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EL SALVADOR, HONDURAS, NICARAGUA

INTEGRATED MANAGEMENT OF THE ECOSYSTEMS OF THE GULF OF FONSECA

(RS-X1019)

GEF PROJECT DOCUMENT

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CONTENT

ABBREVIATIONS

ACTRIGOLFO	*Asociación Civil Trinacional del Golfo de Fonseca*
ACUGOLFO	*Agrupación de salineros, agricultores, comerciantes, ganaderos y pescadores*.
TDA	Transboundary Diagnostic Analysis
AECI	Spanish International Cooperation Agency
ALIDES	Central American Alliance for Sustainable Development
AFE-COHDEFOR	Forestry Administration of COHDEFOR
ANDA	*Administración Nacional de Acueductos y Alcantarillados (El Salvador)*
ANDA	*Asociación Nicaragüense de Acuicultores (Nicaragua)*
ANDAH	*Asociación Nacional de Acuicultores de Honduras*
APAGOLF	*Asociación de Pescadores del Golfo de Fonseca*
ASIGOLFO	*Asociación Intermunicipal de Municipios del Golfo de Fonseca*
IDB	Inter-American Development Bank
CATIE	Tropical Agricultural Research and Higher Education Center
CCAD	Central American Commission on Environment and Development
CEPA	*Comisión Ejecutiva Portuaria Autónoma of El Salvador*
CIRA	*Centro Investigaciones Recursos Acuáticos - Nicaragua*
CODECA	*Asociación Coordinadora de Comunidades para el Desarrollo del Cacahuatique*
CODDEFFAGOLF	*Comité para la Defensa y Desarrollo de la Flora y Fauna del Golfo de Fonseca*
COHDEFOR	*Corporación Hondureña de Desarrollo Forestal*
COPECO	*Comisión de Contingencias*
DANIDA	Danish Agency for International Development
EIA	Environmental Impact Assessment
ENSO	El Niño – Southern Oscillation, warm phase
ENP	*Empresa Nacional Portuaria de Honduras*
FENAPESCAH	*Federación Nacional de Pescadores de Honduras*
FENICPESCA	*Federación Nicaragüense de Pescadores Artesanales*
FORCUENCAS	Project to Strengthen Local Natural Resources Management in the Patuca, Choluteca, and Negro river watersheds
GEF	Global Environmental Facility
GTZ	German Cooperation Agency
INAFOR	*Instituto Nacional Forestal of Nicaragua*
INETER	*Instituto Nicaragüense de Estudios Territoriales*
INTUR	*Instituto Nicaragüense de Turismo*
LIDER	*Fundación Luchadores Integrados al Desarrollo de la Región*
MAG	Ministry of Agriculture of El Salvador
CENDEPESCA	*Centro de Desarrollo Pesquero*
CENTA	*Centro Nacional de Tecnología Agrícola y Forestal*
MAGFOR	Ministry of Agriculture and Forestry of Nicaragua
MARN	Ministry of Environment and Natural Resources of El Salvador
MARENA	Ministry of Environment and Natural Resources of Nicaragua
MIFIC	Ministry of Industrial Development and Commerce of Nicaragua
ADPESCA	*Administración Nacional de Pesca y Acuicultura*
NASMAR	*Mancomunidad de Municipios del Golfo de Fonseca en Honduras*
NOAA	U.S. National Oceanic and Atmospheric Administration
OAS	Organization of American States
NGOs	Non-governmental organizations
SAP	Strategic Action Program
SANAA	*Servicio Autónomo Nacional de Acueductos y Alcantarillados*
PARCA	*Plan Ambiental de la Región de Centro América*

PERCON	Strategic Regional Program on Connectivity
PERTAP	Strategic Regional Program on Protected Areas
PGIEGF	*Proyecto Gestión Integrada de los Ecosistemas al Golfo de Fonseca*
UNDP	United Nations Development Program
UNEP	United Nations Environmental Program
PROARCA-SIGMA	Regional Environmental Program for Central America, USAID – Environmental Management Systems
PROGOLFO	*Proyecto Conservación de los Ecosistemas Costeros del Golfo de Fonseca*
PROMANGLE	*Proyecto Manejo y Conservación de los Manglares del Golfo de Fonseca*
PROMEBIO	Strategic Regional Program for Monitoring and Evaluation of Biodiversity
SAG	Secretariat of Agriculture of Honduras
DIGEPESCA	*Dirección General de Pesca y Acuicultura*
SELVA	*Asociación Somos Ecologistas en Lucha por la Vida y el Ambiente*
SERNA	Secretariat of Environment and Natural Resources Honduras
SGSICA	General Secretariat of the Central American Integration System
SNET	*Servicio Nacional de Estudios Territoriales*
UCPR	Regional Project Coordination Unit
USAID	United States Agency for International Development

I. FRAME OF REFERENCE

A. Transboundary collaboration in the Gulf of Fonseca

1.1 This project responds to a series of agreements signed by the Governments of El Salvador, Honduras and Nicaragua. In 1993, the Presidents of the three countries signed the *Amapala Agreement*, where they affirmed their interest in conserving and preserving the Gulf due to its importance for each country. In the context of *Plan Puebla Panamá* (PPP), the three countries also selected the Gulf of Fonseca as a priority area for regional integration, and in 2004 asked the IDB to support the preparation of a GEF project that would promote the integrated management of its ecosystems. As a part of developing the present proposal, a donor roundtable for the Gulf of Fonseca was held at Zacate Grande Island, Honduras in 2005. The Ministers of the Ministry of Environment and Natural Resources of El Salvador (MARN), the Secretariat of Environment and Natural Resources of Honduras (SERNA), and the Ministry of Environment and Natural Resources of Nicaragua (MARENA) signed the Declaration of Zacate Grande, where they agreed to push forward a trinational coordination initiative for the integrated management of the Gulf, with the aim of managing its ecosystems in a sustainable manner as a means of enhancing their countries' development with a regional perspective. The Declaration recognizes that achievement of this goal will require a consolidated effort on the part of all donors, including complementary financing for the non-reimbursable GEF funding. The IDB agreed to support the formulation of the trinational project with the endorsement of the involved Governments and in cooperation with the Central American Commission on Environment and Development (CCAD).

B. Description of the Gulf of Fonseca

1.2 **Biogeographical aspects**. The Gulf of Fonseca is situated along the Central American Pacific coast, bordering the *Republic of Honduras* to the North, the Pacific Ocean to the South, the *Republic of El Salvador* to the west; and the *Republics of Nicaragua* and Honduras to the east. It is a tropical estuarine system made up of a set of interrelated ecosystems, such as its interior estuary, mangroves, and continental and island coasts encompassing an area of 3,200 km^2. It is part of the Pacific Central American Coastal Large Marine Ecosystem (LME).[1] Mangroves occupy 1,100 km^2, accounting for approximately 22% of the entire area of mangroves along the Pacific coast of Central America. The Gulf has a variable depth, but is characterized by shallow waters, having at its mouth depths of nearly 30 m, and in the bays from 10 m to 0.5 m (Figure 1). It has a continental coastline of 409 km in length. Within the Gulf, 18 islands add up to an extension of 547 km^2. Six main tributary watersheds and other smaller ones cover an area of approximately 21,000 km^2 (Figure 2). The Goascorán and Río Negro watersheds are transboundary, the first shared by El Salvador and Honduras, the second by Honduras and Nicaragua. As one of only two multinational maritime bodies in Central America with transboundary watersheds[2], the Gulf requires particularly close international coordination to maintain the integrity of its ecosystems.

[1] http://na.nefsc.noaa.gov/lme/text/lme11.htm

[2] The other multi-national maritime body is the Gulf of Honduras.

Figure 1. Bays that form in the Gulf of Fonseca and other relevant characteristics

Figure 2. Tributary Watersheds Drainage into Gulf of Fonseca

1.3 **Ecological importance**. Along with the Gulfs of Guayaquil, Nicoya, Chiriqui and Panama, the Gulf of Fonseca is one of the most important tropical coastal systems along the Eastern Pacific Ocean in Latin America due to the size of the estuarine complex and mangrove belt and its proximity to areas with high concentrations of nutrients such as seasonal upwellings and seamounts. Similarly, it is also considered as one of the most biologically rich maritime areas of Central America and provides spawning, nursery and

feeding areas for a range of species of fish and shellfish, including stocks that have traditionally supported the most productive artisanal fisheries in the region. Given its physical and ecological characteristics, the Gulf has traditionally sustained one of the most productive artisanal fisheries of the region, and currently accounts for a significant share of the total production of shrimp farmed in Central America, an important source of revenue for all three countries.

1.4 In 1999, an area of 69,711 ha of mangrove in the Honduran part of the Mesoamerican Biological Corridor was designated Ramsar site #1000[3] due to its importance as shelter for migratory and resident birds, and as spawning, reproduction, and feeding areas for turtles, crustaceans, mollusks, and fish. In 2001, the Estero Real and Llanos de Apacunca deltas in Nicaragua (81,700 ha) were also designated Ramsar site #1136[4], as they were considered crucial for conserving the water resources of the region and habitats for species whose conservation is of global importance. The mangroves, in addition to providing economic sustenance, serve as filters as they retain contaminants from the mainland, retain sediments, and provide a first line of protection against coastal erosion and the impacts of tropical storms that are frequent in the Gulf region.

1.5 The area of the Gulf of Fonseca includes ten Protected Natural Areas under co-management agreements in the coastal marine zone of Honduras (total area of 812 $km^{2)}$; four in the coastal marine zone of Nicaragua, two co-management agreements (total area of 764 km^2); and two in El Salvador, with an area of 229 km^2 and with co-management agreement, though they have yet to be officially declared Protected Natural Areas. As briefly described above, the integrity of the Gulf's coastal and marine ecosystems and the tributary watersheds to which they are directly linked, contribute to regional and global benefits. They also raise complex transboundary considerations such as sustainable fisheries, pollution and sediment control that call for a vision shared among all three countries of the Gulf's future development and innovative action at the local level to attain that goal.

C. Socioeconomic Context

1.6 **Population**. The estimated population of the Gulf of Fonseca region is more than 750,000 persons, distributed across 19 coastal municipalities (Table I-1). To a large extent, they meet their needs by directly using the goods and services provided by the Gulf. In recent years, the population in the Nicaraguan part of the Gulf region has increased 4.2%, greater than the national average; in Honduras, population increase has been 2.3% on average, though some municipalities have rates above 3.5%; and in El Salvador this increase has been of 1.2%, the lowest rate of population increase in the area. However, on average, population density in the Gulf region is greater than the national population density in any of the three countries.

[3] http://www.ramsar.org/sitelist_order.pdf

[4] Ibid.

Table I-1. Population, Area, and Population Density

Municipality	Population	Area (km²)	Population Density (persons/ km²)	Municipality	Population	Area (km²)	Population Density (persons/ km²)
Honduras (2006)				**Nicaragua (2001-2005)**			
San Lorenzo	31,662	234.6	135	Chinandega	121,793	686.61	177
Nacaome	50,580	528	95.8	El Viejo	76,775	1279.41	60
Amapala	10,538	80.7	130.6	Somotillo	29,030	724.71	40
Choluteca	134,452	1069.1	125.8	Puerto Morazán	13,328	517.34	25
Marcovia	42,671	428.3	88.5	Villanueva	25,660	779.88	33
El Triunfo	36,705	301.5	121.7	**El Salvador (2005)**			
Namasigue	25,606	200.9	127.5	La Unión	36,903	144.38 [2]	255
Alianza	7,707	215.0	35.8	Conchagua	42,229	209.09	202
Goascorán	13,673	200.5	68.2	Meanguera	7,738	16.68	463
				San Alejo	22,793	251.64	77
				Pasaquina	23,814	295.28	80

Source: UNDP (2006), UNDP (2005). PROGOLFO, 1998.

1.7 **Access to Basic Services**. There is uneven coverage of basic services (drinking water, wastewater treatment, solid waste management, electricity, and communications) in the 19 municipalities of the Gulf (Table I-2). Such services are generally only found in the main town in each municipality. A high percentage of rural homes (between 80% and 95%, depending on the country) do not have domestic sewage treatment. Solid waste is also poorly managed, especially in rural areas, where trash is normally burned, buried, dumped at unauthorized trash heaps, and disposed of in mangroves, rivers and creek beds, contributing to a large extent to the Gulf's pollution. Similarly, most of the water supply services do not provide any treatment and are not truly potable. Inhabitants lacking services in their homes obtain water from rivers and shallow wells other sources near their homes, few of which can be considered as safe for consumption. Thus, gastrointestinal diseases are the leading factor in terms of both, morbidity and mortality.

Table I-2. Access to Basic Services

Municipality	Electricity (%)	Access to water (%)	Municipality	Electricity (%)	Access to water (%)
Honduras (2006)			**Nicaragua (2001-2005)**		
San Lorenzo	nd	79.8	Chinandega	43	90.5
Nacaome	18	48.3	El Viejo	48	40.7
Amapala	29	59.1	Somotillo	39	75.4
Choluteca	37	63.9	Puerto Morazán	32	96.1
Marcovia	15	49.2	Villanueva	31	40.8
El Triunfo	9	21.5	**El Salvador (2005)**		
Namasigue	5	33.6	La Unión	60	33.4
Alianza	nd	64.9	Conchagua	Nd	81.5
Goascorán	nd	36.9	Meanguera	97	84.5
			San Alejo	54	49.8
			Pasaquina	91	52.9

Source: UNDP (2006), UNDP (2005). PROGOLFO, 1998; Informe 262 El Salvador 2006, ODM.

1.8 **Economic structure**. The majority of the economically active population in the Gulf's region[5] depends on primary sectors, with subsistence agriculture and artisanal fishing in the coastal zones being the leading sources of employment. During the last decade, new productive activities such as small factories and agro-industries have developed with a focus on production of non-traditional exports such as shrimp farming, the production of watermelon, melon, and cashews. Additionally, commerce and services' sectors have been showing a steady growth rate during recent years, with sharp increases expected in sectors such as commercial shipping.

1.9 **Agriculture and agroindustry**. Agricultural subsistence activities are predominant in the entire Gulf region. Farmers have limited access to government services, financial aid and technical assistance, which diminishes opportunities to enhance productivity and commercialization in a sustainable manner. Even if the majority of the land in coastal municipalities is owned by cooperatives, these are in the process of selling the lands, so that current land use is expected to shift to non-agricultural uses such as urbanization, tourism, *maquila* and speculation. Cattle production systems are generally family-based and dual purpose, all involving extensive grazing with little technology. Regarding agroindustry, in Nicaragua and Honduras the production of sugarcane continues to be important in the Gulf of Fonseca municipalities, alongside the industrial production of soy, cotton, peanuts and sesame. For Nicaragua and El Salvador, corn production is an important activity. The main agroindustrial companies in the Gulf area are located in Honduras. Other major agroindustrial firms found in Honduras are the melon and watermelon packing facilities. Other industries in the area include processors of cashew, peanuts, feed concentrate, and dairy products. It is important to highlight two features: (a) most of the employment generated in these sectors are either temporary or unstable, and (b) agricultural production systems (either subsistence or intensive) need to improve sustainable land management practices and reduce agrochemical run-off, in light of their existing and potential impacts on the Gulf's ecosystems.

