with the aforementioned impacts of deforestation, increased erosion and sedimentation, agricultural runoff and waste disposal.

#### ***Overfishing and Inappropriate Aquaculture Development***

19. Overfishing occurs when artisanal, sport and especially industrial fishers fish in disregard of regulations pertaining to closed-seasons, closed and protected areas, fishing of spawning aggregations, and with a lack of respect for size and limit/number limitations. These actions interrupt reproductive processes, gradually reducing stocks available for subsequent fisheries, with resulting reductions in fisheries revenue for local and national economies. Based on the results of FAO's 1994 Survey of the Wider Caribbean, just over 35% of stocks in the region were regarded as over-exploited; however 70% of the pelagic stocks and 60% of the demersal stocks were considered over-exploited. The over-dimensional fishing fleets, especially in Honduras where the number of industrial ships was 360 in 1996, places great fishing pressure on the primary commercial species, especially as these now use more advanced navigation and fish-finding equipment and some pull as many as four trawling nets. Species under the greatest pressure are lobster, conch, shrimp and certain species of finfish (esp. grouper and large grazers), for which overall harvests has been reduced by 60-75% based on catch-per-unit-effort, or CPUE, since 1979 in Honduras and Belize (ESA Consultores, 1998; Rodríguez and Windevohel, 1998), with similar reductions noted in the rest of the MBRS. Utilization of illegal equipment and fishing methods, including the use of SCUBA for lobster and conch fishing, has led to excessive local depredation and reduction in stocks of key commercial species. Sport fishers and divers glean "trophy" fish from reefs and lagoons, especially jewfish, groupers, kingfish and snook. By-catch of fishing activities, especially with small-sieve nets and drift-lines, of both marketable and non-marketable species is estimated in the Caribbean at 60-70% of industrial catches, resulting in important reductions in overall fisheries biomass in the MBRS. In 1986, unutilized by-catch from the shrimping industry of Honduras was estimated at 67 million pounds (Foer and Olsen, 1992). The Wider Caribbean region has the highest percentage of discards than any other major fishing area world-wide, with shrimp fishing producing the greater volume of discards (CEPNET, 1999). Shrimp trawlers also disrupt or destroy important quantities of sea-grass beds and corals.
20. The burgeoning shrimp farming industry is gaining impetus in Belize and Guatemala. Poor siting and construction of ponds in areas exposed to storms and floods can introduce exotic species and diseases into lagoons and other habitats in coastal ecosystems. Similarly, exotic

tilapia species can be accidentally or intentionally introduced in local streams, lagoons and wetland areas and compete and/or reduce indigenous fish populations. If shrimp larvae are collected from local beaches, estuaries and lagoons, this could result in reductions in nurseries of natural stocks, in turn impacting open water shrimp fisheries in the MBRS. Effluent discharged from ponds into coastal waters can induce local eutrophication and introduce exotic diseases into local estuarine and reef ecosystems; or the antibiotics used to control diseases may destroy beneficial bacteria in natural settings. Finally, depending on methods of bio-prospecting and capture/harvest, certain species of interest could be over-harvested, potentially reducing their populations beyond recovery thresholds, and/or cause interruption to ecosystem functions and trophic chains in localized locations.

### ***Inappropriate Port Management, Shipping and Navigation Practices***

21. More than 90% of commerce in the region is transported by ocean-going ships, making ports and navigation of high economic development value, but also a focal point for real and potential threats to the ecological health of the MBRS (Rodríguez and Windevoxxel, 1998). Oil terminals at Puerto Santo Tomás de Castilla in Guatemala (export and import) and Puerto Cortes and Tela Honduras (import) involve the transport of millions of gallons of petroleum and derivatives through the MBRS region each month. Two oil tankers carrying a total of 55,000 barrels of fuel visit Belize each month (Foer and Olsen, 1992), while approximately 400,000 metric tons of crude oil are shipped out of Guatemala each month. Ports and jetties construction and dredging associated with channel and harbor maintenance results in increased suspension of sedimentation in sea-grass beds and nearby coral reefs stressing and potentially smothering these, and interrupting photosynthetic processes of corals' symbiotic and other alga. Redeposition of sediments may induce changes in coastal morphologic processes resulting in erosion of beaches, accretion of sediments in navigation channels, estuaries and coastal lagoons, and may change flows in local currents and flushing of bays and estuaries. Changes in coastal morphology may reduce defenses against storms and actually instigate more damage from storm surge and flooding.
22. Inadequate port management can lead to spills of organic, inorganic and toxic cargoes, including fuel, lubricants and bilge waters, which can contaminate coastal waters, potentially impacting nearby reefs, beaches, bays and estuaries and their resident living organisms. With the operation of oil terminals (Puerto Santo Tomás de Castilla in Guatemala, Tela and Puerto Cortés in Honduras), improper transfer of cargoes lead to contamination. Where these involve offshore transfer docks (Tela), conduits lying on the sea floor may break or leak.
23. Inappropriate waste management practices on ships and ports, including accidental or intentional dumping of sewage, oily bilge waters, waste oil and solid wastes into open seas, harbors and bays, can result in eutrophication and/or chemical contamination of estuaries, bays, wetlands, reefs and sea-grass beds. Most ports have limited facilities to receive solid and liquid wastes from ships, inducing many to dump their wastes directly into the sea. Puerto Santo Tomás de Castilla in Guatemala, for instance, receives nearly 5,000 metric tons of solid wastes annually from ships, even as it has inadequate waste landfill facilities (Fernandez, 1995). Much of these wastes are dumped in the open air and some making their way back to the coastal waters and beaches. Such spills can cause fish kills as well as cause sublethal impacts to aquatic organisms residing in fresh, salt and brackish water, and their related trophic chains. As solid and liquid wastes float ashore, they foul beaches, represent human health hazards and reduce aesthetics important to the tourism industry. Finally, accidents such as collisions, groundings and founder of ships can cause physical damage to reefs, and potentially lead to complete loss overboard of cargoes and leakage of fuels and lubricants into the sea. Hazardous cargoes, such as petroleum, chemicals, fertilizers, pesticides, palm oil, radioactive materials

and similar toxic substances could cause local and subregional catastrophic damage to most all aspects of coastal ecosystems.

#### ***Natural Oceanographic and Climato-Meteorological Phenomena***

24. Oceanographic and climato-meteorological features are permanent phenomena in nature and only represent threats inasmuch as improperly executed anthropogenic development activities expose humans and their infrastructure to greater risk. Hence, the intermediate and root causes do not apply here. Rather, if these phenomena are not considered in planning and implementing development activities, the threats and causes described above can be more acute and bring about much more negative consequences for the human and natural environments. As described in Matrix 1, predominating currents and winds tend to influence the transport and concentration of sediments and contaminants entering the MBRS. The damaging effects of tropical storms, hurricanes and *El Niño/La Niña* events (especially floods and storm surges) are exacerbated through improper development actions practiced in coastal areas and inland locations. The MBRS receives more than 60 tropical storms per century, with various hurricanes hitting Honduras, Belize and Quintana Roo, including Mitch in 1998, Gilbert in 1988, Greta in 1978, Fifi in 1974 and Hattie in 1961 among the most damaging (Heyman and Kerfve, unpublished).
25. Coral diseases and bleaching are believed aggravated in areas of high sedimentation and contamination brought about by anthropogenic activities on shore. The bleaching event of 1997-1998 was perhaps the most damaging to date for the MBRS, with corals from the southern coast of Quintana Roo through Belize and into the Bay Islands suffering extensive mortality (Kramer and Kramer, 2000). The same study found that coral diseases were also widespread in the MBRS, with the highest levels of infestation occurring in back reef areas and patch reefs in Belize and off the leeward coasts of Cayos Cochinos and the Bay Islands of Honduras. Also, the rising sea level brought about by global warming will have much greater impacts on infrastructure built in areas reclaimed from shorelines, wetlands, mangroves and low islands.

#### ***Principal Transboundary Issues***

26. The TRCA study yielded an analysis of the principal transboundary issues affecting the ecological health of the MBRS, due primarily to predominating currents and winds found in the Western Caribbean (see Map 1). There are several major ocean current features affecting the MBRS: (i) the gyre is strongest during the dry-season months of January to April; (ii) the principal southeasterly-to-northwesterly Caribbean current generally moves waters off the northeast coast of Honduras toward the Yucatan Strait east of the counter-clockwise rotating gyre that roughly encompasses the Gulf of Honduras, from the Bay Islands to Glover's Reef in Belize; and (iii) seasonal close-shore currents move east to west off the North Coast of Honduras and the Bay Islands and in to the Gulf of Honduras, until they meet currents flowing south along the Belizean Coast and tend to mix in the Gulf. The Bahía de Amatique, located at the westernmost extreme of the Gulf of Honduras, has a semi-closed clockwise circulation influenced by the meeting of the coastal currents from Honduras and Belize. The Bahía de Chetumal drains into the border area of Belize and Mexico and near the bifurcation of the Caribbean current, where it mixes with the current flowing south along the Belizean Coast. Easterly trade winds predominate in the MBRS region, tending to push surface currents into the Gulf of Honduras and into the coast of Belize. Coastal drainage from the inland and coastal watersheds of the North Coast of Honduras generally appear to flow toward the Gulf bringing any suspended sediments and contaminants (and for that matter floating solid wastes). A similar phenomenon occurs with drainage from the interior and coasts, including drainage from the Bahía de Chetumal in Mexico and the Corozal Bay in Belize, wherein con-



taminants flow along-shore into the coral lagoon leeward of the barrier reefs and islands of Belize, picking up drainage from the resort town of San Pedro, then on toward Belize City. Of particular concern is the Bahía de Amatique wherein sediments and pollutants have a greater residence time and can adversely affect aquatic organisms. Hence, the Gulf of Honduras and Bahía de Chetumal are the regional foci for the collection of sediments and contaminants entering the MBRS, as these are induced by the previously identified threats.

27. Other transboundary problems include that of uncontrolled cross-border fishing by industrial and artisanal fishers in restricted areas, during closed season, in spawning aggregations, and with destructive fishing equipment and practices. The species most at risk are ocean and lagoon shrimp, lobster, conch and selected finfishes (especially grouper), but depredation also occurs with manatee and sea turtles. Also, the lack of control of dumping of liquid and solid wastes by ships at sea and at port facilities has led to degradation of open waters, reefs, beaches seagrass beds, estuaries and tidal wetlands. The impacts of these activities are especially noticeable on the leeward sides of the barrier islands of Belize and Bay Islands of Honduras, as well as the Gulf of Honduras. Finally, uncontrolled coastal development and the lack of contingency planning on the part of all governments in the MBRS region has increased the damage inflicted by tropical storms and hurricanes, with Hurricane Mitch being the most emphatic lesson. These storms destroy coastal infrastructure and buildings, spilling into the sea vast quantities of solid and liquid wastes, including hazardous chemicals, and organic materials and sediments, contaminating resources throughout the MBRS. The increased exposure and vulnerability of the coasts due to inappropriate land clearing, dredging and filling has resulted in important losses in the natural coastal defenses that offered better protection against such storms. Also, the rapid deforestation of inland watersheds has led to increased erosion, flash flooding and sedimentation.

### **C. Legal and Regulatory Frameworks**

28. Each of the countries comprising the MBRS have fairly comprehensive legal frameworks for protecting the environment and coastal resources, although their application is disparate depending on the productive subsector involved and country. Each of the countries has legislation requiring environmental impact assessments of development projects in coastal areas, whether these are urban, residential, industrial, ports or tourism projects. In isolated cases, especially for Mexico in Cozumel, Chetumal and the Cancun-Tulum Corridor, land-use planning and zoning has been carried out in coastal areas as means to guide environmentally sound development. Compliance with these plans, however, has been irregular with developers varying from stipulations generating local pressure on coastal resources and presenting new localities of environmental damage and contamination. Land-use planning is almost non-existent in Guatemala and Honduras, although programs have been proposed for coastal Guatemala and the Bay Islands, the latter being financed under the Bay Islands Environmental Management Program by IDB.
29. Also, each of the countries is signatory to many of the international and regional conventions and treaties which were ratified to encourage and facilitate the countries' adherence to international standards of environmental protection of marine and coastal resources. The lack of action of the countries comprising the MBRS on many, if not most, of these conventions and treaties complicates regional efforts to conserve and promote sustainable use of the MBRS. Both the international conventions and national legal/regulatory frameworks provide a basis for qualifying many of the root and intermediate causes. That is, the lack of compliance with existing international and regional protocols, and national and municipal regulations, norms and standards is, in itself, an intermediate cause of many of the impacts manifested in the MBRS by the specific anthropogenic actions associated with the threats. Comprehensive list

of national laws and regulations, as well as international and regional conventions and treaties, are provided in the TRCA report.

**D. Regional and National-Level Projects and Programs**

30. Of direct importance to the current MBRS project design are several regional and national initiatives dealing with the MBRS and coastal and reef resources (comprehensive lists of projects and programs are provided in the TRCA report). The coastal resources management component of the Regional Environmental Project for Central America, *PROARCA-COSTAS*, is co-financed by USAID with matching funds provided by international NGOs The Nature Conservancy (TNC), Worldwide Fund for Nature (WWF) and the University of Rhode Island/Coastal Resources Center (URI/CRC). The project supports capacity building and empowerment of local communities in the development of strategies for the sustainable use of coastal resources focusing on pilot areas in Belize, Guatemala and Honduras. A new regional initiative, *Conservation of the Mesoamerican Caribbean Reef Ecoregion*, is being coordinated by WWF and focuses on the biological assessment of the MBRS region and determining priority interventions for treating root causes to resource degradation from a bio-diversity conservation perspective. Both of these projects complement the Mesoamerican Biological Corridor Initiative spearheaded by CCAD. There are numerous ongoing international and regional programs providing technical assistance in coastal resources assessment, monitoring and capacity building. These include the Caribbean Coastal Marine Productivity Program (CARICOMP) and the UNEP-coordinated Caribbean Environment Program (CEP). Also, the Global Coral Reef Monitoring Network, operating through its Caribbean Sub-node is supported by various international and regional organizations with local coral reef monitoring carried out with GO and NGO staffs in all four MBRS countries. The Intergovernmental Oceanographic Commission/Subcommission for the Caribbean is coordinating support to countries in the Wider Caribbean Region to ratify and adopt actions under the protocols of the Cartagena Convention and supports scientific research, training and monitoring of oceanographic, fisheries and biological diversity parameters. There are also various projects under preparation with financing from the GEF, World Bank, Inter-American Development Bank, UNDP, C/ITZ, USAID, DANIDA and other bi- and multilaterals directed to objectives of conservation of coastal and marine resources. There is currently a GEF Block B grant to develop the Gulf of Honduras Maritime Pollution Control Project with IDB support.
31. At the national level, several projects stand out due to their direct relevance to the MBRS (see Annex 3 for the lists of projects and programs in each of the participating countries). There are various small projects related to protected areas (PAs) management of both marine and coastal and near-coastal protected areas, supported by local and international NGOs and private entities, national and state governments, and bilateral and multilateral funding, including GEF, World Bank, IDB and USAID. Particular projects of interest are: the Southern Quintana Roo Integrated Coastal Zone Management Project (Amigos de Sian Ka'an, University of Quintana Roo, USAID); Conservation and Sustainable Use of the Barrier Reef Complex of Belize (Coastal Zone Management Authority and Institute, UNDP/GEF); the Trinational Alliance for Conservation of the Gulf of Honduras (currently developing new project initiatives) supported by PROARCA/COSTAS; and the Bay Islands Environmental Program (Honduran Tourism Institute, IDB) and Sustainable Coastal Tourism Planning and Management Project (Honduran Tourism Institute, FUNDEMUN, GEF/World Bank, currently in design), both in Honduras.

**E. Public Participation in the Design of the Project and Assessment of Potential Impacts of Project Implementation**

32. During the design phase of the project, stakeholders were consulted across employing a variety of approaches. Three regional project-planning workshops brought together members of the National Barrier Reef Committees of each country. These committees are comprised of representatives of government agencies responsible for themes related to the MBRS (including natural resources management, environmental protection, protected areas management and fisheries), NGOs active in coastal and marine areas, and representatives of private industry (especially tourism). These same workshops included invitees from community-based organizations, including Garífuna fishing villages from Honduras, Guatemala and Belize. Workshops permitted interchange of ideas and interests concerning the values placed on MBRS resources and current economic and cultural uses. Wide participation of stakeholders in work groups and plenary sessions enriched the design process and helped focus regional priorities.
33. The TRCA study, which is used as the principal basis for this EA, involved numerous consultations with members of the National Barrier Reef Committees within their own countries in order to assess national priorities and comprehend the outreach and activities of projects and programs being implemented within each country. Similarly, contact made with representatives of regional and international projects provided a basis for avoiding duplication and promotion of synergistic approaches for regional cooperation with existing projects. The results of the study were used in the preparation of the final project design and current EA. It should be mentioned here that all stakeholders consulted opined that the MBRS project would have important positive environmental and social impacts for the MBRS region.

**Iii. Mbrs Project Description**

34. The project design proposes four principal components to treat many of the aforementioned threats to the ecological health of the MBRS. A brief description of each component is presented below.

**A. Marine Protected Areas Management Component**

35. This component will be limited to a total of 15 marine protected areas (MPAs)<sup>3</sup>, nine of which already have some legal protection, and six others which are in different stages of the process of legal creation. Criteria for selection of the MPAs included in the project were based on the significance of the protected area with respect to contributing to MBRS ecosystem characteristics, diversity and processes. The majority of the MPAs (9) are located in the two priority transboundary areas of the MBRS identified during the TRCA study--the Chetumal Bay area (Mexico/Belize), and the Gulf of Honduras (Belize/Guatemala/Honduras). The remaining MPAs included were selected to ensure a spatially dispersed pattern of MPAs loosely connecting the two transboundary areas. By the end of the project, the MBRS will have established a minimally-acceptable number and geographic coverage of well managed MPAs in the MBRS region, which will serve as regional models from which expansion and replication could occur in the program's possible future phases. The component consists of two sub-components: (i) planning, management, and monitoring of marine protected areas; and (ii) institutional strengthening.

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<sup>3</sup> MPAs include coastal and marine extensions.

***Sub-component A: Planning, Management, and Monitoring of Marine Protected Areas (MPA)***

36. The objective of this sub-component is to strengthen conservation measures in existing internationally-significant MPAs and to support the creation, planning, and initial development of a limited number of new MPAs in the MBRS region. Emphasis will be placed on supporting investments that should result in immediate improvements in MPA protection and management while increasing the probability of achieving long-term sustainability of management efforts. Specific activities to be supported through this sub-component of the project are indicated below.

*Establishment of ecological and socioeconomic MPA data baselines and monitoring*

37. In anticipation of the preparation of MPA management and operational plans, rapid evaluations of basic ecological and socioeconomic factors and conditions, including legal and policy analyses and land tenure issues, will be carried out for each MPA included in the project's first phase. In addition to providing the necessary information to prepare the aforementioned management and operational plans, selected indicators reflecting baseline conditions will be monitored over time using simple methods that can be applied by MPA staff. An international consultant, working with the staff of the respective MPA management agency together with local scientists, will assist in carrying out rapid assessments and in the establishment of baseline conditions for each MPA. A regional expert meeting will be held to review the initial results of these assessments and to devise a monitoring methodology appropriate for park staff to periodically assess the "health" of MPA ecosystems and gauge the effectiveness of project-supported management efforts. This activity will help determine to what extent MPAs are meeting their expressed goal of contributing to the maintenance and recovery of the health, diversity, and productivity of the marine and coastal ecosystems of the MBRS area.

*Development of management plans and financial strategies for MPAs*

38. For four MPAs (Corozal Bay, Gladden Spit, Sarstoon-Temash, and Omoa-Baracoa), new long-term (10-year) management plans will be prepared. In each management plan, financial strategies will be formulated specifying existing and potential revenue generation alternatives and include the identification of local and international funding sources. In addition, two-year operational plans, providing greater detail and specific budgets, will be prepared for each MPA and updated annually. Under this activity, funds will be provided for local and international consultants, participatory workshops, preparation, publication and dissemination of management and operational plans, as well as for posters including MPA maps and plan executive summaries. For the eleven remaining existing and proposed MPAs, long-term management plans either exist or are currently in preparation. Short-term technical assistance will be provided to evaluate the success to date of plan implementation, review and harmonize planning methodologies, and periodically evaluate the efficacy of plan implementation. Where needed, two-year operational plans will also be prepared and updated annually.

*Provision of basic equipment and infrastructure*

39. This activity supports the purchase of the basic equipment and infrastructure in each MPA needed to facilitate the planning process, enhance administrative capacity, and allow MPA staff to rapidly implement the priority measures outlined in the aforementioned operational plans. While specific investments will be finalized according to priority needs identified in each operational plan, likely equipment and infrastructure for the two regional MPA complexes (the Xcalak/Bacalar Chico, and Sarstoon-Temash/Sarstún) situated in the Mexico-Belize and Belize-Guatemala transboundary areas, respectively and Utila Island (Honduras)

will include: boats, motors, and motorcycles; dive equipment; mooring and marker buoys; ranger stations; and public use facilities (visitor centers, signage, trails, and composting toilets). For the remaining 10 MPAs, a basic package of computer hardware, software and peripherals as well as communications equipment (base and mobile radios, batteries and chargers), GPS units, and basic office furniture will be provided.

*Transboundary cooperation in policy, protection, and management of MPAs*

40. Most of the MPAs selected to receive support under the project are located on or in proximity to international borders. Many of the threats and root causes faced by these MPAs cannot be resolved through unilateral national efforts. Current issues in need of effective bi- and tri-national management responses include management of migratory fish and wildlife stocks, addressing cross-border infractions of existing laws, and the conservation and management of trans-frontier parks. Under this activity, funds will be reserved to facilitate regular meetings of the field and supervisory staff of MPA management agencies in the Bay of Chetumal and Gulf of Honduras transboundary areas, respectively. It is expected that these meetings and the resulting dialogue and decisions will provide the eventual basis for formalizing the process leading to the joint co-management of relevant MPAs in these and other transboundary areas.

