

**REPORT AND RECOMMENDATION**

**OF THE**

**PRESIDENT**

**TO THE**

**BOARD OF DIRECTORS**

**ON A**

**PROPOSED LOAN**

**TO THE**

**DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA**

**FOR THE**

**COASTAL RESOURCE MANAGEMENT PROJECT**

**November 1999**

**CURRENCY EQUIVALENTS**  
**(as of 31 October 1999)**

Currency Unit	–	Sri Lanka Rupee/s (SLRe/SLRs)
SLRe1.00	=	\$0.0140
\$1.00	=	SLRs71.550

The Sri Lankan rupee is allowed to float against a weighted average basket of currencies of Sri Lanka's major trading partners. For the purpose of calculations in this report, a rate of \$1.00 = SLRs70.81 has been used, which was the rate generally prevailing at the time of loan appraisal.

**ABBREVIATIONS**

BME	-	benefit monitoring and evaluation
CBO	-	community-based organization
CCA	-	Coast Conservation Act
CCAC	-	Coast Conservation Advisory Council
CCC	-	community coordination committee
CCD	-	Coast Conservation Department
CEA	-	Central Environment Authority
CERM	-	coastal environment and resource management
CFC	-	Ceylon Fisheries Corporation
CFHC	-	Ceylon Fishery Harbours Corporation
CIDA	-	Canadian International Development Agency
CRM	-	coastal resources management
CZMP	-	Coastal Zone Management Plan
DANIDA	-	Danish International Development Assistance
DFAR	-	Department of Fisheries and Aquatic Resources
DFID	-	Department for International Development
EA	-	executing agency
EIA	-	environmental impact assessment
EIRR	-	economic internal rate of return
EU	-	European Union
FGD	-	focus group discussion
FPIU	-	field project implementation unit
FRP	-	fiberglass reinforced plastic
GST	-	goods and service tax
GTZ	-	Deutsche Gesellschaft für Technische Zusammenarbeit (German Agency for Technical Cooperation)
IA	-	implementing agency
IBE	-	inboard engine
IEC	-	information, education and communication
IUCN	-	The World Conservation Union
JBIC	-	Japan Bank for International Cooperation
JICA	-	Japan International Cooperation Agency
LCB	-	local competitive bidding
MFARD	-	Ministry of Fisheries and Aquatic Resources Development
MPPA	-	Marine Pollution Prevention Authority
NARA	-	National Aquatic Resources Research and Development Agency

NGO	-	nongovernment organization
NORAD	-	Norwegian Agency for Development
O&M	-	operation and maintenance
OBE	-	outboard engine
PD	-	project director
PMD	-	Planning and Monitoring Division
PMO	-	project management office
RSA	-	rapid social assessment
SAM	-	special area management
SCF	-	standard conversion factor
SEEDS	-	Sarvodaya Economic Enterprises Development Services
Sida	-	Swedish International Development Cooperation Agency
TA	-	technical assistance
TOR	-	terms of reference
UNDP	-	United Nations Development Programme
UN/FAO	-	Food and Agriculture Organization of the United Nations
USAID	-	United States Agency for International Development
WTP	-	willingness to pay

## **NOTES**

- (i) The fiscal year (FY) of the Government ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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## **LOAN AND PROJECT SUMMARY**

<b>Borrower</b>	Democratic Socialist Republic of Sri Lanka
<b>Project Description</b>	<p>The Project will cover six districts in North Western, Western, and Southern provinces. The Project aim is to minimize the potential adverse impacts of coastal erosion in critical coastal stretches through the establishment of appropriate physical interventions intended to stabilize the coastline. Environmental degradation in selected lagoons, that support coastal fishing will be addressed by following the Special Area Management (SAM) planning approach, which has been pilot-tested in Sri Lanka. The Project will also encourage the sustained management and development of coastal fisheries resources by implementing activities intended to address the following identified issues: overfishing in coastal waters, the high percentage of fish wastage, and lack of infrastructure support facilities in specific locations. The institutional capabilities of the concerned Government agencies and community organizations in resource management will be strengthened under the Project through interventions intended to address the identified institutional weaknesses.</p>
<b>Classification</b>	Primary - Environment
<b>Environmental Assessment</b>	<p>Category - A</p> <p>An environmental impact assessment (EIA) was undertaken and the summary EIA was circulated to the Board on 29 July 1999.</p>
<b>Rationale</b>	<p>Attention is urgently needed to address the following key issues in the Sri Lankan coastal resources sector: (i) serious erosion of the coastline, especially in areas with concentrated economic activity or vital infrastructure; (ii) unmanaged fishing in coastal and offshore areas; (iii) pollution and uncontrolled exploitation of lagoons and estuaries, coral reefs, mangrove swamps, sea grass beds, other wetlands, and dune systems; and (iv) widespread poverty among the coastal population. Failure to accord priority to these issues would put the enormous contribution of the coastal belt to the economy at risk. A significant percentage of the population living in the coastal areas obtain their livelihood by exploiting the fishing and nonliving marine resources. Many live below the poverty line and unless measures are taken to improve their income levels and they are retrained to undertake alternate livelihood activities, the pressure they exert on the resource base will continue to exacerbate the situation. Institutional reforms and capacity-building efforts are required to support more efficient management practices. The Government will not be able to implement an integrated approach to the conservation and management of coastal resources without the necessary administrative capacities and legal environment.</p>

**Objectives and Scope**

The main objective of the Project is to establish integrated management of coastal resources to improve their sustainability. The Project will have four components: (i) coastline stabilization, which will address the problem of coastal erosion and develop proactive/preventive management schemes; (ii) coastal environment and resource management (CERM), which will address problems of coastal resource degradation and include activities intended to reduce pollution in lagoons and relieve pressure on coastal resources; (iii) fisheries resource management and quality improvement, which will aim at sustainable coastal fisheries management supported by the construction of harbors/anchorage and ancillary facilities that will allow the improvement of fish quality and the reduction of handling losses; and (iv) institutional strengthening, which will enhance the institutional capabilities of the Ministry of Fisheries and Aquatic Resources Development (MFARD), other concerned agencies, and community organizations in coastal and fisheries resource management.

**Cost Estimates**

The total project cost is estimated at \$80.0 million equivalent, comprising about \$44.0 million (55 percent) in foreign exchange and approximately \$36.0 million (45 percent) in local currency costs.

**Financing Plan**

<b>Source</b>	<b>\$ million</b>			
	<b>Foreign Exchange</b>	<b>Local Currency</b>	<b>Total Cost</b>	<b>Percent</b>
Bank	29.32	10.68	40.00	50.0
The Netherlands	7.31	5.45	12.76	16.0
Government	7.37	19.78	27.15	33.9
Beneficiaries	-	0.09	0.09	0.1
<b>Total</b>	<b>44.0</b>	<b>36.0</b>	<b>80.0</b>	<b>100.0</b>

**Loan Amount and Terms**

The equivalent in various currencies of SDR 28,806,000 (\$40.0 million approximately) from the Bank's Special Funds resources. The amortization period will be 32 years including a grace period of 8 years, with an interest charge of 1 percent per annum during the grace period and 1.5 percent per annum thereafter.

**Period of Utilization**

Until December 2005

**Implementation Arrangements**

An interagency project steering committee will be established, to be chaired by the secretary of MFARD to ensure the full cooperation of and effective liaison with the other participating or concerned Government agencies. Nongovernment organizations (NGOs) and community-based organizations (CBOs) will also play an important role in implementing project activities at the community level. For this purpose, MFARD will

establish close working arrangements with NGOs/CBOs, in consultation with the Bank.

A project management office (PMO) will be established in MFARD under a project director. The project director will directly supervise each of the six site managers heading the field project implementation units (FPIUs) at the project sites and the two project implementation units (PIUs) at the Coast Conservation Department (CCD) and Ceylon Fishery Harbours Corporation (CFHC), who will be reporting directly to him. The FPIUs will be located at the CERM project sites. The site managers will coordinate with engineering staff at both the zonal and district offices of CCD and the district fishery extension officers (DFEOs).

**Executing Agency**

Ministry of Fisheries and Aquatic Resources Development

**Procurement**

The PMO will be responsible for the procurement of all goods and services under the Project. All services, supplies and equipment to be financed by the Bank will be procured in accordance with the Bank's *Guidelines for Procurement*. Bank-financed civil works contracts estimated to cost \$1.0 million and above for the harbors and all such contracts for the coastline stabilization component will be awarded on the basis of international competitive bidding. Other Bank-financed civil works contracts of less than \$1.0 million will be carried out by prequalified contractors selected under the Government's local competitive bidding procedures satisfactory to the Bank. All Bank-financed civil works contracts with a value of \$500,000 equivalent and above will be subject to prior approval by the Bank. Bank-financed supply contracts estimated to cost an equivalent of more than \$500,000 will be awarded on the basis of international competitive bidding. Supply contracts of \$500,000 or less (except for minor items costing less than \$100,000 to be procured by direct purchase) will be awarded on the basis of international shopping.

**Consulting Services**

The Project is expected to use 207 person-months of international and 455 person-months of domestic consulting services. There is need for implementation capacity assistance to both CCD and CFHC during project implementation. Institutional support for MFARD, CCD, and CFHC for design and management, and supervision support for the civil works and expertise in areas such as the design and implementation of extension programs, update of the Coastal Zone Management Plan, design and implementation of the corporate training programs at MFARD and its key agencies, development of a fishery harbor operations manual, design and installation of a data collection and management system at MFARD and its key agencies, and design and conduct of orientation courses on fisheries licensing and regulation, are also necessary. The consultants will be recruited in accordance with the Bank's *Guidelines on the Use of Consultants* and other arrangements

satisfactory to the Bank on the engagement of domestic consultants.

**Estimated Project  
Completion Date**

June 2005

**Project Benefits  
and Beneficiaries**

The economic internal rate of return for the whole Project has been estimated at about 15.3 percent. The Project will target about 76,500 households in the six locations, representing about 75 percent of the total households living in the coastal areas in the six districts covered by the Project and whose household income is less than SLRs80,000 per year.

Economic benefits expected from the coastline stabilization component are (i) benefits from the prevention of economic losses to the national economy such as value of houses and buildings saved due the Project; (ii) avoidance of removal and administrative costs and disruption of works; and (iii) the opportunity costs of agricultural land and potential loss in the tourist industry, which would have been prevented with the implementation of the Project.

Quantifiable benefits from the coastal environment and resources management component will mainly be the estimated use values concerning biodiversity, value of production generated from lagoon fishery, coastal shrimp fishery, and coastal small pelagic fishery as well as the perceived tourists' willingness to pay for recreational use of the lagoons. Benefits derived from the fisheries resources management and quality improvement component were projected mainly from increased fish landings due to the construction of fishery harbors.

The principal nonquantifiable benefits consist of (i) institutional strengthening of MFARD and its key agencies directly involved in the implementation of project-related activities; (ii) enhancement of interagency linkages through cooperation in the coordination and implementation of coastal resource management plans and activities; (iii) improved and effective resource management and protection; (iv) enhanced beneficiary participation in resource management and project implementation; (v) establishment of strong partnerships among local government, the communities, and NGOs/CBOs in community-based resource management; (vi) increased food supply, improved nutrition, and health; and (vii) improved community welfare.



## I. THE PROPOSAL

1. I submit for your approval the following Report and Recommendation on a proposed loan to the Democratic Socialist Republic of Sri Lanka for the Coastal Resource Management Project.

## II. INTRODUCTION

2. In 1997, a high-level delegation from the Government of the Democratic Socialist Republic of Sri Lanka requested Bank assistance to address the problem of severe coastal erosion, especially on the west coast of Sri Lanka; and environmental degradation of the wetlands and lagoons that supported the regeneration of coastal resources. It was also considered necessary to address the indiscriminate extraction of nonliving marine resources. To establish the feasibility of the project, the Bank approved in June 1998 technical assistance (TA) to assist the Government in the preparation of an investment project.<sup>1</sup> A comprehensive approach to the environmental problems faced in the coastal areas and the utilization of resources in the coastal areas was developed through a series of project design workshops, in which a wide section of the stakeholders participated. The Government reconfirmed the high priority attached to this Project during the Bank's 1999 Country Programming Mission. The project objectives, scope, costs, and implementation arrangements were confirmed with the Government during the Fact-Finding and Appraisal Missions<sup>2</sup> in 19 April-7 May 1999 and 14 June-2 July 1999, respectively. The project framework is attached as Appendix 1.

## III. BACKGROUND<sup>3</sup>

### A. Coastal Resources Sector

#### 1. Economic Importance

3. In this island nation, the 1,770-kilometer (km) long coastline is a critical lifeline that anchors the country's social, economic, and environmental development. The coastal zone is a highly productive ecosystem that serves as an important base for the country's growth. The natural ecosystems within the coastal zone are diverse, and include lagoons and estuaries, coral reefs, mangrove swamps, sea grass beds, other wetlands, and dune systems. Coastal habitats play an important role in the daily lives of the people in terms of livelihood, economic output, and food production. The coastal zone holds approximately 24 percent of the country's land area and is home to about 32 percent of the country's population. The settlement of human populations along the coast has occurred largely because this narrow zone is the area closest to many important resources, including food stocks and raw materials for construction. The coastal zone has 65 percent of the island's urban areas, and accounts for nearly 80 percent of the country's annual fish production and 70 percent of its total industrial output. Marine fish production peaked in 1994 and has been fluctuating between 150,000 and 157,000 tons since then. With the exception of a few fish stocks, the harvest in the country's coastal waters appears to have reached the optimum level, and some stocks already manifest signs of overexploitation.

4. The coastal zone hosts nearly 50 percent of the country's tourist facilities. The hotels in coastal resorts, excluding the Colombo area, have almost 10,000 rooms. Major roads and rail

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<sup>1</sup> TA 3034-SRI: *Coastal Resource Management Project*, for \$850,000, approved on 25 June 1998.

<sup>2</sup> The Appraisal Mission comprised C.R. Rajendran, Mission Leader and Senior Project Specialist; P. Safran, Project Specialist; D. Utami, Economist, Environment; V.S. Rekha, Counsel; and D. Parker and C. Stere, Staff Consultants.