1.10 **Fishing.** The Gulf is particularly significant in terms of marine and coastal biodiversity and productivity. It is also habitat to shared species such as shrimp (*Loliolopsis diomedeae*), pargos (*Pagrus pagrus*), corvina (*Pachyurus bonariensis*), dorados (*Salminus maxillosus*), robalo (*Centropomus robalito*), picudo (*Xiphias gladius*), and smaller pelagic species. Most of these species fetch high commercial prices in domestic and foreign markets. Fishing in the Gulf of Fonseca is primarily artisanal, except for a small commercial fishing fleet represented principally by two firms established in 2003 at the Port of La Unión (El Salvador) engaged in tuna fishing and processing. There are approximately 20,000 artisanal fishers in the region (Table I-3). Some work in fishing to supplement their main jobs as wage-workers in industrial or agricultural activities. Some 72% of the vessels are wooden dinghies, while 28% are fiberglass boats[6]. In addition to traditional fishing practices, fishing for shrimp post-larvae has increased in the last decade. This activity involves the use of toxics during the process of collecting and sorting larvae to eliminate the accompanying by-catch, placing stocks under additional pressure. As fisheries in the Gulf are market-driven with primarily open access conditions, overexploitation is common. As a result, stocks of fishes and crustaceans are reported to be declining based on volumes of catch, catch per unit effort (as well as the size of individuals), while fishing pressure as determined by the size of the fishing fleet and number of licensed and unlicensed fishers has increased.

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5 Honduras 180,000 persons, Nicaragua 84,400 persons, El Salvador 45,600 persons.

6 WWF, PROARCA. Las Voces de los Pescadores. Estudio trinacional del sector pesquero artesanal en el Golfo de Fonseca.

Table I-3. Fishing Activity in the Gulf of Fonseca[7]

Country	Number of industrial boats	Number of artisanal boats	Number of artisanal fishers	Species	Production (metric tons annually)
Honduras	Fishing in the Honduran part of the Gulf of Fonseca is mainly artisanal.	2,450 Most made of fiberglass or aluminum. Outboard motors from 15 to 25 HP.	11,700 (including 4,000 engaged in catching shrimp post-larvae)	White shrimp, shrimp post-larvae, tilapia	1,000 metric tons annually
El Salvador	17 authorized motorboats (only 10 in operation)	3,600	13,000	White shrimp Brown and red shrimp Prawns Pargo, róbalo, corvina, macarela. Larger pelagic species such as yellow-fin tuna, barrilete, patudo, and shark.	NA
Nicaragua	Fiberglass launches or dinghies with outboard motors up to 75 HP	NA	5,384	Lobster, shrimp, dorado, pargo, mero, shark.	122,000 pounds of shrimp tail 240,000 pounds of lobster tail.

1.11 **Aquaculture.** The ecosystems of the Honduran and Nicaraguan areas of the Gulf of Fonseca are particularly favorable for aquaculture. This economic activity generates an important amount of employment either permanent or temporary. In Honduras, aquaculture is concentrated in the departments of Choluteca and Valle[8], providing employment to approximately 27,000 persons. There is, however, currently a moratorium on new shrimp pond concessions. There is also a relevant artisanal production of tilapia, as an alternative for fishers. In Nicaragua aquaculture is concentrated in the Estero Real, department of Chinandega[9], providing employment to 26,000 persons, and it has been developed through cooperatives and private enterprises. This activity has given rise to the shrimp processing plants in the area. In El Salvador, aquaculture has not developed at the same rate as in Honduras and Nicaragua, and though there are two shellfish processing plants, most of the product is caught in high seas[10]. While its economic relevance is undeniable (Table I-4), there is concern that the development and operation of shrimp farms could cause negative effects on the carrying capacity of the estuarine ecosystems[11].

7 FAO. Informational summary on fisheries by country: El Salvador (2005), Honduras (2002), Nicaragua (2002).

8 CLACDS-INCAE (Centro Latinoamericano de Competitividad y Desarrollo Sostenible) Brenes, Esteban. Figueroa, Luis. Pomareda, Carlos. 1997. La Industria del Camarón en Honduras, Condiciones de Competitividad.

9 Cato et al. 2005. Nicaragua's shrimp subsector: Developing a production capacity and export market during rapidly changing worldwide safety and quality regulations. Agricultural and Rural Development Discussion Paper. World Bank, p. 17. http://siteresources.worldbank.org/INTRANETTRADE/Resources/Topics/Standards/NicaraguaCountrySurveyF.pdf

10 FAO, 2005. Informational summary on fisheries by country: El Salvador. http://www.fao.org/fi/fcp/es/SLV/profile.htm

11 Ward (n.y.) Evaluation of the shrimp farming impacts in the Gulf of Fonseca Region. See http://pdacrsp.oregonstate.edu/pubs/technical/17tch/8HR2-2.pdf

Table I-4. Shrimp Farming and Exports

	Hectares farmed[12]	Exports[13]	
Country		Value (US$ millions)	Volume (thousands of kilos)
Honduras	10,490	152	16,654
Nicaragua	9,351	23	7,000
TOTAL	19,841	175	23,000

1.12 **Mining.** Mining activities are of limited scope in the municipalities of the Gulf. There are limestone quarries in operation in Honduras with mines exploiting deposits of gold, silver, copper, gypsum/limestone, and ornamental stones in the municipality of Marcovia. In Nicaragua there are three gold mines in the municipality of Villa Nueva in which nearly 100 persons work. In El Salvador, kaolin deposits are found in the region known as La Carmen, and mineral resources are to be found in most of the municipalities of the region. Salt production is another industry developed to some extent in El Salvador and Honduras. El Salvador has some 150 enterprises that generate seasonal employment, including approximately 1,500 direct jobs and 300 indirect jobs. Despite the small-scale mining activity, the use of primitive and low cost technologies by artisanal miners expose themselves and others in the region to a large proportion of neurotoxins. Toxic elements such as copper, cadmium and zinc –often associated with acidic mine drainage may be affecting local aquatic life (in both the tributary watersheds and the Gulf).

1.13 **Services Sector.** Basic services such as banking, mail, and telecommunications are concentrated in the departmental capitals. Outside of the urban centers, the infrastructure for trade and services is inadequate. Tourism is not yet significant in terms of employment and benefits due to weak marketing, an incipient communications network, limited local capacities in tourism management and limited access to credit. This situation prevents benefits to be expanded from the coastal areas towards other parts within the Gulf. The greatest potential for sustainable tourism is associated with the coastal zone and nearshore waters of the Gulf, including its islands and protected areas. Basic sanitation and tourism infrastructure works, along with appropriate planning schemes are required if the industry is to develop its potential in a sustainable manner. **Port operations** are concentrated in San Lorenzo in Honduras. However, the development of the megaport in Port of La Unión - Cutuco in El Salvador and the construction of the dry canal that is to join this port with Puerto Cortés (Honduras) on the Atlantic represent a significant economic opportunity for the Gulf Region as well a factor that will contribute to increased maritime and overland commercial transportation.

[12] Source data for Honduras: FAO, 2002. Informational summary on fisheries by country: Honduras; Source data for Nicaragua: Cato et al. 2005.

[13] Source data for Honduras: Central Bank of Honduras, 2005. Exports of Goods from Honduras 2000-2004. http://www.bch.hn/download/exportaciones_2000_2004.pdf
Source data for Nicaragua: IICA-JICA. 2004. Cadena Agroindustrial de Mariscos en Nicaragua. http://www.iica.int.ni/Estudios_PDF/Cadena_Marisco.pdf

Table I-5. Comparative Volume of Port Operations in the Region

Port	Ocean	Country	Freight (thousands of tons)			
			2001	2002	2003	2004
Acajutla	P	ES	4,575	4,546	4,698	4,686
La Unión-Cutuco**	**P**	**ES**	**-**	**-**	**-**	**987**
San Lorenzo	**P**	**H**	**783**	**718**	**659**	**811**
Cortés	A	H	5,862	5,782	6,306	7,012
Corinto	P	N	1,115	1,107	1,088	1,296
Sandino	P	N	1,184	933	1,000	978
Total Central America			59,633	56,991	64,207	76,134

* Source: COCATRAM http://www.cocatram.org.ni/estadist.htm

** Estimate for the first year of operations, includes imports, exports, and domestic use. Source: EIA for Puerto Cutuco, 2004.

D. Regional and National policies and institutional framework

1.14 **Legal framework.** There are several norms and agreements that aim to regulate the activities that could affect the Gulf's ecosystems. These include the right to a healthy environment as a constitutional right, international conventions and agreements on the environment, regional agreements in the context of Central American integration, and a variety of domestic statutory provisions. Some of these instruments, though not all, mention coastal and marine resources. *El Salvador* mentions the protection of these resources in its Law on the Environment, which comes under the jurisdiction of MARN, although specific regulations have yet to be developed. There is also the Law on Fisheries, which is managed by CENDEPESCA within the Ministry of Agriculture. In *Honduras*, in addition to the provisions of the General Law on the Environment, the Potable Water and Sanitation Law gives SERNA and SANAA the main responsibilities for watershed management. There is also a Fisheries Law that regulates the activity, which is managed by DIGEPESCA within the SAG. In the case of *Nicaragua*, there are the General Law on the Environment and Natural Resources managed by MARENA, as well as a Fisheries and Aquaculture Law with corresponding regulations, administered by ADPESCA within the Ministry of Industrial Development and Commerce. Although there is a Central American fisheries policy, different actors have expressed the urgency of adapting this fisheries policy to the reality of the Gulf, and of working in coordination for its implementation.

1.15 Despite the existing national legislation regulating activities that could affect the Gulf's ecosystems, there are some gaps that need to be taken into consideration with a view of moving towards legal frameworks that support effective, integrated management of the Gulf. These are related to: (i) the absence of either laws or regulations for land use planning and management (i.e., *'ordenamiento territorial'*); (ii) overlapping and/or contradictory regulations for watershed management; (iii) weaknesses in national Fisheries Laws that are often outdated and that fail to incorporate the foundation for managing sustainable fisheries consistent with the FAO Code-of-Conduct for Responsible Fisheries and international best practice for regulating coastal aquaculture; and (iv) the lack of regulations on the coastal-marine zone (pollution, sedimentation, dredging, filling).

1.16 Additionally, the application of national legislation often suffers from 'regulatory dispersal' and a sectoral normative outlook on key issues, where the application of one specific sectoral norm is eventually cancelled by the impact of another from a different sector or institution. The legal analysis conducted for the preparation of the project provides examples such as the following: (i) in Nicaragua, several conflicts exist because the overlapping institutional responsibilities related to water use among INAA, MIFIC, MAGFOR, INE and MARENA, considering that the hydroelectric and agricultural sectors' use/demand can generate negative impacts on water resources, whereas the environmental legislation aims to protect watersheds and water resources for human consumption; (ii) in Honduras, the Law on the Exploitation of National Waters has a sectoral approach that does not respond to the current needs of regulating the use of this resource, making evident several contradictions when applied by institutions such as DGRH/SERNA, DGRD/SAC, SANAA, Municipalities, Health Secretary and the National Energy Enterprise; (iii) in Nicaragua, there are inconsistencies between the central and local governments that have impeded the development of municipal statutory provisions for regulating the use of the marine and coastal zone and its associated resources[14].

1.17 In addition to the overlaps, contradictions and gaps, there are other factors that prevent the three countries from working in a more effective manner in promoting compliance and enforcing the legal framework relevant to the management of the Gulf's ecosystems. The main issues can be summarized as follows: (i) limited institutional and financial capacity from key institutions for promoting compliance (i.e., through economic and other incentives) and enforcing the existing laws as well as a general sense of specific-sites lawlessness; (ii) despite the existence of regulations, environmental infractions are not adequately penalized due to poor monitoring and control given the scarce personnel for these duties; (iii) environmental audits as well as environmental impact assessments for developments in the coastal zone do not have a clear procedural framework for their application; and (iv) although there are existing regional agreements between the three countries reflecting their commitment to cooperate in managing the Gulf's ecosystems, there is no existing regional cooperation framework in place that can support coordinated action to address key threats within the Gulf. That is why it is necessary to continue the efforts begun by the CCAD to establish an upper-level mechanism for coordinating the environmental prosecutors' offices in the region, proposing regional harmonization of the legal systems and environmental standards for water and air pollution.

1.18 **Activities of National level agencies in the Gulf - El Salvador**. Among the international cooperation projects[15] that the Ministry of Environment and Natural Resources (MARN) is carrying out in the Gulf, there is the support for the implementation of management plans for wetlands of the eastern coastal plain and the support for the operation of the watershed agencies in the Gulf. The Ministry of Agriculture (MAG) is carrying out programs in the Gulf area through the *Centro de Desarrollo Pesquero* (CENDEPESCA-Zonal Office in La Unión)[16], the *Centro Nacional de Tecnología Agrícola y Forestal* (CENTA)[17], and the Bureau of Management of

[14] For example, there was a municipal regulation related to ban harvesting of marine turtles which was not valid because this type of regulation was a strict competence of MARENA. Other example is related to a marine and coastal plan for the Municipality of El Viejo, that has not advanced since seven years ago given the fact that the previous Direction of Marine and Coastal Zones of MARENA does not exist anymore.

[15] Bureau of International Cooperation and Affairs of the MARN.

[16] Fisheries Development Center.

[17] National Center for Agricultural and Forestry Technology.

Forests, Watersheds, and Irrigation (two forestry agencies from La Unión). There are two relevant governmental institutions: the *Administracion Nacional de Acueductos y Alcantarillados* (ANDA)[18] which is also is responsible of building and operating the urban and rural aqueducts and sewers systems, besides performing research, treatment and final disposition of residual waters; and the *Comision Ejecutiva Portuaria Autonoma* (CEPA) in charge of building the new megaport at La Union - Cutuco.

1.19 **Honduras.** The Secretariat for Natural Resources and Environment (SERNA) has a Regional Office in Choluteca, where it maintains the former office of the PROGOLFO Project, which is part of the General Bureau for Environmental Management of SERNA. In addition, SERNA carries out projects that have an impact on the Gulf of Fonseca, such as the Natural Resources Management Program (MARENA Program - Bureau of Water Resources) and the Nacaome River Dam Project. SERNA is also furthering initiatives in the Gulf region through the Center for Studies and Control of Pollutants and the Action Plan to combat Desertification. The Secretariat of Agriculture has a presence in the Gulf through its Regional Office (Choluteca) and its Delegation of the General Bureau of Fisheries and Aquaculture in San Lorenzo (Valle). The *Corporación Hondureña de Desarrollo Forestal*, which is under the *Administración Forestal del Estado* (AFE-COHDEFOR), has entered into a Technical Cooperation Agreement for Co-management of Protected Areas and the Ramsar Site in the Gulf, in January 2006, with CODDEFFAGOLF. The *Empresa Nacional Portuaria* (ENP) is in charge of managing ports such as the one in San Lorenzo as well as applying mitigation plans for them. Finally, the *Servicio Autonomo Nacional de Acueductos y Alcantarillados* (SANAA) is responsible of building and operate the urban and rural aqueducts and sewers systems, which is critical for the purposes of this initiative.

1.20 **Nicaragua.** The Ministry of Environment and Natural Resources (MARENA) has a departmental office in Chinandega. The following are some of the initiatives it is currently pursuing: designing and implementing environmental management plans for the shrimp companies operating in the Estero Real; technical assistance for the shrimp companies; control of the mangrove forest exploitation; preparing and securing approval of three management plans (for San Cristóbal, delta of the Estero Real, and Cosiguina). The Ministry of Development, Industry, and Commerce (MIFIC)) is undertaking activities mainly involving the land-use management of shrimp farming and fishing in the Gulf, and maintaining control posts. The *Administración Nacional de Pesca* (ADPESCA), under MIFIC, oversees the sustainable use and harvesting of fisheries resources, and researches and monitors these natural resources. The *Instituto Nacional Forestal* (INAFOR) has a border control post. The Naval Force has a naval base in Potosí, helping the police with the legal and illegal trafficking of natural resources (fish, shrimp larvae, etc.). It is the agency entrusted with issuing navigation permits from vessel launches in Nicaragua to El Salvador, with a camp at Los Marañones, to the northeast of Potosí. Finally, the *Instituto Nicaragüense de Estudios Territoriales* (INETER) is engaged in cartographic studies, GIS and satellite photography, and monitoring the Gulf Basin.