***Sub-component B: Institutional Strengthening***

41. To address the substantial institutional building needs in the region, training courses and workshops for protected area directors, technical staff, rangers, and key collaborators from local and national government agencies, collaborating NGOs, and local communities, will be supported under this sub-component. Courses will be from two to three weeks in duration, and will be held preferably at or in proximity to MPAs selected to receive management and planning assistance through the project. Training libraries providing basic information on all aspects of marine protected area management will be established or improved in all MPAs with sufficient staff infrastructure in the MBRS area. Specific activities to be supported through this sub-component of the project include the following activities.

*Training courses and workshops*

42. Training events to be supported through the project include the following:
  - Management planning for MPAs (two events @ three weeks each, for MPA managerial staff and senior government, university, and NGO staff)
  - Basic training for MPA rangers (two events @ three weeks each)
  - Principles of MPA management (two events @ three weeks each, for midlevel and para-professional staff of MPA management agencies and collaborators)
  - Development of MPA financial strategies (two events @ two weeks each, for supervisory staff at MPAs and responsible government agencies and NGOs)
  - Administration of MPAs (two events @ two weeks each, for mid-level and senior staff of MPAs and management agencies)
  - Community relations (two events @ two weeks each, for mid-level and supervisory MPA staff and community leaders, collaborating NGOs and municipal representatives)
  - MPA public use and tourism programs (two events @ three weeks each, for MPA public use program personnel, tourism institute staff, and local entrepreneurs and community association representatives)

*Training library development*

43. In addition to supporting regional training events, the project will also provide a basic standardized training library to all MPA headquarters and ranger stations throughout the MBRS region (approximately fifty offices). This would facilitate continual professional improvement for MPA field staff who often lack even minimal access to training manuals, natural history publications, best-practices/management guides and other books on themes relevant to MPA management programs.

**B. Regional Environmental Information System Component**

44. Developing and providing access to relevant environmental data from the region is a critical element toward promoting the regional perspective and consensus required for management of the MBRS as an integrated ecological system. The establishment of a regional environmental information system (EIS) will provide an essential tool required for organized data management and decision support. Moreover, a regional EIS can be used interactively with other project components serving both as a recipient of and source for data with the MPA, Sustainable Use, and Public Education and Awareness project components.
45. In the program's initial phase, the objective of the EIS component will be to provide the basic framework to guide data collection, processing, distribution and utilization in support of promoting improved management of the MBRS. Specifically, the component will provide support for the design and implementation of a bi-lingual EIS whose architecture will allow broad access to policy makers, technicians, and the public at large. While the establishment of an EIS will be a major product of the initial phase of the MBRS program, it nevertheless should be viewed as a "living" system that will grow in complexity and value as new data are developed and are made accessible. The component consists of the following two sub-components: (i) creation and implementation of an MBRS regional environmental information system; and ii) establishment of an integrated synoptic MBRS monitoring program.

*Sub-component A: Creation and Implementation of a Distributed, Web-based EIS*

46. Under this sub-component, a web-based EIS will be established which will include basic environmental data for reefs and adjacent waters in the MBRS region, outflows for selected watersheds, and accessible local and regional monitoring data, including data that form part of broader-scale programs such as CARICOMP and CPACC. Specific activities to be supported through this sub-component of the project are described below.

*Equipment support*

47. Through this activity, the project will support the purchase of equipment, software, and the costs associated with gaining access to the Web required to implement a distributed, web-based, bilingual EIS. The EIS will consist of two tiers: a primary technical tier accessible to all participating data nodes, and a secondary, publicly accessible tier providing information on the MBRS--the latter in support of the project's public education and other components. The provision of equipment and training will be conditional on a commitment by each national node agency to participate fully in the EIS by providing staff resources to maintain data and links to the EIS, and by making data available through the system according to previously agreed procedures.

*Meta-database establishment*

48. This activity will support the construction of a comprehensive meta-database, a regional bibliography, and a core of legacy databases which will be maintained by a component-supported regional office which will also be responsible for maintaining the web-based EIS structure and the publicly accessible information tier. At minimum, baseline geo-referenced maps, and first-cut distributions of major watersheds, coastal water masses, and broad habitat types in shallow waters will be included in the EIS. Much of these data will have to be generated by appropriate node agencies at the national level and/or the regional office. The meta-database will also be designed with hyperlinks to other relevant national, regional and international scientific research, training and technical project websites to facilitate further more specific searches and research by theme and geographic location.

*Information dissemination*

49. The dissemination of information (electronically and in print) on the results stemming from monitoring and other activities being undertaken to gauge and manage the environmental "health" of the MBRS will be supported through the distribution of hard and digital copies of tabular and georeferenced data, research and monitoring reports, training opportunities and relevant archival information. The project will maintain a E-mailing list of interested and relevant organizations and institutions, as well as offer periodic bibliographies and reports in hardcopy to be made available at national node agencies and the regional project office in Belize.

*Training*

50. The activity will support a coordinated series of intensive, in-country training workshops designed to build node agency skills in GIS and data management. Participant skills will also be strengthened in: (i) the design of monitoring programs that will support improved decision-making; (ii) the interpretation of remotely sensed data; and (iii) the statistical analysis of monitoring data including "reference condition" and other advanced techniques. All participating agencies will have a role in the development of the training program to target their respective institutional needs.

*Technical support*

51. In support of the creation and implementation of the EIS, a small regional office composed of 2 technical specialists (an environmental monitoring specialist and an information technologist) and a set of national node agencies (at least one per country) will be established through this activity. The regional office will coordinate the development and operation of the EIS, maintain baseline and legacy data, and manage the publicly accessible information database.

***Sub-component B: Establishment of an Integrated Synoptic MBRS Monitoring Program***

52. The MBRS can be viewed as consisting of a number local reef structures surrounded by water and embedded in a mosaic of inter-linked ecosystems. The ecological linkages between reefs, other marine environments, and coastal watersheds, are mediated, partially or entirely, by water flow. However, despite the importance of water currents in transporting nutrients, pollutants, and reproductive products across ecosystem and national boundaries, there is a dearth of data on the region's current regime and its influence on the status and processes of MBRS reefs and other critical ecosystems. Nor is there sufficient information related to the complex patterns of reproduction, larval dispersal, and recruitment of corals, fish, and other important

reef components; patterns which depend on the complex interaction of water flow and larval behavior.

53. Under this sub-component, a regional monitoring program for the collection of synoptic data on physical oceanography (surface currents) and ecological connections among and between reefs and adjacent ecosystems (including coastal watersheds) will be implemented. In the initial phase of the program, the geographic emphasis of the monitoring activities will be in the two transboundary areas of the MBRS. Criteria for the identification of specific monitoring locations will include: presence of biodiversity-rich ecosystems; importance of the areas as sources or sinks for recruitment of corals, fish, or other important community components; and presence and degree of threat associated with pollution stemming from onshore activities. In addition to the sites in the two transboundary areas, an additional 5 or 6 sites will be supported at strategic locations selected for their value in contributing to a more complete understanding of the ecological processes that characterize the MBRS. Monitoring activities will be planned and designed in association with the MBRS MPA monitoring activity described above, to ensure technical coherence and operational efficiency between the two activities. Specific activities to be supported under this sub-component are described below.

*Baseline assessment and monitoring program*

54. This activity will support the preparation of an MBRS environmental baseline. In order to initiate the preparation of the baseline at the project inception, an integrated summary of present knowledge will be assimilated concerning the ecology of the MBRS based on currently available information on current regime, patterns of pollution risk, interconnection of locations and habitats within the region, and ecosystem state and dynamics. The results of the assessment will be presented at an initial planning workshop of the sub-component's Technical Working Group (TWG) in PY 1. Based on the results of the study, it will be the task of the TWG to develop a detailed proposal for a regional monitoring study of surface current patterns, water quality, and reef community dynamics to include coral and fish recruitment.
55. The monitoring study will be supported by ancillary field studies designed to characterize the biotic communities and laboratory analyses. Annual coral reef assessments, using the field survey carried out in association with the current MBRS project design as a baseline<sup>4</sup>, will be instituted beginning in PY1 and continue through the life of project. This site-specific monitoring will provide latitudinal data concerning the ecological health of the reefs, especially in reference to coral diseases, bleaching, recovery rates and mortality. A key input into the monitoring program will be flow and water quality monitoring at Rio Hondo and New River, and at Motagua, Chamelecón, and Ulúa rivers and an assessment of their importance as outlets for sediments and agro-chemicals and other bioactive compounds that may affect the "health" of the reefs, as correlated with annual reef assessments. An additional input will be the completion of a risk analysis using satellite imagery of river flood plumes, and/or analysis of off-shore sediments derived from terrigenous materials, to identify those reef communities that are most at risk to river-borne pollutants. A key output will be the development of a hydrodynamic model of surface currents near the end of the first phase of the project. In addition to equipment and logistical support, this activity will support the contracting of highly-technical specialists to assist in the identification of sources of recruited larvae, the collection and conduct of sensitive chemical analyses of water quality, and developing a hydrodynamic surface flow model for the region.

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<sup>4</sup> Kramer and Kramer. Ecological Status of the Mesoamerican Barrier Reef System: Impacts of Hurricane Mitch and 1998 Coral Bleaching. Final Report to the World Bank. University of Miami/RSMAS. January 2000.



*Targeted research*

56. Water quality issues are likely to be monitored more effectively if a simple but reliable set of bio-monitors could be identified for water quality. While a number of simple bio-monitors have been tried in coral reef systems in the past, none have yet gained widespread acceptance and use. This activity would support the development of one or more simple, inexpensive bio-monitoring indicators for water quality that could be applied routinely to monitor coral reef habitat in the region. By using identified variations in water quality at monitored sites, it will be possible to use field experiments to evaluate the precision and reliability of different bio-monitoring techniques. Once a technique has been developed and verified in the field, it would be integrated into the MPA monitoring activity.

**C. Promotion of Sustainable Uses of the MBRS Component**

57. The objective of the component is to provide relevant information and assistance to decision-makers and managers of productive sectors dependent on the MBRS so that adverse impacts of their activities are minimized and productivity is enhanced. The component seeks to facilitate necessary incentives to stakeholders contributing to the sustainability of resources and the economic activities that depend on them. The component is designed to identify those technical, social and institutional interventions that will enhance the conditions and opportunities for rational use of the resources of the MBRS. Component activities will initially focus on the two most significantly important and potentially harmful economic sectors dependent on the MBRS, fishing and tourism, under the following sub-components.

***Sub-component A: Promote Sustainable Fisheries Management.***

58. There are strong indications that several commercial species of finfish, crustacea and mollusks are either fully or over-exploited throughout the MBRS region. These species represent an important source of income for thousands of families throughout the MBRS region and population levels need to be maintained to reduce the risk of possible economic and social loss.
59. Many of these same species play key functional roles in the reef ecosystem and their populations must be maintained at reproductively viable threshold levels. Despite the importance of the resource, sustainable management objectives for most of these species have rarely been achieved in the region; a situation attributed largely to a lack of awareness (among policy makers, resource managers and fishers), poor education, conflicts among user groups in the coastal zone, and minimum research capacity in the MBRS region. This sub-component will address this issue by supporting the following activities.

***Determination of spawning aggregation sites***

60. This activity will present clear scientific bases and recommendations to be considered in the formulation of a regional policy promoting the sustainable use and management of these sites which will be developed through the appropriate fora. This activity will facilitate the collection and analysis of scientific and anecdotal information documenting the location of these sites, their ecological and socioeconomic importance, and the production of a regional map indicating exact geographical location, dimension, and status of exploitation (by fishing and other activities). In this assessment, priority shall be given to the following commercially important species: Nassau grouper, the mutton snapper, the yellowtail snapper and the hogfish. This activity will be conducted in PY1, and will require the services of two specialists with expertise in the ecology of spawning aggregations and in the development of marine fisheries

policy, respectively, with emphasis given to the establishment of conservation areas (MPAs) to protect selected species during annual spawning events.

#### *Monitoring*

61. This is a follow-up activity to the mapping of fish aggregation sites with the objective of monitoring the status of aggregation sites in the MBRS region over a three-year period (PY2 - PY4). Visual surveys using underwater video will be used to estimate changes in aggregation size, sex ratios, species composition and social behavior. Exact geographical location and the physical extent of the aggregation will be monitored using GPS. Support in the form of equipment needed for the monitoring of basic fisheries activities (cameras, GPS units, nets, calipers, balances, snorkling gear, microscopes, etc.) will be provided to national project partners in PY2.

#### *Sustainable fisheries management*

62. Assistance in building regional research capacity will be provided in the form of training, technical assistance and equipment. The design and establishment of a regional fisheries data collection and management system will be completed in PY2. This activity will review existing fisheries data collection systems in the region, determine the feasibility of modifying them to suit MBRS needs, and produce a suitable regional fisheries data collection and management system for the MBRS, using customized software and development of a users' manual. This system must be compatible with the MBRS EIS to be established under the project. A 3-day regional workshop will be held in PY2 to obtain country endorsement of the data collection system as well as training in its use. Copies of the software, users' manual, computers and printers will be provided to the four countries in an effort to initiate immediate use of the new data collection system. In addition to training in traditional data collection system approaches and on a pilot basis, this activity will support an 8-day training workshop, during PY2, to facilitate application in all four countries of ECOPATH and ECOSIM data modeling programs. These programs employ an ecosystems approach, as opposed to traditional species-specific methods.
63. An assessment of the socioeconomic interrelationships between fishing and other user groups within the coastal zone of the MBRS will be conducted in PY2. This assessment will identify positive relationships as well as conflicts between fishers and other user groups, and will recommend guidelines for enhancing positive and mutually-beneficial relationships as well as conflict resolution measures.
64. Regional and follow-up national training for fishers, government officials and members of NGOs in co-management techniques will be conducted in PY2 and PY3. This activity will introduce the topic of co-management and will lay the groundwork for the involvement of stakeholders in the management of coastal resources. Professional peer exchange and hands-on training in specific skills will be provided to technicians working in fisheries management within the MBRS. These training will be conducted in PY2, PY3, PY4, PY5 and will make available trained technicians to the region at a faster rate than long-term degree programs.

#### *Promotion of sustainable livelihoods*

65. During PY2 and PY3, this activity will support vocational training of fishers located in the two priority transboundary areas in alternative economic activities. Training should impart to fishers the capacity needed to diversify from fishing into more sustainable income-generating

activities including, but not limited to, kayaking, sport-fishing, tour-guiding, dive mastering, naturalist and similar vocations.

***Sub-component B: Facilitation of Sustainable Coastal and Marine Tourism***

66. Tourism is the world's fastest growing industry. Tourist arrivals to the Central America sub-region represented the highest average annual percentage growth increase within the Americas region over the past three years. A large part of this growth is in nature-based tourism, relying on the amenities or attractions of the Caribbean Basin's unique marine environment. The MBRS still boasts some of the least spoiled coastal profiles and some of the most outstanding underwater experiences in the Caribbean. However, in the absence of adequate environmental management guidelines or regulatory regimes, proliferation of traditional sea and sun tourism in parts of the region (Cancun, in particular) has occurred often at a significant ecological and socioeconomic cost. There is a critical need to stimulate an on-going policy dialogue and facilitate specific actions necessary to ensure sustainable tourism principles and practices are implemented through regional cooperation.
67. The objective of this sub-component is to formulate and facilitate application of policy guidelines and best practice models for sustainable coastal and marine tourism in the four countries of the MBRS. The desired outcome is to provide and disseminate examples which demonstrate how to minimize the adverse impacts of tourism and enhance its potential beneficial effects on coastal/marine habitats and resources and on human communities located near tourism destinations. Actions proposed are integrally-linked to the objectives and activities proposed under the other three components of the MBRS project. The following activities are planned over the initial five-year phase of the project.

***Regional policy dialogue and cooperative action forum***

68. To facilitate a tourism policy that provides helpful direction for local MPA protection, senior government officials and their tourism industry counterparts need to be better informed about critical coastal and marine tourism issues and problems. Initially, this activity will focus on obtaining tourism industry commitment and NGO support for the government to implement workable environmental impact assessment, inspection and enforcement systems for coastal land and marine uses. Planning guidance will also be provided to develop innovative tour/trip circuits which "package" and market marine parks together nationally and regionally (e.g., Wildlife Conservation Society's Regional Trails Project or marine ecotourism associated with an MPA in a priority transboundary area such as the Xcalak/Bacalar Chico or Sarstoon-Temash/Sarstún). This activity will also provide support for an annual forum to facilitate: (i) developing consensus on a regional strategy and priority actions; (ii) selection of at least one specific priority regional cooperation issue and action agenda to address each year; (iii) drafting, adoption and dissemination of achievable action plans; (iv) implementation and follow-up through technical assistance, training and/or collaborative activities; and (v) monitoring and evaluation of outcomes.

***Catalogue of exemplary practices***

69. Voluntary codes of conduct in critical segments of the coastal and marine tourism industry need to be considered and adopted by tourism-related businesses. International and regional organizations have invested considerable resources in developing sustainable tourism guidelines and codes of conduct (for example USAID-supported sustainable tourism efforts in Quintana Roo and the UNEP's Caribbean Environment Program). This activity will support an extensive literature search and interviews with sustainable tourism experts, from which

"good practices" will be identified and adapted for use in the MBRS region. A catalogue of "exemplary practices" for sustainable coastal tourism will be developed and disseminated widely in the region through print and the project's website.

*Regional environmental certification program*

70. Under this activity, a region-wide, independent environmental certification program will be established for coastal and marine tourism operations in key sub-sectors (e.g., hotel/resort facilities, diving operations, yachting and live-aboards, ecolodges, cruise ship tours on land). This program will include: (i) agreement on a strategy and steps for certification, including performance based standards for environmental certification/ecolabeling; (ii) formulation and adoption of an independent certification and marketing system that positions the MBRS region as one of the world's leading sustainable tourism destinations; (iii) provision of resources for establishment of the program on a pilot basis in high priority transboundary tourism destinations linked to one or more MPAs; and (iv) development and adoption of a plan for expanding and financing the certification system (for instance, fee for service, cooperative marketing to the green market). Efforts will be made to create cost-effective linkages and cooperative activities with other on-going certification (for example, programs sponsored by the Caribbean Action for Sustainable Tourism).

*Marine tourism exemplary practices study tour*

71. This tour will be designed to provide an opportunity for a number of "emerging" marine-focused travel and ecotourism operators (those who are not fully market-ready, or are just starting to market their product) to learn, exchange information, and network with successful businesses in their field. A two week marine tourism exemplary practices study tour will be designed to network and share ideas with 5 or 6 established and leading adventure travel, marine travel and ecotourism operators in Central America. Throughout the tour, experts will conduct seminars on a number of topics, including product development, marketing strategies, environmental conservation and management, partnering with the travel trade, packaging, and market research. Materials will be prepared on environmental practices, community involvement, conservation financing and interpretation. A technical report will also be drafted and widely disseminated to the tourism industry, interested NGOs and government officials through print and the project website in order to share lessons learned, case examples and pitfalls to avoid.

**D. Environmental Education and Public Awareness Component**

72. A major cause underlying threats to the MBRS as identified in the threat and root cause analysis in support of MBRS project preparation was the lack of public education and awareness concerning the environmental, social and economic significance of the MBRS, and issues that need to be addressed to ensure its sustainability. A critical element to developing the political will and policies required to manage the MBRS is building sufficient public support to catalyze change. The objective of the environmental education and public awareness component is to increase environmental awareness among a variety of stakeholders and promote the development of human capacity to change practices that are detrimental to the MBRS.

*Sub-component A: Development of an Environmental Awareness Campaign*

73. Under this sub-component, the general public's awareness of the importance of the MBRS as a "world class" resource and the need to promote its conservation and sustainable use will be enhanced. This will be carried out by supporting development of a broad-based public aware-

ness campaign using printed and audio-visual messages that will be disseminated through general media and at public gatherings. Activities under the sub-component include the following.

*Establishment of a database and information "clearinghouse"*

74. MBRS project staff and consultants will gather published and unpublished materials and media resources located within and beyond the region with relevance to MBRS objectives. These will be entered into a database and made available through the MBRS project website. A catalog of MBRS reference materials will be promoted via all printed and audio-visual materials produced by the project. Also, relevant materials in support of the environmental education sub-component will be reproduced and distributed to target users/audiences.

*Public awareness campaign strategy*

75. A public awareness campaign strategy will be developed through a series of meetings and interviews with key stakeholders in the four MBRS countries. It will be implemented on a national basis and will focus on the value and need for conservation of the shared resources of the MBRS.

*Development and dissemination of information materials*

76. In support of the campaign, printed and audio-visual materials will be produced and disseminated by project staff and associated stakeholders. Materials will be produced in English, Spanish and, in some cases, Garífuna and will include: brochures, posters, and comic books (five of each); videos (three, each of which can be excerpted for television spots); and radio spots (four). A graphic designer will create a logo to be identified with MBRS conservation and sustainable use, and other materials to be used to generate public awareness. Two one-day seminars for National Barrier Reef Committees and mass media representatives will be held in each of the four countries to promote the project and disseminate printed and audio-visual materials

***Sub-component B: Formal and Informal Education***

77. The objective of this sub-component is to increase knowledge and promote changes in attitudes and behavior towards the conservation and sustainable use of the MBRS, with particular focus in the transboundary areas, through the strengthening of formal and informal environmental education programs. Students at primary and secondary school levels will be educated about the significance of MBRS and the need to promote sustainable management practices. Assistance will be provided through creation and/or adaptation of curriculum materials for students, as well as teachers' guides and teacher training to ensure successful use. The sub-component will contribute to non-formal education of professionals in industry and tourism sectors that directly affect MBRS resources, and/or for community leaders who maintain strong influence on MBRS stakeholders. This will be carried out through a series of workshops in which participants will be exposed to examples of "best practices" in the sector and learn how to improve their respective patterns of resource utilization. An awards program will provide public recognition for those community-based, industrial, governmental and non-governmental entities that demonstrate their commitment to improving the quality of MBRS resources. Specific activities supported under the sub-component are described below.