<sup>3</sup> CER: SRI 98029: *Country Economic Review, Sri Lanka*, December 1998.

transport infrastructure are likewise located along the coastal stretch, together with the country's commercial ports and fishery harbors and anchorages. Some of the richest areas of biodiversity in the country occur in the coastal zone and include coral reefs, extensive sea grass beds, mangrove forests, highly productive estuaries and lagoons, and sanctuaries that altogether cover an area of 160,000 hectares (ha). Moreover, substantial reserves of valuable minerals; nearly 100 sites of special historical, archaeological, cultural, or religious significance; and places of special scenic or recreational importance are found in the coastal zone.

## **2. Development Issues**

5. The coastal zone, which is extremely valuable to the country's economy, is also very fragile. Beaches and coastal stretches are continuously subjected to wave action and increasingly threatened by natural processes like storm surges that cause erosion or accretion. Sand mining for construction, reef breaking for coral mining, reef dynamiting for fish, and removal of coastal vegetation exacerbate the problem. The end result is increasing coastal erosion and the consequent loss of usable land and associated infrastructure, houses, and archaeological and religious sites, all accompanied by social and economic losses. The unmanaged growth of the tourism industry has resulted in the incorrect siting of facilities. Increased shoreline protection works, undertaken as emergency measures or in an ad hoc manner by the property owners have limited the access of fishermen to beaches to berth boats and kept out local residents seeking recreational opportunities. Increased encroachment of coastal pollution or unplanned and unauthorized development has caused direct habitat loss and increased public health risks due to inadequate infrastructure for sanitary sewerage and potable water.

6. Government estimates in 1981/82 placed the rate of land loss through coastal erosion at 200,000-300,000 square meters a year in the 685 km long western, southwestern, and southern coastal sectors. Similar figures were reached in later Government estimates in 1993. The Government, with Bank assistance, prepared a status report on coastal erosion in the southwest and west coast of Sri Lanka in September 1998. The report concluded that the coastal erosion rates will (i) show significant increases in areas with high littoral drift as a result of the decline in the sand supply from rivers to the nearshore areas characterized by long sandy beaches, as in the coast north of Maggona Headland; (ii) increase further in areas with limited net littoral drift due to an increase in relative sea level rise and the effects of coral mining, such as in the coast between Maggona Headland and Galle; and (iii) increase in coastal stretches that are so far considered relatively stable, such as the coast between Bentota and Ambalangoda. The threat to vital infrastructure like roads and railway track has increased, and precautionary measures have been taken in places where the need is urgent. The present emergency-type solutions that have been adopted are not suitable as erosion is merely transferred to adjacent areas thus requiring the construction of more temporary revetments that affect the access of fisherfolk and tourists to the sea and need annual repair and maintenance.

7. Pollution from industrial, agricultural, and domestic sources has degraded the coastal habitats and threatens the sustainability of the nearshore coastal fisheries. Among the estuaries and lagoons spread along the coastline, the major ones that contribute significantly to fisheries resources are the Puttalam Lagoon, Negombo Lagoon, Bolgoda-Panadura Estuary, Batticaloa Lagoon, and Jaffna Lagoon. Lagoons and estuaries are threatened by pollution and siltation, exacerbated in some cases by water diversions that reduce natural flows. Pollution can result when lagoons are used as harbors (e.g., in Negombo and Chilaw), or disposal sites for sewage (e.g., in Kelani Estuary, Negombo and Lunawa lagoons), or when they receive industrial effluents (e.g., in Lunawa and Negombo lagoons). A number of lagoons are being severely affected by encroachment and land reclamation, which contributes to a direct loss of functional lagoon area (e.g., in Chilaw, Negombo, and Mawella lagoons). Cumulative damage to

mangroves has resulted from overutilization of the resource and transformation of large areas to other uses such as shrimp pond aquaculture and lowland agriculture. Salt marsh areas have also been destroyed by conversions to alternative uses, including salt farming (e.g., at Hambantota and Palavi), shrimp aquaculture, or reclamation (e.g., Muthurajawela Marsh).

8. Coral reefs continue to be damaged as a result of the activities of divers collecting fish for the ornamental fish export trade and overuse of the coral reef area by tourists and boat operators, even in marine protected areas. Due to destructive fishing practices and the adverse environmental impact of siltation and pollution, only two (Kandakuliya and Talawila) of some eight coral reef areas studied in the Coastal Resources Management Project funded by the United States Agency for International Development (USAID) showed live coral coverage greater than 50 percent. Two nearshore reefs, Weligama and Polhena, showed a significant proportion of dead corals, while at Hikkaduwa and Akurala, about 25 percent dead corals were reported. The use of "moxy" nets for collection of ornamental fish for export has destroyed coral reefs and reduced the stocks of fish and shellfish utilizing the reefs for their habitat.

9. Estimates indicate that the existing fishery harbors can accommodate about 1,450 inboard engine (IBE) boats, and while the capacity may increase when the additional harbors being planned by the Government in Colombo, Galle, and Tangalle are completed, it may not be sufficient, especially if the expected future increase in fleet size and composition of the boat population is taken into account. Even though several fishing harbors and landing sites have been constructed/rehabilitated or are under construction, the need for harbor facilities is still urgent because most of the existing fish harbors and almost all beach landing sites in the country have poor or substandard infrastructure facilities that do not allow good handling of the landed catch. Facilities such as auction sheds with adequate freshwater supply, toilets, and other basic amenities either are not available or are in poor condition. Unloading and handling methods are very unsatisfactory. Lack of knowledge of proper handling and postharvest practices has led to the poor quality of fish products and has serious implications for the export trade. Therefore, another key area that needs close attention is the upgrading of infrastructure facilities to conform to health and hygiene standards set by the European Union, to encourage fish export from the project area.

### **3. Institutional Framework for Coastal Resource Management**

10. The overall responsibility for fisheries and coastal resource management in Sri Lanka is vested in the Ministry of Fisheries and Aquatic Resources Development (MFARD). MFARD has two main departments: the Coast Conservation Department (CCD) and the Department of Fisheries and Aquatic Resources (DFAR). The ministry has functions related to all fishery matters, including administration, policy making, management, development, research, and monitoring and evaluation. CCD is the agency mandated to exercise overall responsibility for activities within the coastal zone; it derives its responsibilities from the Coast Conservation Act (CCA) of 1993. CCD is organized into three operational divisions: (i) Planning, Research, and Design Division; (ii) Works Division; and (iii) Coastal Resources Management Division. DFAR is the largest of MFARD's functional organizations and is the main implementing agency for the administration, development, regulation, and monitoring of fisheries and living aquatic resources. It is also responsible for extension and other technical and welfare services to fishing communities. DFAR is charged with the administration and enforcement of the Fisheries and Aquatic Resources Act of 1991 (or the Fisheries Act). The National Aquatic Resources Research and Development Agency (NARA), the research arm of MFARD, was established under NARA Act No. 54 of 1981. The Ceylon Fishery Harbours Corporation (CFHC), established in 1972 under the State Industrial Corporations Act of 1957, is under the supervision of MFARD. CFHC is charged with responsibility for construction, operation, and

management of fishery harbors and related facilities. It is now in charge of the operation and maintenance (O&M) of seven fishery harbors and 22 anchorages.

11. MFARD has clear goals and its departments have elaborated their own strategic plans. The Government's goal is to ensure sustainable growth in the fishery sector through resource management, modernization, upgrading of technology, and export promotion. As CCD is under MFARD, there is adequate coordination between the regulatory and development functions in coastal resources management. The overall capacity to identify objectives and to develop programs is hindered mainly by inadequate trained staff at middle level, and weak implementation capacities. The Works Division of CCD undertakes most of the physical works for erosion protection. Part of the works are contracted to private contractors and part carried out by CCD staff. This takes up a considerable amount of time and effort. Except for the need to have the capacity to deal with emergencies, the entire physical works can be undertaken by the private sector. Implementation of the Fisheries Act by DFAR remains weak. The department needs to strengthen its technical expertise and strengthen coordination with other offices at both province and district levels.

12. To ensure close interagency coordination in coastal resource management (CRM), the CCA provided for the setting up of a Coast Conservation Advisory Council (CCAC) composed of representatives of all Government ministries and agencies whose mandates converge on the work to be carried out by CCD. Provision was also made for one representative each from the universities, a private voluntary organization concerned with the coastal environment, and the fishing industry. While CCAC has provision for stakeholder representation, it has not functioned in an advisory capacity on policy issues. Instead its meetings have only focused on the approval or disapproval of applications for permits for buildings and other structures along the coast. The Government has agreed to reconstitute CCAC to enable the council to provide policy-level inputs, and to better reflect stakeholder consensus in policy making.

#### **4. Poverty Issues**

13. Although Sri Lanka has strong social indicators compared with other countries in South Asia, approximately 21 percent of the population still live in poverty. Despite the high priority that the Government has attached to poverty reduction in recent years, the number of poor people has not declined significantly in the 1990s. The recent socioeconomic survey by the Central Bank of Sri Lanka showed that total poverty in the country declined from 27 percent in 1985-1986 to 22 percent in 1990-1991 and to 21 percent in 1997-1998. Rapid social assessment (RSA) was undertaken for the Project using the poverty line adopted under the Samurdhi<sup>4</sup> program of the Government, under which beneficiaries who received an income transfer of SLRs500–1,000 per month were considered as living below the poverty line. An independent analysis also assessed the impact of the Project on poverty reduction.<sup>5</sup> The two estimates show that poverty varies between 20-32 percent as per the RSA, and 20-29 percent as per the independent analysis in the project area. The main causes of poverty in the rural areas are underemployment and low-productivity occupations. The rural poor also are characterized by lower levels of education and a higher percentage of income spent on food.

14. Many studies carried out in fishing communities have shown that the majority of the fisher families fall into the poorest category of the population. Some overarching characteristics of poverty prevail in fisher communities. The primary dependence of fisher families on a rapidly

<sup>4</sup> Samurdhi is a national program for poverty alleviation introduced in 1994. It focuses mainly on creating employment and promoting income-generating activities. Several distinct activities are undertaken under Samurdhi. The Poor Relief Programme and Social Security Programme provide direct relief to the poorest sections.

<sup>5</sup> This analysis was made by Marga Institute in Colombo at the request of the Bank in July 1999.

depleting resource is one of the major causes of deprivation. The scarcity of opportunities for additional income generation, the nature of the habitat, poor housing, and lack of access to basic amenities typify deprivation in fishing communities in general. The seasonal nature of their main or sole activity to generate income creates a situation where even if incomes from fishing are reasonably high, fisherfolk are unable to spread that income into the no-fishing season. The women's lack of skills, education and training, and opportunities for earning an income renders the families highly vulnerable in the event of death or disability of the male. Their potential for saving is very low and therefore they have little prospect of investing in other income-generating activities.

15. Poverty in the coastal areas and its close nexus with the increasing pressure on coastal resources are recognized by the Government. The inability of the resource base to regenerate itself under the heavy pressure of exploitation sets up a resource depletion-poverty cycle, which further exacerbates the situation. The problem is particularly acute in areas where coral reefs are mined and mangrove areas converted, through landfill and encroachments, for shrimp aquaculture and lowland agriculture. The Government is well aware of the importance of job creation to address the problem of poverty. Significant efforts in the recent past (like the Samurdhi program) have focused on the importance of rural livelihood development programs. These programs have been complemented by skills development with extension and credit support, and development of infrastructure and marketing support. The Government is also formulating a policy framework for poverty reduction in the country.

16. Access to credit is more of an issue than is availability of credit to the poor in the coastal areas. The National Development Bank provides refinancing to a variety of activities undertaken by commercial banks and rural development banks. The SANASA Development Bank, through its 8,400 village-level activities, is also well placed to extend credit, as is the Sarvodaya Economic Enterprises Development Services (SEEDS), another nongovernment organization (NGO), which has the institutional network to provide credit support to livelihood development programs. Between the two, about SLRs145 million had been extended as loans for microenterprise type of activities by the end of 1997. In addition, cooperative rural banks had provided about SLRs152 million as credit for such purposes till the end of 1997. Different state-funded programs such as Surathura Program and Samurdhi Development Credit Scheme also provide small loans to encourage income-generating activities.

## **B. Government Policies and Plans**

### **1. Strategic Framework**

17. The Government's coastal zone management policy is embodied in the Coastal Zone Management Plan (CZMP) 1997 and Coastal 2000 - A Resource Management Strategy for Sri Lanka's Coastal Region. The latter document, based on 20 special studies commissioned by the Government, provides the direction for future strategic interventions in coastal zone management based on the achievements and shortcomings of the first decade of work in the sector. Current fisheries policies and strategies contained in the National Fisheries Development Plan, 1995-2000 and in the six-year Fisheries Development Program, 1999-2004 complement the policies and strategies contained in the CZMP and in Coastal 2000, with their strong emphasis on poverty reduction, coast conservation, and environmental protection. MFARD particularly intends to assist the small-scale fisherfolk through skills upgrading, implementation of welfare schemes, and encouraging cottage industries as alternative sources of livelihood. In addition, administrative reforms in MFARD have also been identified.

18. The Government is very much conscious of the extent to which its poverty reduction efforts are linked with the problems faced in the management of coastal resources. The

Government recognizes the need for a more integrated approach to CRM and the long-term impact of environmental degradation. Specific efforts taken include the special area management (SAM) planning approach to protect wetlands and lagoons. Actual implementation of SAM plans has been constrained by lack of investment, but the Rekawa development program has shown promise. The policy objectives of MFARD in its Fisheries Development Program 1999-2004 are to improve national nutrition and food security through increased fishing, increase employment opportunities, uplift the socioeconomic status of fisherfolk including women, increase export earnings from the industry, and improve the skills of the fishing community. To operationalize these objectives, programs for skills upgrading, extension and credit, and strengthening fisheries cooperatives including capacities to improve savings mobilization will be undertaken, combined with targeted welfare schemes. The progress of MFARD's efforts can be considered satisfactory on the whole. However, MFARD needs to undertake greater resource conservation efforts; its emphasis has so far been on income generation and increase in production. Environmental degradation should be addressed at the same time by educating and involving the communities through information dissemination.