1.21 **Local government authorities.** El Salvador, Honduras and Nicaragua are at distinct stages of devolution of environmental and natural resources management responsibilities to local governments. Some coastal municipalities of the Gulf have an administrative agency for environmental management, known as a *dirección*, *unidad*, or *comisión*.

[18] National Administration of Aqueducts and Sewers.

Environmental management activities are carried out through these agencies, and in some cases, through other local government offices entrusted with functions such as sanitation and waste collection. In addition, the local authorities have issued regulations for the protection, conservation, and sustainable use of natural resources in key sectors such as water, mangroves, forestry, artisanal fishing, catching larvae, etc. They also have rules and regulations for developing environmental management instruments established in the national legislation, within the scope of their municipal authority. In addition, they have developed strategic planning instruments that incorporate environmental factors. Some environmental units have received support from international cooperation agencies for carrying out local environmental management activities. On average, one to three persons are dedicated to the environmental activities within the 19 coastal municipalities of the Gulf.

1.22 The mayors' offices in the municipalities of the Gulf have sought to coordinate their actions by creating federations (*mancomunidades*) of municipalities in each country, such as ASIGOLFO in El Salvador and NASMAR in Honduras, with different degrees of progress. Previous initiatives such as PROGOLFO have sought to strengthen the associations at the trinational level, particularly the *Mancomunidad de Municipios del Golfo de Fonseca* (MUGOLFO), which seeks to coordinate actions among the three countries at the local level, to support sustainable management of the Gulf.

1.23 **Civil society organizations.** Some organizations have considerable institutional capacities developed as a result of their work as implementing agencies of projects financed by international donors. For example, since 2003 the *Comité para la Defensa y Desarrollo de la Flora y Fauna del Golfo de Fonseca* (CODDEFFAGOLF - Honduras) has been executing projects for donors such as HIVOS, the Netherlands, the Swedish Society for Nature Conservation, and the Canadian International Development Agency, among others. Some of these organizations are working to ensure trinational coordination through the *Asociación Civil Trinacional del Golfo de Fonseca* (ACTRIGOLFO)[19]. One of the accomplishments of ACTRIGOLFO has been to initiate joint actions that bring together CODDEFFAGOLF, LIDER, SELVA, and CODECA to protect the four main bays of the Gulf. Additionally, there are organizations that bring together artisanal fishers from the region that also receive international support for initiatives the foster sustainable fishing practices and help improve the economic conditions of the fishers. These include the *Cooperativa de Pescadores Artesanales of Puerto Morazán* (Nicaragua), with 287 members; the *Asociación de Pescadores Artesanales of Playa del Cuco* (El Salvador), the *Centro de Acopio municipal of Playa del Cuco*, the *AECI's Lonja* Project (El Salvador); the *Asociación de Pescadores of Playitas* (El Salvador), which has also received support from USAID and the European Union; the *Cooperativa de Pesca Artesanal* PROMANICARL of Potosí; and the *Cooperativa de Pescadores Varios de Amapala y la Bahía de Chismuyo* in Honduras.

E. Conformance to regional and national plans

1.24 The project is consistent with a series of regional agreements, strategies, policies, regulations and action plans in the three countries individually and collectively. In *Honduras*, the project is in line with several of the guidelines presented in the National

[19] ACTRIGOLFO was constituted in 1995, in the framework of Regional Environmental Program for Central America (PROARCA)/Costas project, and has had some difficulties continuing its activities. Nonetheless, in 2003 the civil society organizations of the Gulf succeeded in reactivating it.

Environment Policy with regards to the ecosystem conservation objective, which stipulates that water resources should be managed in an integrated, decentralized and participatory manner. Additionally, the National Watershed Management Strategy, the National Poverty Reduction Strategy, the General Environment Law, the Water Law and the Poverty Reduction and National Sustainable Development Plan (2006 – 2010) also support the activities to be developed by the project. In relation to sectoral policies that look for regulating the pesticides run-off from the agricultural practices, the project is aligned with what is included within Priority Measures of the Agroforestry Sector 2004 – 2008 and the Rural Areas Policy.

1.25 In *El Salvador,* the project objectives are consistent with the National Environment Policy and the Environmental Law, which promotes the sustainable management of natural resources. The National Action Plan to Combat Desertification and Drought has highlighted the Governmental responsibilities in promoting the development of rural areas, supporting farmers and agricultural enterprises in accomplishing efficiency and sustainability in productive sectors, as well as the Law for the Control of Pesticides, Fertilizers and Agrochemicals aims to promote the regulation in the use these type of substances.

1.26 In *Nicaragua*, the Government promulgated the Environmental Policy, which serves as a frame for the Environmental Plan 2001 – 2005, that promotes the integrated management of critical areas that embraces several resources, such as is the case of the Gulf. Additionally, the National Plan for Water Resources, Development and Territorial Planning which involves the rational use of land and water resources, whereas the General Environment and Natural Resources Law alongside the Soil Protection and Erosion Control Law make reference to the need of supporting actions that will result in mitigation measures related to the causes the of environmental degradation.

1.27 **Trinationally**, the project will be consistent with the Regional Environmental Plan for Central America (PARCA) approved in 1999 as a result of the ALIDES. At present, a new PARCA is in place for 2005-2010. This new strategic planning instrument has the following strategic thematic lines: (i) conservation and sustainable use of the natural resource base, and (ii) pollution prevention and control. The strategic instrumental lines are: (a) developing and implementing regionally harmonized instruments and actions for environmental management that are cross-cutting and intersectoral (for both thematic lines); and (b) strengthening the regional environmental institutional framework (CCAD) and national capacities for environmental management. The objectives and components of the project coincide with the thematic and instrumental lines of PARCA 2005-2010. In 2002, El Salvador, Honduras and Nicaragua were among the seven countries that signed the Convention for Cooperation in the Protection and Sustainable development of the Marine and Coastal Environmental of the Northeast Pacific under the Regional Seas Program. Signatory countries recognized as priority problems many of the threats being addressed by this project.

1.28 Moreover, in July 2003 the three countries signed a Memorandum of Understanding for the Mesoamerican Sustainable Development Initiative (IMDS) of Puebla-Panamá Plan (PPP). One priority of the IMDS is to foster sustainable development programs in transboundary areas, and the Gulf of Fonseca was selected as a priority area at the Second Technical Meeting of IMDS held in Managua, Nicaragua, in September 2004. Regarding other strategic planning instruments at the regional level, with trinational implications, the agreement that establishes the Central American Commission on Environment and

Development (CCAD) serves as a strategic institutional instrument for strengthening cooperation at the trinational level. The Amapala Agreement of 1993 is the special provision applicable to the Gulf that is currently in effect and that confirms the commitment of El Salvador, Honduras, and Nicaragua to cooperate on the Gulf's conservation, which is essential to the integrated management of the Gulf. Finally, in the context of the Plan Puebla-Panamá, in April 2006 these countries –alongside the rest of the Central American Countries— signed the Voluntary Agreement for Sustainable Environmental Conduct, that in relation to international waters, stated that the projects, plans and programs that can affect these transboundary bodies must ensure the establishment of agreements or understanding among the parties, as is the case of this initiative.

F. Threats and root cause analysis

1.29 A series of interrelated problems affecting the medium and long-term functional integrity of the ecosystems of the Gulf of Fonseca have been identified. Some of these threats appear to be relatively localized whereas others are common to the three countries. These regional threats have transboundary causes and effects, as follows:

1.30 **Pollution.** The organic matter derived from human and animal wastes without proper wastewater treatment and contaminants from agrochemicals, aquaculture effluents and industrial wastes are being discharged into the waters of the Gulf of Fonseca in significant amounts. Although data comparable across the Gulf are limited, there is evidence of reduced dissolved oxygen levels mainly in the estuaries during the dry season. Oxygen levels below a minimum standard of 5 mg/l have been measured within the estuaries in Pedregal, San Bernardo, and Estero Real[20]. A unidimensional model of dissolved oxygen in Estero Pedregal indicated that its estuarine waters were degraded 12 km above from its mouth due to shrimp pond effluents and that additional shrimp ponds were not viable[21]. These and other studies confirm that hydrodynamic conditions along with trends in dissolved oxygen levels[22], suspended sediments, nutrients, pathogens and other contaminants are such that the farmed shrimp industry itself recognizes the need for auto-regulation. As for other pollutants, the presence of residual pesticides and heavy metals in the tissues of fish and other living organisms has been reported as a result of agricultural run-off. As pollutants are transported downstream, they accumulate in coastal sediments and food chains, affect the health of ecosystems such as wetlands and mangroves, and are carried across boundaries by currents within the Gulf. They also have a direct impact on human health

1.31 **Sedimentation**. Processes in the Gulf are closely linked to its tributary watersheds in all three countries and that some processes have transboundary implications requiring regional cooperation. One of these processes is sedimentation in coastal and marine ecosystems originating from severe erosion upstream. Very limited field data exist to help understand what portion of that sedimentation is human-induced rather than natural, to pinpoint those critical sub- and micro watersheds contributing excessive sediment loads that affect the Gulf's ecosystems and to proceed with a cost-effective approach where all three countries can tackle the problem in a cooperative manner in an area

20 As presented by recent studies of the University of Texas and the Universidad Centroamericana (UCA).

21 Ward, 2000.

22 Persistent low dissolved oxygen levels result in the elimination or reduction of aerobic organisms, particularly species with limited horizontal mobility such as post-larvae, interrupting their natural maturation and interrupting the biological food chain.

covering approximately 21,000 square kilometers (total estimated area of all tributary watersheds). Based on results from other watershed management projects in the Gulf region (see paragraph 1.50 below), deforestation in the tributary watersheds of the Gulf is one of the main causes of severe erosion, soil loss and downstream sedimentation. The sediment loads discharged into the Gulf per watershed are correlated with their stream flow, population, economic activity and land use. Table I-6 shows an estimate of the amounts of sediment discharged into the Gulf in tons per day; the Choluteca, Nacaome, and Goascorán watersheds account for about 85% of the total. Although very limited monitoring has taken place, models indicate that erosion potential is higher in the low-lying sectors of the watersheds due to the intensive agriculture and limited vegetation cover combined with the higher precipitation intensities characteristic of the coastal part of the tributary watersheds[23]. Applied research undertaken in similar circumstances indicate that sedimentation can several direct consequences on the Gulf's marine and coastal ecosystems, many with transboundary implications. For example increased turbidity and reduced light penetration in coastal waters can impede the development of submerged grasses that are critical for the reproduction of marine fauna, including commercial fish stocks that are shared by all three countries. Excessive sedimentation in nearshore areas can also lead to changes in the hydrology of mangroves and eventual die-off.

Table I-6. Estimated Sediment Discharges per Watershed

Watershed	Area	Average Precipitation (mm)	Water flow (m^3/s)	Module $lps/km^2/year$	Discharge of Sediment* (Tons/day)	Total range $Ton/km^2/yr$
Choluteca	7,976	1,327	104	13	8,986	411-2,056
Nacaome	3,478	1,666	71	20	6,134	644-3,219
Goascorán	2,428	1,909	57	24	4,925	740-3,702
Estero Real	3,799	1,293	19	5	1,642	158-789
Negro	2,322	1,774	12	5	1,037	163-815
Sirama	366	1,505	6	17	518	517-2,585

* Based on a conservative estimate of average concentration of 1,000 mg/l.

1.32 **Overexploitation of fish and shellfish.** Most of the living marine resources (shrimp and fish species) are overexploited at levels ranging from 31% to 178% of the reference value used in a detailed study of fisheries in the Gulf[24]. The catch of wild shrimp post-larvae and the associated by-catch above recruitment rates have placed significant pressure on all juveniles stocks in the estuaries as well as stocks at sea. In the Gulf of Fonseca many species of mollusks and crustaceans associated with the estuaries, mangroves and rocky reefs have been overexploited by artisanal fishing, and have also been affected by the loss of habitats, sedimentation and pollution. There are indications that artisanal fishing of shark is leading to their depletion, especially species such as the black tip hammerhead sharks. In addition, the harvest of the most common fishes for domestic consumption is above sustainable yields.

1.33 **Transboundary conflicts among fishers.** The depletion of coastal stocks within the Gulf has translated to increasing disputes among artisanal fishers of the three countries who, to

[23] During the conduct of the TDA for the IW Gulf of Fonseca project, a simple model was run to determine potential erosion upstream providing an estimate of the relative contribution of sediments into the Gulf from major watersheds.

[24] SAG/DIGEPESCA. *Informe de Evaluación y Ordenación de Recursos Pesqueros en el Golfo de Fonseca (Honduras)* (September 2004-August 2005).

maintain their capture levels, cross international boundaries, leading to the seizure of their product and fishing gear. The unit of effort per catch has increased significantly in recent years, and fishers are forced to invest more hours for the same catch and more money in fuel to reach fishing waters further and further from the coast[25]. Other confrontations are caused by the entry of commercial (industrial) fishing boats in artisanal fishing areas and their use of drift nets, which reduce the overall available catch.

1.34 **Overuse of water resources.** The agricultural and agroindustrial sectors make more intense use of water during the dry season, placing pressure on surface and groundwater resources. For example, in the lower part of the Choluteca river watershed, large tracts of land planted in melon for export, watermelon, and sugarcane are irrigated, leading the surface and groundwater flows at the mouth to be reduced considerably. In the mangroves and estuaries, fresh water flows maintain salt concentrations at levels required for the survival and reproduction of species dependent on those ecosystems. When freshwater flows are diminished due to the reduction of infiltration, overuse of the resource, or both at the same time, higher salt concentrations have a negative impact on productivity.

1.35 **Habitat degradation.** The coastal zone of the Gulf of Fonseca has been undergoing a process of rapid land use change in the last several decades (Table I-7). A loss of at least 50% of mangrove forests since the 1960s has been documented in the Gulf of Fonseca and is considered a priority threat (See Table I-8). The destruction of mangroves has resulted mainly from the construction of shrimp ponds (both industrial and artisanal), uncontrolled exploitation for fuelwood, urban growth, and the expansion of facilities for salt production. According to some studies, the largest-scale losses of mangrove occurred in the 1960s and 1970s, mainly due to areas given over salt production, whereas those occurred in the 1980s and 1990s were due to the establishment of shrimp farming. In relation to the extraction of mangrove timber, studies done in the Gulf region have confirmed that the poorest communities depend more on wood as a fuel. While encroachment of mangroves for farmed shrimp production has slowed considerably, research undertaken in the Gulf of Fonseca indicate that trends in mangrove deforestation persist due to the increasing fuelwood demands of a growing population on a declining forest stock.[26] The same study concludes that the mangroves of the Gulf of Fonseca are a shared resource crossing national boundaries that requires coordinated efforts to allocate resource use rights, enforcement and the promotion of alternative to fuelwood. Mangrove and wetland losses across the Gulf translate to losses in habitat for migratory bird species as well as species that use the entire Gulf as shelter.