*Production and dissemination of education materials*

78. This activity will support the production of primary school level curriculum materials for students and associated teaching guides, and support for two regional 6-day training workshops for teachers. Secondary school level curriculum materials for students and associated teaching guides will also be produced, and their use supported through the implementation of two regional 6-day training workshops for teachers. An annual coastal resources fair and contest will be established for secondary school level students to exhibit and award projects that most successfully support MBRS conservation and sustainable use.

*Regional workshops*

79. Six 4-day regional workshops will be conducted to educate and train the following target groups: (i) leading industrialists about best practices for conservation and sustainable use of the MBRS; (ii) tourism professionals about best practices for conservation and sustainable use of the MBRS; and (iii) influential community leaders (e.g., religious, local government, social organizations) about conservation and sustainable use of the MBRS.

*Regional conferences*

80. Two 2-day regional conferences will be held for members of the business and tourism sectors and community leaders to present the activities/projects they have implemented and to give awards for those subprojects and activities which most successfully support MBRS conservation and sustainable use objectives. These activities will be coordinated especially with those under the MPA and Sustainable Uses project components.

**IV. ANALYSIS OF THE IMPACTS OF THE PROJECT, AND PROPOSED MEASURES TO ENHANCE POSITIVE AND AVOID OR MITIGATE POTENTIALLY NEGATIVE IMPACTS**

81. As can be perceived from the objectives and description of activities under each of the four components, the MBRS project is designed to treat many of the fundamental threats to the ecological health of the MBRS, as well as contribute to the sustainable utilization of resources found therein. The environmental and social impact of the project will be overwhelmingly positive, directly and indirectly. The project will make important contributions to the body of knowledge concerning the status of the MBRS and its resources, and the real and potential negative impacts of anthropogenic activities as these are manifested on the MBRS. The project seeks synergistic linkages with ongoing local, national, regional and international projects and programs that deal with conservation and sustainable use of MBRS resources. By design, the project should complement both ongoing and future projects and programs, especially in areas where these programs lack a regional perspective in terms of conservation and sustainable use of the shared resources of the MBRS.
82. The proposed project will provide assistance and support to both governmental and non-governmental entities, as well as contribute to sustainable use initiatives with resource users at the local/community level. The MBRS project places emphasis on the two priority transboundary areas that have been identified as those most at risk of unsustainable depredation of resources. These areas have traditionally been ignored by national governments and/or excluded from project outreach as they are in many cases regarded as "lawless" and outside of regulatory outreach. Because of natural conditions created by prevailing ocean currents and winds, these same transboundary areas are the principal receptors of sediments and contami-

nants that emanate from land- and marine-based sources, and are most at risk of ecological degradation.

83. There is a risk of minor negative environmental and social impacts related to project implementation. Financing of infrastructure construction and improvements could present temporary and localized impacts in the form of sedimentation or contamination if proper safeguards are not employed to avoid or mitigate these. Also, related to the establishment or development of MPAs and fisheries conservation efforts is the potential for disrupting traditionally-practiced economic activities (fishing), although these have been found to be, in turn, degrading the resources leading to self-elimination of these activities in certain areas. In both cases, the project includes mitigation strategies and measures to avoid or dissipate any such potential impacts.
84. An analysis of the probable and potential positive and negative environmental and social impacts is presented below for each of the project components. As necessary and appropriate, measures to enhance the positive impacts of the project and avoid or mitigate potentially negative impacts are indicated.

**A. Marine Protected Areas Management Component**

85. Activities under this component will have immediate and positive impacts on efforts to conserve marine and coastal ecological complexes. Investments are targeted at consolidating management of 9 existing MPAs, and facilitating the establishment of 6 new MPAs currently in differing processes of legal designation. The creation and/or consolidation of 15 MPAs should advance objectives of the establishment of a Mesoamerican marine and coastal corridor to complement the terrestrial Mesoamerican Biological Corridor. The project will complement ongoing and planned national-level biological conservation projects and several regional efforts (for instance PROARCA/COSTAS financed by USAID), contributing to the effective management of legally-protected areas that, up to the present, have been regarded as "paper parks". MPAs to be funded under the MBRS project have been selected based on regional conservation criteria and funding will be facilitated for the preparation of management plans and effective on-site management.
86. Proposed training, facilitation of equipment and transboundary cooperation activities proposed under the component should significantly improve the on-site management of MPAs. As MPAs are consolidated and become better managed, their social and economic significance will increase with greater visitation of residents and tourists. Efforts under the MPA component will be coordinated with activities proposed under the Promotion of Sustainable Uses component. Synergies among these components will facilitate mutual objectives of enhanced biological conservation and sustainable utilization of marine and coastal resources, especially coral reefs (diving, kayaking and other ecotourism activities ) and fisheries (as populations of species currently overexploited recover). Furthermore, an increase in the area under effective conservation management and increased tourism activity associated with MPAs should bring about added value of economic opportunities to local communities.
87. There exists the potential for some minor negative impacts associated with construction of ranger stations and public use facilities in the two transboundary areas of Xcalak/Bacalar Chico and Sarstoon-Temash/Sarstún , and Utila Island in the Gulf of Honduras. Land clearing, limited excavation and soil movement associated with establishment of these facilities may result in increased erosion and sedimentation. Depending on the siting of structures, they could interfere with natural coastal processes and defenses from tropical storms. Also, operation of these facilities could lead to contamination of the surrounding environment with liquid and

solid wastes if these are not properly contained and disposed of. In order to avoid or mitigate potentially negative consequences of these activities, a simple environmental impact assessment will be carried out for each structure proposed. This assessment will comply with all EA regulations found in each respective country and World Bank policies and guidelines. To complement this effort a set of guidelines will be developed to incorporate the environmental dimension into the siting and construction of protected areas management infrastructure and avoid contamination of fragile ecosystems in and adjacent to the MPAs. An MBRS regional project staff member will develop these instruments, train local MPA staff in their application and monitor compliance.

88. In some cases, local communities have traditionally used waters and reefs of the MPAs (both existing and several slated for legal declaration) for their fishing activities. Some of these fishers have constructed and used temporary shelters as fishing camps on several of the islands and coastal locations found within the MPAs. Depending on the frequency of fishing and species fished, these fishers could be impacted should their access to fisheries resources be limited or restricted altogether. The location and importance of these locations has not yet been determined, nor which communities or individuals depend on them. It should also be mentioned, however, that many of then traditional fishing locations within the MBRS have been abandoned due to diminishing stocks, especially for grouper, sardines, conch and lobster. In essence, the fishers have degraded their own resource and impacted their own livelihoods by not respecting basic fishing regulations (fishing out of season, overfishing species beyond set catch limits, harvesting undersized individuals ).
89. In order to respond to the potential for adversely impacting local fisher communities, as part of the proposed rapid ecological assessments for each of the MPAs to be supported by the project, local fisher communities will be consulted in order to determine the significance of local fisheries within the MPAs. Depending on the results of these assessments, strategies and policies for mitigation or compensation of any perceived impacts would be adopted. The project, with activities proposed under the Promotion of Sustainable Uses Component, already envisions vocational training to transform fishers into tour and sport-fishing guides and dive-masters. These fishers, already possessing good knowledge of the waters and reefs within many of the MPAs could also become park rangers within the MPAs and/or para-investigators in support of research and monitoring activities proposed under the EIS and Sustainable Uses components.

**B. Regional Environmental Information System Component**

90. The TRCA found that the lack of basic scientific information on the status and dynamics of the MBRS is the single most pervasive limitation to environmentally-sound management of MBRS resources. This situation is compounded by the multiplicity of procedures and formats for what little data are collected in each of the countries and by several regional and international entities. This component will respond directly to these deficiencies in its establishment of a bilingual EIS with outreach in each and among the four countries that make up the MBRS.
91. The creation of a web-based EIS with a complementary meta-database will enable scientists, students, resource managers and decision-makers ready access to information pertinent to the conservation and sustainable use of the MBRS. Better-informed decisions should lead to better management of MBRS resources. Establishment of the EIS will also necessitate consolidation of parameters, procedures, protocols and formats for the collection of information relevant to the monitoring of the ecological health of the MBRS and the impacts of natural phenomena and anthropogenic activities. As part of the EIS, a regional integrated synoptic envi-



ronmental monitoring program will contribute both baseline and longitudinal information on the dynamics of the MBRS, including such aspects as water quality, surface currents, recruitment areas, impacts of principal river discharges, coral reef health and tendencies, and bio-monitors. Over time, the EIS and environmental monitoring program should facilitate a better understanding of MBRS ecological processes, the importance of certain geographical areas (such as MPAs and spawning aggregation sites), and sources of contamination and causes of degradation of MBRS resources.

92. Establishment of the regional EIS, with both central and national nodes, will have very positive environmental impact within each country and the region as a whole, as development planning and conservation efforts will be facilitated with an improved knowledge base concerning the potential for impacts, both positive and negative. Capacity building in each of the countries, to be brought about through the provision of equipment, training and sustained technical assistance, should contribute to the sustainability of environmental monitoring efforts as these relate to MBRS resources. The EIS will support all other components by serving as receptor and disseminator of information concerning basic ecology, fisheries, tourism resources and the need for proper management of MBRS resources. The monitoring program will be supplemented by, and feed back information to, data management activities to be handled under the MPA and Sustainable Uses components. Information from the EIS will also be made available for inclusion in materials to be promoted under the Environmental Education and Awareness component.

#### **C. Promotion of Sustainable Uses of the MBRS Component**

93. This component focuses on the most important economic activities utilizing resources in the MBRS—fisheries and tourism—seeking to make both more sustainable. Activities under the Sustainable Fisheries sub-component are oriented primarily to improving scientific knowledge regarding the reproduction dynamics and viability of populations of selected economically-important marine finfishes which are currently believed overexploited. The delimitation and monitoring of spawning aggregation sites will lead to a better understanding of the status of Nassau grouper, mutton snapper, yellowtail snapper and the hogfish. Modeling of this information and other data available in each of the countries and at a regional level will permit better assessment of ecosystem conditions and tendencies, which will, in turn, lead to the development of strategies and policies of improved fisheries management in the MBRS. One intermediate objective of the sub-component is to consider establishment of spawning aggregation sites as MPAs as a strategy to protect at-risk species. This strategy would also serve to counteract any conflicting efforts to use information concerning the location of spawning aggregation sites for out-of-season depredation of these fish species.
94. The sub-component also includes an assessment of the interrelationships of different groups of users of MBRS resources (primarily tour operators and fishers) with the intent of developing mutually-sustainable utilization strategies that balance resource use with objectives of conservation. Also included are activities for the vocational retraining of fishers located in the two priority transboundary areas in alternative economic activities more consistent with the objectives of sustainable use of the MBRS. The conversion of fishers to tour and sport-fishing guides, divemasters, park rangers and naturalists will have both positive social and environmental impacts. Also, as fisheries stocking rates improve, strategies for sustainable fisheries of selected species can be developed with possible redeployment of fishers from affected communities.
95. The Facilitation of Sustainable Coastal and Marine Tourism sub-component will provide guidance to tour operators, government authorities and NGOs on environmentally-sound

tourism practices, including "green" certification. The proposed regional forum among representatives of the tourism and national regulatory agencies of the MBRS is designed to bring regional tourism issues and policies into dialogue and facilitate adoption of uniform environmental impact assessment procedures and tourism "best practices" for the industry. The same forum will promote packaging of regional tours within the MBRS, itself a strategy to promote sustainable use of this shared resource. Tourism best-practices guides will be prepared based on lessons learned in the region and widely distributed throughout the region. Among the best practices to be embraced by the project are: policies of social inclusion, participation of local communities (community-based tourism), consideration and respect of local social and cultural features (esp. Garífuna), and utilization of locally-available services. This will be followed up with a marine tourism exemplary practices tour and a regional environmental certification program designed to encourage tour operators to adopt best practices and promote environmental protection and conservation objectives of the project. Sustainable tourism under this sub-component will be directly linked with activities under the MPA component in an attempt to bring added economic value to the objectives of protected areas management.

**D. Environmental Education and Awareness Component**

96. Activities proposed under this component will enhance the understanding of the environmental, social and economic value of the MBRS, its fragility and needs to conserve its shared resources. The component is intended to complement all three other components in raising the awareness with a clearinghouse function, through the packaging and dissemination of information in printed and audio-visual media within each of the countries. The component will target relevant stakeholders and convene media events to present information on the MBRS and extol the need for its conservation.
97. The formal and informal education activities are targeted primarily within the two priority transboundary areas. While formal education media will be made available throughout the MBRS region, it will be complemented with training of primary and secondary teachers in schools within the transboundary areas in order to enhance the positive impact of environmental education efforts. Similarly, informal education events will target representatives of industries determined to present the greatest risk to the integrity of the MBRS, as well as tour operators (the latter in direct coordination with the Sustainable Tourism sub-component) and groups of community leaders. Non-formal education will focus on the dissemination of environmentally-sound best practices. Annual "green" awards programs are designed to engender a sense of competitiveness among educators (through coastal resources fairs) and industrialists (clean industry).

**V. ENVIRONMENTAL MANAGEMENT PLAN: INSTITUTIONAL FRAMEWORK, COSTS AND TIMETABLE**

98. As indicated above, the MBRS project will produce overwhelmingly positive environmental and social impacts in the region. The MBRS project, as designed, constitutes in itself an *environmental management plan (EMP)*. The most important effort at environmental and social impact mitigation and management will be to implement the project as designed with the greatest level of efficiency and coordination with national partners. For this reason, the regional office Natural Resources Management Specialist will monitor annual work plans and evaluations, and effect field visits, to ensure compliance with project's intermediate objectives of effective environmental and social management. The only additional activities that need to be included in the project to avoid potentially negative environmental impacts are those related to the construction of protected areas management infrastructure in five MPAs, four of

which are in transboundary areas. The following activities are proposed to avoid or mitigate potential impacts.

**A. Simplified Environmental Impact Assessment**

99. As described under the section dealing with the MPA component, a simple environmental impact assessment procedure, such as an annotated checklist (*Ficha Ambiental*), should be used for siting and design of each structure. This checklist should be applied in the field by personnel of each respective MPA, or the organization charged with management of the MPA. The checklist is based on a best practice model and modified to reflect local conditions and risks, by the Natural Resources Management Specialist assigned to the project's regional office in Belize. MPA personnel will be trained in the use of the checklist in a two-day workshop to be organized by the Specialist, who will then also monitor compliance with the procedure. The procedure should be compliant with any and all applicable regulations and norms in each of the respective countries as may be stipulated in local or national laws and codes. As appropriate, the procedure and checklist should be adapted to local environmental and socioeconomic conditions.

**B. Environmental Management Guidelines for Construction and Operation of MPA Infrastructure**

100. In addition to the environmental impact assessment procedure, it will be necessary to follow a number of environmental management guidelines designed to avoid or at least ameliorate any possible on-site impacts associated with construction and operation of MPA infrastructure. Once the sites and general environmental conditions in each of the MPAs proposed for infrastructure construction are better understood, the regional Natural Resources Management Specialist will apply a series of environmental management guidelines for the construction and operation of all MPA infrastructure. Where and when appropriate, these guidelines should be supplemented with any and all applicable regulations, norms and conditions as may be stipulated in local or national laws and codes. As appropriate, these guidelines should be adapted to local environmental and socioeconomic conditions. The following items, among others, were considered for inclusion in the guidelines to be prepared by the Specialist:

***Construction Phase***

- Construction should take place during the dry season to reduce potential for rain and storm-related erosion/sedimentation and contamination;
- The designs for infrastructure should mimic local architecture and employ local building materials when available and appropriate; structures should blend in with the local natural and/or cultural settings;
- Avoid siting structures near or within high tide or annual storm surge levels;
- Avoid clearing and/or draining of mangroves or wetland areas;
- Avoid excavation/dredging or quarrying of coral rocks and sand, especially along coastal headlands, reefs and seagrass areas;

- If cultural or archaeological evidence is discovered during construction, cease activities and proceed with a rapid investigation, valuation and, if necessary relocation of infrastructure and/or rescue of cultural resources;
- Construction techniques should include silt barriers and berms to control accelerated erosion and sedimentation of nearby wetland, riparian or coastal areas;
- A solid waste management plan should be in place at the time of initiation of construction, with necessary receptacles for storage, and transport (for removal from area) and/or incineration facilities maintained in good working order;
- Any oil, grease or fuel should be stored in containers and protected from storms (rain and tides); the contractor should have in place a contingency plan for oil and fuel spills, including equipment to contain and dispose of spilled substances;
- All areas cleared should be returned to their original (or better) condition, with any re-vegetation employing native species.

#### ***Operational Phase***

- A solid waste management plan should be developed and in place, with necessary storage receptacles and transport and/or incineration or sanitary landfill facilities maintained in good working order;
  - Unless connection with an established septic treatment system is available, MPAs should be equipped with composting toilets (*Clivus multrium*) to avoid contamination of surrounding soil and nearby wetland, riparian or coastal areas;
  - The MPA should have contingency plans for all types of accidents, spills and evacuations for tropical storms;
  - All fuel, lubricants and potentially-hazardous substances should be stored in storm-proof containers and storage facilities.
101. These general guidelines will be complemented with particular impact mitigation and/or environmental mitigation and management specifications that may be stipulated on the basis of the environmental impact assessment procedure described above as it is applied on a case by case basis. These mitigation measures and environmental management guidelines will be incorporated in applicable construction contracts with compliance monitored by MPA personnel trained by the Specialist. In complement, guidelines for environmental management required during the operation of MPA infrastructure will be implemented by MPA personnel with technical assistance, as required, provided by the Specialist.

#### **C. Costs and Timetable**

102. Costs for the training activity have already been included in the budget for the MPA component; hence the implementation of actions indicated above require no additional financing under the project. The training will be combined with other planned MPA training events. The timetable for preparation of the environmental impact assessment procedure and checklist, and environmental management guidelines will coincide with the execution schedule for design

and construction of MPA infrastructure. It is expected that these instruments will be prepared in PY1.

## **VI. RISKS**

103. The project design recognizes the interconnectedness of ecological processes within the MBRS, and the transboundary nature of the environmental impacts of improper designed or executed anthropogenic activities. These transboundary impacts can only be dealt with integrally with coordinated national and regional responses. Obviously, a regional project or program can only be as strong as the sum of its parts. This is especially true in relation to the number of existing and proposed projects within each of the four countries that make up the MBRS. With so many national and regional initiatives, it is not surprising that the level of coordination among these projects has been very limited. In some cases, project managers do not know of the existence of other projects; while in other cases, financial aid institutions and/or project management agencies do not want to complicate their own efforts with collaborations with other projects. Coordination among bilateral and multilateral organizations, whether at the country or regional level, has been poor, resulting in various instances of duplication of activities, several with the same counterpart institutions. While many of these national and regional projects support activities that coincide thematically with the proposed MBRS project, they do not have uniform geographical coverage throughout the MBRS region. They also differ strategically and methodologically, in some areas, from those of the MBRS initiative, especially in terms of their treatment, or no, of threats to the MBRS and their causes and in procedures and protocols for environmental monitoring and information formats. These traditional deficiencies also represent a risk to the present regional project effort.
104. The MBRS project should facilitate coordination on technical, methodological and operational levels among regional and national projects and programs related to conservation and sustainable use objectives of the project achieving technical synergies as well as financial and implementation efficiencies of scale. While the regional project should add value to activities implemented under the array of national and local initiatives, these same national and local projects must also make accommodations for achieving greater impact on a regional scale, especially for those resources shared within the MBRS. Thus, it will be incumbent on managers of the regional MBRS project to forge collaborations in order to create operational synergies and make best use of the limited resources available for financing activities to be proposed under project components. Areas of opportunity for collaboration in activities can be found for each MBRS component, including aspects of: policy and regulatory strengthening, training, environmental education and public outreach campaigns and media development, planning responses for contingencies, and in areas of inventory, monitoring and the development of the proposed environmental information system.
105. Another important risk is presented by the extremely limited technical and managerial capacity of the four countries' national government institutions in MBRS countries responsible for managing MBRS resources. Personnel are either too few, ill prepared professionally and/or are constantly changed limiting agencies ability to successfully execute complex integrated marine and coastal resources management projects; or they lack absorptive capacity for still more resources, even where these are needed. These same countries are also weak in their promotion of policies that favor implementation of projects promoting conservation and sustainable use of marine and coastal resources, especially where special economic interests tend to exert greater influence to maintain the status quo of overexploitation.

106. The MBRS project seeks to democratize its outreach and work with private industry, NGOs and, potentially, selected community-based organizations, in addition to governmental agencies in the four countries. This diversification of partners should alleviate the impacts of policy and personnel changes in a particular country, as well as ensure continuity of activities and flow of project resources.