## **2. Legal Framework**

19. CRM was formally established in Sri Lanka with the enactment of the Coast Conservation Act (CCA) (Act No. 57) of 1981. It went into effect on 1 October 1983, but was subsequently amended in 1988. The Act defined the coastal zone, mandated CCD to undertake research to describe the existing condition of the coastal zone, and called for the preparation of a CZMP to provide the framework for the regulation and control of development activities within the coastal zone. It also directed the establishment of the CCAC with various advisory and review responsibilities for matters relating to coastal zone activities, and gave the director of CCD the responsibility for administering the provisions of the Act, formulating and executing coastal conservation schemes, and conducting research for coastal conservation. The CCA has adopted the issuance of permits as the principal mechanism for regulating a wide range of development activities within the coastal zone. Permits are to be issued only for specific activities with no demonstrable adverse effects on the stability, productivity, and environmental quality of the coastal zone. The amendment to the CCA in 1988 authorized the director of CCD to delegate powers, duties, and functions to Government agents or public officers of coastal administrative districts; banned various coral mining activities; authorized enforcement actions to be taken against boats engaged in illegal activities; and granted the public free use of and access to all beaches in the country. After the approval of Coastal 2000 by the Government, MFARD began the process of drafting urgently required amendments to the CCA to provide the legal basis for the implementation of the policies and strategies recommended in Coastal 2000. Cabinet approval for the proposed amendments has already been accorded.

20. The prevailing Fisheries and Aquatic Resources Act No. 2 of 1996 (hereinafter referred to as the Fisheries Act) went into operation on 11 January 1996 and replaced Fisheries Ordinance No. 24 of 1940, which was repealed in 1996. The Fisheries Act simplifies and extends the purposes enunciated in the 1940 Ordinance, and was brought in to "provide for the management, regulation, conservation, and development of fisheries and aquatic resources in Sri Lanka." Cabinet approval for the proposed amendments has already been accorded.

## **C. External Assistance to the Sector**

21. Development efforts in the coastal resources sector have been supported, to a large extent, by assistance provided by various multilateral and bilateral funding agencies. The multilateral funding agencies include the Bank, the Food and Agriculture Organization of the United Nations (UN/FAO), the United Nations Development Programme (UNDP), and the World Bank. The bilateral funding agencies include the Abu Dhabi Fund, Canadian International

Development Agency (CIDA), Danish International Development Assistance (DANIDA), European Union (EU), German Agency for Technical Cooperation (GTZ), Japan Bank for International Cooperation (JBIC), through its official development assistance window, Japan International Cooperation Agency (JICA), Korean International Cooperation Agency, Norwegian Agency for Development (NORAD), British Overseas Development Agency (ODA), Swedish International Development Cooperation Agency (Sida), United States Agency for International Development (USAID), and Government of the Netherlands among others.

22. External assistance to the sector has been in the form of loans, TA grants, and regional cooperation projects. This assistance has been heavily biased, however, toward the fisheries subsector. The emphasis has been on increasing fish production and improving the quality of fish. In more recent projects, greater attention is being paid to conservation and environmental protection. The achievements in the sector with respect to increased production and policy changes have been assisted by external assistance to a large extent. Coastal protection and environment projects have been supported mainly by TAs from bilateral agencies. The Bank has extended four loans since 1972 to this sector.<sup>6</sup> In addition, the Kirinda fisheries harbor has been financed by the Japanese Government. A list of major externally assisted project and TA grants from 1990 is given in Appendix 2.

23. The Bank is also providing \$2.86 million for a regional TA project for the Improvement of the Database for Fisheries Management. This TA is implemented by the International Council for Living Aquatic Resources Management and participated in by eight countries: Bangladesh, India, Indonesia, Malaysia, Philippines, Sri Lanka, Thailand, and Viet Nam. The Project, which will be implemented in 1998-2002, aims to (i) develop a fishery resource information system, (ii) develop strategies and action plans, and (iii) strengthen the capacity of fisheries institutions of the participating countries.

24. FAO has implemented a major regional cooperation project in coastal fisheries called the Bay of Bengal Programme, which has played a catalytic and consultative role in developing coastal fisheries management in the Bay of Bengal to help improve the conditions of small-scale fisherfolk communities. The program, which was initially entitled Development of Small-scale Fisheries in the Bay of Bengal, started in January 1979 and initially covered Bangladesh, India, Malaysia, Sri Lanka, and Thailand. It was later expanded to cover Indonesia and the Maldives. Funding support came mainly from the governments of Denmark, Japan, and United Kingdom, and the International Maritime Organization of the United Nations. Several TA projects have been, and are still being, funded and implemented under this program.

#### **D. Lessons Learned**

25. The four previous Bank loan-funded fisheries projects in Sri Lanka were mainly development-oriented and focused on the utilization of fisheries resources for direct extractive purposes rather than on sustainable resource management. The projects had increased fish production as a primary goal, and comprised interventions meant to improve the efficiency of fishing operations through the introduction of new and advanced technologies in fish capture, culture, postharvest handling, and processing. The overall result was a shift from the use of traditional fishing methods to the adoption of new and modern techniques in fish production, processing, and marketing.

<sup>6</sup> The following projects in the fisheries sector have been approved: (i) Loan 115-SRI: *Fisheries Development Project*, for \$3.1 million, approved on 14 December 1972; (ii) Loan 520-SRI: *Second Fisheries Development Project*, for \$13.5 million, approved on 20 August 1981; (iii) Loan 648-SRI: *Aquaculture Development Project*, for \$17.27 million, approved on 3 November 1983; and (iv) Loan 1201-SRI: *Fisheries Sector Project*, for \$26.0 million, approved on 1 December 1992.

26. There are lessons to be drawn from the implementation of the earlier Bank-funded fisheries projects, which have been rated as “partially successful.” The evaluation of the Fisheries Development Project concluded, among others, that there is a need for full consultations with local fisherfolk and for a realistic assessment of their financial and managerial capabilities to undertake major programs. The performance audit of the Fisheries II Project echoed this recommendation, noting the desirability of consultations with the target beneficiaries during project design. It also suggested the merits of having a certain degree of flexibility in project design so that necessary changes could be implemented rapidly. The problems encountered during the implementation of these projects demonstrated the need for effective project management, including day-to-day supervision by a project manager and close monitoring by the Bank. Particularly encouraging is the implementation performance so far in the ongoing Fisheries Sector Project. Compared with past projects and despite some problems during initial implementation, mainly due to poor technical input and lack of qualified staff to manage the Project, MFARD has become familiar with the Bank’s procedures and requirements for project implementation.

27. Only the most recent loan-funded project, the Fisheries Sector Project (footnote 6), has been implemented with the aim of reducing pressure on coastal fisheries resources by encouraging offshore fishing and increasing the income of coastal fisherfolk through the provision of alternative livelihood opportunities. Fish landing facilities at three harbors (Mirissa, Purunawella, and Beruwela) in the priority areas have been improved, and credit has been provided to local fishing communities. Improved fish handling, storage, and marketing facilities have enhanced the quality of fish and increased fishers' income. The local-community-participation approach for harbor facilities management has also demonstrated its effectiveness in improving fish landings and handling as well as the financial sustainability of the rehabilitated harbors, with user fees now being levied.

28. Given the present status of the country’s fisheries resources, particularly in the coastal areas, it is imperative that the planning and design of future interventions in the sector should take note of the need for sustainable management of the country’s fisheries resources. Rather than promote only increased production, future projects should carefully evaluate the resource status and, based on the results of the assessment, adopt a resource management and/or rehabilitation strategy that would ensure the sustainability of the coastal and marine resources.

29. Other lessons to note are incorporated in a Bank study of 27 completed Bank-assisted fisheries projects as of 30 June 1998.<sup>7</sup> The main recommendations pertain to the need for promoting integrated CRM to prevent resource depletion and for a holistic approach to project design. Greater supervisory inputs from the Bank for projects involving new technologies are required during the initial years of implementation so as to (i) identify emerging problems at a much earlier stage, and (ii) react with appropriate assistance in a more timely manner. Similarly the institutional capability of the executing agency (EA) should be carefully assessed to ensure that it could effectively carry out its responsibilities. If necessary, strengthening of the EA staff prior to loan approval or during implementation may be considered. It was also recommended that governments should focus on the provision of a suitable policy, institutional, and regulatory framework and support services including research, training, and extension.

30. The ongoing and past external sources of assistance provide tested approaches to be adopted by the Bank under the Project. The TA grants given by DANIDA and GTZ have provided well-tested approaches to implement and to monitor the beach nourishment technique as well as other techniques to minimize and localize the coastal erosion. The USAID TA grant

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<sup>7</sup> Operations Evaluation Office. 1998. Sector Synthesis of Evaluation Findings in the Fisheries Sector. Asian Development Bank, Manila.

on CRM provided a ready-to-use model on community participation for sustainable use of coastal resources. An evaluation of the implementation of SAM approaches developed by USAID for coastal environment and resource management in Rekawa and Hikkaduwa was carried out by the World Conservation Union (IUCN) in 1997. The result showed that in adopting this approach the successful factors are (i) active participation of the local communities, (ii) effective liaison between government officials from the district secretariat and CCD, and (iii) display of a clear priority issue as well as targets and goals to be achieved. The proposed Project has been designed, taking the above lessons into account.

## **E. The Bank's Sector Strategy**

31. The Bank's recently approved Country Operational Strategy for Sri Lanka<sup>8</sup> identifies natural resource management as one of the main elements of the Bank's strategy for Sri Lanka. The other elements of the strategy are (i) policy and institutional reform at the national level, (ii) human resource development, (iii) expansion of infrastructure, and (iv) social dimensions. In line with this strategy, Bank operations in the natural resources sector of Sri Lanka are expected to focus on three areas: (i) forestry and biodiversity conservation and management, (ii) comprehensive water resource management, and (iii) assistance in coastal resource management. The expanded focus on natural resource management, which entails the location of projects in rural and coastal areas, is expected to have a beneficial impact on employment and the income levels of the population in marginal communities, while addressing some of the negative externalities and social impacts associated with structural transformation.

32. In the coastal and marine resources subsector, Bank assistance is expected to address issues such as marine resources depletion, coastal erosion, and deterioration of coastal habitats through an integrated approach based on rehabilitation of coastal habitats and beaches, reduction of erosion-prone areas, improvement of fish breeding habitats and fisheries management, income-generating opportunities for impoverished coastal populations, and strengthening of sector institutions.

33. The Bank's Policy on Fisheries<sup>9</sup> provides for assistance to promote integrated coastal fisheries management. The emphasis is on meeting the twin objectives of reducing destructive fishing practices and pollution, which reduce the productivity of the resource, while encouraging measures to improve coastal fishing, which will contribute to the economic development of the coastal communities. Efforts will be made to introduce effective policies and enforcement capacity to prevent destructive fishing practices, and destruction of habitats, especially mangroves; and to eliminate coral mining and trading of coral-based products. The private sector will be encouraged to play a larger role in fisheries while governments will principally be responsible for establishing the policy, institutional, and regulatory framework to support the sustainable management of fisheries resources. The Bank's environmental guidelines will be applied rigorously in developing and implementing projects in the fisheries sector, and a participatory process will be followed in formulating projects.

34. The widespread poverty among artisanal fishers and fisherfolk communities, overfished resources, and increasing degradation of fishing grounds, especially in nearshore coastal areas, are key areas for Bank support. Poverty reduction is a priority concern, particularly because poverty contributes to resource degradation. And as reducing the dependence of communities on fisheries resources for food and livelihood is key to sustainable resource management, the exit of marginal fishers from coastal fishing needs to be encouraged. Non-

<sup>8</sup> *Country Operational Strategy for Sri Lanka: Promoting the Environment for Growth*, circulated to the Board on 23 March 1999.

<sup>9</sup> *The Bank's Policy on Fisheries* dated October 1997.

fishing employment alternatives may be provided through investments in human capital through skills training and promotion of alternative livelihood programs. These need to target the entire fishing household, women included, as increasing their contribution to household income will complement efforts to reduce dependence on the fisheries resources.

35. The stronger participation of stakeholders in resolving issues of access, allocation of user rights, and monitoring and enforcement will be a concern for Bank assistance. The Bank will encourage the Government to involve local government units and fishing communities in fisheries management as an integral component of national policy. The Bank will also support the strengthening of the management capabilities of fishing communities through community organization and participation, training, and other forms of assistance, including the active involvement of NGOs in areas where they have a comparative advantage.

## **F. Policy Dialogue**

36. The Bank has been able to target specific policy changes to improve the management of natural resources in Sri Lanka through its past loan and TA operations. The changes have generally been restricted to the specific subsectors such as forests, water, and fisheries to which Bank assistance has been extended. The Bank is in the process of encouraging the Government to adopt a more comprehensive approach to the management of all natural resources and is expected to extend support for management of the land and marine resources in a manner similar to that of the water sector.

37. Private sector development is a strategic national priority and the Bank's efforts to encourage private sector development have the Government's full support. However, while fishing is done entirely in the private sector and fishing vessels are owned privately, little private sector investment can be expected to establish landing facilities and marketing facilities. The private sector does not even fully meet the demand for ice and salt. Hence, it has become necessary for the Government, through CFHC, to provide the necessary infrastructure for the fishing vessels. Maintenance of these facilities has so far been financed through the budget. The following key areas have been the center of the Bank's policy dialogue in the coastal and marine resources sector.