[25] According to the testimonies from organized fishers and communities, gathered in consultations done during the PDF-B stage.

[26] Centro de Estudios Ambientales y Sociales para el Desarrollo Sostenible, CODDEFFAGOLF< International Center for Research on Women. 2000. A Platform for action for the sustainable management of mangroves in the Gulf of Fonseca.

Table I-7. Land use change in the Gulf of Fonseca coastal zone (1976-1997)

	1997		1976		Change	
Category	**Ha**	**%**	**Ha**	**%**	**Ha**	**%**
Forest	150,484.19	19.44	180,814.31	25.82	-30,330.12	-6.38
Tierra en Barbecho	155,554.88	20.10	196,907.50	28.12	-41,352.62	-8.02
Mangrove	44,842.88	5.79	74,863.50	10.69	-30,020.62	-4.90
Forested mangrove	17,262.31	2.23	30,047.50	4.29	-12,781.19	-2.06
Other wetlands	151.81	0.02	0.00	0.00	151.81	0.02
Crops	100,120.88	12.94	73,060.81	10.43	27,060.07	2.51
Pastures	155,442.50	20.08	111,506.38	15.92	43,936.12	4.16
Uncovered soils	53,574.75	6.92	33,021.19	4.72	20,553.56	2.20
Burneo areas	7,773.69	1.00	0.00	0.00	7,773.69	1.00

Source: PROGOLFO

Table I-8. Historical evolution of mangrove cover and the areas set aside for shrimp farming and salt production in the region (ha)

Category/Year	1976	1986	1993	1997
Shrimp and salt production	6,920	8,038	15,549	24,309
Mangroves	185,892	73,993	69,305	62,261

1.36 The main root causes contributing to the deterioration of the trinational water body include:

1.37 *Poor coordination between the involved countries, limited capacities and the absence of common tools in order to co-manage the Gulf's resources with a regional perspective.* While there have been projects promoting initiatives across the Gulf, none to date have resulted in a functional tri-national institutional framework that incorporates relevant national agencies, local governments, civil society organizations and the private sector. Capacities for integrated coastal resource management at the local, national and regional levels are limited. As indicated in the legal review above, El Salvador, Honduras and Nicaragua are at distinct stages of devolution of environmental and natural resources management responsibilities to local governments. In most cases, municipal responsibilities in coastal resource management (CRM) in the Gulf of Fonseca are incipient. One of the challenges is to develop local capacities in step with the decentralization process currently in progress in each of the three countries. The other challenge is to promote this increased local responsibility in CRM while respecting considerations that are of national interest. Common tools, such as information systems, monitoring networks and regional models are lacking. Technical and operational capacities at all levels for using these tools for integrated ecosystem management and planning in a coordinated and participatory manner, are incipient.

1.38 *Absence of harmonized legal/financial mechanisms and planning instruments for guaranteeing the sustainability of the Gulf's marine and coastal ecosystems*. Although

there are some instruments for regulating human activities that affect the ecosystems within the Gulf, these are limited primarily to the national level with little buy in locally, inconsistent across countries, are not financially sustainable in the long term, and their enforcement is incipient. In addition, incentive schemes for promoting compliance locally are lacking. This is the case, for example, for open access artisanal fisheries and harvesting mangrove wood for fuel where there are no incentives for producers to adhere to co-management plans without clarification of resource use rights. Few common policies, plans or strategies have been agreed upon or implemented in order to effectively address pollution control, sedimentation, transboundary conflicts that exacerbate land and marine resource overuse, and habitat degradation. In part, none of these instruments have been developed due to lack of opportune and updated environmental information about the Gulf of Fonseca and its tributary watersheds, its trends, and current and future impacts under different development and land use scenarios.

1.39 *Limited sustainable alternative livelihoods*. The Gulf of Fonseca is one of the poorest regions in the Central American isthmus. Its population density is greater than the national average in the three countries, and the majority of the inhabitants are settled either on the adjacent zones of the main tributary river basins that drain the Gulf, or along its shores. As the majority of the economically active population is dedicated to subsistence activities and is dependent on scarce natural resources for food safety, fuel and other basic needs, poverty is widespread throughout the Gulf in the three countries. Subsistence level users groups are poorly organized and have limited opportunities to participate in the management of the resources they depend on such as in the case of fisheries. Poor coastal communities and households have limited access to government services, including support to enhance in a sustainable manner productivity and commercialization. Improved markets, alternatives such as tourism are unlikely without a coordinated effort to manage resources across the region.

G. Project Strategy

1.40 The threats and root causes identified above point to the need for trinational cooperation in the integrated coastal resource management (CRM) of the Gulf of Fonseca. In this context, integration refers to the biophysical and socio-economic linkages between the tri-national water body, the coastal zone and its tributary watersheds upstream as well as the coordination (or vertical integration) between regional, national, and local governments and organizations. Under these circumstances, the project's strategy for intervention considers factors crucial for sustainability including the following: (a) it must **build on a common understanding of the Gulf of Fonseca as a system**, shared by the three countries locally and nationally, with the purpose of ensuring that the working relationships already existent between the three countries are strengthened over the course of the project. To that end, the project incorporates two highly complementary features: (i) activities that build local capacities for CRM across the three countries, with an emphasis on municipal governments and organizations; and (ii) a high-level trinational decision-making process that strives for regional consensus and cooperation for the integrated management of the Gulf as a means of addressing transboundary environmental considerations[27]; (b) it must genuinely **engage and promote ownership**

[27] This is coupled with a commitment to: (a) ensure that the negotiation of all formal agreements involve relevant parties including the Ministries of External Affairs of each respective country; and (b) limit the scope of the project to issues that do not entail boundary considerations.

in the project among actors involved in the three countries[28] by means of **practical activities that can attain measurable field results** that translate to both socio-economic and environmental benefits in terms of sustainable, productive uses of coastal and marine resources and preventing contamination and excessive sedimentation in the Gulf. In this regard, the project proposes to work *with* the national environmental authorities and *through* the 19 municipalities and their associations, civil society organizations, and educational institutions to carry out co-management arrangements, demonstrate environmentally-friendly technology and best practices as well as promoting an innovative model linking applied research, education and extension (see below); (c) it must **base concerted management decisions on scientific knowledge of both the tributary watersheds and the Gulf's waterbody dynamics**. The strategy thus incorporates Gulf-wide decision tools that enable the three governments and stakeholders to pinpoint where scarce financial and human resources are best invested.

1.41 The project responds to the **GEF's Operational Program 9 Integrated Land and Water Multiple Focal Area,** through the implementation of a more comprehensive, ecosystem-based approach in managing the Gulf and their drainage basins, by establishing and strengthening regional policies, institutional arrangements and capacity building for its integrated management as a tri-national estuarine and marine system, improving the management of tributary watersheds for pollution control and prevention, and supporting the generation of environmental goods and services that can contribute to regional economic development.

1.42 The project will contribute to two of the three **GEF Strategic Objectives for GEF-4** within this focal area: (a) the one related to *catalyze implementation of agreed reforms and on-the-ground stress reduction investments to address transboundary water concerns* (IW-1), via the implementation of the established Central American Regional Environmental Plan, the Amapala Agreement (signed by the three countries), the regional fisheries policy and other regional agreements by supporting harmonization of national policies and regulations, promoting regional planning instruments, and leveraging investments in the recovery of regional fisheries and other coastal resources and pollution control, and (b) the other related to *expand foundational capacity building to a limited number of new transboundary systems through integrated approaches and foster replication through targeted learning for the IW portfolio* (IW-2) by means of promoting the dissemination and adoption of emerging issues for managing transboundary waters in a cross-sectoral manner, and the establishment of the Tri-national Commission for the Integrated Ecosystem Management of the Gulf of Fonseca, that, with the support of the Central American Commission for Environment and Development (CCDA), will serve as a first step towards establishing a permanent high-level institutional arrangement for regional policy coordination and management of the Gulf.

1.43 The project intervention has emphasized **cost-effectiveness** by: (a) capitalizing on local resources (i.e., existing entities located in and involved with the Gulf region, existing local facilities) and on the consolidation of existing networks (i.e., for monitoring) and management tools (i.e., municipal development plans) thereby avoiding a considerable more expensive project intervention based predominantly on centralized interventions, the creation of new entities and networks; (b) improving trinational coordination and integration of management practices within the scope of existing agreements while taking

[28] Including stakeholders (inhabitants, *mancomunidades*, NGOs, among others) from the 19 coastal municipalities in the three countries.

a phased, progressive approach to the formulation and negotiation of new agreements; (c) promoting long-term shifts in investments and expenditure by private, public and international cooperation stakeholders, in favor of measures that will counteract the emerging trends towards the Gulf's and transboundary tributaries' environmental degradation, and thus prevent further negative impacts that are likely to be more costly to mitigate once they appear.

1.44 The project includes several features that are **innovative** regionally and for IW projects. These include: (a) capacity building and the consolidation of tri-national alliances of coastal municipalities (mancomunidades) and user organizations (i.e., fishers and aquaculture producers) to facilitate interchanges, joint priority setting and participation in the regional policy-making and planning initiatives (including the first multi-national coastal management plan for Central America formulated through a process that is locally driven and nationally endorsed; (b) development of a Gulf-wide fisheries policy with ecosystem-based fisheries assessment and co-management as driving principles. Partnerships with specialized institutions such as the National Oceanic and Atmospheric Administration (NOAA), the French Research Institution for Exploitation of the Sea (IFREMER) and others are being sought to give the initiative sustainability and ensure its scientific soundness. IDB has had successful experience in involving IFREMER in sustainable fisheries initiatives elsewhere in Honduras; (c) a regional institutional structure for execution that promotes the integration of applied inter-disciplinary research, field extension in coastal and marine resources management, and education as an adaptation of the successful U.S. Sea Grant model; and (d) development of a regional, interactive decision support model that links policy and investment scenarios in the tributary watersheds with risk scenarios in the Gulf that can be used for various regional applications including Strategic Environmental Assessments. Finally, the development of the financial plan as a unified sustainable financing mechanism will ensure the sustainability of the program.

H. Agreement with other projects of the Bank, regional financing institutions, GEF, and other donors

1.45 The GEF Project for Integrated Management of the Ecosystems of the Gulf of Fonseca has objectives that complement other initiatives have been implemented, are currently being carried out in its area of influence, or that are being drawn up. It seeks to build on the results of these initiatives and to generate synergies and complementarities, in an effort to have greater impacts. These include the following projects:

1.46 **Coastal Ecosystem Conservation in the Gulf of Fonseca Project (PROGOLFO)**, a joint regional initiative financed by the Danish Agency for International Development (DANIDA), and carried out by the governments of El Salvador, Honduras, and Nicaragua from 1999 to 2003 through MARN, SERNA and MARENA. This Project sought to foster the sustainable development of the natural, socioeconomic, and institutional resources of the Gulf by preparing a strategic framework for management and development aimed at addressing the key environmental problems. One of the major contributions of this effort was to generate a significant amount of information on the coastal marine zone of the Gulf of Fonseca that has been used as a basis for developing this new project. Additionally, it helped to strengthen the involvement of governmental institutions, local governments, NGOs in the participative design of a regional strategy for the Gulf's integrated management.

1.47 **Environmental Regional Program for Central America (PROARCA),** through its component of Coastal Zone Management (PROARCA / Costas) executed its first phase from 1996 to 2001, with resources from USAID. This component fostered the effective management of marine and coastal resources in some Central American specific areas, developing and sharing information, tools and methods for the integrated management of coastal zones, at the time that it strengthened the international collaboration for the effective management of transboundary coastal areas.

1.48 **Project for the Conservation of Coastal Ecosystems in the Gulf of Fonseca**, with funds from AECI-ARAUCARIA, with a period of execution from 2005 to 2010. At present, the project is performing baseline studies. Among its objectives, the present initiative looks for complements the one related to foster the sustainable management, in an integral and participatory manner of the ecosystems of the Gulf of Fonseca, so as to reduce degradation and contamination, improve the availability and management of the natural resources, resolve conflicts over access to and management of the natural resources, and ensure access to natural resources so as to benefit the various sectors of the population"[29]. The Secretariat of Agriculture is carrying out the Gulf of Fonseca Mangrove Management and Conservation Project (PROMANGLE – Valle and Choluteca) and the Forest and Water Project (Choluteca).

1.49 Additionally, The United States **Millennium Account** (MCC), through its agreements with each country, will be carrying out activities for the productive sector and watershed management in the Gulf's area. For example, in Nicaragua, the Millennium Account has accorded priority to the departments of León and Chinandega for implementing the productive projects and management of watersheds that include the Estero Real watershed.

1.50 **Honduras Natural Resources Management Program (MARENA). T**he IDB is currently supporting the Government of Honduras in addressing land degradation through a national watershed management program entiled MARENA. The Reitoca and Verdugo sub-watersheds (located in the upper parts of the Naocome watershed -- one of the main contributors of contaminants and sediments to the Gulf) are included in the area of intervention. Actions that are being implemented relate to forest fire control, soil and water conservation, including good agricultural practices (see http://www.marena.hn for more information). This is a multi-phase loan and, following the results of an evaluation expected in May, discussions are foreseen on a possible second phase.

I. Lessons Learned

1.51 The project will capitalize on the experiences and lessons learned not only from previous efforts both within Central America and worldwide[30], but also from those acquired by the Bank during the preparation and execution of other national and regional sustainable development projects[31]. Among these lessons, the following merit special mention: (i) the importance of effective participation of stakeholders and institutions representing

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29 CCAD, September 2006. Portfolio of Regional Projects of the Central American Commission on Environment and Development. Available at http://www.ccad.es; The Philippine experience in coastal resource management (CRM), for example, could offer some lessons for policy reform. Information on the Philippine experience is available on the website: www.oneocean.org

30 As mentioned in section XX, such as such as PROGOLFO, the Program for the Consolidation of the Mesoamerican Biological Corridor, and PROARCA / Costas.

31 Such as the IDB-GEF project Environmental Protection and Maritime Transport Pollution Control in the Gulf of Honduras.

different interests across sectors from the three countries, including communities, local governments, NGOs, and private enterprise, from the stage of consultation during project design through implementation, monitoring, and evaluation; (ii) coordination between donors and national, local, and regional agencies so as to avoid duplication of effort and to be able to use the results of prior interventions as inputs; (iii) the need to address socioeconomic issues by generating environmental goods and services capable of improving the quality of life, particularly of subsistence resource users; (iv) strengthening incentives for co-management, compliance with environmental regulations, and implementation of CRM over the long-term through the clarification of resource use rights in exchange for local stewardship, financial and economic incentives for cleaner production and benchmark systems; (v) the importance of incorporating conflict resolution activities; (vi) design and implement activities that address the priorities expressed by the communities, coupling long-term development objectives with tangible short-term benefits to sustain the interest of stakeholders; (vii) the need of constantly strengthening stakeholder capacities; and (viii) ensure effective and transparent feedback mechanisms amongst all involved parties to promote accountability and responsive project management. Important additional lessons learned have been documented by the GEF's International Waters Program. One of these refers to the regional schemes for management and coordination for implementing programs in which the design of structures that allow for coordination among countries and within each country have been effective.