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**Environmental Data Sheet for Projects  
in the IBRD/IDA Lending Program**

<b>Country:</b>	Regional (Mexico, Belize, Guatemala, Honduras)	<b>Project Id:</b>	GE-P0 53349
<b>Project:</b>	Conservation And Sustainable Use of the Mesoamerican Barrier Reef System (MBRS)		
<b>Appraisal Date:</b>	12/10/01-12-15/01	<b>IBRD (GEF)/Total Cost:</b>	US\$11.0 / US\$24.2
<b>Board Date:</b>	Proposed: July 5, 2001	<b>IDA Amount (US\$M):</b>	US\${Cost}: 0
<b>Managing Division:</b>	LCC2C	<b>Sector:</b>	Environment
<b>Lending Instruments:</b>	No	<b>Status:</b>	Negotiated
<b>EA Category:</b>	"B"	<b>Date Assigned:</b>	May 22, 2001
<b>DATE DATA SHEET UPDATED:</b> April 25, 2001			
<p><b>MAJOR PROJECT COMPONENTS:</b> Goals are to facilitate enhanced protection of vulnerable coastal and marine ecosystems and assist governments of Mexico, Belize, Honduras and Guatemala, NGOs and private efforts to promote sustainable use of MBRS resources. Project will have the following components:</p> <ol style="list-style-type: none"> <li>1. <i>Marine Protected Areas:</i> Support for consolidation of 15 MPAs through rapid ecological assessments, drafting of management plans, equipment, training and technical assistance. Support for establishment of three transboundary MPAs in the Bay of Chetumal and Gulf of Honduras.</li> <li>2. <i>Regional Environmental Information System:</i> Development of a web-based integrated environmental information system (EIS) with a regional node and a minimum of four national nodes. Equipment, training and technical assistance to establish operational EIS in each country, with outreach/access provided to government, NGOs, universities and private users of information. EIS will function as a meta-database site. Development of an integrated synoptic environmental monitoring program, focusing water quality, oceanographic parameters and selected biological indicators. Data will be integrated into EIS and made available to users.</li> <li>3. <i>Promotion of Sustainable Uses of the MBRS:</i> Support for delimitation, mapping and monitoring/control of spawning aggregation sites for selected at-risk species, introduction of regional protocols for collection and processing of data to be used in development of management strategies and policies. Counterparts in national fisheries authorities will be trained in use of ecosystem modeling as a fisheries management tool. Proposes an assessment of relationship between fishers and other groups of resource users (esp. tourism) to ascertain strategies and programs for mutually-beneficial management of fisheries resources and vocational retraining of fishers in other economic activities. Sustainable tourism sub-component will promote adoption of best practices in siting, design, construction and operation of tourism infrastructure and ecotourism packaging and operations, including regional environmental certification program. This will be supplemented with regional seminars to promote dialogue and adoption of uniform environmental assessment and management standards, and regional exemplary practice tours. Model regional tour packages will be promoted.</li> <li>4. <i>Environmental Education and Public Awareness:</i> Development of media for public awareness campaigns and formal and non-formal education. A clearinghouse will collect, classify, repackage and distribute relevant information to further goals of the project. Formal education activities consist of production of curriculum guides for dissemination throughout the region, with teacher training concentrated in transboundary areas. Non-formal education targets selected industries presenting environmental risks to MBRS.</li> </ol>			
<p><b>PROJECT LOCATION:</b> The MBRS project area stretches about 1,000km from Isla de Contoy, Mexico south along the coasts of Belize and Guatemala, including the barrier reef and offshore islands, to the Gulf of Honduras, and then east along the North Coast of Honduras, including the Bay Islands, to the mouth of the Aguán River, and includes adjacent marine ecosystems and coastal watersheds in these countries. The inland boundaries of the study area vary by country and specific locality, but are generally intended to encompass those land and water resources within the coastal plains and adjacent coastal watersheds. The ocean extension of the study area varies from approximately 40 km off the northern coast of Quintana Roo in Mexico, extending out some 240 km from the apex of the Gulf of Honduras, to approximately 50 km off the North Coast of Honduras.</p> <p>The MBRS includes the second longest barrier reef in the world, and is unique in the Western Hemisphere for its size, its array of reef types and the luxuriance of corals. The MBRS stabilizes and protects coastal landscapes, maintains coastal water quality, sustains species of commercial importance, serves as breeding and feeding grounds for marine mammals, reptiles, fish and invertebrates, and offers employment alternatives and incomes to approximately one million people living in coastal zones adjacent to the reefs. Several national parks and reserves have been designated as World Heritage sites.</p>			
<p><b>MAJOR ENVIRONMENTAL ISSUES:</b> A Threat and Root Causes/Transboundary Diagnostic Analysis was carried out during the design process. The following threats are considered the background under which the project will be implemented:</p> <ul style="list-style-type: none"> <li>• <i>Coastal/Island Development and Unsustainable Tourism</i>, which includes urban, hotel and resort development and related infrastructure (pollution/contamination, eutrophication, sedimentation, physical reef damage, impacts to estuary and lagoons and mangrove destruction, beach erosion, habitat change, etc.);</li> <li>• <i>Inappropriate Inland Resource and Land Use and Industrial Development</i>, encompassing a broad range of agricultural, urban and industrial development in inland watersheds with direct or indirect impacts on the MBRS (sedimentation, pollution/contamination, eutrophication, habitat and species/abundance changes, mass kills of organisms, etc.);</li> <li>• <i>Overfishing and Aquaculture</i>, in relation to industrial, artisanal, subsistence and recreational fishing, and aquaculture in coastal areas, which pose real and potential impacts of species and abundance change, local extinction of selected species, habitat change/symbiosis imbalances, reduced subsistence and revenues from fisheries, etc.</li> <li>• <i>Inappropriate Port, Shipping and Navigation Practices</i>, including water, reef and beach contamination, reef damage, impacts to aquatic species and fisheries (including mass kills), degradation of the tourism values, etc.</li> <li>• <i>Natural Geomorphological and Climato-Meteorological Phenomena</i>, with immediate relevance to recent coral bleaching events associated with El Niño, impacts of hurricanes (with emphasis on Hurricane Mitch) and predominant ocean currents; environmental</li> </ul>			

<p>and socioeconomic impacts from anthropogenic activities (see above) are exacerbated by these natural phenomena.</p> <p>The MBRS project is designed to address many ecological threats to the MBRS, as well as contribute to sustainable use of its resources. The environmental and social impact of the project will be overwhelmingly positive, directly and indirectly. It will contribute to knowledge concerning the status of the MBRS and its resources, and the real and potential negative impacts of anthropogenic activities. The project seeks synergistic linkages with ongoing local, national, regional and international projects and programs that deal with conservation and sustainable use of MBRS resources. By design, the project should complement ongoing and future projects and programs for the MBRS, especially where these programs lack a regional perspective.</p>	
<p><b>OTHER ENVIRONMENTAL ISSUES:</b> The potential for negative environmental impacts under this project is practically nil. The only real risk posed by the project as designed is related to the siting and construction of MPA infrastructure (ranger stations and public use facilities in the two transboundary areas of Xcalak/Bacalar Chico and Sarstoon-Temash/Sarstún, and Utila Island). Land clearing and excavations could pose some risks of accelerated erosion and sedimentation in fragile coastal areas, and loss of mangrove or other species at risk. Depending on the operation of the ranger stations and visitors' centers, environmental contamination could occur as tourism pressure is increased, bringing about generation of greater volume of liquid and solid wastes.</p> <p>In some cases, local communities have traditionally used waters and reefs of the MPAs (both existing and proposed) for fishing activities. Some fishers have constructed temporary shelters as fishing camps on several of the islands and coastal locations found within the MPAs. Depending on the frequency of fishing and species fished, these fishers could be impacted should their access to fisheries resources be limited or restricted altogether. The location and importance of traditionally used fishing sites in MPAs have not yet been determined, nor which communities or individuals depend on them. It should also be mentioned, however, that many traditional fishing locations within the MBRS have been abandoned due to diminishing stocks, especially for grouper, sardines, conch and lobster, because of fishing out of season, overfishing species beyond set catch limits, etc.</p>	
<p><b>PROPOSED ACTIONS:</b> To avoid or mitigate potentially negative consequences of MPA infrastructure construction under the project, a simple environmental impact assessment will be carried out and environmental impact mitigation measures will be incorporated into MPA management plans at each site. The assessment and mitigation measures will comply with all environmental assessment regulations found in each respective country and World Bank policies and guidelines. The Project Coordination Unit (PCU) will ensure that management plans include environmental review and mitigation measures where infrastructure and other civil works are involved. It will also monitor compliance and help set up a monitoring program for local MPA staff.</p> <p>To respond to the potential for adversely impacting local fisher communities, as part of the proposed rapid ecological assessments for each of the MPAs to be supported by the project, local fisher communities will be consulted in order to determine the significance of local fisheries within the MPAs. Depending on the results of these assessments, strategies and policies for mitigation or compensation of any perceived impacts would be adopted. The project, with activities proposed under the Promotion of Sustainable Uses Component, already envisions vocational training to transform fishers into tour and sport-fishing guides and dive-masters. These fishers, who have good knowledge of the waters and reefs within many of the MPAs, could also become park rangers and/or para-investigators in support of research and monitoring activities proposed under the EIS and Sustainable Uses components.</p>	
<p><b>JUSTIFICATION/RATIONALE FOR ENVIRONMENTAL CATEGORY:</b> Although the project is expected to have overwhelmingly positive environmental impacts, the potential for some negative impacts exists, thus justifying the B category rating.</p>	
<p><b>REPORTING SCHEDULE:</b> <i>Category B: is there a separate environmental analysis?</i> An environmental analysis of the project has been appended to the PAD. Separate environmental reviews will be performed for sub-activities, such as minor civil works associated with MPA management plans that will be prepared under the project. These will be done on an as-needed basis.</p>	
<p><b>REMARKS:</b> During the design phase of the project, stakeholders were consulted through a variety of approaches. Three regional project-planning workshops brought together members of the National Barrier Reef Committees of each country. These committees are comprised of representatives of government agencies responsible for themes related to MBRS, NGOs active in coastal and marine areas, and representatives of private industry. The workshops also included invitees from community-based organizations, including Garifuna fishing villages from Honduras, Guatemala and Belize. Workshops permitted interchange of ideas and interests concerning the values placed on MBRS resources and current economic and cultural uses. Wide participation of stakeholders in work groups and plenary sessions enriched the design process and helped focus regional priorities.</p> <p>The TRCA study, which was used as the principal basis for the EA, involved numerous consultations with members of the National Barrier Reef Committees to assess national priorities and comprehend the outreach and activities of projects and programs being implemented within each country. Similarly, representatives of regional and international projects provided information to avoid duplication and promote synergistic approaches for regional cooperation with existing projects. The TRCA study was used in the final project design and current EA. All stakeholders were of the opinion that the MBRS project would have important positive environmental and social impacts for the MBRS region.</p>	
<p>Signature and Date: _____</p> <p>Name Director</p>	<p>Signature and Date: _____</p> <p>John Redwood Director, LCSES</p>
<p>Initials and Date: _____</p> <p>Task Manager's Initials</p>	<p>Initials and Date: _____</p> <p>Walter Vergara, EA Review Coordinator</p>

**Central America Commission on Environment and Development  
Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**

**Annex 12**

**Social Assessment of the Meso-American Barrier Reef System (MBRS) Area of Influence**

**Executive Summary**

**I. Introduction**

1. As part of the project preparation for the Conservation and Sustainable Use of the Meso-American Barrier Reef System (MBRS) Project (the Project), a social assessment (SA) with the following specific objectives was conducted: (i) Identify ecosystem users and their activities, especially fisheries and tourism, and the impact these have on the reef. (ii) Identify key stakeholders, especially the ethnic groups residing in these zones, to ensure that their recommendations are taken into account in Project design. (iii) Identify possible negative impacts of the Project, if any, especially on the MBRS, archeological sites, Marine Protected Areas (MPA) and coastal conservation areas. (iv) Propose mechanisms and strategies arising from local groups for their participation in the Project. (v) Identify best opportunities for strengthening the technical and institutional ability of community organizations to contribute to the Project objective and achieve an improved gender and ethnic balance.

2. This document summarizes the main results of this social assessment. The first part describes the ethnic and indigenous groups, with a special section assessing the status of women. The second part analyzes recent regional development, since it significantly influences risks, capabilities and the local population's perceptions. Then the risks, perceptions and potential conflict areas are described. The last section describes recommended actions.

3. The SA results include an Indigenous People's Participation and development Plan, prepared in order to support indigenous peoples' and ethnic groups' (Garífuna, mestizos, blacks, Creoles, Mayas) participation in MBRS conservation and the Project and to target actions to them and, in particular, to lower income groups and women. The Plan includes a matrix that identifies, in the Project cost tables, activities and costs related to participation and development of ethnic and indigenous groups.

**II. Methodology**

4. The SA was done for each of the four countries in the Project impact areas, after agreeing upon the methodology to be used. It was agreed to limit the SA to the areas of the transboundary limits of Chetumal Bay and the Gulf of Honduras and to focus on the fishing and tourism industries, since these are the main geographic foci of the project and activities to be supported under sustainable use. The results of these four reports (which are available as national reports) are consolidated in the main report, summarized in this section. The SA consisted of: (i) a literature review; (ii) identification of ethnic and indigenous groups in the Project impact areas and field visits; (iii) surveys and open-ended interviews (205) with representatives from all key groups; and (iv) focus groups and discussions with experts (8).

**III. Social Assessment Results**

**III.1 Ethnic and Indigenous Groups in the Project Area**

5. For purposes of this Project an attempt was made to identify the population that lives in the impact area, defined as those who live along the coast, on the islands and within six miles inland of the areas bordering on Chetumal Bay and the Gulf of Honduras.

6. In Belize, these people are primarily Creoles and Garifuna who live in Corozal, Stann Creek District and Punta Gorda. This is a population of about 64,000 people. It is important to point out the high growth rate reflected in national census figures for these districts, primarily due to immigration to Belize from both its northern and southern borders. This growth is occurring in rural areas, except for Toledo District. The majority of immigrants engage in subsistence agriculture, farming hillsides or working as laborers on large plantations.
7. In Mexico there are two ethnic groups: Mestizos and Mayans. The area of the project, the South, is isolated with mainly a commercial activity that is declining and with a population of about a 1000, settled in two small villages Majahual and Xcalak. These two villages have a population of about 600. Social indicators are not good for the area, illiteracy is 13%, 53% of the population is unemployed, 28% works in agriculture and only 33% have running water in their homes.
8. Beneficiaries of the project in Guatemala are about 9,000; however, data on the area is not reliable. The Quiche and the Queweche are about 3,000. They have great mobility and are settled in the villages of Sarstún, Sarstún Creek, San Juan Cocoli, Guaira and in Livingston in Plan Grande and Plan Grande Tatin.
9. The Garifuna are about 3,500, and are in the villages of Quewehe and some in Livingston and Puerto Barrios. The Ladinos are about 500 in Sarstún and some 1,500 in Livingston.
10. In the project area in Honduras the indigenous and ethnic population belong to the Garifuna and Ladino communities in Cortes and Atlántida. The areas described for both countries are ones of the fastest growing, specially because of migration which occurs in Guatemala because of the possibility of having access to land, mainly municipal or state land; and in Honduras because of employment opportunities.
11. Women in the ethnic groups studied mainly play traditional roles, with their social indicators reflecting inequalities, with high responsibilities in the economy and at home and very open to change.
12. Women are key actors, very knowledgeable, consumer and user of their natural resources, and thus, they are very interested in its conservation and resent its degradation. They define the demand coming from house consumption (including those products that are contaminated), they select the home energy sources, determine the methods for family health and for garbage disposal. Any environmental educational program must have them as a primary target.
13. Women are hard workers, more responsible in managing the family budget and usually take care of the home farms. However, the roles society assign them are the traditional ones. Most of those consulted assigned them the roles of wives, mothers, and sometimes, house managers. Clearly they do not decide, but participate, in community and government matters.
14. There is a clear division of labor among gender groups, with women usually taking the ones with lower salaries such as maids, teachers, secretaries, etc. Fishing is a male activity in which women participate through the cleaning, drying and selling of the fish. Some of the new jobs created by the Ecotourism industry, such as rangers, researchers, guides, boat operators, etc., are not open to women, but they are very willing to enter that market.

### III.2 Regional Development

15. In general the impact area's population has deep roots in the land and lifestyles have been greatly influenced by the geography and environment. The land is very diverse, with many fragile ecosystems. Some have little agricultural potential and yet are the last agricultural frontier. All possess great beauty, and are centers of unique ecological processes, full of cultural richness and diversity with multiethnic characteristics. Due to this, in all the countries many areas in or around the Project area have been declared specially protected areas or ecological reserves. This zone is experiencing profound changes which have affected the region's natural environment and its inhabitants, particularly ethnic groups.

16. The vast majority of local groups have lived on and worked the land without benefit of legal titles; their claim comes from the long-standing nature of their settlements. This causes great uncertainty among the inhabitants, particularly in recent years due to land pressure produced by tourism and real estate development. The inhabitants' movements do not obey political-administrative divisions; they constantly move across borders. Cultures and traditions reflect ethnic identity and history, not borders. Nevertheless, no information and knowledge exists, nor is research being done or information being gathered about local cultures, history or ecosystems.

17. Traditional economic activities- fisheries and agriculture- have stagnated or declined in all the countries. This is due to factors that impact negatively on these economic activities, such as inappropriate practices, and to factors which lure the population towards other activities such as tourism and urban development. Socio-economic development has been very inequitable, reflected in the poverty rates for the zone, which are even higher for the ethnic groups. This has stimulated large portions of the local population to migrate, mainly towards the United States, resulting in their remittances becoming an important source for the local economy.

18. Disorganized and uncontrolled growth of human settlements along the coast and coastal cays has served as a magnet for the economically active population (EAP) and has negatively affected the environment and the MBRS. Wastewater and garbage are not properly treated, except in Belize. There have been several natural or man-made disasters in the zone, but none of the countries has prevention or response policies or plans available to deal with them.

19. Fisheries continues to be the means of subsistence for several of the local populations, the majority of which use traditional methods. But this has been affected by inappropriate practices, water pollution, natural disasters and climatic changes. Fishing is men's work, although women perform several of the activities which are indispensable and complementary to the industry.

20. The development that has most affected the zone is that of the tourism industry. This sector has undergone accelerated development in an uneven, unsustainable and dependent manner. Tourism is unsustainable due to the pressure it puts on the environment, as well as the social problems it causes. The mass tourism that has developed in zones adjacent to those in the Project, especially in the Yucatan and Bay Islands, has upset the ecological balance. The clients and investors of the tourism industry are foreigners; this creates dependency, and on top of migration, affects local cultures.

21. Although currently proposed tourism is low-impact, the local population has created fears that this tourist development, together with environmental protection measures, will deprive them of, or at least reduce, their traditional means of subsistence and affect their culture. These perceptions and the interests of the local population towards tourism vary according to social class; higher income and more educated groups are more open to it.

### III.3 Capabilities, Risks and Potential Conflict Areas

22. The poverty the great majority of the population lives in leads them to a life of subsistence in which the fundamental concern is meeting basic needs, even at the expense of their environment. Given the lack of more environmentally suitable alternatives, which basic infrastructure and alternative employment opportunities could provide, the local residents are compelled to damage their ecosystem.

23. Lack of education and information about environmental issues, cultural values and history of the region's ethnic groups leads to low awareness about the importance of the environment and limits the possibilities for alternative employment. Prejudice and fear against the tourism industry also exists, because of the negative impacts it has had on local populations, from the way it has been developed up until now (mass tourism). The local population does not distinguish between this tourism and the alternative of ecotourism and the Project, therefore their prejudices and fears extend to these. There is, therefore, a need for education about the Project and ecotourism. This awareness-raising and educational process should happen as soon as possible to avoid negative feelings and gain support for the Project.

24. The ways in which the tourist industry is developing, or is planned to be developed in some cases, does not reflect the goals of preservation and harmony with the environment. So that this unsustainable brand of tourism does not happen, or does not continue in some cases, regulatory and operating mechanisms for ecotourism need to be defined along with incentives for compliance, as well as the institutional means to enforce these regulations.

25. For the educational campaign and Project implementation to be effective appropriate intermediaries need to be used. For the ethnic groups and indigenous population these are the traditional ones with a presence in the region. Many times these are ethnic or professional organizations, which should join forces with other, more formal or more eminent institutions.

26. Area urban and economic development create serious environmental contamination problems; wastewater and garbage are not treated. Urban growth and real estate development occur without proper planning and with even less adequate regulation and control. These developmental problems are heightened by the lack of a disaster prevention policy and the mechanisms to enforce such a policy or mitigate the effects of these phenomena.

27. This relatively recent growth puts pressure on the land, which have been occupied by indigenous and ethnic groups without legal security. This legal insecurity over land is creating social unrest, accelerated environmental degradation and hinders participation in the Project and other environmental programs.

28. Border tensions exists along Belize's borders; to the north due to a border dispute and to the south due to differences in regulations and differences in the way different national groups respect these regulations. These tensions are also due to inappropriate fishing techniques still employed by some groups.

29. Lastly, but equally important, is the discrimination women endure in these ethnic groups which affects the lack of environmental preservation, does not allow for a more equitable balance in development and wastes valuable resources.

### **III.4 Perception of the Project**

30. The Project is little known in the impact area, but when it is presented to the communities, they all considered that it could have a favorable impact and see it as positive. Upon learning about the Project, the local inhabitants' expectations are high; the majority hope that the Project will provide employment opportunities, training and a better environment. There also exist fears regarding the Project over the negative impact upon traditional employment opportunities, foreign intrusion, inequity in its benefits and political preferences in its implementation.

31. All the communities expressed that they would like to participate actively in the project, primarily by means of representation on the advisory committee, participation in the implementation of certain components and by conducting a social audit of the Project.

### **III.5 Recommended Actions**

32. To counteract risks, take advantage of capabilities and avoid the potential conflicts previously mentioned, the SA makes a series of recommendations described below, the great majority of which are contained in the Indigenous People's Participation and Development Plan. The recommendations not contained in the Plan are beyond the scope of the Project or are being addressed by other projects being implemented or planned.

33. As poverty is one of the factors most affecting the environment, and since income generation is the priority identified by the people, the creation of alternative sources of income must be given top-priority attention. Alternatives identified are fish and ocean farming, and strengthening and opening-up jobs created by ecotourism and maritime handicrafts, especially to women. In order for all these alternative businesses to be successful they should be accompanied by technical assistance and some initial subsidies.

34. Environmental, cultural and historical research, awareness-raising and educational programs should be supported and strengthened. This would have the objective of reinforcing local inhabitants' esteem and pride, in order to strengthen their identity, train them and contribute to the tourism industry. More should be learned about the MBRS and local ecosystems, history and cultures. This should be disseminated to the different target groups in an accessible manner, which implies appropriate language use in the local languages.

35. Ecotourism must obey clear rules and limits on its development and mechanisms should exist to reach general agreement on, disseminate and ensure compliance with these norms, through monitoring and enforcement and adequate incentive systems.. The development of this industry should include cultural, historical and environmental aspects, primarily those of the region and its ethnic groups and population. Ecotourism should train, educate and include local people, especially women, indigenous people and members of ethnic groups.