### **1. Legal Environment**

38. The Bank has discussed with the Government the need to enact a new law that will supersede the Coast Conservation Act of 1981 (subsequently amended in 1988) to provide a stronger legal basis for the implementation of the policies and strategies for coastal environment and resource management (CERM). The present Act has been able to implement parts of the CZMP, but needs to be strengthened for better coordination and enforcement. Further, it is necessary to address the problems arising from overlapping or contradictory statutes, which give similar powers over the coastal zone to various ministries or authorities, and which have, in effect, caused the powers, functions, and duties of CCD to be eroded over the years. It has been proposed that the existing CCA be repealed and a new law enacted, which will have all the desired changes including the designation of CCD as the coordinating agency for all matters in the coastal zone, grant of additional powers to the director, and reconstitution of the CCAC to make it an effective policy-recommending body to the minister on matters affecting the coastal zone. The new Act, which will also resolve the legislative overlaps with other laws, is proposed to be called the Coast Conservation and Coastal Resource Management Act. It is proposed that CCD be renamed the Coast Conservation and Coastal Resource Management Department. At the request of the Government, Bank assistance was provided under TA 3034-SRI to draft the new Act for easy processing within the Government. Cabinet approval has been accorded to the proposed new legislation.

39. To strengthen the law for effective conservation and enforcement, amendments to the Fisheries Act of 1996 are also necessary. The required amendments have been identified; they cover eight specific areas relating to CRM: licensing of fishing operations, regulation of foreign fishing boats, seizure of fishing boats and other materials, settlement of fishing disputes, conservation, flora and fauna conservation/protection, chank fisheries and pearl fisheries, and composition of fisheries management committees. The proposed amendments govern the issuance of licenses to fishing vessels and strict enforcement of resource conservation measures. Fisheries whose management was omitted from the 1996 Act, such as that for the chank fishery, are proposed to be reincorporated in the amendments. It is proposed that membership in fisheries management committees in designated fishery management areas be expanded by including representatives of fishery cooperatives as well as relevant NGOs. Loopholes in the law due to poor wording also need to be closed by clarifying the activities that are prohibited. Cabinet approval has been accorded to these amendments.

40. It is expected that all action necessary for submission to the Parliament of the proposed amendments to both Acts and the subsequent legislative action would be completed as soon as possible and not later than one year of loan effectiveness. The Government has also assured that exercise of power by concerned government agencies under the Urban Development Law and the Tourism Development Act, which have a bearing on the coastal zone, will be done with prior concurrence of CCD.

## 2. Cost Recovery

41. The extent to which the maintenance of the fishing harbors and anchorages depends on the Government budget for O&M is an important factor to determine whether further investments in such infrastructure support are sustainable. From recommendations made under a Bank-funded TA project<sup>10</sup> approved in conjunction with the ongoing Fisheries Sector Project, it was noted that the Government has introduced berthing charges as a first step in implementing cost-recovery measures (equivalent to about 1 percent of the estimated value of fish landing) in four selected ports: Beruwela, Galle, Tangalle, and Kirinda.<sup>11</sup> It has already been agreed that this system will be introduced in all the ports financed under the Fisheries Sector Project. The present berthing charges will be increased to about 2 percent of all fish landings when all the facilities to be provided in the harbors are completed. The amount is estimated to be sufficient to cover all O&M costs. Once fish auctions are established, it would also be possible to adopt a system of charges based on actual fish landings rather than on the size of boats as is presently done. It has been agreed that the process of cost recovery established under the Fisheries Sector Project would be extended to the fishing harbors and anchorages to be established under the proposed Project. It is expected that CFHC, which is expected to maintain the fishery harbors, will be able to meet all O&M costs eventually from the collection of berthing charges.

42. Even though there is a high concentration of tourist facilities along the coast, the coastline is treated as public property and is not owned by individuals or hotels. It is difficult to isolate specific beneficiaries from the coastline stabilization measures, that can be targeted for cost recovery of the capital costs. The maintenance costs for the coastline stabilization component is also estimated to be significant (about \$1.75 million annually), making it necessary for the Government to consider whether there is scope to generate additional revenues to meet these costs. The Government felt that the expenditure was entirely justifiable as a public good as the benefit of the investment will be enjoyed by society as a whole, and should be met from existing revenues under the national budget. At the same time, the

<sup>10</sup> TA 1795-SRI: *Rationalization of Fishery Harbor and Other Charges*, for \$590,000, approved on 1 December 1992.

<sup>11</sup> Present berthing charges are as follows: (i) inboard engine (IBE) boats: 45'-49', SLRs1,125; 40'-45', SLRs900; 40', SLRs675; 36', SLRs562.50; 34', SLRs337.50; 28', SLRs220; and (ii) outboard engine (OBE) boats, SLRs112.50.

Government recognizes the need to ensure that the present erosion rates are reduced and the economic value of beaches is preserved. As the potential for tourism would be most vulnerable to beach erosion, the scope for revenue generation from the tourism industry could be examined. There is little potential to collect revenues from other sources. However, it has to be recognized that the tourism sector has only started to show signs of recovery after nearly a decade of recession due to the negative impact of the civil conflict. It is therefore necessary to be cautious in the introduction of additional levies and to identify the mechanisms only after extensive discussions with industry. At the Government's request, a small-scale TA has been extended to assess the potential and develop a suitable mechanism for the purpose.<sup>12</sup> The Government has agreed that action to be taken will be worked out by the Government in consultation with the Bank and other stakeholders within six months of the receipt of the final report of the TA.

### **3. Subsidies**

43. The Government has an ongoing program of subsidies for new and existing fishing vessels, which include boats that fish in the coastal areas and those that fish in offshore waters. These subsidies are extended to a targeted beneficiary group of poor fisherfolk and is intended mainly to (i) encourage a shift from coastal to offshore fishing, (ii) encourage adoption of more modern fishing practices, and (iii) support the installation of modern communication and navigation equipment to encourage the safety of fishing fleets and fisherfolk. The Government agreed with the Bank, under the ongoing Fisheries Sector Project, to review the feasibility of reducing and eventually eliminating subsidies to new offshore fishing vessels. While there has been an overall reduction in the total subsidy amount paid by the Government for all types of fishing boats in 1997 and 1998, subsidies still paid for new fishing vessels of both types currently amount to about SLRs57 million per annum or about 22 percent of the total annual recurrent expenditure for MFARD and 3 percent of the ministry's total annual budget. However, the subsidies are only 0.03 percent of the Government's total annual recurrent expenditure. The amount of subsidy varies according to vessel size and the type of equipment installed. While there is no firm estimate of the maximum sustainable yield for Sri Lanka, present catch data indicate that further increases in the number of offshore fishing boats do not appear to be a priority needing incentives. Instead, it is important to improve yields through the reduction of postharvest losses and improvement of fish-handling practices. The Government's position is that substantial progress has been made in the past few years in the reduction of subsidies to fishing boats in the coastal areas. Subsidies particularly encouraged existing fishing vessels to install improved facilities, which enable these vessels to take to offshore fishing, thus reducing the pressure on coastal fishing.

44. The Government does acknowledge the need to reduce the pressure on coastal fishing to provide for resource regeneration. The Government has, therefore, agreed to progressively phase out the subsidies for fishing boats by reducing the subsidies by 15 percent annually for coastal and offshore boats and to restrict the subsidy to only offshore vessels after 2002. The Government has also agreed to review with the Bank during the midterm review of the Project the need for continuing the subsidy for offshore vessels. The review will focus on the need for incentives to be continued to targeted beneficiaries for a limited number of offshore fishing vessels to facilitate the adoption of new technology for diversified fishing, navigation, and improved preservation of catch.

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<sup>12</sup> TA 3274-SRI: *Cost Recovery Mechanism Analysis for Coastal Zone Protection*, for \$150,000, approved on 13 October 1999.

#### **4. Sand Mining**

45. Excessive sand mining and inappropriate location of sand mining operations contribute to shoreline erosion and beach retreat by cutting the sand supply to downdrift beaches. The sand mining problem is aggravated by the increased demand for sand by the construction industry in the 1980s. In 1991, phase I of the National Sand Study for Sri Lanka was conducted by the Central Environmental Authority (CEA), in collaboration with the Ministry of Foreign Affairs of the Netherlands to compile all available information and data on sand mining in Sri Lanka. On completion of phase I in 1992, it was found that there was a direct link between the erosion sites and sand mining. In 1997, phase II of the project was initiated by CCD and CEA with Government funds to identify alternative sources of sea sand. The study was carried out by the University of Moratuwa. A task force was set up within the Ministry of Forestry and Environment to recommend steps for implementing the use of the alternatives recommended by the study, such as dunes sand, offshore sand, quarry dust, and alternative construction practices.

46. The Government has already banned the use of coral reef-based lime in Government construction from 1 January 1999 and is mounting an awareness campaign in this regard. River sand mining, which is one of the causes of coastal erosion, has also been regulated in the coastal zone, but upstream sand mining continues to be a problem. For want of suitable substitutes, and in view of the significant impact it will have on the poorer segments of the population involved in this activity, the Government is looking at possible alternatives. A task force appointed by the President's secretariat is in the process of finalizing recommendations for its control, but these recommendations are essentially administrative in nature. The alternatives suggested need to be studied in detail. A study to review sand mining alternatives, including cost recovery options, will be undertaken as part of the proposed Project. The recommendations will be considered by the Ministry of Forestry and Environment separately.

#### **5. Institutional Reform**

47. Because of the need to introduce institutional changes within MFARD to strengthen CCD's position as the central coordinating agency for CERM activities, and to give a more active management role to DFAR, the Bank and the Government agreed that the following measures will be taken:

- (i) The CCAC will be reconstituted within one year of loan effectiveness to make it an effective policy-recommending body to the minister of MFARD on matters affecting the coastal zone.
- (ii) The phasing out of CCD's physical construction works using private contractors. By the end of project implementation in 2005, it will confine itself to policy and planning of CERM activities as well as execution of emergency works, if necessary.
- (iii) A Planning and Monitoring Division (PMD) at MFARD will be established by December 2000 and made operational by December 2002. It will serve as the data center of the agencies and departments under MFARD to advise on policy and operational matters.
- (iv) A data collection and management system in MFARD will be established by 2001 and will become operational by December 2002 to serve as a facility for storage and inventory of relevant information on fisheries to support the PMD of MFARD as well as facilitate coastal zone planning and management.

- (v) A new Central Extension Unit (CEU) will be established within DFAR by December 2001 to spearhead the awareness programs and provide technical direction and training for field extension officers and social welfare services in the target communities.

The Government has agreed to assign the staff required for items (iii), (iv), and (v).

## **6. Administrative Reform**

48. The Bank has also recommended to the Government that administrative control over the Marine Pollution Prevention Authority (MPPA) be transferred to MFARD from the Ministry of Ports under which it presently functions. This would allow better coordination and implementation of environmental protection between CCD (on land) and MPPA (in water). At present the director of CCD is on the advisory committee of MPPA, but this arrangement is not considered sufficient to ensure coordination of activities and enforcement of regulations.

## **IV. THE PROPOSED PROJECT**

### **A. Rationale**

49. The Project will be implemented at selected sites belonging to six administrative districts along the north western, western, and southern coasts of the country. The districts are (i) Puttalam in North Western Province; (ii) Gampaha, Colombo, and Kalutara in Western Province; and (iii) Galle and Hambantota in Southern Province (see map). The sites were selected through an extensive process of consultations with all stakeholders in a two-stage process. At the first stage, the criteria for site selection were developed and approved; at the second stage, the criteria were applied to a list of sites and the prioritized sites identified. The Project will target as its primary beneficiaries about 75 percent of the total households (76,500 households) in the coastal areas of these districts. The beneficiaries are mostly small fishers, small prawn farmers, fish processors, lagoon fishers, coral miners, fish vendors, small agriculture operators, and other workers in the fishing industry and allied fields, whose incomes are generally seasonal.

50. A detailed description of the project area is in Appendix 3. In selecting the project area, environmental considerations were the principal guiding factor. It is expected that project interventions in the selected sites will result in an integrated resource management effort and maximize the benefits. While erosion rates and threat to the economic infrastructure are the main reasons for the stretches identified for erosion protection, the wetlands/lagoons chosen are considered vital to maintain coastal resource regeneration. Harbor sites were determined by boat population and the need for safe landing areas, and intended to reduce loss due to poor handling and storage.

51. Sustainable management of the coastal resources will require an integrated approach that covers all aspects and will provide a balance between conservation and development. Attention is urgently needed to address the following key issues in the Sri Lankan coastal resources sector: (i) serious erosion of the coastline, especially in areas with concentrated economic activity or vital infrastructure; (ii) unmanaged fishing in coastal and offshore areas; (iii) pollution and uncontrolled exploitation of lagoons and estuaries, coral reefs, mangrove swamps, sea grass beds, other wetlands, and dune systems; and (iv) widespread poverty among the coastal population. Failure to accord priority to these issues would put the enormous contribution of the coastal belt to the economy at risk.

52. Erosion control has so far been attempted by the Government in an ad hoc manner with numerous revetments, seawalls, groins, and breakwaters constructed in several areas in an effort to control erosion and protect the coast. However, these physical structures have spoiled the natural beauty of the beach and have adversely affected tourist traffic. More importantly, they have resulted only in transferring the erosion problem to adjacent areas since they were built largely to protect important assets but without a plan for long-term protection. Although these erosion control measures have reduced losses of land and infrastructure, they have been essentially emergency measures. A planned and sustainable strategy has not been attempted due to inadequacy of resources and capacity constraints. Monitoring of the coastline and of the extent and rate of erosion is also very rudimentary, and there is no planning of necessary preventive measures. The problem has become particularly acute in the southern and south western parts of the coast.

53. Pollution and depletive livelihood activities, caused by poverty among the population dependent on natural resources, pose a serious threat to the diverse natural ecosystems in the coastal belt, and have severely damaged marine sanctuaries and wetlands that provide valuable habitat for fish and other living aquatic resources. A significant percentage of the population living in the coastal areas earn their livelihood by exploiting the fishing and nonliving marine resources. The income levels of many are below the poverty line, and unless measures are taken to improve their income levels and retrain them to undertake alternate livelihood activities, the pressure that this population exerts on the resource base will continue to exacerbate the situation.

54. Uncontrolled coral mining has destroyed precious coral reefs and affected the country's tourism potential. Illegal encroachment into lagoon areas, uncontrolled discharge of industrial and domestic wastes, and intensive illegal harvesting of mangroves for fuel and shelter have also contributed significantly to the decline of marine ecosystems. Except for some site-specific resource management efforts undertaken with external assistance, there is no comprehensive strategy for the preservation of lagoons and wetlands, and local community involvement in sustainable management practices is limited, if not altogether lacking.