II. THE PROGRAM

J. Purpose and objectives of the Project

2.1 The **purpose** of the Project is to foster the sustainable use of the Gulf of Fonseca's marine and coastal resources and the integrated management of its ecosystems through the support of a trinational framework for cooperation. The **specific objectives** are to: (i) establish and strengthen institutional arrangements for an effective and participatory management of the Gulf's ecosystems; (ii) foster integrated planning and regulatory management of coastal and marine resources in the Gulf of Fonseca; (iii) establish decision-making systems for pollution and sediment monitoring, prevention, and control; and (iv) support the promotion of livelihoods compatible with the sustainable use of the Gulf's resources. The **global objective** of the full GEF project is to contribute to the health of the trinational coastal and marine ecosystems of the Gulf of Fonseca, one of the most important tropical coastal systems and the only multi-national Gulf along the Eastern Pacific coast of Latin America.

K. Description of the Project Components

2.2 The GEF Project has a five-year horizon, and consists of the following components[32]: (1) institutional strengthening for regional management of the Gulf; (2) coastal and marine ecosystem management; (3) pollution and sediment prevention and control; and (4) promotion of sustainable livelihoods.

[32] The project boundaries coincide with the full tributary watersheds and the marine waters of the Gulf of Fonseca. However, the intensity of activities varies across this Region. For example, the activities of Component 2 (resource management) are limited to the boundaries of the 19 coastal municipalities and adjacent coastal waters. The hydrological modeling covers entire watersheds in that it will be based on data from satellite imagery and detailed land use and topographical maps for instance.

1. COMPONENT 1: Institutional strengthening for regional management of the Gulf (GEF US$1,120,000; Total US$1,360,000)

2.3 This component will strengthen the technical and operational capacities of stakeholders at different levels, required for effective trinational cooperation and management of the Gulf based on a shared understanding of its functioning, importance and threats. While GEF resources will finance the majority of this component, complementary financing from the countries will be directed at primarily at reinforcement of the trinational coordination framework. The component includes the following activities:

2.4 ***a. Strengthening the technical and operational capacities of key stakeholders in regional and local institutions, as well as social actors.*** The technical and operational capacities of the regional and local public institutions involved in the management of the Gulf will be reinforced through the following: (i) design (based on an existing diagnosis) and implementation of training modules[33] for specialized technical personnel designated by each country[34] in the application of hydrological, hydrodynamic, and environmental monitoring models in the Gulf and its watersheds[35]; (ii) training modules for the 19 local governments of the coastal zone of the Gulf on matters related to participatory mapping for coastal planning, watersheds and linkages to the coastal zone (sedimentation, pollution), pollution prevention, risk management, environmental education, land-use management, and local environmental monitoring and CRM evaluation (including application of the CRM benchmark system described in Component 2 (a). This will include technical assistance to municipalities to develop and apply incentives schemes in areas that fall within their responsibility (i.e., land use bylaws, construction permits, property taxes)[36]; and (iii) technical assistance and basic communication equipment to foster associative working relations between municipalities and federations of municipalities of the Gulf to carry out specific projects of mutual interest such as risk management in coastal zones as identified in the trinational coastal management plan. The technical and operational capacities of social actors to actively participate in the sustainable management of the Gulf's natural resources will be enhanced through technical training of personnel from local and regional user associations (i.e., *Juntas de agua*) in watershed management practices.

2.5 ***b. Reinforcement of the trinational coordination framework:*** The following activities will be financed: (i) organizational and financial[37] support to a Trinational Commission for the Integrated Management of the Ecosystems of the Gulf of Fonseca that will be established through a formal Cooperation Agreement among El Salvador, Honduras, and Nicaragua.[38] Although this would be confirmed in the negotiations leading to the signature of the Agreement, this Commission would consist at the outset of the Ministers of MARN, SERNA and MARENA. It would discuss policies on issues of mutual interest (i.e., fisheries and aquaculture), support the coordination of national actions related to the

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33 The intent is to use CRM training materials that are already packaged and ready for use where possible (see for example: www.oneocean.org).

34 Personnel from SERNA, MARN, MARENA, SANAA, ENP, ANDA (Nicaragua) and others.

35 See Component 3 for a description of the models.

36 Such as property tax incentives for pollutant technologies.

37 The financial support will include the technical personnel and operating costs of the Regional Project Coordination Unit (UCPR) as a first step to establishing a permanent secretariat of the Trinational Commission in the Gulf of Fonseca.

38 All three countries agree that the establishment of the Trinational Commission and its functions must be the result of a systematic drafting of the Cooperation Agreement as an activity of the Project and negotiations involving all responsible parties including each country's Ministry of External Affairs.

integrity of the Gulf's ecosystem, and approve and periodically evaluate regional plans and the pollution control strategy; (ii) legal advisory services to provide legal capacity and negotiation skills to the appropriate entities, as a means of facilitating future trinational projects and resources; (iii) development of strategic instruments whose essential objective is legislative harmonization and strengthening for their implementation and enforcement regionally, nationally, and locally; (iv) implementation of mechanisms to ensure coordination between projects and donors within the Gulf, including a consolidated project database linked to a public accessible web page consistent with IW:LEARN guidance; and (v) a feasibility study for the establishment of a Sea-Grant type model involving a formal partnership (and grant mechanism) among the academic/scientific institutions of the Gulf, government and private industry for coastal and marine resource education, research and extension.

2.6 ***c. Enhancement of the mechanisms for the involvement of the civil society in the Gulf's management***: This entails: (i) quarterly meetings of the Trinational Advisory Forum and a network of local committees that will foster the broad participation of the local governments, civil society organizations, non-governmental organizations, the private sector, and the scientific community with a presence in the Gulf of Fonseca in the planning and social monitoring of the Project's activities; (ii) implementation of a social communication strategy for disseminating the project activities through grassroots organizations (fishing cooperatives, women and youth groups). The strategy would include financing for users groups to witness, discuss and conduct periodic joint reviews of results derived from Components 2, 3 and 4 of the project; (iii) environmental education programs through formal, informal, and non-formal education channels, including the production and distribution of environmental education materials, local radio programs and exhibitions in community market fairs; (iv) training of municipal environmental units to raise the awareness of the population in general about the conservation and sustainable use of the Gulf's ecosystems and resources; and (v) organization of periodic forums/public consultations, and elaboration of reports to disseminate the relevant environmental legislation.

2.7 ***d. Consolidation of the information node for monitoring the Gulf of Fonseca by linking in the local and national information systems with a Regional one***. The following activities will be financed: (i) compiling and harmonizing relevant information from the three countries to be used by the project (i.e. hydrological data, maps, socioeconomic information, etc.). This will require inter-institutional arrangements assigning specific responsibilities for the systematic sharing of information; (ii) establishing the monitoring and evaluation system of the performance and impact of managing trinationally the Gulf's resources[39], which will serve as inputs for the publication of a bi-annual report on the status of the Gulf; (iii) technical assistance, training, equipment, and purchase of data (i.e. satellite images); and (iv) systematizing the information on lessons learned and good practices for disseminating accomplishments and successful experiences, including contributions to the network of GEF projects in international waters (IW:LEARN).

[39] With indicators on socioeconomic and environmental conditions, reduction of pressure, and processes.

2. COMPONENT 2: Management of Coastal and Marine Ecosystems (GEF US$1,666,000; Total US$3,255,000)

2.8 The focus of the component is to improve current practices for natural resources management and use in the context of consensus-based regional policies and goals developed specifically for the Gulf. The GEF resources will be used for all four activities of the Component and complemented by co-financing from the countries and participating donor agencies in the fisheries and mangrove co-management as well as the financial sustainability. The activities to be carried out under this component are:

2.9 ***a. Design and implement a trinational coastal management plan for the Gulf of Fonseca as a foundation for effective local Coastal Resource Management (CRM).*** This entails the development and implementation of a coastal management plan that will be developed through a participatory approach at the local level, will promote leadership and alliances of municipal governments for CRM, and be endorsed by national authorities in all three countries. The purpose of the Plan will be to link the local reality in terms of the use of coastal-marine resources to a regional view of the Gulf, including shared strategic lines and consensus-based scenarios for sectoral development. As the first multinational coastal management plan for Central America, it will be an important accomplishment of the Project. The Plan will be focused on the coastal municipalities of the Gulf while consistent with national legislation and the plans already existing or in the process of formulation in the municipalities of the Gulf[40]. Building on international best practice for coastal planning, the development of the plan will combine resource mapping based on the best available scientific information and a participatory mapping and zoning process in each municipality. In this process, communities with the help of local governments will map resource distribution, use patterns, issues and possible management zones and identify tools available for implementation (i.e., conservation on private lands). The participatory maps will be superimposed with the map(s) derived from the scientific information to delineate zones for specific resource use and management strategies (i.e., multiple use zones). The resulting local zoning will be shared among municipalities and national authorities as a basis for developing common strategic lines of action, confirming responsibilities for CRM functions and establishing regional alliances. The trinational Plan will incorporate a common "CRM benchmark system" by which local and national governments can set targets and measure advances in CRM in the Gulf region. The Plan will be the regional instrument for implementing strategies for reducing pollutants, managing mangroves, preserving other habitat, and sustainable harvesting fisheries resources. The project will finance the compilation of the technical maps, facilitators and workshops for the participatory mapping process and regional consultation, the publication/divulgation, and initial implementation of the Plan.

2.10 ***b. Develop fisheries and aquaculture policy and co-management for the Gulf among the three countries:*** This entails the reform, consolidation and/or preparation of instruments that will contribute to sustainable fisheries and aquaculture in the Gulf of Fonseca, including greater involvement of fishers in management, promoting the shift from open to managed access, and the prevention of impacts from coastal aquaculture. The following will be financed: (i) workshops for the processes of harmonizing legal instruments and procedures (i.e., vessel inventories and registries, concessions, closed

[40] All the local governments of the Gulf have development plans that are being executed. The Salvadoran municipalities have land-use management plans; such plans are being designed in Honduras; and in Nicaragua only the municipality of Somotillo has such a plan.

seasons, establishment of no take zones, EIA and mitigation guidelines for aquaculture); (ii) the design of the regional policy, in keeping with the principles of the Policy for Integration of Fisheries and Aquaculture in the Central American Isthmus, and based on knowledge of the behavior the Gulf as part of a Large Marine Ecosystem. The Policy will set specific targets for the CRM benchmark system mentioned above; (iii) co-management of fisheries in suitable areas[41] through the strengthening of fisher associations, participatory data collection and monitoring as a complement to existing monitoring conducted by national fisheries agencies, updating of registries, voluntary participation in by-catch reduction (i.e., of shrimp post-larvae), demonstrations of productive alternatives such as the cultivation of bivalves, jaiba and other species, pilot introduction of local tradable fishing quotas; (iv) consensus-building workshops in close coordination with the entities that have the mandate for negotiating and resolving disputes over marine resources; and (v) logistical support for cooperative enforcement schemes involving regional offices of national fisheries and environment agencies and municipal environment units.

2.11 ***c. Enhancing the financial sustainability for the management and co-management of the Gulf's resources.*** This activity will support the management of the Gulf's ecosystems in the long term. The project will: (i) accompany the relevant institutions in developing instruments to leverage resources that could include concession rights, resource use fees, port fares, tourism tariffs, payments for environmental services, charges to activities with high environmental impacts, governmental contributions, among others (Annex F); (ii) analyze the feasibility for establishing a trinational Trust Fund[42], including the development of an associated fund strategy; and (iii) conduct a roundtable of investors and donors, and in general marketing the project activities for establishing partnerships that could mobilize additional resources for the stages after the period of GEF financing and for those initiatives not eligible for GEF funds.

2.12 ***d. Environmental restoration of mangrove ecosystems.*** This activity is aimed at contributing to improve the integrity of the mangrove ecosystems (ME). It will finance: (i) a land tenure study in the coastal zone of all three countries to determine adequate intervention strategies for each ME, helping to establish clear limits through georeferencing, survey existing resource users (i.e., fuel wood collectors, shellfish harvesters), and propose arrangements for the allocation of resource rights as a first step towards reducing conflicts over resource use in these strategic areas; (ii) the application of co-management arrangements for ME in suitable areas (i.e., multiple use zones coinciding with pilot field projects for fisheries) whereby resources users will be organized and given restricted use rights over resources in exchange for stewardship and maintenance of the mangrove of concern (including participatory data collection and monitoring as a complement to existing baseline compiled through PROGOLFO, PROARCA, and PROMANGLE[43]); (iii) exchanges of groups of users and co-administrators to share good practices for management of the ME; and (iv) actions involving natural restoration and reforestation of the mangrove and introduction of alternatives for diminishing the extraction of firewood, such as growing native species, as well as initiatives to prevent degradation such as establishing tree nurseries and community forestry plantations for consuming firewood.

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41 To be selected as pilot field projects.

42 Previous experiences with the development of trust funds supported by the GEF will be examined in establishing the feasibility of this financial mechanism. See the Financial Sustainability Analysis (Annex F) for a review of experience in IW projects.

43 This would include a harmonized scheme for monitoring mangrove die-off.

3. COMPONENT 3: Pollution and Sediment Prevention and Control /Decision-making Models (GEF US$1,380,000; Total US$8,136,000)

2.13 The objective of this component is to improve the knowledge base regarding the dynamics of the Gulf and its tributary watersheds so as to reach a regional consensus on the priorities for pollution prevention and control, with an emphasis on processes that have transboundary implications that require regional cooperation. Also included is sedimentation in coastal and marine ecosystems originating from severe erosion upstream. The Project will support the participation of the Regional Technical Committee and an ad hoc subcommittee on modeling, to assure the participation of the technical professionals from the national and local governmental institutions, as well as from academia in each country. GEF resources will be used in all the activities of the component and complemented with national resources for the monitoring and the regional strategy and participating donor agencies in water quality monitoring. The activities to be carried out under this component are:

2.14 ***a. Expansion of the hydrometric and water quality monitoring network in the tributary watersheds of the Gulf of Fonseca.*** This activity involves the consolidation of existing monitoring networks through the installation of hydrometric stations and the initiation of data collection and analysis of hydrological, sediment and other water quality parameters at the outlets of the Gulf's tributary watersheds. Hydrometric and meteorological monitoring will be done by the respective institutions of each country (SNET of the MARN in El Salvador, Water Resources Department of SERNA in Honduras, and INETER in Nicaragua), in cooperation with organizations from the aquaculture and port sectors, and through written agreements with the CCAD. The most important waterways that should be included in this monitoring program are the Sirama, Goascorán, Nacaome, Choluteca, Sampile, and Negro rivers, and the Estero Real. The first activity to be undertaken is an evaluation of the existing network of hydrometric stations, and a determination of their operative capabilities[44]. In addition, as part of this activity, initiatives to take measures of stream flow will be financed, and samples will be taken gauge concentrations of suspended sediments and the main parameters that define water quality. The monitoring parameters, including the frequency with which data are to be collected, will be defined, and the protocols for taking samples will be harmonized throughout the region. The feasibility of selecting three demonstration zones at the mouth of the priority watersheds early on in the program will be assessed to establish a link between monitoring, modeling and cleaner production activities.

2.15 ***b. Update of bathymetric information and establishment of monitoring the atmosphere, the hydrodynamics, and water quality within the Gulf of Fonseca.*** This activity seeks to update bathymetric and other physical information in order to develop the hydrodynamic model needed to understand sediment and contaminant circulation within the Gulf. Two types of monitoring will be financed: measurement of variables along the shore and in the islands of the Gulf, and measurements for at least 12 sites within the Gulf's waters. The main activities to be financed will be: (i) evaluating the current facilities, seeking to render compatible the future measures with the current ones, and incorporating strategic

[44] A preliminary evaluation was done during Project preparation. According to the Hydrological Report (attached), the following are in operation: a hydrometric station in the Sirama river watershed (Sirama), four in the Goascorán river watershed (El Amatillo, El Sauce, Pasaquina, and La Ceiba), two in the Nacaome river watershed (El Zambito and Las Mercedes), three in the Choluteca river watershed (Hernando López, Paso La Ceiba, and Puente Choluteca), and one in the Sampile river watershed (Puente Sampile). Of all these stations, only three are near where their waterways discharge into the Gulf, namely Sirama (Sirama river), La Ceiba (Goascorán river) and Puente Choluteca (Choluteca river).

sectors in taking the measurements: fishers, naval forces, among others; (ii) identifying and adapting the means of marine transport, and signing the respective agreements; (iii) processing, systematization and verification of the data quality; and (iv) establish the regional marine network for data exchange. The project will finance the equipment needed to measure depth, ocean currents, thermohaline structure, dissolved oxygen and pH at the twelve sites.