36. To overcome prejudices and negative perceptions against the Project and the development of low-impact tourism, the related education and training components should take place as soon as possible, at the same time as the other components, if not sooner. This information and education campaign should be adapted to the different target groups; it can be imparted through the formal educational system as well as through the non-formal, utilizing native languages and a simple format.

37. The phenomenon of urban and real estate development in the zone and its effects on the environment and local populations are far-reaching and have great impact, but correcting them requires actions beyond the scope of the Project. Nevertheless, sustainable land use can be encouraged through

the planning and discussing of master plans, training about the use of public goods and policy guidelines for real estate development. Ordenamiento Territorial (Land Use Planning) and Ordenamiento Ecológico (Ecological Zoning), have been legally mandated in Mexico, and planning is underway in Quintana Roo. In Belize, zoning plans for the entire coastline have been developed by the Coastal Zone Management Authority and are in the process of being implemented. Although Honduras has no equivalent land use plans for the Caribbean Coast, zoning and strategic planning for nature and culture based tourism development will be supported under a World Bank Project for Sustainable Coastal Tourism being developed in parallel with the GEF MBRS Project. Only Guatemala does not yet have any ongoing or proposed Zoning or Land Use Planning for its Caribbean Coast.

38. The conflicts that occur among fishermen and between them and the authorities in the two border areas in the north and south of Belize should be studied and discussed, with an attempt at implementing mechanisms, some temporary, to enforce agreements, including respect for fishing practices.

39. Women's participation should be fostered and furthered on the Project technical working groups and the National Barrier Reef Committees and in the institutions providing services to the Project. Opening up to women certain jobs traditionally reserved for men must be supported, and women should be given preference in training for these kinds of work. Educational programs should include gender components. Institutions that already have a presence in the area and have worked around these issues should be used to implement these projects.

40. Local organizations have widely varying capabilities; because of this the Project needs to support them, which is achieved mainly by working with them during implementation. All the institutions are interested in working with the Project, although to do that some need to be strengthened, which can be achieved through workshops, training and coordination.

41. Social tension generated by insecurity over land tenure among several of the local ethnic and indigenous groups is one of the areas of greatest potential conflict, and at the same time it influences poor environmental management. Therefore, it must be studied and discussed as part of the Project, at least in terms of the land in the Project impact area.

42. Many of the solutions and actions proposed here are only viable, and others will be much more effective, if they are carried out from a regional perspective and as a regional effort, involving all four countries. Those actions and policies that support the Project, if it is to achieve its objectives, should also seek equity between groups, giving preference to ethnic and indigenous groups and women.

#### **IV. Participation Plan and Indigenous People's Development Plan**

43. The Project Participation Plan, which includes an Indigenous People's Development Plan (The Plan) presented below was developed to take into account the majority of the above-mentioned recommendations. Its target groups include indigenous and ethnic groups, and preferentially women, from the Project impact area. Many of the actions are focused on the tourism and fishing industries due to their importance in the area.

44. The budget to implement the Plan has been included in the Project cost tables. Its implementation would take care of all the concerns expressed by the communities and ethnic groups during the consultation process of the social analysis, that are not being addressed by other means or projects in the area. These groups did not identify any potential negative impacts of the project in their communities and environment.



45. The social communications campaign would address the lack of education and information about environmental issues and reduce the prejudice and fears against the tourism industry that some have. Special effort would be made to target many of those activities to the local groups, ensuring that the educational material is produced in their languages and including these topics in the formal and informal education systems. It is important that this component starts as early as possible in the project.

46. By identifying and developing alternative income generating opportunities or simply opening existing jobs to minorities and women the second component of the program would contribute to mitigate the effects of poverty and inequality.

47. The institutional development component would strengthen management and technical capacity of local institutions, mainly the fishing cooperatives. The Plan recommends that the main target of this component be the institutions that have a presence in the project area, many of which are the ethnic and professional associations or cooperatives.

48. Existing and potential areas of conflict would be either reduced or avoided by studying and discussing the issues of the regulatory framework for the economic development of indigenous and ethnic groups, the land tenure and land security, socio-environmental conflicts and by training community leaders. All of these are the topics of the last three components of the Plan.

**Participation Plan and Indigenous Peoples Development Matrix**

**MBRS Project**

Strategies	Activities	Benefits for Indigenous Groups and Communities	Indicators	Time	Cost (USD)
<b>I. Social Communication Campaign</b>	1. Planning, design and implementation of environmental education campaign.	Communities increase their knowledge about links between environment and development and derive increased capacity for natural resource management.	At least 75% of indigenous and Afro-Caribbean communities benefit from campaign by EOP.	2001-2005	360,020
	2. Planning, design and implementation to increase environmental and MBRS content in local formal educational systems.	Communities and teachers increase their knowledge about their environment and MBRS.	At least 25% of indigenous and Afro-Caribbean communities benefit from formal environmental education campaign by EOP.	2002-2005	261,230
	3. Non-formal education to commercial sectors on environmental issues.	Business owners and employees receive training about MBRS and environment.	At least 40% of indigenous and Afro-Caribbean communities benefit from training by EOP.	2002-2005	199,120
	4. Dissemination of best practices for MPA management and sustainable tourism development including benefits for indigenous populations and ethnic groups.	Indigenous and ethnic populations gain increased knowledge about sustainable tourism and MPA management.	1,000 copies of publication disseminated by EOP.	2002-2003	49,000
	5. Environmental certification program.	Increased awareness of and opportunities to benefit from environmental certification programs.	At least 25% of indigenous and Afro-Caribbean communities benefit from program by EOP.	2001-2005	135,280
<b>II. Alternative Income Generating Programs</b>	1. Training of park rangers/ecological guides or administrators.	Women, indigenous people, other ethnic group members, and other non-indigenous communities receive training as guides, park rangers or administrators.	Representatives from at least 10% of indigenous and/ or Afro-Caribbean individuals trained by EOP.	2002-2004	156,300
	2. Sustainable livelihoods promotion program.	Women, indigenous people and other members of ethnic groups are trained and learn about new employment-generating alternatives.	Representatives from at least 50% of indigenous or Afro-Caribbean communities trained by EOP.	2002-2004	124,440
	3. Tour to visit exemplary practices of marine tourism.	Women, indigenous people and other members of ethnic groups are trained and learn about new employment generating alternatives.	At least 10% of participants derived from indigenous or Afro-Caribbean communities.	2002	127,040

Strategies	Activities	Benefits for Indigenous Groups and Communities	Indicators	Time	Cost (USD)
III. Institutional Development	1. Training in drafting management plans for MPAs.	Local institutions strengthen their capacity to manage protected areas.	At least four local and community institutions and non-government organizations receive training by EOP.	2001-2003	160,200
	2. Technical assistance for fishing cooperatives and other institutions.	Fishing cooperatives strengthen their technical managerial capability.	At least four institutions representing Indigenous or Afro-Caribbean groups receive technical assistance or training by EOP.	2002-2004	224,730
IV. Institutional Arrangements for Increased Participation of Indigenous & Ethnic Groups	1. National Barrier Reef Committees and technical working groups formed which will incorporate representation of indigenous and ethnic groups.	Increased participation of indigenous and ethnic groups in decision making related to sustainability of the MBRS.	Representatives of at least 50% of indigenous and ethnic groups will participate in National Barrier Reef Committees or TWGs from BOP to EOP.	2001-2005	204,850
	2. Formation and continuous operation of local advisory councils in relation to establishment and management of MPAs.	Increased participation of indigenous peoples in the design, implementation and monitoring of MPAs.	In those MPAs which affect indigenous communities, the representatives of indigenous or Afro-Caribbean people on the committees will be of such a number as to reflect such communities' proportions in the local population.	2003	84,000
V. Land Tenure Related Issues	1. Form technical working group and hold bi-annual meetings which address land tenure issues.	Land tenure issues analyzed and discussed in the context of MPA management by technical working groups.	Land tenure issues addressed in at least 33% communities associated with MPAs by EOP.	2001	112,500
VI. Socio-Economic Conflict Management	1. Drafting and discussion of master plans.	Integration of conservation objectives with livelihood concerns in marine protected area management planning.	Indigenous livelihood issues addressed in management and operation plans for all Project MPAs that affect indigenous peoples.	2002-2004	780,120
	2. Training of local leaders and others in community relations and the use of public goods.	Community leaders more capable of exercising leadership, manage community relations and managing public goods.	Forty women, indigenous people, members of other ethnic groups and non-indigenous groups trained by EOP.	2002-2003	174,305
VII. Monitoring and Evaluation	1. Monitoring and evaluation of Project performance and impact.	Quantitative and qualitative socio-economic information on impact of Project on indigenous peoples' welfare and livelihoods.	Participatory assessment of progress against project indicators for Indigenous and Afro-Caribbean groups at Midterm Review and Final Project Evaluation	2002-2005	50,000

**Central America Commission on Environment and Development**  
**Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**

**Annex 13**

**Threat and Root Cause Analysis**

**Matrix 1: Main Threats to the Ecological Health of the MBRS and their Root Causes<sup>1</sup> and Actions Proposed to Address Them**

Threat	Proposed Actions	
	National Initiatives	Regional Initiatives
<b><i>A. Coastal/Island Development and Unsustainable Tourism</i></b>		
<b>1. Urbanization at Inappropriate Sites in Coastal Areas without Adequate Environmental Engineering and Management Practices</b>	a. Participatory development and implementation of land-use plans and zoning based on economic, social, cultural and environmental parameters, preferably at the subregional level; including the establishment and active co-management of reserves.	i. Technical assistance and training in the preparation and enforcement of land-use and zoning plans; promote the use of habitat mapping among parameters used to determine zoning, land use and biodiversity conservation through establishment of system of coastal and marine protected areas (MPAs).
	b. Development of sector-specific guidelines for preparation of EIAs and standards and codes for land development and structures in coastal areas.	ii. Publication and dissemination of practical guides for the preparation of sector-specific EIAs and building/construction codes for coastal areas.
	c. Development of local (municipal, developer, NGO) capacity to prepare EIAs and enforce and monitor mitigation compliance.	iii. Technical assistance and training of GOs and NGOs in the preparation of sector-specific EIAs, practical mitigation and enforcement strategies.
	d. Development of inventories of coastal resources and use/user conflicts (including land use, water resources, geomorphology, ecosystem composition/condition, and point sources of contamination, sedimentation and impact), and monitoring of selected indicators of condition and intactness (esp. water quality).	iv. Co-implementation with local GOs and NGOs of a regional initiative for development of coastal resources inventories, using uniform parameters of analysis and presentation, and taking advantage of regional economies of scale for purchase and analysis of data (imagery, research). Publication of a "Status of the MBRS" with national annexes.
	e. Assistance to national and local GOs in reforming their governance model to streamline and decentralize planning and normative procedures, promote integrated coastal management models, and actively enforce zoning and protected areas regulations.	v. Utilize regional and international political lobby and assistance (SICA-CCAD, WB, IDB, UNDP, UNEP, etc.) to facilitate GO and private sector officials' incorporation of the environmental costs of land and resources development into national and local government accounts, including permanent environmental monitoring programs.
	f. Lift subsidies favoring coastal and urban development, and charge the real costs for water, energy, sanitation and transport, including their environmental and social costs.	vi. Support continuing initiatives to consolidate and expand the Meso-American Biological Corridor and its marine-coastal extensions in each country.

<sup>1</sup> For correlation of intermediate and root causes for each respective threat, see corresponding section of Matrix 1.

Threat	Proposed Actions	
	National Initiatives	Regional Initiatives
<b>2. Uncontrolled, Poorly-Planned Tourism Development in Coastal Areas and Off-shore Islands</b>	a. [See A.1.a, b, c, d, e & f above]	i. [See A.1.i, ii, iii, iv, v & vi above]
	b. Develop participatory community-based strategies for tourism development, avoiding dependence on the "Club Med Model".	ii. Assistance to facilitate environmental awareness and use of clean technology and total-quality manufacturing processes as promoted under ISO 9000 and 14000 initiatives, Green Globe and others; dissemination of practical guides and seminars for the tourism sector; disseminate guidelines for sustainable tourism development, using the Sian Ka'an/USAID and CEP/CEN project materials as a basis.
	c. Implement vocational rehabilitation training programs to transform farmers, fishers and laborers into tourism/sportfishing/ecotourism guides and related fields to generate the local economy.	iii. Facilitate regional training-of-trainers courses to local NGOs, universities and educators, in vocational rehabilitation to support the tourism industry.
	d. Determine carrying capacities at specific tourist/dive/fishing sites, and for islands, protected areas and reef areas as a whole; form a committee of resource users, tourist operators, conservationists and responsible GO authority and, based on best judgment and--considering environmental, social and economic factors--propose the numbers and types (professional divers, cruise-ship tourists, backpackers, day-trippers, over-nighters, etc.) that should occupy a site/area for how long, in what season and how accompanied.	iv. Facilitate local workshops with GO, NGO, tour operators, community members using uniform methodologies for the region for determining carrying capacities for different types tourism activities in different settings. Disseminate guides and technical materials as listed in USAID/URI's "Selected Guidelines, Handbooks and Tools for Coral Reef Management".
	e. Promulgate diving and pleasure boating regulations, placing responsibility of awareness training on tour/dive operators and divemasters.	v. Provide uniform guidelines for the preparation of diver/pleasure-boater guides so that local regulations and rules can be developed for all destinations in the MBRS.
	f. Institute the use of a portion of tourist/airport taxes, divers' tags, concessions, admission fees for MPAs and similar mechanisms, returning all revenue to the locations where they were collected to foster self-financing conservation programs and protected areas management.	vi. Disseminate uniform guidelines for the development of self-financing mechanisms for community-managed reserves (lagoons, natural areas, reefs and islands). vii. Promote the Galapagos Tourism Model, which combines a research facility and museum with tourism (also practiced at Anthony's Key Resort/Marine Sciences Center in Sandy Bay, Roatan).
<b>3. Uncontrolled Operation of Cruise Ships and Live-Aboards</b>	a. Develop a cruise-ship/live-aboard tourism policy and regulations, that promote the use of local services and personnel, and provide awareness and skills training as required.	i. Facilitate assistance and demonstrations/models for the development of cruise-ship/live-aboard tourism, including policies, regulations and proposals for support infrastructure. Use the experience of the Belize Tourism Board as a starting point.
	b. Develop options for reception of cruise-ship wastes at local ports, including a tipping/disposal fee to finance environmentally-sound disposal facilities.	ii. Utilize regional and international political lobby and assistance (SICA-CCAD, WB, IDB, IOCARIBE, UNEP/CEP, UNDP, UNEP, etc.) to facilitate adoption and/or ratification and enforcement by the four countries, of international conventions related to the management of wastes from ships.
	c. [See A.2.d above]	

Threat	Proposed Actions	
	National Initiatives	Regional Initiatives
<b>4. Industrialization in Coastal Areas without Adequate Environmental Engineering and Management Practices</b>	a. [See A.1.a, b, c, d, e & f above]	i. [See A.1.i, ii, iii, iv, v & vi above]
	b. Ratify and enforce regional and international conventions relating to disposal of wastes into the sea and coastal areas.	ii. Utilize regional and international political lobby and assistance (SICA-CCAD, WB, IDB, IOCARIBE, UNEP/CEP, UNDP, UNEP, etc.) to facilitate adoption and/or ratification and enforcement by the four countries, of international conventions related to control of discharges of wastes into the sea and coastal areas.
	c. Develop an inventory of industries in areas where contamination is known or suspected, recording aspects of the nature, volume, form, locations and frequency of waste disposal; facilitate improvement of current licensing/permitting systems for operation of industrial processes based in part on this inventory, environmental auditing and monitoring of selected parameters (esp. water quality). "Hot spots" should be indicated for more research, frequent monitoring and control.	iii. Assistance to facilitate environmental awareness and use of clean technology and total-quality manufacturing processes as promoted under ISO 9000 and 14000 initiatives; dissemination of practical guides and seminars by industrial sector.
<b>5. Unplanned, Uncontrolled Small Scale and Industrial Agricultural Development in Coastal Areas</b>	a. [See A.1.a, b, c, d, e & f above]	i. [See A.1.i, ii, iii, iv, v & vi above]
	b. Intensify programs for settlement/resettlement of landless and poor, and promote equitable sale, transfer and titling of lands, and provide technical assistance for appropriate land and natural resource use, including sustainable agriculture to support the tourism industry.	ii. Provide financing and assistance for settlement of the landless and poor in areas based on strict integrated land-use planning, good environmental management and social equity and economic opportunity; and assistance for improved land and resource use systems.
	c. Develop an inventory of point and non-point sources known or suspected of contamination, recording aspects of the nature, volume, form, locations and frequency of waste disposal; facilitate improvement of current control and/or licensing/permitting systems for discharges (or runoff) of agricultural operations based in part on this inventory and monitoring of selected parameters (esp. water quality). "Hot spots" should be indicated for more research, frequent monitoring and control	iii. [See A.4.iii above]
<b>6. Petroleum Exploration and Development in Fragile Areas and/or without Adequate Environmental Engineering and Management Practices</b>	a. [See A.1.a, b, c, d & f above]	i. [See A.1.i, ii, iii, iv, v & vi and A.4.iii above]
	b. Develop an inventory of all oil exploration/exploitation sites/areas; develop contingency plans and response capability for the containment and control of oil spills and related accidents. Ratify and/or enforce regional and international conventions relating to cleanup of oil spills in the sea and obtain necessary equipment for same.	ii. Utilize regional and international political lobby and assistance (SICA-CCAD, WB, IDB, IOCARIBE, UNEP/CEP, UNDP, UNEP, etc.) to facilitate adoption and/or ratification and enforcement by the four countries, of international conventions related to control of oil spills in the Wider Caribbean (MARPOL, Cartagena Convention).
<b><i>B. Inappropriate Inland Resource and Land Use and Industrial Development</i></b>		
<b>1. Conversion of Fragile Lands to Agricultural Uses in Upland Watersheds and Riparian Areas</b>	a. Participatory development and implementation of watershed management plans and zoning based on economic, social, cultural and environmental parameters, preferably at the subregional level; including the establishment and active co-management of reserves.	i. Technical assistance and training in the preparation and enforcement of watershed management and zoning plans; promote the use of habitat mapping among parameters used to determine zoning for land use and biodiversity conservation through establishment of system of protected areas.
	b. [See A.5.b above]	ii. [See A.5.ii above]
	c. Develop updated inventories of natural resources, current land uses and socioeconomic parameters (including land/resource tenure) in watersheds as a basis for preparation of watershed management plans and programs.	iii. [See A.1.v & vi above]

Threat	Proposed Actions	
	National Initiatives	Regional Initiatives
	<p>d. Provide assistance to national and local GOs in reforming their governance model to streamline and decentralize planning and normative procedures, and integrated enforcement of zoning and protected areas regulations.</p> <p>e. Lift subsidies favoring lowland extensive cattle ranching and logging in upland watersheds, and charge the real costs for water and energy services derived from watersheds, including their environmental and social costs.</p>	<p>e. Convene seminars with GO officials from countries in the region to present and discuss integrated land-use/natural resources planning, with emphasis on decentralization and local empowerment.</p>
<b>2. Inland Industrial Development without Adequate Environmental Engineering and Management Practices</b>	a. Participatory development and implementation of land-use plans and industrial zoning based on economic, social, cultural and environmental parameters, preferably at the subregional level.	i. Technical assistance and training in the preparation and enforcement of land-use and zoning plans.
	b. Development of sector-specific guidelines for preparation of EIAs and standards and codes for land development and industrial processes.	ii. Publication and dissemination of practical guides for the preparation of sector-specific EIAs and building/construction codes for relevant sectors.
	c. Development of local (municipal, developer, NGO) capacity to prepare EIAs and enforce and monitor mitigation compliance; promote voluntary compliance with environmental regulations (ISO 14000).	iii. Technical assistance and training of GOs and NGOs in the preparation of sector-specific EIAs, practical mitigation and enforcement strategies.
	d. Development of inventories of water resources, ecosystem composition/condition, and point sources of contamination and impact, as a basis for improvement of current systems of permits for industrial processes, and to facilitate monitoring of selected environmental indicators (esp. water quality).	iv. [See A.4.iii above]
		v. Utilize regional and international political lobby and assistance (SICA-CCAD, WB, IDB, UNDP, UNEP, bilaterals, etc.) to facilitate GO and private sector officials' incorporation of the environmental costs of industrial development into national and local government accounts, including permanent environmental monitoring programs.
<b>3. Building of Transport Infrastructure (Roads, Airports) without Adequate Environmental Engineering and Contingencies for Socioeconomic Growth and Environmental</b>	a. [See B.1.d and B.2.a and c]	i. [See B.2.i, ii and iii above]
	b. Development of sector-specific guidelines for preparation of EIAs and standards and codes for construction.	ii. Utilize regional and international political lobby and assistance (SICA-CCAD, WB, IDB, UNDP, UNEP, etc.) to facilitate GO and private sector officials' incorporation of the environmental costs of transport development into national and local government accounts, including permanent environmental monitoring programs.
	c. Development of inventories of land and water resources, ecosystem composition/condition and socioeconomic parameters as a basis for land-use plans and routing of transport corridors, and to facilitate monitoring of selected environmental indicators (esp. WQ)	
<b>C. Overfishing and Inappropriate Aquaculture Development</b>		
<b>1. Unsustainable Industrial, Artisanal and Sport Fisheries Practices</b>	a. Modernize fisheries laws and regulations considering new realities of equipment (fishfinders, GPS, etc.), declining stocks, saturation of fishing fleet, and alternative resource utilization (sportfishing, tourism).	i. Facilitate uniform fisheries policies and regulations (closed season, size/catch limits, no-take T&E species, equipment restrictions, etc.) throughout the region, based on regional conditions and fisheries in the MBRs. Propose a system of incentives to industrial fishers to reduce their fleets and fishing activities, and propose economic alternatives to current fisheries practices; propose a uniform system for recording fisheries harvests/landings and develop a database for assessing trends for sustainable fisheries and conservation purposes.