55. Although offshore fishing has been actively encouraged in the recent past, an urgently needed proactive program to conserve coastal fisheries is absent. The problem of over-fishing, even in offshore areas, is compounded by poor onboard storage and onshore handling, and by environmental pollution caused by oil, trash, and fish debris from fishing boats. With the expected increase in the number of multiday boats, the demand for additional harbor facilities will have to be met by the Government simultaneously with the implementation of better and more effective fisheries resource management interventions, including the regulation and control of fishing effort and the introduction of measures to reduce fish spoilage. The latter can have a significant overall impact on fisherfolk income.

56. For the Government to be able to carry out these tasks, institutional reforms and capacity-building efforts to support more efficient management practices are required: (i) the legal basis for CRM has to be streamlined to allow unified control and strengthen the enforcement capacity of the concerned institutions, (ii) more systematic monitoring needs to be set in place to assist in planning and management control, and (iii) present institutional arrangements have to be revamped and substantial capacity-building efforts undertaken. Without these measures, the Government will not be able to implement an integrated approach to the conservation and management of coastal resources.

## **B. Objectives and Scope**

57. The overall goal of the sector is to enhance environmental protection in the coastal areas and contribute to poverty reduction among fisherfolk communities. The main objective of the Project is to establish integrated management of coastal resources to improve their sustainability.

58. The Project will comprise four components:

- (i) coastline stabilization, which will address the problem of coastal erosion and develop proactive coastal erosion management systems;
- (ii) coastal environment and resource management, which will address problems of coastal resource degradation and include activities intended to improve the income levels of coastal communities, thereby relieving the pressure on coastal resources;
- (iii) fisheries resource management and quality improvement, which will aim at sustainable coastal fisheries management supported by the construction of harbors/anchorages and ancillary facilities that will permit the improvement of fish quality and reduction of pollution in lagoons; and
- (iv) institutional strengthening, which will enhance the institutional capabilities of MFARD, other concerned agencies, and community organizations in coastal and fisheries resource management. A participatory approach to CRM will be adopted in the development and implementation of community-based SAM plans.

### **1. Coastline Stabilization Component**

59. The Project will aim to minimize the potential adverse impacts of coastal erosion in critical coastal stretches through the establishment of appropriate physical interventions intended to stabilize the coastline. In parallel, the Project will promote a shift in erosion management approach from defensive/reactive to proactive/preventive and include activities in support of the overall coastal erosion management strategy, including the conduct of special studies, monitoring of the structural and functional performance of the physical structures, and establishment of a coastal engineering data center. The works will be implemented in seven specific coastal segments from Galle to Chilaw, an overall length of 52 km out of a total stretch of 210 km. Part A of this component will cover five sites extending over 37 km (nos. 1-4 in Table 1), and Part B will cover two sites extending over 15 km (no. 5 in Table 1).

60. The engineering measures proposed for establishment at the sites will include artificial beach nourishment and a combination of other structures including groins, revetments, and offshore breakwaters to obtain the optimum stabilization scheme in terms of construction and establishment cost, maintenance cost, and functionality. The design concepts were planned taking full account of the need to ensure that they are consistent with the concepts embodied in the Coastal Zone Management Plan, 1997.

### **2. Coastal Environment and Resource Management (CERM) Component**

61. To implement CRM activities at the local level, a location-specific, community-based participatory approach will be used through the establishment of community coordinating committees (CCCs). Using a modular approach, different combinations of the following modules

are proposed for each site according to its management needs: (i) community strengthening; (ii) awareness building; (iii) SAM plan preparation; (iv) habitat conservation and resource management interventions; (v) measures to improve water exchange in lagoons; and (vi) social programs that will include provision for social infrastructure, training for livelihood development, microenterprise development support, etc.

### **3. Fisheries Resource Management and Quality Improvement Component**

62. This component will aim at the sustained management and development of coastal fisheries resources through activities that address the following identified issues: overfishing in coastal waters, generally poor quality of fish landings and high percentage of fish wastage, and lack of infrastructure support facilities in specific locations. The Project will address resource sustainability issues through (i) installation of a simplified, functional, community-based monitoring, control, and surveillance (MCS); (ii) implementation of community-based fisheries management activities as part of the CRM/SAM process; (iii) diversification of fishing effort to reduce pressure on coastal fish stocks; and (iv) conduct of special fisheries investigations/research studies. An information campaign will be launched to publicize the improved fishing boat design and promote its adoption among multiday boat operators and fishers. To minimize fish spoilage, fish handling and storage techniques will be improved through an intensive campaign targeting fish vessel crewmembers, fish handlers, processors, marketers, traders, and retailers as well as the general public.

63. To complement the fish quality enhancement interventions described earlier and to support the Project's environmental objectives, two fishery harbors will be constructed at Chilaw and Hambantota and two anchorages will be rehabilitated as harbors at Ambalangoda and Kalametiya. The civil works in the selected sites will include (i) rehabilitation of shore-based facilities, including dredging, rock excavation, construction of breakwaters, quay walls, jetties, revetments, and shore services including fish handling sheds, net repair sheds, and fueling facilities; (ii) installation or improvement of existing associated services, including access roads, toilets, perimeter fences, water, electricity, and area lighting; and (iii) regular maintenance to keep the harbors and anchorages open.

### **4. Institutional Strengthening Component**

64. This component will aim at enhancing the institutional capabilities of concerned MFARD agencies and community-based organizations (CBOs) in resource management. The Project will include interventions intended to address identified institutional weaknesses and equip the concerned agencies and stakeholder groups for the roles they are expected to play in CRM. Strengthening of the capabilities of MFARD and its offices will be closely linked to interventions for improving community-level monitoring and data-gathering capabilities. A substantial training and technical support element will target MFARD personnel, at provincial and local levels and department/corporation/agency level as well as community beneficiaries, as trainees. The proposed fellowships and training courses for staff of MFARD and its key agencies have been developed in consultation with MFARD, but the specific arrangements will need to be worked out during implementation. The ministry's data collection, processing, and database management capabilities will also be strengthened.

65. The institutional strengthening of CCD will particularly focus on building the capacity of the Planning Research and Design Division as well as the zonal and district offices, which will be established in the field under the Project. A computerized database management system will be established in that division for the compilation, storage, and retrieval of data in the form of plans, drawings, photographic records, survey data, coastline monitoring measurements, and

information on the condition of physical installations necessary for the effective functioning of CCD.

66. Specific research studies will be undertaken to improve MFARD's management capacities and to provide some insights into difficult issues. Six topics have been identified as vital to providing relevant information for effective planning and policy making for CRM and conservation. They are (i) marine fishery resources and stock assessment; (ii) reducing postharvest losses by improving onboard fishing technology; (iii) fisheries technology; (iii) fisheries sector livelihood potential; (iv) water quality in the coastal zone under the SAM program; (v) sand mining and alternatives; and (vi) policy on licensing, regulation and subsidies and the effect of existing and phased-out subsidies. The list of research topics was developed in consultation with the agencies concerned, and the detailed terms of reference will be worked out following an agreed upon outline terms of reference (available as a supplementary appendix) in consultation with the Bank during project implementation.

67. Specific project interventions under the first three components and the locations within the selected districts where they will be implemented are summarized in Table 1.

**Table 1: Project Interventions and Locations**

<b>Coastline Stabilization</b>	<b>Coastal Environment and Resources Management</b>	<b>Fisheries Resource Management and Quality Improvement</b>
<p><b>1. Puttalam</b> Maha Oya-Lansigama (13 km)</p> <p><b>2. Gampaha</b> Colombo North-Dickowita (8 km)</p> <p><b>3. Colombo</b> Moratuwa-Koralawela (2 km)</p> <p><b>4. Kalutara</b> Wadduwa-Kalutara (6 km) Kalu Ganga-Maggonna Headland (8 km)</p> <p><b>5. Galle</b> Beruwela-Bentota (7 km) Hikkaduwa-Galle (8 km)</p>	<p><b>1. Puttalam</b> Bar Reef<sup>a</sup></p> <p><b>2. Gampaha</b> Negombo Lagoon/Muthurajawela Marsh<sup>a</sup></p> <p><b>3. Colombo</b> Lunawa Lagoon<sup>a</sup></p> <p><b>4. Galle</b> Madu Ganga Estuary<sup>a</sup> Unawatuna Bay<sup>a</sup> Hikkaduwa<sup>a</sup></p> <p><b>5. Hambantota</b> Kalametiya Lagoon<sup>b</sup> Mawella Lagoon<sup>c</sup> Tangalle/Hambantota<sup>d</sup></p>	<p><b>1. Puttalam</b> Chilaw harbor</p> <p><b>2. Galle</b> Ambalongoda Anchorage</p> <p><b>3. Hambantota</b> Kalametiya anchorage Hambantota harbor</p>

<sup>a</sup> Site for preparation of special area management (SAM) plans.

<sup>b</sup> Strengthening of Community Coordinating Committee, conduct of information, education, and communication programs, and establishment of awareness visitors centers.

<sup>c</sup> Research/development/implementation of measures for improvement of water flow/water quality in lagoons.

<sup>d</sup> Design/implementation of solid waste management/pollution prevention program.

### **C. Cost Estimates**

68. The total project cost is estimated at \$80.0 million equivalent, comprising about \$44.0 million (55 percent) in foreign exchange and \$36.0 million equivalent (45 percent) in local currency costs (Table 2). A more detailed cost estimate table is shown in Appendix 4.

**Table 2: Project Cost Estimates**  
(\$ million)

Component	Foreign Exchange	Local Currency	Total Cost
<b>A. Base Cost<sup>a</sup></b>			
1. Coastline Stabilization			
a. Coastline Stabilization: Part A	18.32	10.42	28.74
b. Coastline Stabilization: Part B	3.49	3.65	7.14
<b>Subtotal Coastline Stabilization</b>	<b>21.81</b>	<b>14.07</b>	<b>35.88</b>
2. Coastal Environment and Resources Management	3.63	4.46	8.09
3. Fisheries Resource Management and Quality Improvement	6.51	8.23	14.74
4. Institutional Strengthening	2.34	1.93	4.27
<b>Subtotal (A)</b>	<b>34.29</b>	<b>28.69</b>	<b>62.98</b>
<b>B. Contingencies</b>			
1. Physical <sup>b</sup>	5.93	4.90	10.83
2. Price <sup>c</sup>	2.95	2.41	5.36
<b>Subtotal (B)</b>	<b>8.88</b>	<b>7.31</b>	<b>16.19</b>
<b>C. Interest During Construction</b>	<b>0.83</b>	-	<b>0.83</b>
<b>Total<sup>e</sup></b>	<b>44.00</b>	<b>36.00<sup>d</sup></b>	<b>80.00</b>

<sup>a</sup> Base cost estimates include costs of civil works as well as other components of investment and recurrent costs. A more detailed breakdown is in Appendix 4.

<sup>b</sup> Physical contingencies are based on 20 percent of base cost of civil works for coastline stabilization and harbors, and 10 percent of all other costs.

<sup>c</sup> Price contingencies are based on average annual escalation of 2.4 percent for foreign exchange and 11 percent for local currency cost in 2000 and 10 percent thereafter.

<sup>d</sup> Local currency figures include taxes and duties of about \$1.26 million equivalent.

<sup>e</sup> Total may not tally due to rounding.

#### D. Financing Plan

69. It is proposed that the Bank provide a loan of \$40.0 million from its Special Funds resources to finance about 50 percent of the total Project cost. The proposed Bank loan will have a repayment period of 32 years, including an 8-year grace period, and will carry an interest charge of 1.0 percent per annum during the grace period and 1.5 percent thereafter. The proposed financing plan is in Table 3. The financing plan, by component, is in Appendix 5.

**Table 3: Financing Plan**  
(\$ million)

Source	Foreign Exchange	Local Currency	Total Cost	Percent
Bank	29.32	10.68	40.00	50.0
Netherlands	7.31	5.45	12.76	16.0
Government <sup>a</sup>	7.37	19.78	27.15	33.9
Beneficiaries	-	0.09	0.09	0.1
<b>Total</b>	<b>44.0</b>	<b>36.0</b>	<b>80.0</b>	<b>100.0</b>

<sup>a</sup> Inclusive of commercial borrowing to be arranged by the Government.

70. The Government of the Netherlands accords high priority to environmental protection and natural resource management in Sri Lanka and has expressed interest to provide grant cofinancing amounting to about \$12.76 million. This is planned to cover the financing for the entire CERM and institution strengthening components of the Project. Board approval for administering the amount as per Bank guidelines will be obtained as soon as the cofinancing arrangements are firmed up. Including this grant cofinancing, it is expected that about 66 percent of the total cost will be met by external financing and 33.9 percent by the Government's own resources. Beneficiaries will contribute in the form of labor for the construction of social infrastructure facilities in the CERM component. The Bank will partially finance Part A of the coastline stabilization component, and the Government is expected to avail itself of commercial borrowings to finance Part B of this component. The commercial borrowings may include a subsidized financial scheme of the Netherlands Government, which is available only to Dutch contractors, or similar schemes to be offered by other member countries.

71. The Government has confirmed that its contributions will be reflected appropriately in the Government's Six-Year Development Program. The proposed level of local currency financing by the Bank takes into account the Government's continuing inability to self-finance a substantial proportion of the investment program required to enable Sri Lanka to undergo the economic and social transition to a higher level of development and to reduce the high rate of poverty. Between 1994 and 1997, the Government had succeeded in reducing the budget deficit from 10.5 percent of GDP to 7.9 percent. Consistent with this strategy, the 1998 budget imposed a 10 percent cut in expenditures other than salaries, pensions, and education and health activities. Outlays were significantly reduced with the retirement of the public debt in 1997, utilizing the proceeds from privatization. On the revenue side, a goods and service tax (GST) was introduced in April 1998. Despite these measures, however, the budget deficit in 1998 was 8.1 percent of GDP after taking into account privatization proceeds and grants. This outcome was largely due to the lower than anticipated tax receipts in the first year of operation of the GST and larger than anticipated outlays on capital investment and defense. For 1999, the overall budget deficit has been revised to 7.8 percent of GDP against a forecast of 6.5 percent.