2.16 ***c. Implementation and start-up of a hydrological model in the tributary watersheds of the Gulf of Fonseca.*** This activity consists of the installation and application of a simple hydrological model of the Gulf's tributary watersheds that will simulate data series of stream flows, sediments, and pollutants that reach the Gulf, for current conditions and possible future scenarios of change in land-use patterns and the implementation of pollution control measures, both structural and non-structural. Financing will be provided for installing and training in the use of a hydrological model equal or similar to the SWAT (Soil Water Assessment Tool), which has been successfully implemented in several Central and South American basins. In addition to systematizing existing information and information obtained by the monitoring network, the project will finance: (i) a characterization of the watersheds that drain into the Gulf, using the cartographic information that makes it possible to delineate watersheds and sub-watersheds, calculation of segments, definition of the watersheds' morphometry alongside the updated characteristics of plant cover and land use, lithology and soils, as well as hydrogeology; (ii) an inventory of the point sources (household, industrial, and agricultural liquid discharges) of pollution, including their georeferenced location; (iii) characterization of the non-point agricultural sources including the characterization of the use and application of agrochemicals; and (iv) implementation and calibration of the hydrological model in each watershed, reproducing the observed series of water flows, sediment production, and water quality standards. The characterization and inventory of point sources will be conducted with the participation of local governments and NGOs. Modeling results will be summarized as maps and time series that can easily be interpreted by national and local stakeholders. Early runs of the model based on existing information will provide a technical foundation for selecting pollution and sediment control investments *in tributary watersheds* to be financed in Component 4.

2.17 ***d. Implementation and start-up of a hydrodynamic and water quality model for the Gulf of Fonseca.*** This second model will support decisions on possible investments and measures for pollution and sediment control based on potential impacts on the Gulf of Fonseca. The model will be based on the equations for conservation of mass and quantity of movement for free surface flow in shallow waters. Its results will include the spatial and temporal variations in nearshore and oceanographic conditions based on the existing data and the information collected as part of the project. The model will incorporate options for modeling turbulence, Coriolis forces, effect of the wind on the water surface, friction at the bottom, evaporation, precipitation, transport of suspended sediments, salinity, dissolved oxygen, organic matter, nitrates, and phosphates. The biological processes will include the carbon and nutrients cycle, and the growth of phytoplankton and zooplankton. The nearshore conditions will include elevations of the tide, velocities, stream flows, radiation and algorithms capable of representing regions that dry up during the periods of low tide, and that then flood during high tide. The model will be calibrated and validated prior to applying it to predict the dynamic of the Gulf. The project will finance the services needed for the design, installation, and training in the use of the model.

2.18 ***e. Designing and execution of a regional strategy for pollution and sediment control in the Gulf of Fonseca.*** Once both models (hydrological and hydrodynamic) are calibrated and in operation, scenarios of sediment and contaminant discharges from the watersheds will be modeled. The combined models will serve as a decision support tool for formulating and implementing the regional strategy for pollution and sediment control of the Gulf of Fonseca with the aim of preventing potential negative impacts on its ecosystems in a cost-effective manner. The following steps will be taken to arrive at the strategy: (i) medium-term water quality (and sediment where appropriate) targets for managing the Gulf's ecosystems and reducing the potential for transboundary and other impacts will be defined by consensus; (ii) using the calibrated model on hydrodynamics and water quality, scenarios will be simulated with different discharges of pollutants and sediments per tributary watershed to obtain the minimum levels required in the Gulf; (iii) once the permissible discharges of pollutants and sediments are defined for each watershed, the hydrological model will be applied, calibrated by different scenarios of pollution reduction and land use changes, until attaining the pollutant and sediment loads permissible where the watersheds drain into the Gulf. The hydrological model will make it possible to evaluate alternative pollution and sediment control scenarios. Defining the baseline of pollution and potential erosion from the watersheds and scenarios for reduction will take into consideration a series of years representing average and extreme (dry years and rainy years) hydrological conditions. In addition, the scenarios will take into account a 25-year time horizon, including considerations on population growth, changes in land use, and agricultural and industrial activity. These will be the basis for proposing, discussing with national and local authorities and reaching a formal agreement among the three countries on a phased investment plan by watershed. The intent is to develop the strategy in parallel with the other activities of Component 3, involving directly the various regional and national committees of the Project. Immediate results will serve in the selection of investments in Component 4.

4. COMPONENT 4: Promotion of sustainable livelihoods (GEF US$500,000; Total US$12,251,000)

2.19 This component will facilitate both (i) the shift from currently unsustainable productive practices and livelihoods towards sustainable use of environmental goods and services conserving ecosystem resilience and integrity, and (ii) the adoption of best practices in natural resource use and the use of clean technologies in economic sectors that have an impact in the tributary watersheds and the Gulf's waterbody (in line with the trinational coastal management plan and regional pollution and sediment control strategy). Under this component, support will be given to binational and trinational activities, as well as local activities in each of the three countries. GEF resources will be used for field extension activities and the complementary co-financing will be used for investments included in both activities (alternative livelihoods and cleaner production) as a means of implementing the regional pollution and sediment control strategy.

2.20 ***a. Sustainable use of natural resources and development of alternative livelihoods.*** The subcomponent will build on applied research and lessons learned concerning improved small-scale coastal and marine related income generating activities. The activities will support a set of current and tested community-based environmentally sustainable and financially viable productive projects that will offer the population alternatives for subsistence, while reducing pressure on coastal and marine resources. The eligible projects include initiatives supporting the development of innovative opportunities for youths, women, micro and artisanal producers using environmental goods and services

with a business perspective and long-term financial and environmental viability. The following activities will be financed: (i) design and implementation of incentive systems to enhance the environmental performance of community-based initiatives, enterprises and organizations; (ii) technical exchanges with other projects / programs that have designed and implemented payment for environmental services mechanisms specifically designed for watersheds; (iii) technical assistance for the design and investment costs of pilot replicable projects of community interest based on sustainable use of environmental goods and services and proposed by NGOs, producers and community organizations; (iv) training and advisory services on business development for micro and small producers who work in environmentally sustainable activities, including different aspects of business management that will facilitate their insertion in value chains with better prospects for financial viability in the long run. The priority issues for this technical assistance include: supporting associative relationships, market intelligence y opportunities for comercialization, technology changes to enhance efficient use of natural resources and product quality, development and implementation of business plans, training in financial administration and business organization, compliance with technical and environmental norms and regulations and sanitary and phytosanitary standards.

2.21 The initiatives eligible for receiving support from the GEF project under this activity, defined based on the demand identified among the organizations with an active presence in the zone, include: (i) sustainable fishing; (ii) sustainable aquaculture; (iii) ecotourism and arrangements for co-management of marine and coastal areas; (iv) sustainable agriculture and agroforestry, cultivation of fruits and crops with high nutritional and commercial value; (v) sustainable use of mangroves/apiculture; (vi) production and marketing of crafts; (vii) recycling of solid waste; (viii) small investments in infrastructure that make it possible to start up productive projects; (ix) risk prevention; (x) conservation of water resources; (xi) others to be identified during the project's execution[45]. Where appropriate, preference will be given to geographic locations that coincide with the areas selected for field pilot projects under Component 2(b) and (c) (fisheries and mangroves).

2.22 ***b. Support the adoption of cleaner production in targeted sectors and industries.*** The activities under this component will be focused on developing cleaner production practices in current productive sectors identified as critical for pollution control in the Gulf. According to the Transboundary Diagnostic Analysis, these priority sectors include: aquaculture, the shrimp and fish processing industries, and agriculture of export products such as melon and watermelon. Financing will be provided for: (i) disseminating information and raising awareness on the issue of cleaner production in keeping with the reality of these priority sectors in the Gulf. In particular, an effort will be made to document the competitive advantages deriving from the use of cleaner production, including cuts in production costs, improved rate of return, better access to international markets, and other economic incentives that may exist for those industries that decide to implement these initiatives. The means of communication to be used will include workshops for sectoral dissemination, institutional correspondence to the leading companies in each sector, and the project's webpage; (ii) a technical training program in the implementation of cleaner production that answers to the needs of the industries in the Gulf area. The program will have a basic component on general methods of cleaner production, and a specific component for each sector that will be conducted in parallel

[45] Besides being demand-driven, any potential initiative has to be supported by a business plan as well as by a market feasibility study.

with the demonstration "zones" referred to in Component 3(a). An effort will be made to have the providers of technical assistance for cleaner production in the region take it upon themselves to establish and maintain a network among the industries interested in implementing these practices to share successful experiences and challenges that can facilitate the dissemination of these techniques.

III. COSTS AND FINANCING

3.1 The cost of the Project is US$ 26,326,000; GEF will finance US$ 5,000,000 of this amount, which will be administered by the Bank. The governments' contribution is US$ 1,990,000, consisting of administrative and financing costs and in-kind contributions for the execution of the components. In addition, US$ 19,336,000 corresponds to co-financing of US$ 4,000,000 from the AECI; US$ 14,400,000 from MCC; and US$ 936,000 from JICA. Table III-1 shows the indicative budget, distributed by activity and source. Appendix 1 includes the detailed budget and breakdown in the co-financing.

TABLE III-1. Budget by Source of Investment (in thousands of US$)

Components	GEF	Gov.	Agencies	Total
COMPONENT 1: Institutional Strengthening for Regional Management of the Gulf	1,120	240	0	1,360
COMPONENT 2: Management of Costal and Marine Ecosystems	1,666	160	1,429	3,255
COMPONENT 3: Pollution and Sedimentation Prevention and Control/Decision-making Models	1,380	500	6,256	8,136
COMPONENT 4: Promotion of sustainable livelihoods	500	100	11,651	12,251
Administration	334	990	0	1,324
TOTAL	**5,000**	**1,990**	**19,336**	**26,326**

IV. PROJECT IMPLEMENTATION

L. General Framework for Implementation

4.1 The framework for implementing the Project will seek to involve all relevant agencies and organizations in all three countries involved in the management of the Gulf of Fonseca's ecosystems, relying on temporary arrangements while progress is made towards establishing a permanent framework for cooperation. The intent is to establish a Trinational Commission as part of the project through a Cooperation Agreement (see below). In the interim, the implementation structure will consist of two parts: (i) the formal arrangements for project execution, including all administrative and financial aspects which are not intended to exist beyond the period of execution of the project; and (ii) the decision-making and participatory structure which is intended to transform itself into a permanent framework for trinational cooperation for integrated management of the Gulf's ecosystems (see Diagram IV-1). The arrangements proposed will facilitate ongoing consultation and dialogue among the government institutions, local governments, NGOs, scientific community, private organizations, and civil society for decision-making regarding the project activities. Based on an analysis of different options

for trinational execution schemes and consistent with the Zacate Grande Declaration, the three Ministries of Environment (MARN, MARENA and SERNA) have identified CCAD as the regional institution that would take on a transitory role in the integrated management of the Gulf of Fonseca while the trinational scheme is consolidated.[46]

M. Project Execution

4.2 **The Executing Agency** will be the CCAD, through its Executive Secretariat. The Executive Secretariat of the CCAD will be accountable to the Bank for all financial, administrative and management coordination activities and shall establish a Regional Project Coordination Unit (UCPR), that will respond to the Regional Executive Committee.[47] The costs of the UCPR shall be covered by the GEF project. The Executive Secretariat of the CCAD, through the UCPR, shall be authorized to have recourse to the contracting of non-governmental or private entities for technical assistance for the project components, and shall submit progress reports on the project to the Regional Executive Committee and the IDB.

4.3 **The Executive Secretariat of the CCAD**, through the UCPR, shall: (i) support the implementation of the Project Operating Regulations; (ii) administer the Project's financial resources in keeping with the financing agreement with the Bank and the cooperation agreements with the ministries of environment of each country; (iii) request the Regional Executive Committee's approval for appointing the Director of the UCPR; (v) propose modifications to the structure of the Project, if necessary; (iv) support the Project evaluation missions that are programmed; (vii) request reports from the UCPR as necessary; and (ix) present the operational plans, budgets, manuals, and other operational instruments to the Regional Executive Committee.

4.4 **The UCPR** shall perform its functions at the Project headquarters to be situated in the Gulf area and will coordinate its activities with the national authorities and with the Regional Executive Secretariat of the CCAD. Selection of the location of the Project headquarters will be based on technical criteria such as access, communications, and availability of office space and other facilities as counterpart contributions[48]. The UCPR will have a Coordinator specialized in project execution and management of coastal-marine resources, a hydrologist specialized in contamination and water quality, a specialist in project administration and monitoring, and a specialist in the information system, as well as the corresponding auxiliary staff. The functions of the UCPR will include: (i) planning, coordinating, and supervising Project activities in each country; (ii) facilitating coordination at the regional and national level, and nationally, and the central, departmental, and local levels; (iii) coordinating with the national teams to prepare the proposed operational plans, budgets, and other operational instruments; (iv) following up on execution of the operational plans and budgets; (vi) submitting progress reports on the Project to the Regional Executive Committee, the Regional Technical Committee and the Bank; (vii) submitting other reports as required; (vii) monitoring and evaluating the demonstration projects and innovative production projects; (viii) coordinating with the, the Executive Secretariat of the CCAD, and the respective national authorities on matters

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46 This implementation framework is subject to final confirmation by all three countries during the appraisal mission.

47 The responsibilities of the Executive Committee would eventually be assumed by the Trinational Commission once the Cooperation Agreement establishing it is agreed upon. This applies to all other instances where the Executive Committee is mentioned in this section.

48 See draft Operating Regulations for a full list of criteria.

important for execution of the Project; and (ix) providing support to the Regional Executive Committee in its functions.

4.5 **Program Participating Agencies.** Specific agreements will be signed when necessary for monitoring and/or providing technical and logistical support to activities (see Components 3 and 4 described below), seeking the involvement of government institutions (MAG, SAG, CODHEFOR, MAGFOR, MIFIC, INETER, etc.) the local governments, NGOs, producers and community organizations as Program Participating Agencies. In addition, the existing structures will be used, such as the federations, and regional associations, be they between local governments and NGOs and other existing community organizations, which will receive technical assistance to ensure decentralized and participatory management and implementation.

4.6 **The execution of Component 1** will involve the procurement of technical assistance services for capacity building and the installation of the information node. **The execution of Component 2** will involve the procurement of technical assistance services for the regional coastal management plan, and the direct involvement of program participating agencies, local governments and NGOs in the execution of activities.