Threat	Proposed Actions	
	National Initiatives	Regional Initiatives
	b. Provision of needed equipment, trained personnel and judicial process to enforce fisheries regulations, especially closed seasons and areas, size limits, quotas on volume, and equipment restrictions; develop an accurate and permanent program for monitoring industrial and artisanal fisheries harvest/landings that include fishing locations.	ii. Develop and/or expand use of modern monitoring equipment (imagery, telemetered buoys for meteorological and oceanographic data) for locating spawning aggregations, nutrient upwellings, and other parameters useful in assessing productivity and needs for conservation.
	c. Reduce the number of industrial fishing boat permits (esp. Honduras and Mexico) through attrition and the use of incentives; strengthen restrictions on trawling in known seagrass and reef areas, and sites of seasonal spawning aggregations of species at risk.	iii. Provide regional seminars and practical on-site training of GO and NGO staffs in aspects of vigilance and enforcement, research and monitoring, both to promote sustainable yields and conservation.
	d. Promote technical and awareness training to industrial and artisanal fishers to improve sustained yields; facilitate vocational rehabilitation of artisanal fishers to sportfishing, diving and coastal/aquatic-ecology guides; protect the rights of artisanal fishers (esp. indigenous groups) to the resources that they have traditionally exploited.	iv. Promote the formation on bi-national (Belize/Mexico) and trinational (Belize/Guatemala/Honduras) fishers' associations as fora for resolution of conflicts among artisanal and industrial fishers in transboundary waters and training in best practices; distribute educational & public awareness & best practices media to fisheries cooperatives & industrial interests; support establishment and management of a bi-national MPAs between Belize and Mexico (Xcalak-Bacalar Chico) and trinational system of coastal and MPAs in the Gulf of Honduras.
	e. Promote aquaculture for replenishment of lagoons and estuaries with species at risk or of economic importance.	v. Promote the MBRS Section of the Meso-American Biological Corridor in order to ensure linkages of reef, lagoon and estuary ecosystems along the entire coast, especially for recruitment of larvae and fry for reef organisms, as well as to conserve the tourism resource. Support the establishment and management of MPAs with linkages to regional and international organizations promoting the SPAW Protocol. Promote signature of the SPAW Protocol by MBRS countries.
	f. Consolidate systems of MPAs as a strategy to increase stocks of T&E and other species under stress (Hol Chan Marine Reserve experience); include sites of spawning aggregations within the system of marine protected areas.	
<b>2. Inappropriate Development and Operation of Aquaculture for Shrimp, Tilapia and other Species</b>	a. Restrict aquaculture operations to sites designated for same under adequately prepared land-use plans for integrated coastal zone management [See A.1.a, b, c & d above].	i. Facilitate training-of-trainers for sustainable aquaculture in MBRS countries, especially in aspects of siting, construction and contingency planning.
	b. Develop clear guidelines and regulations for operation of aquaculture operations, including preparation of contingency plans in case of hurricanes, flooding and accidents; monitoring compliance with these regulations.	ii. Promote aquaculture operations as a regional strategy for replenishment of stocks in local lagoons and estuaries--nurseries for reef and open water fishes.
	c. Restrict or prohibit collection of larvae and fry from coastal areas (lagoons, estuaries, beaches) for use in aquaculture operations.	
<b>3. Uncontrolled Bio-prospecting</b>	a. Development of regulations and permits, with specified collection areas and monitoring of concessions.	i. Assistance to develop a uniform bio-prospecting policy and standard regulations, both to facilitate bio-prospecting and to ensure maintenance of composition of reefs, protection of species of interest from depredation, and patent rights.



Threat	Proposed Actions	
	National Initiatives	Regional Initiatives
<b><i>D. Inappropriate Port Management, Shipping and Navigation Practices</i></b>		
<b>1. Construction of Ports, Jetties, Piers, Oil Terminals and Dredging of Channels without Adequate Environmental Engineering and Construction Practices</b>	a. [See A.1.a, b, c, d, e & f]	i. [See A.1.i, ii, iii, iv, v & vi]
<b>2. Port and Shipping Operations without Adequate Navigational and Environmental Management Practices</b>	b. Develop an inventory of all types of cargo and ships that normally come into ports or sail through area and determine the levels of risk associated with these in terms of environmental damage, likely impacts and probable areas affected; develop contingency plans and response capability for the containment and control of oil spills, foundering, groundings, collisions and related accidents; and obtain equipment and training for applying the plan.	i. Utilize regional and international political lobby and assistance (SICA-CCAD, WB, IDB, IOCARIBE, UNEP/CEP, UNDP, UNEP, etc.) to facilitate adoption and/or ratification and enforcement by the four countries, of international conventions related to safe navigation, ports operations, control of wastes from ships, control of oil spills, etc. in the Wider Caribbean (MARPOL, Cartagena Convention, etc.).
	c. Ratify and/or enforce regional and international conventions relating to control of wastes from ships, safe stowage, transboundary movement of hazardous materials, cleanup of oil spills in the sea, etc.; update relevant legislation and regulations to reflect these; and obtain necessary equipment for same.	ii. Provide financing, technical assistance and training to facilitate compliance with international conventions and treaties among nations of the MBRS to pool resources for mutual enforcement of shipping and pollution control regulations and conventions (national and international), and response to contingencies (accidents, collisions, spills, etc.).
	d. Modernize all navigational aides, communication equipment, bathymetric and navigation charts, etc. to facilitate improved and safer shipping; prepare a port management plan comprising all aspects of navigation, transfer of cargo, waste disposal policies and contingency plans.	
	e. Develop options to receive ship wastes at local ports; tipping/ disposal fees to finance environmentally-sound disposal facilities.	

Threat	Proposed Actions	
	National Initiatives	Regional Initiatives
<b>E. Natural Oceanographic and Climato-Meteorological Phenomena</b> [The following recommendations are to facilitate better understanding of these naturally-occurring phenomena which can exacerbate negative environmental impacts of anthropogenic uses within the MBRS]		
<b>1. Predominating and Seasonal Currents and Winds</b>	a. Improve and fund monitoring of currents and winds in MBRS countries' respective territorial waters, as part of an overall integrated coastal zone monitoring program; other parameters to include in this program are: water quality (temperature, salinity, pH, transparency, TSS, DO, nutrients, hydrocarbons, E. coli, and testing for other parameters, such as pesticides or heavy metals, linked to natural and anthropogenic phenomena present in the region), ecological indicators (bio-accumulators, predators, keystone/indicator species of diversity, coral disease dynamics	i. Facilitate development of a regional coastal zone monitoring system with uniform parameters, data collection & analytical methods, networked throughout the MBRS, with links to international organizations already active in these activities (CARICOMP, NOAA, IOC/IOCARIBE, WMO, FAO, CPACC, ITSU, U.S. Hurricane Forecast Center, etc.)--including standardization of parameters and methods for coral reef (composition, condition/growth characteristics, bleaching, diseases), & water quality monitoring for the MBRS region. Provide financial and technical assistance to achieve regional efficiencies of scale for permanent monitoring programs, including provision of equipment, training and technical assistance.
<b>2. Tropical Storms and Hurricanes</b>	a. Enact necessary land-use planning/zoning legislation for coastal areas and islands, and strictly enforce regulations on land clearing and removal of vegetation on shorelines, estuaries, mangroves and lagoons. Enforce compliance with siting and building standards for structures along the coast, and prohibit occupation of low-lying areas prone to flooding. Publish and distribute regulations and guidelines to all citizens via mass media, in order to raise their awareness of the need for such regulations and their obligations.	i. Facilitate preparation of regional guidelines for land-use planning and disaster preparedness, sector-specific contingency plans (industry, tourism, aquaculture, ports, etc.), and provide technical assistance for their preparation at the national and subregional (transboundary) levels.
	b. Recupérate/rehabilitate shorelines and critical coastal environments (mangroves, beaches, headlands, dunes) as storm defenses.	
	c. Prepare/update emergency evacuation and contingency plans for tropical storms and hurricanes (disaster preparedness), including proper storage/protection and/or relocation of hazardous and toxic substances.	
<b>3. El Niño/La Niña Events</b>	a. Monitor the impacts of these events to reef ecosystems (especially bleaching), correlating the distribution and levels of bleaching with parameters of water quality, currents and winds [See also E.1.a].	i. [See E.1.i]
	b. [See E.2.a, b & c]	ii. [See E.2.i]
<b>4. Diseases in Coral and other Organisms in Coastal and Reef Ecosystems</b>	a. Monitor the incidence and distribution of coral diseases and diseases in other organisms and their correlation to dynamics of water quality, currents and winds [See also E.1.a and E.3.a]	i. [See E.1.i]
<b>5. Climate Change/Global Warming</b>	a. [See E.1.a and E.2.a, b & c and E.3.a]	i. [See E.1.i and E.2.i]
<b>6. Earthquakes and Tsunamis</b>	a. [See E.1.a and E.2.a, b & c and E.3.a]	i. [See E.1.i and E.2.i]

**Matrix 2: Principal Transboundary Issues**

Nature of Threat and Location of Impacts	Origin of the Threats
1. Organic-nutrient contamination from coastal and inland drainages, especially affecting estuarine and coastal lagoon ecosystems from Bahía de Chetumal to Belize City; and fringing, patch and selected barrier reef ecosystems from Xcalak-Bacalar Chico to Hick's Cayes in Belize.	<p>a. Agricultural runoff from large-scale sugarcane farms in the Rio Hondo and New River watersheds (Belize and Mexico)</p> <p>b. Organic waste disposal from two sugar refineries (one each in Mexico and Belize) in the Rio Hondo and New River watersheds</p> <p>c. Untreated sanitary waste disposal from Chetumal, Quintana Roo and Corozal, Belize, and seepage from septic systems on Ambergris Caye</p>
2. Sedimentation, organic and chemical contamination of the Gulf of Honduras, especially affecting ecosystems of coastal estuaries, lagoon, seagrass bed and selected patch reefs.	<p>a. Agricultural runoff from coastal drainages &amp; watersheds of Stann Creek, Placencia, Monkey River, Rio Grande, Rio Moho &amp; Rio Sarstoon of Belize.</p> <p>b. Agricultural runoff from coastal drainages &amp; watersheds of Rio Sarstún, Lago Izabal/Rio Dulce &amp; agricultural and industrial drainages from Rio Motagua watershed of Guatemala</p> <p>c. Agricultural runoff from coastal drainages &amp; tributaries to Rio Motagua &amp; agricultural &amp; industrial drainages from Rio Chamelecon &amp; Rio Ulua watersheds of Honduras</p> <p>d. Contamination from port operations and urban centers in Puerto Barrios/Puerto Castilla (Guatemala) &amp; Puerto Cortes (Honduras)</p>
3. Uncontrolled utilization/depredation of reef and fisheries resources in the MBRS	a. Cross-border tourism by boat (live-aboards, divers, sport fishers) in Belize←Mexico, and Belize←Guatemala←Honduras
4. Uncontrolled fishing/depredation of fisheries resources in the MBRS, especially for lobster, conch, selected finfishes, turtles and manatee; and damage to physical damage to reefs and seagrass beds	a. Cross-border industrial and artisanal fishing in Belize by Guatemalans, Hondurans and Mexicans; Guatemala←Honduras; and by some Belizeans in Mexico.
5. Contamination of territorial and international waters, beaches, reefs, seagrass beds, estuaries and tidal wetlands with organic, chemical and/or solid wastes.	a. Illegal dumping of liquid, solid & hazardous wastes from ships, & shipping accidents in the MBRS, including: (i) dumping of sanitary and food wastes, oily bilge water and solid wastes from ships; (ii) dumping of municipal or industrial wastes for disposal purposes; and (iii) collisions, groundings and foundering of ships with rupture of fuel tanks and loss of lubricants, and/or spill of hazardous cargo (petroleum and derivatives, fertilizer, pesticides/other chemicals, sugar, palm oil; and lack of contingency plans/response capability in region
6. MBRS contamination from many origins as result of tropical storms & hurricanes	7. Lack of regional & national disaster preparedness & contingency plans/capability for emergencies and response

**Matrix 3: Current and Planned Regional Projects/Programs with Relevance to the Conservation and Sustainable Use of the MBRS**

Project/Program Title & Executing Agency	Outreach/Project Area	National Focal Points/ Counterparts	Funding Level (US\$)	Project Start/ End Dates	Objectives, Components, Activities
Regional Environmental Program for Central America/PROARCA(USAID/CCAD)	All Central American Nations	National and Local GOs, NGOs & Community Groups(WWF, TNC, Univ. Rhode Island, International Resources Group)	25 million (COSTAS share is 5.9 million from USAID & 2.2 million from TNC, WWF & URI)	1996-2000(2nd phase probable)	Three principal programs: (i) <i>Central American Protected Areas System</i> , which supports consolidation of CAPAS, especially the Meso-American Biological Corridor, through assistance in: improved management of PAs and buffer zone management, public conservation awareness, improved national and cross-country legal frameworks, green products for export, alternative financing mechanisms, technical capacity building and information dissemination for national orgs. and the CCAD; (ii) <i>Coastal Zone Management/COSTAS</i> , which promotes integrated and sustainable management of coastal resources (fisheries, tourism, conservation of protected areas), focusing especially on empowerment of local entities for stewardship of resources, in four transboundary priority sites of the Gulf of Honduras (Belize/Guatemala/Honduras), Miskito Coast (Honduras/Nicaragua), Gulf of Fonseca (El Salvador/Honduras/Nicaragua) and Gandoca/Bocas del Toro (Costa Rica/Panama), with the use of mini-grants to NGOs, conflict resolution, and training in aspects of strengthening governance and policies in coastal management and in protected areas (Punta Manabique and Port of Honduras) with emphasis on the Meso-American Barrier Reef Initiative; and (iii) <i>Environmental Protection and Legislation/LEPPI</i> , which supports developing environmental awareness and strengthening of national and regional policy frameworks (EIA, land-use planning) and local and national institutions to address pollution problems.
Conservation of the Meso-American Caribbean Reef Ecoregion (WWF)	Meso-American Barrier Reef System(Mexico to Honduras)	GOs, NGOs, resource-user groups		1998 (ongoing)	The MACR Ecoregion forms part of WWF's Global 200 Program, oriented to the conservation of 200 terrestrial, freshwater and marine ecoregions where WWF believes that conservation efforts should be focused. WWF, in collaboration with GOs, NGOs and resources-user groups (stakeholders in fisheries, tourism) is carrying out a biological assessment to develop a knowledge base for conservation planning, including analysis of threats and opportunities to facilitate a conservation strategy and collaborative actions aimed at sustainable use and conservation efforts. To date WWF has sponsored a workshop to identify threats to the ecoregion and their root causes and has begun assembling data on physical and biological parameters. A second workshop will be convened to assess the results of the assessments to set conservation priorities and propose action plans.
Tri-national Alliance for the Conservation of the Gulf of Honduras/TRIGOH Belize (TIDE, BELPO, BTIA), Guatemala (Defensores de la Naturaleza, FUNDARY, FUNDAECO, IDEADS), Honduras (Fundacion Fasquelle, PROANSATE)	Coastal, open water, island and reef areas of the Gulf of Honduras (Belize, Guatemala & Honduras)	NGOs, Community Groups, GOs, resource-use cooperatives & associations	Currently funded with a small grant (PROARCA) ; proposed a 2 million project to IDB	1996 (ongoing)	TRIGOH seeks to develop integrated conservation and sustainable development projects with stakeholders in the region, including a tri-national system of coastal and marine reserves, tri-national activities in fisheries, manatee protection, ecotourism and other economic alternatives for local resource users and residents, port contingency planning, research and monitoring. Has proposed a two-year project <i>Integrated Coastal Management for the Gulf of Honduras</i> , with emphasis on cooperative management of fisheries, control of water quality, and protection of marine diversity.

Project/Program Title & Executing Agency	Outreach/Project Area	National Focal Points/ Counterparts	Funding Level (US\$)	Project Start/ End Dates	Objectives, Components, Activities
Project for the Fisheries Development in Central America/PRADEPESCA(European Union)	Central America, Atlantic and Pacific	Belize (Fisheries Dept), Guatemala (DITEPESCA), Honduras (DIGEPESCA)	13.4 million	Phase I finalized in 1995(Phase II?)	Promotes fisheries and aquaculture development under four sub-projects: marine research and monitoring, aquaculture management, shrimp fisheries management, and artisanal fisheries management.
Plan for Integrated Development of the Gulf of Honduras (OAS/IICA)	Gulf of Honduras, (Bilateral between Guatemala & Honduras)	GOs, NGOs, Community Groups of Guatemala and Honduras		Proposal (since 1997)	Contains a series of smaller integrated conservation and development projects for the lower watershed of the principal rivers draining into the Gulf of Honduras in activities of: resource conservation in watersheds, protected areas management, sustainable agroforestry, ecotourism, energy conservation, and integration of transport and port infrastructure with social development.
Regulation of the Reserve in the Border Region between Belize, Guatemala and Mexico (OAS/IICA)	Border region among Belize, Guatemala and Mexico	GOs of Belize, Guatemala and Mexico		Proposal (since 1996)	Proposes activities in the following areas: natural resources/biodiversity management, scientific investigation, environmental education, recovery of cultural values, ecotourism and institutional strengthening.
Program for Management of Wetlands and Coastal Zones(IUCN)	Central America, Caribbean and Pacific Coasts	GOs, NGOs, Community Groups		1997-2001	Objectives include: (i) identification of priority areas for management; (ii) organizational strengthening; (iii) organizational networks development and information exchange; (iv) strategic planning; and (v) support for implementing international conventions.
Conservation of Marine Biodiversity: Integration of the Tourism Sector with Coastal Protected Areas (IUCN/BMZ)	Central America, Caribbean and Pacific Coasts	GOs, private-sector tourism operators & NGOs in participating countries		1997-2001	Objectives include: (i) evaluation of the relation between tourism activities, including impacts, and coastal-marine ecosystems; (ii) evaluation and valorization of local communities' participation in coastal tourism and conservation of protected areas; (iii) design and implement strategies and guidelines for the conservation of biological diversity using demonstration projects that link tourism with the protected areas management and participation of local communities. The project seeks to develop networks for conservation-based tourism, and is also being implemented in East Africa to facilitate South-South cooperation.
Caribbean Coastal Marine Productivity Program/CARICOMP(UNESCO and various British Institutions)	Caribbean Sea and coastal areas of 18 participating nations	Belize (Fisheries Dept.)	Now primarily funded by participating institutions	1970s (ongoing)	Network of 20 marine labs, parks and reserves in 18 countries in a program to monitor coastal marine productivity in the Caribbean in mangroves, seagrass beds, benthic communities on coral reefs, fisheries and in aspects of meteorological physical water quality. Has rich database, but much data has not been recently analyzed.
Caribbean Fisheries Resource Assessment-CFRAMP (CIDA)	Caribbean Region	GO Authorities in countries responsible for fisheries management	3 million (Phase II); & local GO contributions	1999-2007	Conservation & sustainable use of regional fish stocks. Includes institutional strengthening, training, research on commercial species, regional information systems, policy reform & technical assistance.
Strengthening of Fisheries and Biodiversity Management in African, Caribbean and Pacific Countries (European Union)	Selected Caribbean countries	GOs responsible for fisheries management	5 million (distributed among 45 countries in World	1998-2000	Provides technical & material assistance to researchers& resource managers for improved management of aquatic living organisms, and increase awareness of the importance to conserve biological diversity

Project/Program Title & Executing Agency	Outreach/Project Area	National Focal Points/ Counterparts	Funding Level (US\$)	Project Start/ End Dates	Objectives, Components, Activities
Global Coral Reef Monitoring Network/GCRMN(AIMS, ICLARM, IOC, UNEP, WMO, IUCN, WCMC, URI)	Caribbean Region	Caribbean Sub-node(CARICOMP, participating NGOs and resort operators in MBRS Region, Univ. of Miami/ RSMAS, Univ. of Rhode Island/CRC, Univ. of Texas, Univ. of Windsor)		1996 (ongoing)	Links organizations and people to monitor biophysical, social, cultural and economic aspects of coral reefs within regional networks); improvement of capacity of organizations to monitor reefs in a continuous program to discern trends and discriminate between natural, anthropogenic and climatic changes; supports dissemination of results at local, regional and global scales to coastal/reef management agencies via reports, website, databases. Acts as data-manager for updates on coral bleaching, disease, damage caused by tropical storms, etc. around the World. Organizational and programmatic linkages with ReefBase database networks and Atlantic Gulf Reef Assessment/AGRRA and Rapid Assessment of Management Parameters (RAMP) monitoring initiative.
Caribbean Planning for Climate Change/CPAAC (GEF/OAS)	Caribbean (11 countries)	GOs in participating countries responsible for coastal resources management & monitoring	6.3 million (670,000 to each executing agency)	1997--2001	Provide technical guidance to countries to prepare contingencies for adverse effects of global climate change and sea level rise. Includes pilot projects, training and technology transfer. Has coastal resources inventory and coral reef monitoring components.
Establishment of the Meso-American Regional System of Protected Areas, Buffer Zones and Biological Corridors (GEF/UNDP/CCAD/GTZ/DANIDA)	Meso-American Caribbean	Mexico (SEMARNAP/INE, State GO, NGOs), Belize (DoE, NGOs), Guatemala (CONAP, OCREN, NGOs), Honduras (AFE/COHDEFOR, NGOs)	22.6 million	1999-2004	Supporting actions necessary to consolidate and further develop the Meso-American Biological Corridor. Includes aspects of: land-use planning/zoning; conservation and sustainable use of biological resources; Management of protected areas, buffer zones and corridor connections.
Regional Promotion of the Environment in Central America (IDBFOMIN/GEF/CCAD)	Central America	OGs, NGOs in participating countries	15 million (under negotiation additional 25 million)	1997 (ongoing)	Promotes intra-regional sustainable development in Central America in aspects of conservation of biodiversity, depletion of the ozone layer, protection of international waters and climate change.