72. In recent years, the Government has taken a number of important actions to mobilize nonbudget investment finance for the country. They include the implementation of an ambitious privatization program in sectors such as civil aviation, telecommunications, and the plantation industry. In 1997 and again in 1998, the Government counterguaranteed private sector borrowing on the international capital market under the Bank's guarantee scheme. In addition, the Government secured private investment in capital-intensive industries such as the power supply and ports. An additional 10.5 percent of Government shares in Sri Lanka Telecom is expected to be divested in 1999 and a bond issue of \$200 million is planned for later this year. Despite these actions, the overall capacity of the Government to self-finance the public investment program in the coming years will be limited as debt servicing and the costs related to the ongoing civil conflict continue to absorb about 50 percent of the budget outlays. The proposed level of local cost financing for the Project is therefore justified in view of (i) the prevailing difficult country circumstances, (ii) the positive environmental impact that the Project is expected to have, and (iii) the associated sustainable reduction in the level of poverty in the poor coastal communities.

## **E. Implementation Arrangements**

73. The Ministry of Fisheries and Aquatic Resources Development (MFARD) will be the EA, with the following as Implementing Agencies (IAs): (i) CCD, which will coordinate and supervise the coastline stabilization and CERM activities; (ii) DFAR, which will be responsible for the development and operation of the fisheries management systems and supervision of fish quality enhancement and resource conservation measures; and (iii) CFHC, which will supervise and manage fisheries infrastructure development in the project areas. The EA is described in detail in Appendix 6.

74. An interagency project steering committee (PSC) will be established within six months of loan effectiveness, to be chaired by the secretary of MFARD to ensure the full cooperation of and effective liaison with other relevant implementation agencies. The committee will have, among others, representatives from the National Planning Department, External Resources Department, Marine Pollution Prevention Authority, Ministry of Local Government and Provincial Councils, Ministry of Housing and Urban Development, and Ministry of Tourism. During committee meetings, the representatives of the other relevant agencies will also be invited as required. Site-specific CCCs will also be established at the CERM project sites and will be chaired by the divisional secretaries for project sites under their jurisdiction. The CCCs will include representatives from fishery cooperatives, primary thrift and credit societies, women's groups, and all relevant organizations. Close working relationships with active NGOs in the selected sites will be established to facilitate effective implementation of field-level activities, and training and skills development activities, will be linked to employment demand.

75. MFARD will establish close working arrangements with NGOs/CBOs, in consultation with the Bank, when project implementation commences. In view of the differing capacities and involvements of these agencies, MFARD felt that a uniform approach may not be desirable. The criteria for selection of NGOs have been agreed upon with the Government and will be applied in consultation with the Bank. The NGOs will be contracted in accordance with the Government's standard procedures for the purpose. In principle, the Government has no objection to bearing part of the administrative costs to be incurred by these NGOs for specific activities. The matter will be decided depending on the scope of the involvement and the nature of the tasks to be undertaken.

76. NGOs and CBOs have expressed keen interest in project activities at the community level, particularly with regard to CERM. IUCN, an international organization with extensive experience in biodiversity conservation and CRM, has expressed interest in undertaking (i) SAM planning and facilitation, including design and implementation of biodiversity conservation programs in the Bar Reef, Negombo, Madu Ganga, and Unawatuna Bay areas; (ii) planning and implementation of activities supplementary to the IUCN/Global Environment Facility (GEF) Project in Kalametiya; and (iii) provision of technical advice and coordination of information, education, and communication (IEC) activities, including workshops in the proposed SAM sites. Similarly the Nature Conservation Group has expressed interest in being associated with coral reef protection and rehabilitation in Unawatuna Bay; Seth Sevana, with solid waste management in Lunawa; and the Environmental Foundation Limited (EFL), in environmental legal advocacy activities. Existing credit channels can ensure credit support for livelihood/microenterprise activities. The NGOs/CBOs at the CERM sites will assist individuals in gaining access to the required credit from existing sources. CCCs are expected to monitor the supply of credit for such activities. MFARD has agreed to extend seed money, if required, to encourage livelihood development activities.

### **1. Project Organization**

77. To oversee the day-to-day implementation of the Project, a project management office (PMO) has been established in MFARD under a project director (PD) reporting to the secretary of MFARD. The PD, who has been appointed, will have overall responsibility for project implementation including monitoring, reporting, and coordination. Action is being taken to appoint the necessary PMO staff. A qualified accounting officer will assist in the monitoring and management of project funds and requisitions, and a secretary and administrative and support staff will be appointed. The PD will oversee project management and coordination activities and will be responsible for ensuring that tender documents for the civil works, which are related to investment activities under the supervision and coordination of CCD and CFHC, are prepared by the project consultants. The PD will also be responsible for the production of all accounting, progress, and other reports required by the Government and the Bank.

78. The PD will directly supervise the six field project implementation units (FPIUs) at the CERM project sites and the two project implementation units (PIUs) at CCD and CFHC, which will directly report to the PD. The FPIUs will have jurisdiction over the areas where project investments will be implemented, and will serve as conduits for funds for field-level implementation. The site managers will coordinate with engineering staff of CCD, with respect to the implementation of coastal protection activities, and with the district fishery extension officers (DFEOs) regarding fisheries-related activities. Each site manager will be supported by a CRM mobilizer and a social mobilizer, to be separately hired and who will be specifically responsible for oversight of CERM interventions and liaison with target communities and their representatives. Fishery infrastructure development activities will be coordinated by CFHC, which will report directly to the PMO.

## **2. Implementation Schedule**

79. The Project will be implemented over a period of 66 months, with the first 12 months devoted to preparatory activities including (i) establishment of a PMO at MFARD, PIUs at CCD and CFHC within the first 6 months, and FPIUs at six project sites; (ii) preparation of detailed engineering designs for the construction of coastal protection civil works and harbors/anchorages; (iii) social preparation and community organization work for CERM and livelihood development; (iv) training and skills development for management of livelihood projects; (v) provision of fellowships; and (vi) construction of social infrastructure facilities. The remaining period will be used for the full implementation of coastal stabilization works, CERM activities and preparation of SAM plans, IEC and awareness programs, institutional strengthening activities, and construction of harbors/anchorages. Six months will be allowed for project completion activities. The proposed implementation schedule is in Appendix 7.

80. At the end of the third year, a comprehensive midterm review will be conducted to assess project performance, identify problems and constraints encountered during the first two and a half years of implementation, and propose remedies to the problems identified. A reassessment of project design will likewise be undertaken, including scope, the role of the IAs, and the various implementation arrangements, including any reallocation of funds among components or adjustment of the project area, as required, for the remaining implementation period.

## **3. Procurement**

81. The PMO will be responsible for the procurement of all goods and services under the Project. All services, supplies, and equipment to be financed by the Bank will be procured in accordance with the Bank's *Guidelines for Procurement* and through local competitive bidding (LCB) in accordance with Government procedures, acceptable to the Bank. Bank-financed civil works contracts estimated to cost the equivalent of \$1.0 million and above for the harbors and

all such contracts for the coastline stabilization component will be awarded on the basis of international competitive bidding in accordance with the Bank's *Guidelines for Procurement*. Other Bank-financed civil works contracts (for harbors) of less than \$1.0 million will be carried out by prequalified contractors selected under Government LCB procedures satisfactory to the Bank. The award of contracts with a value of \$500,000 equivalent and above will need prior approval by the Bank. All (or major) Bank-financed civil works contracts under the coastline stabilization component will be tendered and awarded before contracts to be funded by commercial borrowings (to finance Part B of the coastline stabilization component of the Project) will be tendered. Supply contracts estimated to cost the equivalent of more than \$500,000 will be awarded on the basis of international competitive bidding and \$500,000 or less will be awarded on the basis of international shopping. Minor items costing less than \$100,000 may be procured by direct purchase. Information on the major contract packages is in Appendix 8.

#### **4. Consulting Services**

82. The Project will require 662 person-months of consulting services: 207 international and 455 domestic. Of the total, about 366 person-months (129 international and 237 domestic) will support project implementation. CCD and CFHC will need design, management, and supervision support for the civil works. Consulting services will also be provided to support areas such as the design and implementation of IEC programs, update of the CZMP, design and implementation of the corporate training programs at MFARD and its key agencies, development of a fishery harbor operations manual, design and installation of a data collection and management system at MFARD and its key agencies, and design and conduct of orientation courses on fisheries licensing and regulation. Other important areas to be supported are the conduct of research studies and benefit monitoring and evaluation (BME) activities. The outline terms of reference for consulting services are in Appendix 9.

83. The consultants will be recruited in accordance with the Bank's *Guidelines on the Use of Consultants* and other arrangements satisfactory to the Bank on the engagement of domestic consultants. The Government has requested advance action for recruitment of consultants that will be financed under the Bank loan. Approval of advance action, however, does not in any way commit the Bank to finance the Project.

#### **5. Accounts and Audit**

84. All agencies involved in implementation will prepare and maintain separate accounts for project-related disbursements. The PMO will consolidate the accounts from the various FPIUs and submit them to MFARD, which will review the consolidated accounts and, after audit, submit them to the Ministry of Finance and the Bank. The audit report will include, among others, a statement verifying that funds disbursed by the Bank against statements of expenditures have been used for the purpose for which they were provided. Project accounts, together with disbursement documents, will be audited annually by independent auditors acceptable to the Bank, and will be submitted to the Bank within 12 months of the end of each fiscal year. Imprest account facilities will be established directly with MFARD, which has the capacity to undertake and will be responsible for all administrative and accounting requirements relating to the operation and utilization of such a fund. The statement of expenditure (SOE) procedures will be used for reimbursement of eligible expenditures and to liquidate advances covered in the imprest account, in accordance with the Bank's *Loan Disbursement Handbook* and the detailed arrangements agreed upon by the Bank and the Government. The initial amount to be deposited into the imprest account will not be more than the equivalent of \$200,000 and any individual payment to be reimbursed or liquidated under the SOE procedure will not exceed the equivalent of \$50,000. It may also be necessary to establish procedures to expedite the processing of small contracts for local initiatives at the local government level.

## **6. Project Monitoring**

85. Initial work on the conceptualization of a monitoring system at the MFARD Planning Division is currently being carried out under the FAO-funded Bay of Bengal Programme (BOBP). The data collection and management systems that will be established in CCD, DFAR, CFHC, and NARA under the proposed Project will support and complement efforts under BOBP so as to establish in MFARD a monitoring system that will serve as a valuable source of information for planning and programming.

86. The monitoring system to be established in PMD of MFARD will be used to assemble, analyze, and store data and information on all aspects of work of the IAs, and to provide information for project monitoring. Although the data requirements for project monitoring are narrower in scope (related to project components) than those of MFARD (all activities of its departments, authorities, agencies, and corporations), they will share some common data. It is important that the monitoring system is seen as distinct from the general data systems, and is handled and analyzed for a different purpose, i.e., to determine progress, to detect problems early on, and to ensure effective planning and development. These are the main features of the proposed monitoring system:

- (i) a central monitoring unit within PMD of MFARD, which will analyze, consolidate, and present information gathered from the operational departments and agencies of MFARD on both regular ministry program and project progress;
- (ii) a project monitoring unit within PMO, which will monitor progress according to implementation schedules and inputs in keeping with the design objectives;
- (iii) a submonitoring unit within each IA (i.e., CCD, DFAR, and CFHC), which will monitor their own activities and the progress of their particular responsibilities; and
- (iv) project field data and information collection, which will be undertaken through the FPIUs. Coastal protection monitoring will be handled by CCD's district and zonal offices (to be established under the Project at the start of implementation). CFHC will conduct its own monitoring of harbor construction works.

## **7. Benefit Monitoring and Evaluation and Reporting**

87. A BME system will be designed and established at PMD of MFARD by December 2003, utilizing information collected and processed through the data collection and management systems of CCD, DFAR, CFHC, and NARA. BME will be undertaken by a team of consultants who will commence work from the second year of project implementation; they will be recruited for one month every year and will prepare an annual report. The team will be composed of (i) a civil engineer from a private civil engineering firm, (ii) a natural resources management specialist from a national university, and (iii) a social and livelihood assessment expert with extensive experience in community-level social mobilization and livelihood and credit assistance from an NGO. The PMO will submit, through the EA, semiannual progress reports and annual financial reports. A project completion report will also be submitted at the end of the Project within not more than 12 months of project completion.

## **F. Environment and Social Measures**

### **1. Environment**

88. The Project is expected to yield significant environmental benefits in terms of resource conservation, pollution abatement, and improvement of public health. Many of the proposed activities are, in fact, in the nature of environmental mitigation or enhancement measures themselves. The coastal protection works to be set up will prevent substantial losses due to coastal erosion in residential, commercial, and industrial facilities as well as road and railway infrastructure. The Project will also prevent damage to the natural environment, such as wetland areas and other coastal habitat along the coastline. Coastal protection works under the Project will yield direct benefits from the land that would be saved with the stabilization of erosion at the project sites. Modeling studies indicate that the impact of the physical stabilization measures over 52 km will be felt over a much larger area. Coastline stabilization will produce innumerable benefits to the tourism industry, which is the second largest foreign exchange earner of the country next to the tea industry.

89. CERM activities as well as various community development, poverty reduction, and institutional strengthening activities are expected to yield overall positive environmental benefits. Measures to mitigate problems affecting the ecological integrity of coastal habitats will result in improvements in their economic, aesthetic, and recreational values and subsequently ensure their long-term sustainability. The rehabilitation and conservation of coastal habitats and adoption of fisheries management measures will lead to increased fish availability and, consequently, increased fish catches and higher incomes for fisherfolk.