4.7 **For the execution of Component 3**, the hydrometric and meteorological monitoring will be done by the respective institutions of each country (SNET of MARN in El Salvador, Water Resources Department of SERNA in Honduras, and INETER in Nicaragua) through agreements signed with the UCPR. The bathymetric studies and monitoring of the quality of the coastal-marine waters shall be done under contract to research or private institutions under the supervision of the UCPR.[49] The expert on hydrology and pollution from the UCPR will be in charge of supervising collection of the hydrological and hydrometric information needed for designing and implementing the hydrological model. The models will be prepared and calibrated by contract with a firm or consultants from the first year of the project. A Regional Modeling Committee will be constituted made up of a group of specialists from each country which, together with the Monitoring Committee, shall periodically be shown the progress in modeling and its results. The UCPR will participate on this Committee, represented by the specialist in hydrology. It is expected that by the end of the second year there will be a calibrated hydrological and hydrodynamic model. The model will be transferred to the UCPR and to the countries, which will designate personnel from the relevant institutions to receive education and training during the process of developing and implementing the models. Indicative terms of reference have been prepared for the execution of this component.

4.8 **For execution of Component 4,** the initiatives to receive technical assistance and financing will be designed by non-governmental organizations and community-based organizations that have legal status in at least one of the three participating countries. The UCPR will issue a call for proposals at the outset of the project and will widely disseminate the criteria for eligibility, mechanisms for project selection, and dates and formats for submitting proposals through its webpage and other media considered appropriate, such as local radio and community message boards. The organizations interested will submit formal proposals to the UCPR within the established deadlines. During the first two years, a committee made up of members of the Regional Technical Committee will meet twice yearly to assess and assign priority to the proposals received according to procedures established in the Project Operating Regulations. The amounts

[49] Cooperation is being sought from the Mesoamerican and Caribbean Hydrographic Commission.

to be financed per project shall be less than $75,000 and the criteria of eligibility for granting the financing shall be established in the Project Operating Regulations and shall include, among others, the following:

a. *Institutional capacity of the bidding organization.* In order to establish the capacity for execution of the bidding organizations, the following variables will be analyzed: years since legally established, present and historical annual budget, prior and current financing by other donors, types, extent, and impacts of the projects carried out previously, full-time and part-time staff, educational level of the staff.

b. *Local environmental and social benefits*. The impact on the global environmental benefits sought to be attained by this GEF project.

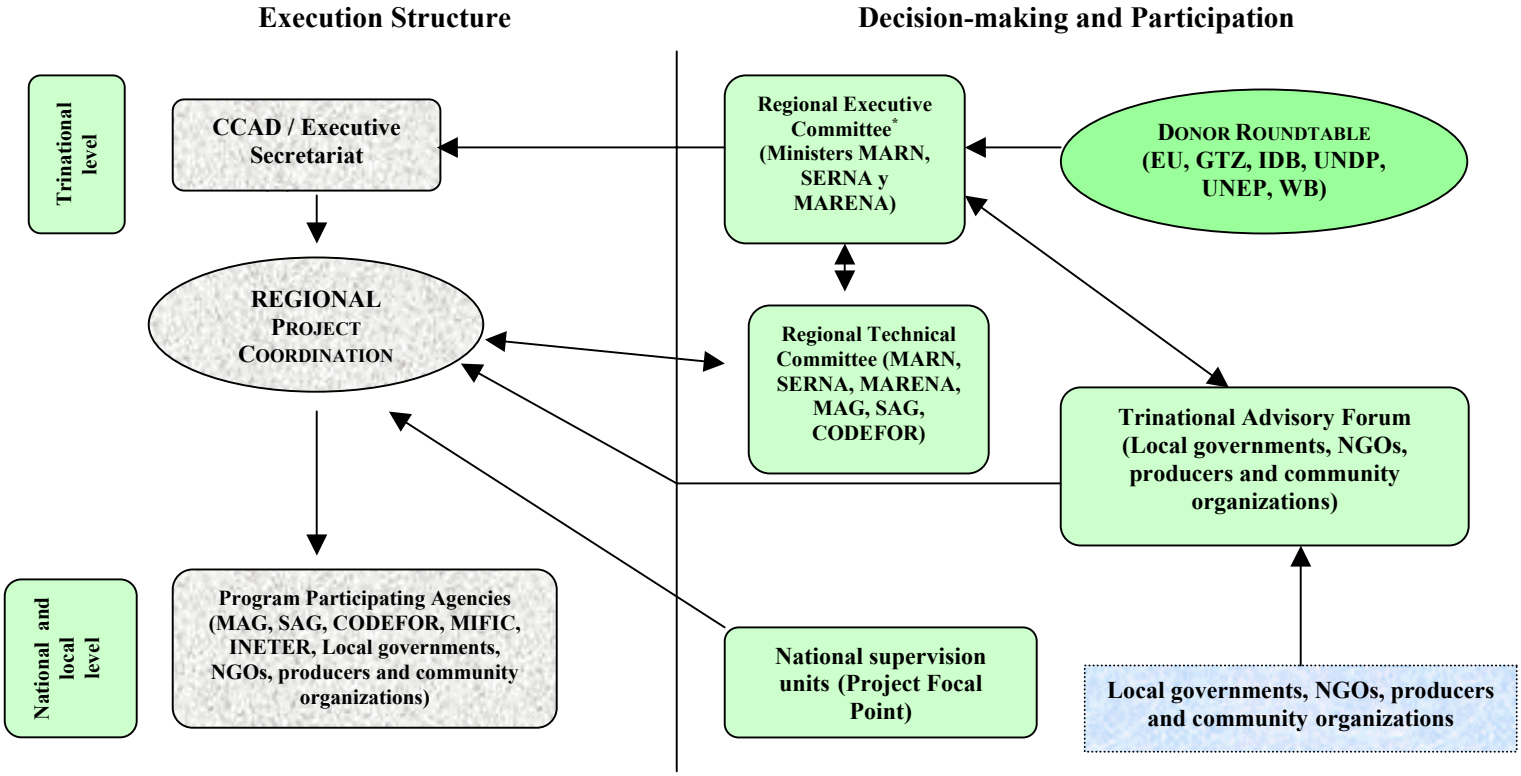
c. *Sustainability.* Project's potential for long-term self-sustainability and replicability.

d. *Compatibility* of the proposal with the strategic lines of investment of the GEF project described above.

N. Decision-making and Participatory framework

4.9 Diagram IV-1 shows the decision-making and participatory scheme that will be the foundation for project implementation. The execution structure is also shown.

Diagram IV-1. Project Execution and Participation Structure



* The responsibilities of the Executive Committee would eventually be assumed by the Trinational Commission once the Cooperation Agreement establishing it is agreed upon.

4.10 **Regional Executive Committee**. The Regional Executive Committee will be made up of the Ministers of the Environment of each country, with the assistance of the Executive Secretariat of the CCAD, which will assume the coordination functions. The Chair shall be revolving. Its basic functions, in addition to those set forth in previous paragraphs, shall be: (i) to foster and facilitate the political support of the three governments for carrying out the Project; (ii) to define regional actions, by consensus; (iii) to learn of the operational plans and budgets; (iii) to establish cooperation mechanisms with the ministries of foreign relations and other competent agencies of each country in relation to the Project activities; (iv) to define cooperation mechanisms with the donor and learn of any agreements between it and the CCAD. Once established by a formal Cooperation Agreement negotiated as one of the activities of the project, the Trinational Commission for the Management of the Gulf of Fonseca Ecosystems would assume some of the functions of the Regional Executive Committee.

4.11 **Trinational Advisory Forum.** The local governments of the region in the three countries will be encouraged to participate, along with civil society organizations, non-governmental organizations, the private sector, and the scientific community in the area. Representatives of these agencies will constitute the Advisory Forum**,** which will be consulted on aspects relating to the design and implementation of the activities programmed and monitoring of result and adjustments of the Program. The Forum will meet 1-2 times a year and will also be consulted on the Annual Operational Plan. The Forum will be responsible for promoting communication and exchange of information

with the groups of users and communities. In order to facilitate the participation of local governments from the Gulf region, the initiative of the Federation of Coastal Municipalities of the Gulf of Fonseca will be launched anew, without prejudice to federations of municipalities that are being organized in each country, such as ASIGOLFO in El Salvador and NASMAR in Honduras.

4.12 **Regional Technical Committee.** The Committee will be made up of representatives of each Ministry of Environment (SERNA, MARN, and MARENA), and of the Secretariat of Agriculture (SAG) and the *Corporación Hondureña de Desarrollo Forestal* (COHDEFOR), in the case of Honduras, the Ministry of Agriculture (MAG) in the case of El Salvador, and the Ministry of Agriculture and Forestry (MAGFOR), Ministry of Industrial Development and Commerce (MIFIC), and the *Instituto Nicaragüense de Estudios Territoriales* (INETER), in the case of Nicaragua; it will also include one representative of the CCAD. Its basic functions include: (i) providing advisory services to the Project Executive Committee (and eventually to the Trinational Commission) and the UCPR on technical aspects of the Project, including, for example, reviewing the terms of reference; (ii) taking stock of the proposed operational plans, budgets, manuals, and other operational instruments, and issuing a report prior to their submission by the Executive Secretariat of the CCAD to the Project Executive Committee; (iii) proposing guidelines for the Executive Committee to coordinate the Project activities; (iv) facilitating cooperation among the three countries; and (v) preparing the reports required by the Executive Committee.

4.13 Additionally, to the extent necessary, it may be agreed to set up **Ad hoc Technical Subcommittees** on fisheries, aquaculture, contamination, forests, and other areas, with representation from the three countries. The Regional Technical Committee and the Ad Hoc Technical Subcommittees may include the participation of universities, non-governmental organizations, and other agencies tied to the Project activities.

4.14 **The national supervision units** within the ministries of each country will be the liaisons between the regional structure and the national structure in the framework for implementation. The national monitoring unit constituted basically by a focal point (i.e. the Division Director) should designate the representatives of other institutions to participate in the Regional Committees (examples include land-use management, modeling, and monitoring). In addition, the national unit may convene and establish ad hoc committees to analyze, comment on, and respond to matters referred by the Regional Committees. For example, the national monitoring units will analyze the actions the country should take to respond to the regional strategy agreed upon by the three countries, and submit its action plans.

4.15 **Donor Roundtable**: This will be a forum where financing institutions providing support to initiatives in the Gulf of Fonseca can seek complementarities and share results and lessons learned of project execution. It will initially be constituted by GEF, JICA, AECI, EU, GTZ, IDB, UNDP, UNEP World Bank and others.

4.16 **Bank supervision**. The Representation of the Bank in one of the three participating IDB Country Offices will be responsible for the supervision of the execution of the project.[50] If required, the IDB office will be strengthened with a specialist assigned to GEF projects to ensure that sufficient capacity is in place for effective supervision.

[50] One of the Bank's criteria in selecting the Country Office will be the location of Project headquarters.

O. Procurement of Goods and Services

4.17 The procurement of goods and services will adhere to the Bank's policies for procurement, GN-2349-7 and GN-2350-7, and in keeping with the procurement plan prepared for this project. The limits for the contracts are shown in Table IV-1.

Table IV-1. Limits on contracts

Type	International Public Biddings[51]	National Biddings	National Private Biddings	Direct contracting
Consulting Services	≥200	< 200	N/A	<30
Goods	≥ 250	≥50 y < 250	< 50	<25
Works	≥5,000	≥350 y <5000	< 350	<50

P. Disbursement periods

4.18 The disbursements should be for 60 months from the start date of the contract. The tentative timeline for disbursements is shown in Table IV-2.

Table IV-2. Showing Disbursements (in thousands of US$)

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total	%
GEF	650	1,250	1,400	1,250	450	5,000	19%
Gov. contributions	260	500	560	500	170	1,990	7.5%
Agencies	2,510	4,830	5,410	4,830	1,756	19,336	73.5%
Total	3,420	6,580	7,370	6,580	2,376	26,326	100%
Percentage	13%	25%	28%	25%	9%	100%	

Q. Monitoring and Evaluation

4.19 Activity **d** of Component **1** embraces actions that will enable the establishment and operation of a monitoring and evaluation system (M&ES) for estimating not only the performance and impacts of the project, but also for obtaining, analyzing and systematizing data required for developing other components (particularly Components 2 through the CRM benchmark system and Component **3**, as described previously). The M&ES will incorporate the baseline generated by the TDA and described in the logical framework matrix (Annex B). Within the first year of the project execution, the complete baseline of outcome and output indicators included in the log-frame matrix will be consolidated and the detailed M&ES will be made operational (see Annex E). The system will include three types of indicators: (i) process outcomes indicators such as the publication of the Trinational Cooperation Agreement and the conformation of the Trinational Commission for the Management of the Gulf of Fonseca Ecosystems; (ii) stress reduction outcomes indicators such as those that reflect amounts of pollutants phased out, improved policies / regulations and progress in local CRM as measured by the CRM benchmark system; and (iii) environmental / water resources status outcomes indicators, such as annual changes in water quality measures at the hydrometric stations by the mouths of the respective watersheds. The M&ES will be build on existing initiatives that have been developed by different stakeholders, and will be located within

[51] For consulting services, a competitive selection process is used rather than bidding.

the UCPR, therefore it is expected that the system will be internalized in the existing institutions, involving their staff and other local organizations, in order to ensure continuity after the life of the project. As indicated in Table 1 in Annex E of the GEF Executive Summary, the total estimated costs for monitoring and evaluation are US$ 400,000.

4.20 A mid-term evaluation will be carried out when 50% of the GEF resources have been disbursed or after 30 months after the project contract goes into effect, whichever comes first. This review will determine if the project strategy is performing according to the established objectives, or if adjustments are necessary. In addition, a final evaluation is to take place when 90% of the GEF resources have been disbursed to determine, among others, the extent to which the project objectives have been reached, the level of stakeholder participation in decision-making, positive changes in beneficiaries and practices due to the intervention, as well as sustainability and cost-effectiveness. Both evaluations will place special emphasis on certain critical issues such as: (1) how effective are the cooperation agreements and the process of designing and implementing the coastal-management plan and the regional pollution control strategy, for bringing about a consensus among the three countries on the strategic guidelines for the integrated management of the Gulf?; (2) have the capacities for management and co-management of coastal-marine resources been improving in the Gulf area?; (3) to what extent have the industries adopted clean production technologies, and the communities internalized / diversified the sustainable use of the ecosystems of Gulf of Fonseca and good practices in their productive activities, and what types of socioeconomic benefits are being generated?; (4) has there been an improvement in the dissemination of information, awareness-raising, and scientific knowledge of the Gulf of Fonseca as a regional ecosystem, so that management decisions are being made on the basis of the best available and accurate information?; and (5) what are the trends observed in the ecological integrity of the ecosystems of Gulf of Fonseca and how is the Project contributing to maintaining them? The results of the evaluations, the lessons learned, and the good practices will be widely disseminated and shared among the local and national governments, strategic local allies, co-financing agencies, and other relevant actors nationally, regionally, and internationally, including efforts financed by the GEF, through the Project's website and IW:Learn.

V. BENEFITS, FEASIBILITY AND RISKS

A. Benefits

5.1 The implementation of this GEF project will contribute to attaining benefits that would not be otherwise obtained without the cooperation of the three countries that share the Gulf. In this regard, the Project's **global environmental benefits** include the following, among others: (i) an overall improvement in the status of the Gulf's marine and coastal resources, including shared fisheries resources, and the prevention of regional (trinational) conflicts over resource use, as a consequence of fully-endorsed social, environmental and economic cooperative agreements for their management in a highly participatory manner; (ii) an enhancement of pollution and sediment control in the Gulf (coastal and marine waters) through harmonized policies, regulations and actions to reduce erosion, liquid and solid wastes, and agrochemicals from tributary watersheds including two transboundary watersheds. This will contribute to the conservation of habitats which sustain fisheries production not only in the Gulf itself, but also along the

rest of the Central American Pacific coast[52]; (iii) an advance in the scientific understanding and assessment of marine and coastal ecosystems as a fundamental basis for sound decision-making; and (iv) at the end, the project will generate global benefits through an integrated approach to Gulf-wide management as reflected in an innovative approach to developing Central America's first multi-national coastal management plan. This and the combined actions of the Project at the field level will strengthen long-term, cross-cutting, and sustainable protection of strategic ecosystems such as the wetlands and mangroves that have been declared to be of global importance by the Ramsar Convention, as habitat for numerous local and migratory bird species.