Project/Program Title & Executing Agency	Outreach/Project Area	National Focal Points/ Counterparts	Funding Level (US\$)	Project Start/ End Dates	Objectives, Components, Activities
Caribbean Environment Programme(UNEP/RCU)(i) Programme for Assessment and Management of Environmental Pollution/AMEP; (ii) Programme for Information Systems for the Management of Marine and Coastal Resources/ CEPNET (IDB/Wider Caribbean Region Marine and Coastal Environmental Information Network);(iii) Regional Programme on Specially Protected Areas and Wildlife;(iv) Caribbean Environmental Network/CEN (USAID)		Mexico (SEMARNAP/INE, EPOMEX), Belize (CZMA&I), Guatemala (CONAMA, INGUAT)		1992 (on-going)	Established to support implementation of the accords set out in the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean (Cartagena Convention) and its protocols(CEPPOL, SPAW, LBSMP). Programs provide support in areas of: diagnostic analysis/research of resource conditions in coastal-marine environments (including pollution detection and monitoring of coral reefs), strategic planning and project preparation, assistance in developing environmentally-sound technologies for sewage control, environmentally-sound tourism, workshops and training. Has broad range of information services, including an excellent website, publications and best-practices guides. CEN Program just concluded. <i>Services seem to be underutilized by MBRs countries.</i>
Gulf of Honduras Maritime Transport Pollution Control Project (GEF/IDB; also potentially WB, UNDP or UNEP)	Gulf of Honduras (Belize, Guatemala, Honduras)	Belize (CZMA&I), Guatemala (CONAMA), Honduras (SERNA),NGOs (TRIGOH), port and maritime transport industry, DGA-SICA/CCAD, COCATRAM	5 million+ (proposed)	Under preparation (GEF Block B)	Proposes a transboundary diagnostic analysis of environmental problems in project area to fill information gaps on key physical and resource use issues (including navigation, port facilities, waste management, contingencies, etc.); improvement/reform of legal, policy and regulatory/enforcement framework for control of maritime pollution (including compliance with international conventions); institutional strengthening at local, national and regional levels; training and equipment for improving national and transboundary collection of environmental information (bathymetry, currents, sediment transport, WQ monitoring, and vulnerability mapping); public participation and environmental awareness; economic mechanisms to encourage control of land- and sea-based pollution; demonstration pilot projects for the major ports; and a regional action plan for navigational safety and contingencies.
Assessment of Damage to North Coast, Bay Islands Coral Reefs and other Intertidal and Subtidal Systems (USGS)	North Coast of Honduras, Bay Islands, Gulf of Honduras	Fundacion VIDA, PROARCA/Costas (others to be determined?)	1.13 million	1999-2001	Diagnostic assessment of damages, sediment quantity, and sediment mobilization of coral reefs, and impacts of sediment and wind/wave damage to mangrove, seagrass and estuary communities in the Gulf of Honduras and Bay Islands. Assessment of accretion and erosion in mouths of rivers draining into Gulf of Honduras and on Bay Islands. Assessment of structural damage to shallow reefs due to wave action of Hurricane Mitch, extent of coral bleaching, black band disease, etc. (objectives to be reassessed in Sept. 1999).
World Meteorological Monitoring Program; World Climate Program; and Ibero-American Regional Climate Program (WMO)	Entire Region	GOs responsible for meteorological monitoring in participating countries		Ongoing	Acts as clearinghouse for collection, analysis and reporting of meteorological data taken in all participating countries, including monitoring of tropical cyclones and monsoons. Also provides technical assistance, training and some support on instrumentation.
North American Aquatic and Atmospheric Administration (NOAA)	Entire Region	GOs responsible for administration of water resources, rivers, oceans and meteorological monitoring		Ongoing (several projects)	Provides assistance and carries out research and monitoring, mapping and imaging of natural processes and phenomena including: weather/climate; oceanography, currents, tides, water quality (physiological/biological) and temperature; monitoring and tracking of storms (hurricanes, tropical storms, El Niño, La Niña, monsoons, drought). Maintains extensive maps, images and databases.

Project/Program Title & Executing Agency	Outreach/Project Area	National Focal Points/ Counterparts	Funding Level (US\$)	Project Start/ End Dates	Objectives, Components, Activities
Intergovernmental Oceanographic Commission--Subcommission for the Caribbean/IOCARIBE(UNESCO)	Entire Region	GOs responsible for marine-coastal resources research and management done in collaboration with NOAA, CARICOMP, OAS, CPACC, FAO, UNEP, GEF, IWC, ITSU, U.S. Hurricane Forecast Center		1982(ongoing)	Responsible for the promotion, development and coordination of the IOC's marine scientific research programs, ocean services and related activities, including training, education and mutual assistance. Programs/projects include, among others: (i) Regional Component of Ocean Processes and Climate Change; (ii) Fishery Oceanography of Highly Migratory and Straddling Species; (iii) Tropical Demersal Recruitment Program; (iv) Coral Reef Monitoring and Research, Cooperation with AGRRA and CARICOMP; (v) Large Marine Ecosystems-Caribbean; (vi) Ecotourism Research; (vii) Coast Beach Dynamics; (viii) Bathymetric Chart of the Caribbean Sea; (ix) Caribbean Environmental Pollution Project-CEPPOL; (x) Cooperation with Contingency Plans for Oil Spills; (xi) Hurricane Effects & Mitigation on Coastal Zones in the IOCARIBE Region; (xii) Regional Component for the Global Ocean Observing System-GOOS; (xiii) Regional Component for the Global Sea Level Observing System-GLOSS; and (xiv) Caribbean Tsunami Warning System.
Post-Mitch Reconstruction (Various Bi- and Multi-lateral agencies)	Honduras, Guatemala	National and local GOs and NGOs	500 million	1999-2020(most projects still in planning stages)	Based on the Consultative Group Meeting in Stockholm in May of 1999, numerous project in integrated coastal resources management, watershed management, disaster preparedness, land-use planning and zoning, protected areas management and environmental damage assessment and monitoring have been proposed and will be funded by IDB, World Bank, UNDP, UNEP, USAID, CIDA, European Union, Spanish, Dutch, Swedish, Japanese and other Governments, including a Regional Environmental and Disaster Mitigation Project (IDB).



Instituto de Derecho Ambiental y Desarrollo Sustentable  
-IDEADS-

**Executive Summary**

*Diagnosis regarding Harmonization of Legislation, Policies, and  
Institutional Coordination  
for the Management of the Reef System of the Mesoamerican  
Caribbean (SAM)*

Consultancy required by World Bank, Contract number 7107830

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Guatemala, March 2000

**Introduction:**

This report has as a main purpose to assist in the Coordination of the project with the most concrete idea regarding the “dimension” that the component “Legislation, Policies, and Regional Coordination” must have in the execution stage of the project.

This reason is the one that explains the format in which this is submitted, focused to the quick identification of activities or topics that must be addressed in the execution stage. This gives elements to size the amount of work, the topics that must be addressed, and the methodology that should be used for its treatment.

The report is formed out by four portions, to wit:

1. Methodology's Description
2. General Report regarding Findings and Recommended Activities
3. Conclusion/Recommendations to the PDC design, and
4. Attachments (as examples in the development of the topics)

Regarding Part 3. “Conclusion/Recommendations to the PDC design”, we want to make it clear, that since the beginning that this is about recommendations to be considered by the project's components. The other components of the project, taking into account our statements, are the ones who will make the decision, in the last chance, about the topics and the deepness in which these must be addressed in the PDC.

## 1. **Methodology**

Following the methodology used for the collection of basic information regarding Fisheries, Biodiversity, Water Pollution, Territorial Ordering, and Tourism is submitted and its ruling, policy, and institutional issues, as well as the methodology that is recommended to be used during the execution stage of the project.

### 1.1 **Methodology for the collection of basic information**

For the basic information collection corresponding to the “Legislation, Policies, and Institutional Framework” component some Charts were developed to be completed by the consultants in Mexico, Belize, Guatemala, and Honduras. The Charts' contents are as follows:

#### I. **Legislation:**

I.A. **Applicable Rules** (including relevant overlaps, ruling gaps, contradictions, accomplishment level, and preliminary recommendations.)

I.B. **Control and Surveillance Mechanisms** (including identification of competent entities, powers and faculties of its officials or employees, legal gaps to accomplish with control and surveillance by the entities in charge and the preliminary recommendations)

#### II. **Policies**

II.A. **Policy Description** (which includes the identification of existing policies, gaps, and preliminary recommendations)

II.B. **Policies Effectiveness** (appreciation regarding the concordance level among policies and applicable ruling, appreciation regarding the accomplishment of the policy, preliminary recommendations to coordinate the policies with legislation, policies among them and to improve the policies implementation.

#### III. **Institutional Framework:**

III.A. **Competent Entities Description** (which includes legal mandates, mandate's gaps, and preliminary recommendations)

III.B **Accomplishment level of the Mandate** (which includes appreciation regarding the accomplishment level of the mandate and preliminary recommendations)

III.C. Relationships among institutions and people (which includes mechanisms for existing coordination among institutions as well as collaboration and coordination mechanisms with similar entities in the neighbor countries, legal gaps identification for the public participation, identification of institutional overlapping occurrences, preliminary recommendations.

The reason to collect this information was double-intended: 1. To constitute a complete and ordered database in the issues that are of interest of the component, so during the execution stage of the project, to be used as a base and reference for the in-depth analysis of what it must be carried out to give accurate recommendations (products of the execution stage) and 2. To count on a very detailed and ample view of the status of the ruling issues, policies, and institutional, as well as the consistent criteria for the "dialog" which must be developed during the execution stage with the other components to prioritize and decide which topics, rules, policies, and which institutions must be subject of an accurate treatment. This information is included as an attachment named "National Reports".

## **1.2 Methodology to be used during the execution stage of the project**

Within the methodological issue, it is very important to highlight two basic principles that are fairly good for them to address the work procedure of this component in the execution stage of the project. (With this statement we assume IDEADS as this component executor).

The first one is to understand that IDEADS's work and its consultants will be instrumental and complemented regarding the criteria and priorities that arose from the components. In other words, no matter the institute counts on a good database regarding the issues that are under its competence (rules, policies, and institutional framework in Mexico, Belize, Guatemala, and Honduras, referred to the topics of Fisheries, Biodiversity, Water Pollution, Territory Ordering, and Tourism) and will create a basic work proposal. The other components must be the ones to make the decision, in its case and definitely, which rules, policies, and institutions to be accurately treated. The institute will contribute in the decision making by submitting its own criteria and arguments.

In this way, in the core of Workgroup number 1, the workshop carried out in Belize City, some general instructions were built, that it is recommended for the "Legislation, Policies, and Institutional Framework" component to follow them, to wit:

- a. The General Purpose of the work in Legislation and Policies must be "the legislation and policies corresponding to the topics fields for them to be determined as harmonic and compatible at the referenced region's level;
- b. For the harmonization and compatibility, prioritization must be given to rules and policies to be available to the users (lower hierarchy and the most specific ones);
- c. For the harmonization and compatibility, prioritization must be given to rules and policies that are related to the people that most directly affected or are nearer to the topics to be treated. Second, the ones that are related to the people that indirectly affect or are far away from them must be searched;

- d. As a criterion to choose in which policies and laws is better to work on, it is convenient to prioritize the ones that are less conflictive and that promises a higher hope of policy feasibility (policy will) and the social and economic feasibility;
- e. For the field work of the regional coordination, it is convenient not to think in the creation of new institutions but in the strengthening of what already exists (example TRIGOH) and in the terms of reference and instances of the "regional coordination";
- f. As a methodological tip, it is important that the legislation and policies harmonization work to be done for the priority of the highlighted topics by the components from priority listings of items or minimum requirements explained by themselves as well as the basic standards given with technical, scientific, economic, and social support;
- g. It is convenient to initiate the rules and policies harmonization from "generating" topics or activities (that are in critic paths of the processes or flows which correspond to the prioritized topics.)

Due the abovementioned instructions were created as a product of experts in some of the topics that correspond to the other components and that are supported not only in their experience but also in the expectations they have of the project, we think that it is convenient to assume them as basic directions for the way in which to proceed in the work of this component in the execution stage of the project.

The second basic principle that will follow up with the work of this component in the execution stage of the project is the one of respect to the exercise of sovereignty of each of the involved countries. In practical terms, this means that these are the competent instances in each of the countries that must make the decision regarding the way and the meaning of the rules, policies, and administrative structures that must be introduced, modified, etc. For this reason, IDEADS will structure its final products corresponding to the execution stage of the project such as recommendations listings or requirements that must accomplish rules, policies, and national institutions that may be mentioned.

In this matter, it is important to point out that the project must foresee what is going to happen with the products that IDEADS submits in the execution stage: to which authority the project must submit and what type of follow up is going to be given to guarantee their effective adoption.

A very developed example is presented in the attachments in the way in which IDEADS will elaborate its basic criterion of intervening for the second stage. This will be the document that will be useful for the discussion and dialogue with the other components to determine the issues that must be treated in an accurate way during the execution stage of the project.

In the case of each prioritized topic (rules, policies, and specific institutional frameworks) as intervening subject by the "Legislation, Policies, and Institutional Framework" component, IDEADS will review and analyze the current status of each one of the countries and to generate a requirements listing that must be met in each one of them (in the way they are displayed in the Attachment).

**2. General Report regarding the Findings and Recommended Actions**

Following there is a Chart in which the main categories of possible intervention appear for the "Legislation, Policies, and Institutional Framework" component in the execution stage of the project, the corresponding sub topics, and activities that are recommended to be carried out during the execution stage of the project. This is a synthesis. A more detailed issue not only of the Findings but also of the recommendations that appear in the Attachment, sorted in the following topics: Fisheries, Biodiversity, Water Pollution, Territory Sorting, and Tourism.

Topic and General Findings (Intervention Categories)	Required activities in the execution stage of the project and observations
<p>1. <u>Legal Framework</u></p> <p>a) a ruling fault is verified (ruling gaps)</p> <p>b) insufficient quality in the ruling is verified (i. e. Duplicity of competence, jurisdiction overlapping, non-adequate hierarchies, lack of suitability).</p> <p>c) lack of regional harmonization of the ruling regimes is verified, as well as the technical criteria and technical standards that must be used as the foundation.</p>	<p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, the laws that must be created will be identified. Accurate recommendations listings for each country will be generated in such way that the ruling elaboration to be in the exercise of sovereignty of each one of them.</p> <p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, the deficient laws will be identified, as well as the deficiencies themselves. The accurate recommendations listings will be created for each country, so the ruling creation to be in the exercise of sovereignty of each one of them.</p> <p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, laws and rules that must be harmonized will be identified. Accurate recommendations listings will be generated for each country in such way that the ruling creation will be in the exercise of sovereignty of each one of them.</p>

Topic and General Findings (Intervention Categories)	Required activities in the execution stage of the project and observations
<p>II. <u>Policies Framework</u></p> <p>a) lack of <u>explicit sector policies</u> is verified (topics) at a national level (topic policies gaps)</p> <p>b) lack of accurate institutional policies at a national level is verified (institutional policies gaps)</p> <p>c) the existence of sector policies is verified (topics) at a national level, not regionally harmonized</p> <p>d) the existence of explicit institutional policies is verified at a national level, not harmonized with the other institutional national policies and not harmonized with the counterparts or equivalent, at a regional level</p>	<p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, accurate recommendations listings will be identified for each country in some way that the ruling generation will be in the exercise of the sovereignty of each one of them.</p> <p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, institutional policies gaps must be identified. Accurate recommendations listings will be generated for each country in some way that the ruling generation to be in the exercise of the sovereignty of each one of them.</p> <p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, existent and accurate sector policies that require regional harmonization. Accurate recommendations listings will be generated for each country in some way that the ruling generation to be in the exercise of the sovereignty of each one of them.</p> <p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, explicit institutional policies will be identified that are not harmonized among them nor with the counterparts at a regional level. Accurate recommendations listings will be generated for each country in some way that the ruling generation to be in the exercise of the sovereignty of each one of them.</p>



Topic and General Findings (Intervention Categories)	Required activities in the execution stage of the project and observations
<p>III. <u>Institutional Framework</u></p> <p>a) responsible institutions with the inadequate or deficient competencies is verified (including that its officials do not count on their necessary powers) or lack of competent institutions</p> <p>b) the presence of responsible or competent institutions with institutional overlapping (institutional gaps)</p> <p>c) the existence of institutions with insufficient installed capacity to carry out their terms of reference and responsibilities</p> <p>d) lack of coordination among counterparts at a regional level is verified</p>	<p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, the differences in the existent institutions competencies will be verified. Accurate recommendations listings will be generated for each country in some way that the ruling generation to be in the exercise of the sovereignty of each one of them.</p> <p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, the main competence overlappings will be identified. Accurate recommendations listings will be generated for each country in some way that the ruling generation to be in the exercise of the sovereignty of each one of them.</p> <p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, the main deficiencies in the installed capacity of the responsible institutions and will be submitted to the decision of the other components for them to discuss and create recommendations. Accurate recommendations listings will be generated for each country in some way that the ruling generation to be in the exercise of the sovereignty of each one of them.</p> <p>From the priorities expressed by the other components and the criteria and minimum requirements given by the same, existent regional coordination gaps will be identified. Accurate recommendations listings will be generated for each country in some way that the ruling generation to be in the exercise of the sovereignty of each one of them.</p>

Following a listing of the activities that will be identified in the core of Group number 1, Belize City Workshop, and that give a very interesting key to assume the dimension that the component work must have during the execution stage of the project (the activities are written in agreement to the terms of the way the work of the "Legislation, Policies, and Institutional Framework" component must be.)

**1. Fisheries**

- A. Proposal for the conforming of the inter- ministries group, of the fisheries authorities, at a regional level.
- B. Proposal for the requirements for the adoption of rules/technical standards for the sustainable management of the fishery resources exploitable and harmonized in the 4 countries, most of all in:
  - 1. Close season period
  - 2. Fishing gears
  - 3. Species Size
  - 4. Control and surveillance mechanisms

**2. Biodiversity Management**

- A. Requirements proposal for the adoption of regionally harmonic national rules for the effective application and fulfillment of international agreements such as:
  - CITES
  - CDB
  - Convenio Interamericano para la Protección de la Tortuga Marina [Inter American Covenant for the Sea Turtle Protection]
  - RAMSAR
  - Protocolo de Cartagena – SPAW
- B. Mechanism proposal of Inter-Institutional coordination at a regional level for a better application of the previous international agreements.
- C. Requirements proposal ruling to guarantee better actions for the protection of endangered species (i. e. Manatee, Turtle, Dolphin), bioprospecting management and development of the Protected Areas of the Regional System.

**3. Water Pollution**

- A. Requirements proposal for the adoption of rules for discharging from sea sources to be harmonized in the 4 countries.
- B. Requirements proposal for the adoption in the national ruling of the commitments acquired in MARPOL and the other related covenants.

- C. Minimum requirements proposal for the creation of sea authorities in charge of the appliance of MARPOL and the other related covenants.

4. **Territorial Ordering**

- A. Requirements proposal for the adoption of the ruling for the space zoning and activities ordering in an harmonic way in the 4 countries for:
- Tourism
  - Industry
  - Agriculture
  - Human Settlements
  - Fishery
  - Other
- B. Requirements proposal for the adoption of an harmonic ruling in the 4 countries regarding the urban planning in the cities of the region.
- C. Proposal for the harmonization of policies for the urban development of the region

5. **Tourism**

- A. General proposal of general purposes and basic principles to be adopted in the national policies regarding Tourism, to obtain regional harmonization. In a particular term: to view the charge capacity, ecotourism promotion, subscription to SAM to the Mayan Route (?).
- B. Requirements proposal to be adopted in the national ruling, related to policies instruments, such as: allowances, voluntary rules subject to certification, taxes, etc.

3. **Conclusion and Recommendations to the PDC Design**

3.1. **Conclusion**

Since at the moment it is not possible to precise which rules, which policies, and particularly which institutions must be treated during the execution stage of the project, definitively because this must come from the other components, it is possible to acknowledge some minimum elements that can give a "sizing" of the Component to the execution stage of the project.

The first of them is about the possible topics (rules, policies, and institutions) that must be treated as a minimum. It may be preliminary considered that, as a minimum it is imperative to work in the topics/activities proposed during the Workshop in Belize City (product of group number 1) and that are displayed in Clause 2. Additionally to this listing, the activities that appear in the Attachments can be added.

It is also evident that for the development of the different topics to be chosen, IDEADS must carry out the work in all the categories mentioned in clause 2 (appointing this will not

always be the same). It is important to keep this in mind because this gives a very important situation to have an idea regarding the intensities of work which are necessary and the adjacent activities that must be carried out (mainly national and regional meetings; as well as the need to count on a main consultant, in charge of the coordination and final generation of the proposals, as well as national consultants.

Taking into account that this is about 5 great topics (Fisheries, Biodiversity, Water Pollution, Territory Ordering, and Tourism), 4 countries (Mexico, Belize, Honduras, and Guatemala) and a total of 11 different categories for the development of the 3 topics: policies, legislation, and institutional framework, it is evident that this will be a whole wide bunch of interventions: assuming that, as a minimum, one participation must be necessary for each topic (5); by country (4), and by category (11), only this will take us to a minimum sum (theoretical) of  $5 \times 4 \times 11 = 20$  participations...

### **3.2 Recommendations to the project's design**

Considering what is referred in the Conclusion (clause 3.1) as well as what concerns to the methodology to be used in the execution stage of this component, we think that what is much reasonable is to have the idea of the "Legislation, Policies, and Institutional Framework" component as a permanent counseling team of the project during a particular number of years.

Contractually, this team (formed out under the leadership of IDEADS, counting on a main consultant and national support consultants in each one of the countries) could be defined to solve, as a minimum, the activities listing adjusted by Group No. 1 of the Workshop in Belize City as well as other elements of this same nature and type to be chosen in the development of the project. Enough funds must be assigned for the development of its job (consultants fees, trips, and work meetings, as well as for secretarial support, etc.)

We recommend an initial full time formula and after a partial time one.