90. In addition, the Project is expected to generate significant socioeconomic benefits to the coastal communities as a result of the establishment of the fishery harbors/anchorage and the resultant improved efficiency of fishing operations due to the availability of support facilities. The proposed fishing harbors and anchorages are all located in intensive fishing areas, and fish landing activities have been practised at all sites. The two fishing harbors (in Chilaw and Hambantota) will be established on existing facilities. To minimize further environmental impacts from the activities, each of the fishing harbors and anchorages will be provided with a solid waste management system; wastewater collection, treatment, and disposal system; oil waste collection system; and adequate sanitation facilities. For each, the effluent from fishery activities will meet the government environmental standard. These measures will improve the general environmental condition of the fishing harbors and anchorages.

91. The environmental impact assessment (EIA) and the summary EIA (SEIA) for the Project were prepared following the Bank's environmental guidelines.<sup>13</sup> The EIA has been reviewed and endorsed by the concerned agencies of the Government. The EIA assesses the positive as well as the adverse environmental impacts arising from the project interventions. The potential adverse impacts include quarry and transport of materials, offshore sand extraction, and dredging. Impact mitigation measures have been identified and will be implemented. They relate mainly to sand extraction, which will be carried out in deepsea areas at least beyond 8 km offshore; and dredging, which will be limited to 2 meters (m) below the existing seabed levels, at depths equal to or greater than 15 m below mean sea level, to avoid hydraulic and geotechnical problems. The dredging of the harbor basin is not likely to result in significant impacts on the biota and the ecology of the area.

92. The EIA concluded that the adverse environmental impacts arising from the Project could be minimized to acceptable levels through the implementation of a set of mitigation

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<sup>13</sup> The SEIA was circulated to the Board on 29 July 1999.

measures. Additional environmental investigation for the coastal stabilization component, and harbors and anchorages will be undertaken in accordance with Government guidelines, and Government clearance will be obtained prior to implementation of the works.

## **2. Social Dimensions**

93. The project area extends from Puttalam in the northwest to Tangalle in the south (excepting Matara district). It is heavily populated, and has a marine fishing population of 145,000, of which 35,000 are active fishers. From the results of a rapid social assessment survey in selected coastal communities in the project area, it is estimated that about 24 percent of the households in the coastal areas of the six districts have an income below SLRs30,000 per year. Of the remaining households, about 13 percent receive a household income of SLRs30,000-45,000, 22 percent enjoy a household income of SLRs45,000-63,000 and another 17 percent earn SLRs63,000-80,000 per year. The major target group of the Project will be the above groups, amounting to about 76,500 households. The remaining 24,000 households (about 24 percent of the total), comprise moderate (13 percent) and high (11 percent) income earners with earnings greater than SLRs80,000 per year per household. An initial social assessment of the project area is in Appendix 10.

94. Aside from its resource management thrusts, the Project also is expected to actively involve the target groups, including women, in project implementation, through the formation of CCCs and the involvement of local NGOs/CBOs. These measures will assist in mainstreaming the beneficiary population in resource management and poverty reduction efforts. In anticipation of their active participation in the Project and to give them a sense of project ownership, which are critical to its success as a community-based undertaking, socioeconomic surveys, national- and local-level workshops, and focus group discussions were conducted as part of the project design process. The results of the surveys and local-level consultations revealed the beneficiary population's problems, needs, wants, and aspirations.

95. Project intervention has been designed to encourage the communities to perceive the need for reducing exploitation and adopting conservation measures, while at the same time demonstrating that additional income can be generated through improved fish handling, reduction in postharvest losses, etc. The Project will complement ongoing Government efforts to address widespread poverty in the fishing community in the country. There is need for concerted efforts to encourage alternative livelihood development activities through skills training and provision of credit, both of which activities are expected to be performed by NGOs/CBOs. It is also expected that women members of the community will be mobilized to play an important role in household income generation, management of fisheries organizations, and resource conservation.

## **3. Gender Analysis**

96. Women's labor is mainly used in fish landing, net cleaning, and net repairs. Traditionally women have also been involved in fish curing and employed in prawn farming. These opportunities have been affected by the destruction of resources in the lagoons, which affects prawn fishing and eliminates the surplus fish catch for drying. Beach erosion has also affected net mending sites and places for vending small catches.

97. The potential and the capacities of women to take advantage of new opportunities for income generation to reduce poverty and deprivation and the sole dependence on fishing have been the focus of several studies. The findings have underscored the capacity of fisher communities, particularly through the initiatives of women, to adapt to nontraditional lifestyles and occupations, provided that an external catalyst works with them and takes them through the

long period of adjustment and change. There is consensus that women have a positive role in poverty reduction through the adoption of enhanced nonfishing activities. Women in the fishing communities in the project locations could be mobilized to become active participants in livelihood development activities in the project and to eventually become instruments through which undue dependence on a depleting resource in fishing can be severed. Women's groups, which actively participated in the planning for the Project, have been actively involved in the SAM planning process and expressed interest in availing themselves of credit for livelihood development activities. Skills development training will target women's groups to the extent possible. Women's groups will also be involved in the community organization efforts under the CERM component, particularly in programs relating to improvement of sanitation and other services. NGOs/CBOs involved with the CERM activities are expected to assist women in accessing credit and undertaking income-generating activities.

## **V. PROJECT JUSTIFICATION**

### **A. Economic Analysis**

98. The overall economic viability of the Project was analyzed by calculating the stream of net incremental costs and benefits attributable to the various components over a period of 20 years. The calculation of incremental costs was based on the estimates of investment cost items consisting of civil works and construction, capital goods including initial operational inputs, consulting services, training, initial working capital requirements, and research and surveys. In addition, recurrent costs including O&M costs incurred during project implementation and after completion were calculated. All costs were expressed in 1999 constant economic values.

99. Incremental economic benefits were estimated from all the components except institutional strengthening. Economic benefits expected from coastline stabilization are (i) the prevention of economic losses to the national economy such as value of houses and buildings saved due to the Project; (ii) avoidance of removal and administrative costs and disruption of work; and (iii) the opportunity costs of agricultural land and potential losses in tourist industry that will be prevented with the implementation of the Project. Economic benefits from CERM are based on (i) use values as generated by the increased production of the coastal shrimp, small pelagic, and lagoon fisheries as well as by recreational values and ecotourism benefits; and (ii) nonuse values such as biodiversity and foreign tourists' willingness to pay (WTP). Economic benefits derived from fisheries management and fish quality improvement are the projected increases in fish landings and reductions in loss of fish production as a result of improved fish handling and processing.

#### **1. Economic Benefits**

100. With the coastline stabilization component, it is expected that 52 km of coastline will be saved in the with-Project situation. The area that will be saved from erosion is estimated at 10.23 ha each year or about 204.6 ha over the life of the Project. The value of houses that will be protected from erosion is estimated at about \$1.27 million each year or about \$25.40 million over 20 years. This benefit is in addition to the savings of owners from not having to remove the building remains or lose work time and income, and also the prevented loss of agricultural production. Potential losses from tourism that will be avoided are estimated at about \$5.1 million each year, or \$102 million over the life of the Project.

101. Quantifiable benefits from the CERM component are derived from the estimated use values concerning biodiversity; value of production generated from the lagoon, coastal shrimp, and small pelagic fisheries; and the perceived tourists' WTP for use of the lagoons for recreation.

102. Benefits from the fisheries management and fish quality improvement component are primarily from increased fish landings due to the construction of fishery harbors. Incremental fish landings are expected to increase from 897 tons per year (t/yr) in year 3 of project implementation to 5,861 t/yr in year 6 and onward. Moreover, increases in fish supply are envisioned due to about 20 percent reduction in postharvest losses over the duration of the Project.

103. Based on the economic cost and benefit streams generated from each of the economic analyses carried out for the various investment activities under the different components, the economic internal rate of return for the whole Project was estimated at 15.3 percent. The detailed economic analysis is attached as Appendix 11.

## **2. Other Benefits**

104. The Project is expected to have numerous nonquantifiable benefits not included in the preceding analysis. The principal ones consist of (i) institutional strengthening of MFARD and its key agencies directly involved in the implementation of project-related activities; (ii) enhancement of interagency linkages through cooperation in the coordination and implementation of CRM plans and activities; (iii) improved and effective resource management and protection; (iv) enhanced beneficiary participation in resource management and project implementation; (v) establishment of strong partnerships among the local government, the communities, and NGOs/CBOs in community-based resource management; (vi) increased food supply, improved nutrition, and health; and (vii) improved community welfare. Other nonquantifiable benefits include the retardation of coastal resource depletion and degradation through effective environmental protection and resource management as well as the promotion of beneficiary participation in community-based CRM and in project implementation.

## **B. Impact on Poverty**

105. Though coastal stabilization appears to be an infrastructure component it contains a number of tangible as well as intangible impacts that will impinge directly on the poor coastal communities, particularly the large numbers of small-scale fisherfolk inhabiting the coastal zone. Around 5,300 fishing families are estimated to directly benefit from beach protection, and about 1,800 permanent and temporary seafront houses, most of which belong to fisherfolk, will be protected in and around the project sites. Although in calculating the benefits the Project assumes a modest 10 ha of land that will be saved per year, the favorable impacts of coastal stabilization are estimated to benefit about 400 ha of coconut plantations and 1,300 ha of home gardens in the project area. The harbors and anchorages are primarily meant to support more mechanized fishing. Nevertheless, members of poor fishing families will also benefit widely from the additional employment opportunities that will be generated by the development of multiday fishing centered on these harbors and anchorages. It is estimated that over 1,000 jobs will be created at the four sites. Simultaneously, with the new/additional facilities, harbors and anchorages will provide opportunities to improve the efficacy of fishing operations of poor fisherfolk, and help upgrade the quality of fish, reduce postharvest losses, and ultimately secure higher prices/incomes, which are estimated to increase by about 10-15 percent. The CERM component will include measures aimed at countering marine resource depletion, water pollution, and deterioration of coastal habitats through an integrated approach. This program will also help to obtain the active participation of the coastal communities in resource management, to empower them and encourage them to make informed decisions on the use of their resources. The CERM component will contribute to the improvement of the health and sanitary conditions of the communities, particularly those living around the marshes, wetlands, and lagoons.

### C. Project Risks

106. It is believed that the technical innovations proposed are sound. If properly implemented, they should pose no serious risk. In integrated projects like this, however, efficiency and interagency cooperation will require special efforts. The participatory nature of the Project will require regular consultations with target groups whose full cooperation is essential. Attitudinal changes are essential to project success, particularly toward environmental protection and quality control practices. The ongoing civil conflict is unlikely to affect project implementation as the sites are not involved in the strife.

107. Certain overlaps and contradictions that exist between the mandates of MFARD and its agencies, and between MFARD and its units and those of other Government agencies, impede the effective management of the coastal resources sector. In this regard, the Project has identified specific countermeasures, such as the proposal to replace the present Coast Conservation Act with a new law incorporating various amendments to rationalize the statutes that give similar powers over the coastal zone to other ministries or authorities, and which have, in effect, caused the powers, functions, and duties of CCD to be eroded over the years.

108. Institutional inadequacies of the EA/IAs, and the lack of cooperation and coordination between Government agencies and different levels of Government are also obstacles to project success. The different mandates, priorities, and funding allocations of various Government agencies could become obstacles to establishing efficient and effective coordinating mechanisms for project implementation. Countermeasures to this risk include (i) a careful design and vigorous implementation of the project's institutional strengthening component, which aims to build the capacity of the EA/IAs; (ii) formation of a PSC at the national level and of CCCs at the local level; (iii) provision of long-term consultants for EA/IAs, and NGO assistance to FPIUs and local governments; and (iv) design and implementation of an effective monitoring and reporting system, with a view to obtaining prompt feedback and allowing timely remedies.

109. The lack of Government counterpart funds may also delay implementation. After project completion, the small annual budget allocated to the coastal resources sector, including fisheries, may also jeopardize the sustainability of the various management systems established under the Project, such as maintenance of coastline stabilization schemes, particularly beach nourishment. The annual budget requirement for the O&M of the various measures to be established under the Project has been estimated. The Government fully recognizes the importance of maintaining the coastline stabilization schemes and is committed to providing sufficient allocations under the national budget to sustain project activities and long-term impacts.

110. One of the more difficult tasks facing the Project is that of fostering the growth of new attitudes and mind set toward resource management, environmental protection, social empowerment, fish quality, hygiene, marketing, and interagency cooperation. The mental outlook and defensive instincts of both coastal communities and local officials will have to be addressed in a long-term program of education, awareness, motivation, and trust-building. Failure to achieve progress in this task will seriously diminish the chances of achieving the major project goals. To counteract this risk, the Project will conduct IECs at the national and local levels. For the government agencies, there will be regular workshops and briefing sessions. Participating officers will be encouraged to share their positive experiences, and efforts will be pursued to disseminate such feedback widely.

## VI. ASSURANCES

### A. Specific Assurances

111. The Government has given the following assurances, in addition to the standard assurances, which have been incorporated in the legal documents:

- (i) As its contribution for efficient implementation of the Project and its long-term impacts, the Government will maintain at all times during and after project implementation adequate budgetary allocation, infrastructure support and staff, as required for the efficient administration and implementation of the Project and its long-term impacts.
- (ii) The Government will maintain adequate budgetary provision to meet the recurring costs on annual maintenance of coastline stabilization works and annual expenses for monitoring coastal erosion.
- (iii) The Government will have its contribution for the Project reflected appropriately in its Six-Year Development Program.
- (iv) The Government will provide adequate counterpart funding and appropriately qualified staff to carry out project activities.
- (v) The Government will establish all the necessary agencies for effective implementation of the Project including the PMO,<sup>14</sup> PIUs and FPIUs, within not more than six months of loan effectiveness.
- (vi) Prior to implementation, the Government will obtain EIA approval for the individual components (coastline stabilization and specific sites for fishing harbors/anchorages) after detailed designs are prepared.
- (vii) Subsidies on fishing boats will be progressively phased out by reducing 15 percent annually for coastal and offshore boats and will be restricted only to offshore vessels after 2002. These subsidies will continue to be targeted to poor fishermen, and used to encourage the shift to offshore fishing and facilitate adoption of new technology for diversified fishing, navigation equipment, and improved preservation of the catch. A detailed review of the need to continue subsidies for offshore vessels will be undertaken with the Bank, during the midterm review of the Project.
- (viii) The CCD's physical construction work will be phased out by the end of project implementation and the department will confine itself to policy, planning, and emergency works.
- (ix) The berthing charges already being levied under the ongoing Fisheries Sector Project (Loan 1201-SRI) will be extended to the harbors and anchorages to be constructed under the Project. The progress achieved by implementation by CFHC of the increase in costs recovered at the harbors and anchorages (berthing charges) will be monitored and reported to the Bank on an annual basis.