5.2 **National and regional benefits** include, among others: (i) improved technical and operational capacities of institutions, civil society organizations, professional and academic networks, private sector associations, users' groups and local governments for an integrated management of the Gulf, and supported by a common CRM benchmark system; (ii) better legal and technical basis for a permanent regional arrangement for management of the Gulf of Fonseca; (iii) a coherent regional framework of policies for managing ecosystems negotiated by the three countries, reflecting a shared vision of the Gulf as an integral system; (iv) new mechanisms for leveraging the financing for managing coastal and marine ecosystems amongst three countries; and (v) regional adoption and replication by the private sector and co-administrators (users of mangroves, cooperatives of fishers, co-managers of protected areas) of innovative cleaner production technologies and good practices.

5.3 **Local benefits** include, among others: (i) a progress in the offer of sustainable alternative livelihoods, which are critical for creating better prospects for bolstering the income of the population, at the same time that it boosts not only food security but also the well-being of its inhabitants; (ii) a pressure reduction on key resources of local scope such as the mangrove forest; (iii) improved local socio-economic conditions through reduced water pollution; and (iv) increased capacity of local institutions as well as of Municipalities to protect public goods against free riders that will enhance the long-term carrying capacity of the Gulf's ecosystems. The achievements of benefits at local and national levels will be largely financed by non-GEF co-financing.

B. Feasibility

5.4 **Institutional.** At the local level, the presence of a strong set of civil society organizations in each country creates opportunities for local participation in the integrated management of ecosystems and ownership of the activities promoted by the GEF IW Project. For example, the *Asociación Civil Trinacional del Golfo de Fonseca* (ACTRIGOLFO) has laid the groundwork for cooperative partnerships to attain local sustainable development. The institutional assessment conducted during project preparation indicates that the 19 local governments of the Gulf have varying levels of capacity in local CRM. Nonetheless most have municipal environmental units and have had prior involvement with environmental management activities. They will be the recipient of much of the capacity building to ensure their effective participation. Institutional challenges arise in the consolidation of the *Mancomunidad de Municipalidades del Golfo de Fonseca* (MUGOLFO), a process initiated previously by the PROGOLFO Project, but which requires the support that this GEF Project plans to provide.

[52] Including the Pacific Central American Coastal LME.

5.5 At the national level SERNA, MARENA, and MARN have actively accompanied the process of designing the project and have expressed their interest in working together to carry it out through their regional offices in the Gulf area, and also with technical liaisons for the Project. The ministries of environment of the three countries have expressed their interest in signing a high-level trinational agreement that would constitute a platform for the Project's actions and for designing collaborative actions in the long run for the coordinated management of the Gulf's ecosystems.

5.6 The selection of CCAD as executing agency was made based on the regional political legitimacy and sustainable development mandate of the institution and its previous successful experiences with project execution supported by execution unit. CCAD has a unit for Coordination of Projects in Execution, that has executed several projects financed by multilateral and bilateral institution (USAID, COSUDE, ASDI, ACDI, DANIDA, PAISES BAJOS, BID, BCIE, WWF, FAO, COOP. ESPAÑOLA, PNUMA, PNUD) including GEF projects (Reserva de Biosfera Transfronteriza Corazón del Corredor Biológico Mesoamericano GEF/BM). The institutional analysis of CCAD undertaken as part of the project preparation shows, that CCAD has adequate systems to manage funds and acquisition processes of services.[53]

5.7 **Financial.** The assessment made, during preparation of the Project, of the feasibility of attaining financial sustainability so as to guarantee the long-term impacts indicates that there are major challenges in connection with this task as in the case of many GEF IW Projects (see Annex F). Nonetheless, if the Project succeeds in diversifying the sources of financing so as to include self-generated sources and external sources and private resources, from private sources, donors and the public sector, its financial viability may be feasible. In this regard, one of the activities of the project includes the design of a business plan for the Full-scale GEF Project, and the creation and operation of a unit to support the investment that will undertake to raise resources for the project from potential private investors and/or donors. The presence of consolidated industry in the region (such as aquaculture in Honduras and Nicaragua) and of large-scale port infrastructure projects and associated developments (such as the Port of La Unión in El Salvador) generate significant opportunities for establishing partnerships between the public and private sectors for attaining environmental objectives such as reducing pollution and sedimentation.

5.8 First, the estimated recurrent costs for sustaining the impacts of the project beyond the horizon of GEF financing come to approximately $300,000 to $500,000 per year. This estimate includes the costs of maintaining the UCPR, which in the long run seeks to become a permanent secretariat for coordinating the actions of the three countries for the integrated management of the Gulf ecosystems. Other investments included in this category of recurrent costs include funds for activities including, among others, the periodic meetings of the Advisory Forum and the Regional Technical Committee; operation and maintenance of the hydrometric network, water quality monitoring; and holding donors' and investors' forums.

5.9 Second, the Financial Sustainability Analysis suggests that the amount the GEF project could generate annually ranges from $350,000 to $1,800,000. Although it is noted that these sums might not be sufficient to cover the recurrent costs of the project, it is important to bear in mind that the investment support structure designed in component 4

[53] Final selection of CCAD is pending confirmation from all three countries during the appraisal mission.

will take charge of mobilizing resources additional to those provided by GEF.[54] Moreover, to reduce the financial risks, an effort will be made for the investment support structure in the GEF project to prioritize its actions on those alternatives that have greater potential for generating resources, and that are easier to implement.

5.10 **Social and Environmental**. Positive global environmental impacts are anticipated, associated with the improvement in the quality of the surface waters in tributary watersheds and coastal zones of the Gulf, as well as the conservation and restoration of critical coastal and marine ecosystems such as estuaries and mangroves. In addition, the institutional strengthening of the public entities at the national and local levels, as well as of the civil society organizations involved in the Gulf's environmental management will have positive long-term impacts. Local residents will also benefit from improved environmental conditions and enhanced opportunities for sustainable livelihoods, augmenting the general wellbeing of the population. Additionally, the involvement of key productive sectors and industries in the adoption of cleaner technologies will help mainstream ecological considerations in the development agenda of the Gulf. The inclusion of targeted groups such as women, youths and artisanal producers generates conditions for increase the equity for minorities. The potential negative environmental impacts, which include possible adverse short-term impacts associated with productive activities supported by the Project, can be prevented or mitigated using well-established and effective measures and through a strict project selection process to be specified in the Project's Operation Regulations.

5.11 The project has been designed based on the social processes previously consolidated by the PROGOLFO Project, which laid the bases for the need of a shared vision and management of the Gulf of Fonseca among the three countries, especially at the local level. In addition, this Project has taken into account during its design, the initiatives of the Central American Commission on Environment and Development (CCAD) in the zone, which has taken the lead in designing regional policies for environmental management that in fact, improve the social welfare. Although these processes contribute to the social and environmental feasibility of the project, it is important to note that the levels of poverty and unmet basic needs of the population pose major challenges in the task of reducing pressures on the Gulf's ecosystems. Therefore, it is important to stress that this Project's success also depends on its capacity for supporting environmentally-sustainable productive projects that make it possible to improve the population's incomes.

C. Consultation and participation

5.12 The process of designing this project involved a broad range of stakeholders who direct, participate actively in, and/or have an impact on the environmental management of the Gulf of Fonseca. While the consultations carried out sought to reach out and involve the groups that participated during implementation of the PROGOLFO Project; new actors were added based on the needs identified. Three trinational workshops were held, one in each country, which included representatives of the environmental authorities from the national and local levels, the productive sectors, and the non-governmental organizations that work in the Gulf of Fonseca. In addition, a trinational workshop was held focused on the local governments of the Gulf, which included the participation of the mayors and/or

[54] A more detailed explanation of these conclusions is found in the annex to the Transboundary Diagnostic Analysis, Financial Sustainability Analysis.

persons in charge of the environmental units from 18 of the 19 coastal municipalities of the project's area of influence. To supplement that workshop, focus group consultations were held to consult with local actors in each country, and two regional tours in the context of which representatives of municipalities, non-governmental organizations, and productive sectors were interviewed.

5.13 Among the key actors consulted in the process are: technical liaisons with the project from SERNA, MARENA, and MARN, representatives of their divisions of international cooperation, and of institutions such as COHDEFOR, DIGEPESCA-SAG, FORCUENCAS, INETER, SNET, and CENDEPESCA; representatives of the Central American Commission on Environment and Development (CCAD), staff of NGOs in the working in the region such as the Asociación Civil Trinacional del Golfo de Fonseca (ACTRIGOLFO), CODECA, ASDI, ASIGOLFO, CODDEFFAGOLF, SELVA, and Fundación LIDER; representatives of the artisanal productive sector such as the Cooperativa de Pescadores Artesanales de Puerto Morazán, Cooperativa de Pesca Artesanal PROMANICARL de Potosí, FENICPESCA, Asociación de Pescadores Playitas, Asociación de Pescadores Artesanales de la Playa del Cuco, Cooperativa de Pescadores Varios de Amapala y la Bahía de Chismuyo, APAGOLF, and FENAPESCAH; representatives of the private sector such as the Asociación Nacional de Acuicultores de Honduras (ANDAH) and CAMANICA; representatives of the Empresa Nacional de Puertos (ENP) of Honduras and of the Comisión Ejecutiva Portuaria Autónoma (CEPA); and donors such as the Spanish International Cooperation Agency (AECI).

5.14 Information dissemination and consultation will continue during project implementation through the social communication strategy and environmental education activities included in Component 1(c) as well as the Project website. Effective local participation in Project activities is a cross-cutting element of each Component. For example, in Component 1, the Trinational Advisory Forum will provide a local venue for discussing and providing feedback on project implementation. The formulation of the coastal management plan (Component 2 (a), will use a participatory mapping technique that will directly involve local governments. The CRM benchmark system will remain as a local tool for municipalities to monitor progress and share experience in coastal management in the Gulf region. Co-management of fisheries and mangroves offers multiple opportunities for producers to take active part in activities such as inventories, registries, and restoration (Components 2 (b) and (c). In Component 3, local governments will participate in collecting data for the models and in assessing their results. Finally, Component 4 provides incentives for micro, small and medium enterprises and industry to take an active role in maintaining the Gulf's ecosystems.

5.15 **Risks**. The success of the project in achieving its global objectives faces three risks: (i) a political risk associated with boundary considerations between the three countries which could cause delays in execution and affect activities aimed at harmonizing policies, norms and procedures for ecosystem management. This risk was recognized at the outset during the preparation process, and the three governments agreed that the project's scope would not encompass or intervene in boundary considerations. All three Ministries of Environment have undertaken to ensure that the appropriate national entities are consulted in a timely manner on any consideration of concern deemed to be beyond the scope of the project. In addition, several formal agreements exist between all three countries that recognize the need for trinational cooperation in managing the Gulf of Fonseca. Despite these measures however, the risk is considered on-going; (ii) a risk

associated with large infrastructure developments in the coastal zone (both planned and in construction) such as the new Port of La Unión-Cutuco, that may lead to increased immigration, commercial maritime and land-based transport, and associated industries which, if not planned. These could trigger increased maritime traffic and rapid land use changes that exceed the gradual capacity building of national and local governments in coastal resources management financed by the project, possibly causing unforeseen local and transboundary impacts on the Gulf' ecosystems. Hence, the importance of project activities in Component 1, such as the enhancement of mechanisms for the involvement of the civil society in the Gulf's management, as well as those considered in Component 4, which seek to work in coordination with the different productive actors in the zone to secure their commitment to conservation of the Gulf's ecosystems; (iii) finally, to a large extent, the success of the project will depend on the availability of the co-financing resources and the commitment of the national governments in allocating their human resources at the right time. The national governments have pledged their support to the project's activities. Additionally, negotiations with other potential donors took place during project preparation and final commitments will be received by all the involved institutions by the time of CEO Endorsement.

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Appendix I: Detailed Budget by Source of Investment (in thousands of US$)

Components / Activities	GEF	Countries	Agencies*	Total
Component 1 - Institutional Strengthening for Regional Management of the Gulf	**1,120**	**240**	**0**	**1,360**
Activity 1.a: Strengthening the technical and operational capacities of key stakeholders of regional and local institutions, as well as social actors.	400	100	0	
Activity 1.b: Reinforcement of trinational coordination framework	270	140	0	
Activity 1.c: Enhancement of the mechanisms for the involvement of the civil society in the Gulf's management	200	0	0	
Activity 1.d: Consolidation of the information node for monitoring the Gulf of Fonseca by linking the local and national information systems with a Regional one.	250	0	0	
Component 2: Management of Coastal and Marine Ecosystems	**1,666**	**160**	**1,429***	**3,255**
Activity 2.a: Design and implement a trinational coastal management plan for the Gulf of Fonseca as a foundation for effective local Coastal Resource Management.	300	0	-	
Activity 2.b: Develop fisheries and aquaculture policies and co-management plans for the Gulf among the three countries.	626	160	-	
Activity 2.c: Enhancing the financial sustainability for the management and co-management of the Gulf's resources.	240	0	-	
Activity 2.d: Environmental restoration of mangrove ecosystems.	500	0	-	
Component 3: Pollution and Sediment Prevention and Control/Decision Making Models	**1,380**	**500**	**6,256***	**8,136**
Activity 3.a: Expansion of the hydrometric and water quality monitoring network in the tributary watershed of the Gulf of Fonseca	350	100	-	
Activity 3.b: Update of bathymetric information and establishment of monitoring the atmosphere, the hydrodynamics, and water quality within the Gulf of Fonseca.	230	300	-	
Activity 3.c: Implementation and start-up of a hydrological model in the tributary watersheds of the Gulf of Fonseca.	260	0	-	
Activity 3.d: Implementation and start-up of a hydrodynamic and water quality model for the Gulf of Fonseca.	240	0	-	
Activity 3.e: Designing and execution of a regional strategy for pollution and sediment control in the Gulf of Fonseca.	300	100	-	
Component 4: Promotion of Sustainable Livelihoods	**500**	**100**	**11,651***	**12,251**
Activity 4.a: Sustainable use of natural resources and development of alternative livelihoods.	400	0	-	-
Activity 4.b: Support the adoption of cleaner production in targeted sectors and industries.	100	100	-	-
OTHER COSTS				
Administration and supervision	**334**	**990**	**0**	**1,324**
TOTAL	**5,000**	**1,990**	**19,336**	**26,326**

* Allocation for individual activities coming from Agencies will be decided during the implementation phase.

Summary of other sources of financing (different from the Countries) by source of investment (in thousands of US$)

Components	MCA	AECI	JICA	Total
Component 1 - Institutional Strengthening for Regional Management of the Gulf	0	0	0	0
Component 2: Management of Coastal and Marine Ecosystems	1,100	329	0	1,429
Component 3: Pollution and Sediment Prevention and Control/Decision Making Models	5,320	0	936	6,256
Component 4: Promotion of Sustainable Livelihoods	7,980	3,671	0	11,651
Totals	**14,400**	**4,000**	**936**	**19,336**