Mainly, we recommend the following formula:

2 years of full time basis for the general support stage to the other components of the Project, which means the development of mechanisms of regional coordination.

3 years of partial time basis for the implementation of concrete actions of harmonization and standardization in specific cases (i. e. close season periods, fishing gears, etc.).

**Central America Commission on Environment and Development  
Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**

**Annex 15**

**A. STAP Reviewer's Comments**

**Review of the Draft GEF Project Appraisal Document for the Conservation and Sustainable Use  
of the Mesoamerican Barrier Reef System**

The project is important, ambitious, very necessary and subject to external risks arising outside the immediate scope and control of the project design or operations.

Revisions to the project design in the past year have clarified the context in respect of other activities in the area. They have also addressed issues of communication and coordination particularly in the context of the workshop convened in June 1999 at the request of CCAD to draft an Action Plan for the MBRS.

I consider that there is evidence of high level commitment to coordination within and beyond the immediate components of the project and that this commitment should reduce the external risk to an acceptable level.

A project of this nature is essential to attempts to secure the future maintenance and wellbeing of the reefs and associated ecosystems of the Mesoamerican Barrier Reef Region. The work done to develop the project to this stage has involved substantial development of trust and recognition of transboundary issues which have to be addressed collaboratively.

I consider that it is important that the project proceed because it is important to maintain momentum to build on the basis of shared recognition of problems and acceptance of the need to find solutions.

Comments on project specifics are provided separately below.

RA Kenchington  
7 June 2000

**Review – Project Specifics**  
**Conservation and Sustainable Use of the Mesoamerican Barrier Reef System (MBRS)**

***Key issues***

*Scientific and technical soundness of the project*

The project is scientifically and technically sound.

*Identification of the global environmental benefits and/or drawbacks of the project*

The project has immense global environmental benefits. The MBRS is an important but endangered ecosystem which is likely to deteriorate seriously over coming decades if measures such as those contained in the proposal are not put in place.

*How the project fits within the context of the goals of GEF, as well as its operational strategies, programme priorities, GEF Council guidance and the provisions of the relevant conventions*

The project fits clearly within the biodiversity and oceans goals of the GEF. It is a priority area and has strong links with CBD, CITES and LOS.

*Regional context*

This is a regional project with highest level support of the participating countries Belize, Honduras, Guatemala and Mexico. The MBRS is a system of global importance and is a significant part of the heritage, biodiversity and natural resource base of coastal communities of Mesoamerica.

*Replicability of the project (added value for the global environment beyond the project itself)*

The project is an example of the approach being fostered by the International Coral Reef Initiative of addressing the conservation and sustainable use of coral reefs and related ecosystems at the regional scale. Success in this project will provide important working examples for the global community.

*Sustainability of the project*

The aim of the project is to build a sustainable basis for conservation and resource use. There is highest level commitment of the governments. The project has elements of risk in that it will involve the development and implementation of sustainable multisectoral management at the local, national and regional level. The design recognizes and seeks to address that risk through a number of community, consultative and educational measures.

*In the case of targeted research projects, it will be necessary to address the issue of the extent to which the project will contribute to the improved definition and implementation of GEF's strategies and policies, thus paving the way for more effective international, technical cooperation, assistance and investment projects.*

The project as a whole addresses fundamental issues in definition and implementation of GEF strategies and the achievement of international goals for conservation and sustainable resource use at the ecosystem and political regional scale. The risk has been mentioned above. The long term viability

of the strategies will depend on achieving success stories which can demonstrate the benefits and so reduce the risk of failure or disinclination to address sustainability.

### ***Secondary issues***

#### ***Linkages to other focal areas***

#### ***Linkages to other programmes and action plans at regional or sub-regional levels***

The project has a large number of linkages to national, aid funded and NGO programs in all four countries. These are detailed in Annex 13 (Threat and Root Cause Analysis) Matrix 3.

#### ***Other beneficial or damaging environmental effects***

The project if successful will lead to an understanding and acceptance in the local and national financial communities of the high social and economic costs of environmental failure and of attempts to restore damaged environments. If this is the case there should be increased resistance to attempts to pursue developments which promise short term bounty but do not address and fully integrate the short, medium and long term social and environmental costs.

#### ***Degree of involvement of stakeholders in the project***

The development of the project design has involved extensive work with stakeholders in the community, professional agencies and governments of the four countries. The design includes a number of mechanisms intended to maintain and further develop this approach.

#### ***Capacity-building aspects***

This is directly addressed in the project design with a sound range of training targets for staff involved as well as training trainers, community educators and teachers to provide the basis for ongoing capacity building.

#### ***Innovativeness of the project***

The project is ambitious and innovative in that it is dealing at the ecosystem scale with a shared natural heritage and resource base in a situation with four regional governments of nations at differing stages of economic development.

### ***Specific Comments on MBRS PAD***

#### ***B. Strategic Context – key performance indicators***

I suggest that something be added to promote public recognition also of the importance of the fundamental but vulnerable natural economic resource for the people of the region

#### ***Component 2. Regional EIS***

A related point but if the EIS is to address the processes which influence reef integrity it should clearly be seen to comprehend information on levels of use, opportunities and social and economic benefits from uses. If the EIS doesn't itself have such information it will need guaranteed access links to get it. The concern is to ensure that the MBRS is seen as a core part of social and economic life and not as a quasi cultural or aesthetic property which is the concern of science and foreign environmentalists.

*Other comments*

P 14. Benefits and target population third dot point. It is important to address the local populations currently dependent etc but as things develop it will also be important to look at the larger scales of national and regional costs and benefits. –The locals are unlikely to get into high-volume low-impact tourism, indeed they may be disadvantaged or displaced by it but the overall benefits at the national level and in terms of foreign earnings and at the national and international level in terms of conservation outcomes. The trick is to ensure that the interests or stake of the locals are taken into account in the overall cost benefit of any changed usage pattern.

P 15. reference to other projects - Be sure to coordinate with UNEP and other partners in the identification of demonstration sites to be supported under the Caribbean regional program of the International Coral Reef Network (ICRAN)'s Strategic Framework. There are clear opportunities for synergy between the two projects here in terms of MPA management training, monitoring and information exchange.

P 17 Indications of borrower commitment, para 3. The signatory status of the countries with respect to IMO conventions would be clearer in a table where all could see. This may generate some valuable peer pressure on those project participant countries which have not yet ratified the treaties.

P 21 Sustainability. Para 1 Could usefully reflect the usefulness of transboundary economic analysis and regional solidarity where the countries trade with the same buyers (e.g., cruise ship operators) and may be tempted or induced into trading environmental compliance standards for short term economic returns.

*Matrix 3 (Current and Planned Regional Projects/Programs Relevant to the MBRS)*

I found this very helpful. It certainly indicates the complexity and the scope of coordination.

*Matrix 2 (Main Transboundary Threats and Actions Proposed)*

Cruise shipping may also be worth mentioning as a transboundary threat. The experience of the last 2 years has shown us that the companies have yet to demonstrate that they can set and maintain acceptable environmental standards. Indeed it seems to be “smart business” to pressure to achieve exemptions from environmental standards and charges! That may not play well in Miami but given court cases in New York we should pressure them to meet standards or ship out!

*Information Deficiencies and Gaps Affecting the Threat and Root Cause Analysis*

Ecological. In addition to the Reef check etc there is a case for monitoring recruitments of fish and corals which are highly variable from year to year and are probably an important factor in resilience.

Tourism. Also useful to monitor levels of visitor expectation, visitor satisfaction and the direct impacts of tourism.

RA Kenchington  
7 June 2000



## **B. Response to the STAP Reviewer's Comments**

The project team has reviewed the STAP reviewer's comments and found them to be very supportive of the project overall. Suggested revisions to the design of specific activities and project performance indicators will be incorporated during the final stages of project preparation into the final project document. This will be part of a larger effort to sharpen the expected project outcomes in terms of performance benchmarks and indicators of progress toward achieving objectives on the ground. Based on these results, not only will project success be measured, but the replicability of specific outcomes determined for scaling up within and outside the region.

### **Response to Specific Comments:**

1. ***Regional EIS (Component 2) and Stakeholder Benefits.*** The final design of the EIS will be developed by the regional technical working groups in a series of workshops, facilitated by technical specialists in Coral Reef EIS. There is now a large body of literature on the types of monitoring and information indicators that need to be included in EIS, to assess socio-economic aspects relating to the sustainability of Coral Reef Ecosystems. These are directly related to the earlier point of ensuring that the public is aware of the economic importance and benefits derived from the MBRS, as well as the impacts that use activities may have on the viability of the system. These types of indicators will be discussed in the regional workshops to develop the data sets that will be included in the MBRS Regional Monitoring and Information System. The overall intent is to develop a user-friendly information system that is of use not only to scientists, but to inform decision-making and create a solid constituency in support of measure to conserve an outstanding marine resource.

2. ***Coordination with ICRAN.*** There is an ongoing exchange of information between the MBRS Project Team and the partners (e.g., UNEP, WCMC, UNF) developing the International Coral Reef Action Framework (ICRAN). A review of the draft ICRAN Strategic Framework by the TTL indicated where synergies may exist between the MBRS project and the proposed Caribbean Regional Program of ICRAN. These include the selection of demonstration sites in the Western Caribbean, MPA management training, monitoring and information dissemination. This dialogue will continue through the Bank's active partnership in ICRI (International Coral Reef Initiative) and ongoing exchanges at the technical level on activities under its sponsorship.

3. ***References to Cruise Shipping and the need to adopt uniform standards*** in the region related to Port State Control, waste management, waste reception are other commitments under MARPOL may be taken up on an issue by issue basis through the Policy Working Group, as well as the Sustainable Tourism Working Group, through dissemination of codes of conduct and design of a regional environmental certification scheme for sustainable tourism enterprises. However, it is likely that many of these issues will be more readily addressed under a complementary regional initiative to control Maritime and Marine Pollution in the Gulf of Honduras, by the IDB with assistance from the GEF.

4. ***Monitoring Tourism Impacts*** could be integrated into activities under the Sustainable Use Component related to carrying capacity assessments for tourism and criteria for the design of environmental certification programs in this sector.

**Central America Commission on Environment and Development  
Conservation and Sustainable Use of the Mesoamerican Barrier Reef System**

**Annex 16**

**Process Framework For Mitigating Potential Livelihood Impacts Associated With  
Strengthening Of Marine Protected Areas**

1. **MBRS Summary.** The Mesoamerican Barrier Reef System (MBRS) Project seeks to protect coral reefs and related coastal ecosystems in the region by promoting their conservation and sustainable use. It is a regional project that unites and strengthens efforts in four countries bordering the world's second longest barrier reef (Mexico, Guatemala, Honduras and Belize). The principal activities of the MBRS Project will include the: strengthening marine protected areas (MPAs), development of a regional environmental information system, promotion of measures to reduce non sustainable practices and adoption of alternative livelihoods in the fishing and tourist industries, environmental education, and regional harmonization of coastal and marine resources management through the coordination of national policies, institutional strengthening, and training. A key aspect of project preparation has been substantial consultation with stakeholders. A Social Assessment and Participation Plan, which includes activities to ensure active involvement of and benefits to Indigenous People in the Project area, has been developed (Annex 12 of the PAD).
2. **Marine Protected Areas (MPAs).** The MBRS has over 60 Coastal and Marine Protected Areas but many exist only on paper, with little or no on-site management. The Project will help consolidate a regional system of 15 MPAs, selected on the basis of their significance in relation to MBRS ecosystem characteristics, biological diversity and ecological processes, and their vulnerability relative to development impacts. Hotspots threatening the MBRS were identified during Project preparation as being in the two transboundary areas (e.g., near the Bay of Chetumal to the north, and the tri-national boundary area in the Gulf of Honduras to the south).
3. The Project will assist this network of MPAs through (i) upgrading existing operational plans (11 MPAs) or drafting new master management plans where none exist (4 MPAs); (ii) establishment of data baselines and monitoring programs to assess MPA effectiveness (15 MPAs); (iii) provision of basic equipment, construction of guard houses and small visitor centers in 5 transboundary MPAs; and (iv) cross border cooperation in policy, protection and management of transboundary MPAs. Table 1 identifies the 15 MPAs to be assisted under the Project, and the type of support to be provided. A map of these areas is attached as an Annex to the PAD.

### Marine and Coastal Protected Areas to be Support through the MBRs MPA Component

	Protected Area	Predominant Ecosystems	Legal Status	Status of Planning	Support to be Provided
1	Banco Chinchorro	Seagrass, reef, cays	Existing	Management plan	OP, modest management
2	Santuario del Manati	Mangroves and seagrass	Existing	Management plan	OP, modest management
3	Corozal Bay*	Mangroves and seagrass	Existing	No plan	MP/OP, modest management
4	Xcalak-Bacalar Chico <sup>1</sup>	Seagrass, mangrove, reef	Proposed	Plan being prepared <sup>3</sup>	Expand MP/OP, major management
5	Bacalar Chico <sup>1</sup>	Seagrass, mangrove, reef	Existing	Management plan	OP, major management
6	South Water Caye	Seagrass, mangrove, reef	Existing	Management plan	OP, modest management
7	Glover's Reef	Cays, reef, seagrass	Existing	Management plan	OP, modest management
8	Port Honduras	Cays, reef, seagrass	Existing	Plan being prepared	OP, modest management
9	Gladden Spit*	Reef (spawning aggregations)	Existing	No plan	MP/OP, modest management
10	Sapodilla Cays	Reef, cays, seagrass	Existing	Management plan	OP, modest management
11	Sarstoon-Temash* <sup>2</sup>	Mangroves and estuaries	Existing	No plan	MP/OP, major management
12	Sarstún <sup>2</sup>	Mangroves and estuaries	Proposed	Plan being prepared	OP, major management
13	Punta de Manabique	Swamp forest, mangrove	Proposed	Plan being prepared	OP, modest management
14	Omoa-Baracoa*	Coastal wetlands, mangroves, swamp forests	Proposed	No plan	MP/OP, modest management
15	Utila/Turtle Harbor	Swamp forest, reefs, seagrass, lagoons	Existing	Plan nearly finished <sup>4</sup>	Expand MP/OP, major management

1 Consists of one of the two MPAs forming the MPA complex in the *Bahia de Chetumal*.

2 Consists of one of the two MPAs forming the MPA complex in the *Golfo de Honduras*.

3 Plan does not include the Bacalar Chico portion of the MPA.

4 Plan only covers Turtle Harbor.

\* indicates MPAs to receive new Master Management Plans

major vs modest management refers to equipment package and infrastructure that will be provided

**4. No Physical Displacement.** To effectively implement the MBRS Project and its component on Marine Protected Areas, no involuntary *physical* displacement or relocation of people would be required, and none will take place as a part of this Project. This is consistent with recent Government practice in all four countries and in some (e.g., Guatemala) it is even prohibited by law. The multiple-use nature of most MPAs in the MBRS, which allows for strict no-take reserves within a core area, surrounded by zones of increasing levels of use, also minimizes the likelihood of significant economic displacement.

**5. Potential Impacts on Livelihoods.** Nonetheless, the possibility remains that some Project activities related to the strengthening of Marine Protected Areas, as in those cases where Management Plans currently do not exist or zoning has not been enforced, might affect the livelihoods of certain groups living within or adjacent to these sites, through new restrictions on their access. This Process Framework outlines the criteria and procedures which the MBRS Project will follow in such cases, to ensure that eligible, affected persons are assisted in their efforts to restore or improve their livelihoods in a manner which maintains the environmental sustainability and territorial integrity of the relevant protected areas. These criteria and procedures will be detailed in the Management Plans, existing or to be developed for these sites and closely linked to the Project's sub-component on Alternative Livelihoods, which aims to reduce environmental and social impacts through support for alternative income generating activities (e.g., linked to recreational fishing, diving, tourism and MPA management) In all cases where traditional resource users are affected by new restrictions in access or use associated with the Project, the MBRS Project would seek to address the livelihood issues of these persons in a manner which is transparent, just, and in accordance with the law in all four countries, as well as consistent with the World Bank's Safeguard Policies on Involuntary Resettlement (OD 4.30), Indigenous Peoples (OD 4.20), and Natural Habitats (OP 4.04).

6. In the preparation of management plans (i.e., updating operational plans or drafting new Master Plans), the following actions relevant to the livelihood concerns of residents or neighbors of MPAs will be carried out. For any given protected area, those steps below that have already been adequately completed in the past (as in the case of already established MPAs), would not be repeated, but updated as needed.

### **Evaluation of Each MPA**

7. (i) A rapid evaluation of basic ecological and socioeconomic factors and conditions in and surrounding MPAs, including legal and policy analyses and land tenure issues, will be undertaken in the context of Marine Protected Area Management planning. In these evaluations, resources used by local populations (type of use, frequency of use, destination) and the cultural and socio-economic characteristics of the users as well as their level of economic dependency, will be identified and assessed.
- (ii) An assessment of the need to restrict access to previous users of MPA sites the types of uses allowed (e.g., through restrictions in fishing gear, location, type and size of species harvested) will be carried out along with an analysis of eligibility of these users for economic mitigation assistance under the Bank's OD 4.30.

## **Consultation and Participation**

8. Project preparation has benefited from a consultative process involving the input of stakeholders at all levels. A social assessment focusing on local community inputs and profiling was also carried out (see Annex 12 of the PAD). The social assessment methodology included field visits, surveys and open-ended interviews with representatives from all key ethnic and indigenous groups in the four participating countries. Focus groups and discussions with local experts were held to determine the main issues that were of concern to local communities with regard to conservation and use of MBRS resources, and how best to ensure their participation in project benefits and decision-making in areas directly affecting them.

9. All four countries currently have laws requiring consultation with local stakeholders prior to the establishment of protected areas and boundary demarcation. The development of management plans must also be done in consultation with local populations and interested parties. Good practice in MPA management planning and implementation encourages the participation of civil society through the formation of a local advisory committee or multi-stakeholder group to ensure that all legitimate interests are represented.

- (iii) Local advisory councils, consisting of key stakeholders (such as parties affected by economic displacement due to MPA existence) in and around MPA sites will be established. These stakeholder groups will be consulted on the development of MPA management plans, involved in decision-making and invited to take part in monitoring of these plans. The local councils could also serve as fora for resolution of conflicts related to MPA social issues. The analyses carried out in the steps above would be done with the active participation of local communities through the local advisory councils or other representative groups.

## **Identification of Mitigation Measures.**

10. In those cases where new restrictions on the use of resources in MPA sites (e.g., in the case of MPAs without current zoning or Management Plans, such as in Corozol Bay, Gladden Spit, Sarstoon-Temash, Omoa Baracoa) result in significant economic displacement of legitimate resource users, mitigation measures to help offset this economic loss will be supported under the project. Assessment of the eligibility of affected groups and the kinds of mitigation measures to be provided will be conducted with the participation of local people.

11. Mitigation measures under the MBRSP will be linked to the Project's Sustainable Use Component and will focus primarily on assistance in the development of alternative livelihoods that would improve the economic condition of affected people. These include training in sustainable livelihood activities such as sport-fishing, kayaking, fly-fishing and recreational diving. For a reasonable post-training transition period, trainees will be provided with the necessary equipment to become immediately involved in income-generating activities using the newly acquired skills. For each livelihood scheme considered, the cultural, social and economical feasibility of the activities to be carried out under the Project will be assessed to determine their appropriateness and how best to integrate such mitigation measures into the management plans for the MPA site.

12. Other mitigation measures in the context of community development, identified in the Indigenous Peoples Development Plan (see PAD Annex 12, Social Assessment), may also be appropriate. These include: a social communications campaign to educate people about the MBRS and its ecological, social and economic value, a local institutional development plan, a regulatory framework for the economic development of indigenous and ethnic groups, gender specific training in small and medium enterprise, technical groups and fora to discuss land tenure issues and other conflicts which are not necessarily related to MPAs but to resource use within the MBRS

**Incorporation of Alternative Livelihood Schemes**

13. For each livelihood system selected, a program will be designed which shall be integrated into the Management Plan for the MPA site in question. In the case of Indigenous People, such assistance will be part of the "Indigenous People's Development Plan" of the Social Assessment (Annex 12 of the PAD). Management plan preparation associated with each MPA will be carried out in consultation with surrounding communities and stakeholders, through the protected area advisory councils to be set up for each MPA.

14. New restrictions or limitations concerning natural resource use within Marine Protected Areas will only be enforced after economic mitigation measures are in place.

**Financing of Alternative Livelihood and Other Economic Mitigation Measures**

15. Assistance in the development of alternative livelihoods for economically displaced individuals will be financed through the budget of Part C of the project. Other mitigation measures, such as those identified in the Participation Plan and Indigenous Peoples Development Plan have been budgeted for and integrated into other project components.

**Preparation and Implementation Responsibilities.**

16. Preparation of Protected Area Master Management Plans in newly established or proposed MPAs and related Operational Plans in all Project MPAs will serve as the mechanism for this Process Framework in these areas. Implementation of the Management Plan and Operational Plan will be the responsibility of government and those institutions (both public and private), authorized to manage the Protected Areas in question. The MBRS Project staff will facilitate and monitor progress toward management plan implementation. Certain MPA management tasks (e.g., management plan preparation and training in alternative livelihood activities) may be contracted out by the National Authorities to qualified organizations. The sociologist of the Project Coordination Unit will be responsible for the coordination of all the activities necessary to ensure participation by indigenous and ethnic communities in the implementation of the Alternative Livelihood Programs.

14. **Monitoring and Evaluation.** Independent of supervision by the National Authorities responsible, it will be the responsibility of the MBRS Project, and in particular the role of the PCU NRM Specialist and the Sociologist, to closely monitor these tasks, including via periodic participatory assessments by project beneficiaries, with publication of the results thereof, to ensure that management objectives are being met and to ensure that project goals are being achieved. Supervision mission by Bank Staff will also be used to periodically

monitor progress in implementation of the Process Framework and of the MPA Management Plans and Operational Plans which would serve as the Action Plans for this framework. A Mid-term Evaluation of the Project will provide a more formal review of progress against benchmarks and of project performance in this context.

Marea Eleni Hatzios

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