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<sup>14</sup> The PMO has already been established.

- (x) The Government will accord greater importance to generating additional revenue from the tourism sector and will identify appropriate market-based instruments to augment cost recoveries for the sector.
- (xi) Adequate measures will be taken to maintain the accounts of Bank funds separately and to strengthen MFARD's capacities for accounting and audit.
- (xii) The Government will actively explore alternatives to abolish river sand mining. A copy of the recommendations of the presidential task force set up in this regard will be submitted to the Bank, along with a time-bound action plan for the implementation of the recommendations.
- (xiii) The present integrated approach to coastal zone management, as envisaged in the Coastal Zone Management Plan, will be periodically updated and continued, and care will be taken to ensure that external assistance to this area is adequately coordinated.
- (xiv) The Government, through MFARD, will continue its emphasis on addressing environmental degradation and the community-based SAM planning approach to protect wetlands and lagoons in the project area.
- (xv) Women being active participants in fisheries and coastal resources management will continue to be mobilized to play an effective role in household income generation through accessing credit, management of fisheries, and coastal resource conservation. Training under alternative livelihood programs will be designed to be employment oriented, with beneficiary preference in favor of women.
- (xvi) All actions required for submissions to the Parliament for its consideration of the proposed amendments to the Fisheries and Aquatic Resources Act, 1996 and introduction of a revised act in place of the Coast Conservation Act, 1981 shall be completed at the earliest opportunity within not more than one year of loan effectiveness.

## **B. Condition for Loan Effectiveness**

112. In case the cofinancing has not been received, the Government will make the appropriate budgetary or other provisions for providing the necessary funds from its own or other sources for the effective implementation of Components B and D of the Project, to the satisfaction of the Bank.

## **VII. RECOMMENDATION**

113. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Bank and recommend that the Board approve the loan in various currencies equivalent to Special Drawing Rights 28,806,000 to the Democratic Socialist Republic of Sri Lanka for the Coastal Resource Management Project, with a term of 32 years, including a grace period of 8 years, and with an interest charge at the rate of 1 percent per annum during the grace period and 1.5 percent per annum thereafter, and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board.

**APPENDIXES**

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**SUPPLEMENTARY APPENDIXES**

(available on request)

A	Fisheries Resource Management
B	Outline Terms of Reference of Proposed Studies
C	Full Cost Estimates
D	Detailed Economic Analysis of the Project and its Components

## PROJECT FRAMEWORK

Design Summary	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
<b>1. Goal</b>			
Enhance environmental protection of coastal areas and contribute to poverty reduction among fisherfolk communities	<ul style="list-style-type: none"> <li>• Coastal erosion along seven specific coastal segments, with a total length of 52 km, reduced from current rate of 10 ha/yr by 2005</li> <li>• SAM plans effectively implemented in 6 critical coastal sites by 2005</li> <li>• Spoilage in catch of multiday boats reduced by 20% by 2005</li> </ul>	<ul style="list-style-type: none"> <li>• Project monitoring reports</li> <li>• Review of national strategies/policies during Country Programming Mission</li> <li>• Aid agency coordination meetings on strategies/policies concerning the sector and related sectors</li> <li>• Benefit monitoring and evaluation (BME) reports</li> </ul>	<ul style="list-style-type: none"> <li>• Effective operation of institutions for coastal resource management is sustained beyond the Project.</li> <li>• Funds are available for planning and maintenance for coastal resource management after the Project.</li> </ul>
<b>2. Purpose/Objective</b>			
Establish integrated management of coastal resources to improve its sustainability	<ul style="list-style-type: none"> <li>• CCD implements coastline protection and stabilization measures in seven specific coastal stretches by 2005.</li> <li>• Six SAM plans implemented by CCD by 2004 in collaboration with coastal communities and NGOs</li> <li>• CFHC manages two safe, efficient, and hygienic harbors and two anchorages by 2005.</li> </ul>	<ul style="list-style-type: none"> <li>• Minutes of CCAC meetings</li> <li>• Meetings with MFARD secretary</li> <li>• NGO reports</li> <li>• Postconstruction monitoring reports</li> <li>• Project monitoring reports</li> <li>• Erosion reports</li> <li>• CCC reports</li> <li>• MCS reports</li> <li>• Fisheries statistics</li> <li>• Project resource inventory reports</li> <li>• Annual reports of DFAR</li> <li>• Fish quality control reports</li> <li>• CFHC harbor reports</li> <li>• Reports of fisheries cooperatives</li> </ul>	<ul style="list-style-type: none"> <li>• Participating Government agencies appoint as members of CCAC competent representatives who are knowledgeable in coastal resource management concerns and issues and are directly involved in policy-making process for the sector.</li> <li>• Field-level monitoring of coastline condition carried out effectively beyond Project</li> <li>• CCD is able to hire adequate and competent incremental staff and is able to effectively encourage community participation.</li> <li>• Effective enforcement of regulations on coastal fishing and fish handling as well as implementation of licensing and MCS measures</li> <li>• Trained CFHC staff apply acquired harbor management skills effectively beyond Project.</li> <li>• No political interference in community-based coastal resource management</li> </ul>
<b>3. Outputs</b>			
<b>3.1 Coastline Stabilization Component</b>			
3.1.1 The most critical coastal stretches (in	<ul style="list-style-type: none"> <li>• Coast erosion control measures</li> </ul>	<ul style="list-style-type: none"> <li>• Postconstruction survey and erosion reports</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable contractor capacity is available.</li> </ul>

Design Summary	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
respect to coastal erosion) on the West, Southwest, and South coast are stabilized.	<p>implemented in 7 identified critical coastal stretches by 2005 with corresponding decrease in their average annual erosion rates currently estimated as follows:</p> <p>Maha Oya-Lansigama – 3 meters/year;</p> <p>Colombo North-Dickowita – 0.5-2.5 meters/year;</p> <p>Moratuwa-Koralawela – 0.3 meters/year;</p> <p>Wadduwa-Kalutara – 0.8 meters/year</p> <p>Kalu Ganga-Maggona – 2.0 meters/year</p> <p>Beruwela-Bentota – 1.0-1.5 meters per year; and</p> <p>Hikkaduwa-Galle – 1.0 meter/year</p>	Postconstruction survey and erosion reports	<ul style="list-style-type: none"> <li>• Government will actively encourage/involve private sector for coast protection works.</li> <li>• Government will provide adequate funds for maintenance in the amount of SLRs90-150 million annually over the period starting in year 2007.</li> <li>• Government will provide adequate funds for monitoring works in the amount of SLRs20 million annually starting in year 2003.</li> </ul>
3.1.2 Coastal erosion management converted from reactive/defensive to proactive/preventive	<ul style="list-style-type: none"> <li>• Revised master plan for coast erosion management is available every 4 years and implemented as a guide for CCD in managing and planning the coastline.</li> </ul>	Consolidated budget reports and erosion reports	
<b>3.2. Coastal Environment and Resources Management Component</b>			
3.2.1 National CZMP revised and updated	<ul style="list-style-type: none"> <li>• National CZMP revised by 2002</li> <li>• SAM plans produced for Bar Reef and Lunawa Lagoon</li> <li>• Existing management plans reviewed/ updated for Negombo Lagoon, Madu Ganga Estuary, Unawatuna, and Kalametiya Lagoon</li> </ul>	<ul style="list-style-type: none"> <li>• Distribution lists</li> <li>• SAM plan reports</li> </ul>	Adequate technical capability exists.

Design Summary	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
3.2.2 Appropriate CRM interventions are effectively implemented in the nine identified CRM sites.	<ul style="list-style-type: none"> <li>• Coral reef areas improved at Bar Reef and Unawatuna</li> <li>• Mangrove areas improved at Negombo, Lunawa, Madu Ganga, and Kalametiya; wildlife habitat</li> <li>• Wildlife habitat at Negombo, Madu Ganga, and Kalametiya</li> <li>• Lagoon water quality improved in Negombo, Lunawa, Madu Ganga, Kalametiya, and Mawella Lagoons</li> <li>• Solid waste reduced at Lunawa, Negombo, and Tangalle/Hambantota</li> <li>• Social infrastructure installed in Negombo and Lunawa by 2005</li> <li>• 1,800 household beneficiaries in coastal communities of the 6 project sites trained as part of livelihood development programs</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat monitoring reports and statistics of CCD and NGOs</li> <li>• Environmental quality monitoring reports of CCD and NGOs</li> <li>• Community surveys and other feedback from NGOs</li> <li>• BME report</li> <li>• Socioeconomic survey</li> <li>• Review missions</li> </ul>	<ul style="list-style-type: none"> <li>• CCCs reconstituted to address key policy issues</li> <li>• Institutional capability adequate</li> <li>• Government will provide budget provisions of SLRs 100-140 million annually.</li> </ul>

### 3.3. Fisheries Resources Management and Quality Improvement Component

3.3.1 Fisheries management systems established	MCS system for conservation and management of fishery resources established by 2002	<ul style="list-style-type: none"> <li>• BME reports</li> <li>• Postproject appraisal</li> <li>• Postproject evaluation</li> <li>• NGO and CBO reports</li> </ul>	Communities, government, and grassroot level community organizations are willing and able to cooperate and support the Project.
3.3.2 Effective quality enhancement and resource conservation measures introduced in Bar Reef, Chilaw, Morawela, Mawella Lagoon, Kalametiya, and Hambantota	<ul style="list-style-type: none"> <li>• Spoilage in catch of multiday boats reduced by 20% by 2005</li> <li>• Village-based fish processing technologies introduced in Bar Reef, Mawella Lagoon, and Kalametiya by 2005</li> </ul>	<ul style="list-style-type: none"> <li>• Survey and appraisal of projects introduced</li> <li>• Statistical reports</li> <li>• Postharvest and marketing consultants reports</li> <li>• BME reports</li> <li>• Review missions</li> </ul>	<ul style="list-style-type: none"> <li>• Dumping of cheap fish from foreign sources into local market</li> <li>• Consumer response to education and awareness campaigns on quality identification and hygiene</li> <li>• Release of adequate funds by government from annual subsidy allocation toward improvements and refrigeration of fish holds</li> <li>• Operators continue to follow improved postharvest practices and maintain the confidence of export processors by supplying high-quality fish.</li> </ul>

Design Summary	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
3.3.3 Fisheries infrastructure developed	Construction of 2 fishery harbors (in Chilaw and Hambantota) and 2 anchorages (in Ambalangoda and Kalametiya) as a means to reduce pollution in lagoons	<ul style="list-style-type: none"> <li>• Survey of harbors and anchorages</li> <li>• Progress reports of site engineers</li> <li>• Review missions</li> </ul>	<ul style="list-style-type: none"> <li>• Acceptance and support of resource users</li> <li>• Selection of competent engineers for timely completion of activities</li> </ul>
<b>3.4 Institutional Strengthening Component</b>			
3.4.1 MFARD capabilities strengthened for more effective resource management	<ul style="list-style-type: none"> <li>• A total of (about 25) MFARD, CCD, DFAR, CFHC, and NARA personnel trained by 2005 in various training courses including corporate training, data collection and management, monitoring and evaluation, harbor management, etc.</li> <li>• Establishment and functioning of monitoring unit within the Planning and Monitoring Division of MFARD by 2002 and networked with each of the data collection and management system established in CCD, DFAR, CFHC, and NARA</li> <li>• CCD/MFARD is the central coordinating agency for all matters in the coastal zone with more powers bestowed on its director by 2001.</li> <li>• Fisheries resource stock assessment</li> <li>• Fisheries technology (gear, type/site, etc.)</li> <li>• Fisheries sector livelihood potential</li> <li>• Water quality in coastal zone</li> <li>• Sand mining alternatives</li> </ul>	<ul style="list-style-type: none"> <li>• Personnel officer reports and director's annual evaluations of the performance of units according to established criteria</li> <li>• MFARD Planning and Monitoring Division annual reports</li> <li>• Annual reports of MFARD, CCD, DFAR, CFHC, and NARA</li> <li>• PMO reports on data information and monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• All staff participate in the exercise and its follow-up, including directors, senior professionals, middle level, and junior level staff.</li> <li>• Staff and unit appraisal and motivational procedures and systems are accepted and incorporated.</li> <li>• Other Government agencies concerned and/or involved in CRM accept CCD/MFARD as the lead agency in coastal resource management.</li> </ul>
<b>4. Activities</b>			
4.1 Critical coastal stretches stabilized <ul style="list-style-type: none"> <li>• Identify and undertake necessary investigations for</li> </ul>	\$35.8 million	Progress report	Close coordination between coastal communities and MFARD

Design Summary	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
<ul style="list-style-type: none"> <li>• coast protection works;</li> <li>• detailed designs for coast protection works carried out;</li> <li>• tender, contract and commission works for coast protection;</li> <li>• supervise construction;</li> <li>• carry out post-construction monitoring; and</li> <li>• identify and implement maintenance work.</li> </ul>			
<p>4.2 Coastal erosion management</p> <ul style="list-style-type: none"> <li>• establish a coastline monitoring system;</li> <li>• identify and evaluate research requirements;</li> <li>• update master plan for coast erosion management;</li> <li>• develop an alternative supply of sand for the construction sector; and</li> <li>• strengthen relevant divisions in CCD to carry out these functions</li> </ul>	\$1.5 million	Progress report	Close coordination between coastal communities and MFARD
<p>4.3. National CZMP revised</p> <ul style="list-style-type: none"> <li>• conduct research, baseline surveys to determine extent and existing condition of resources and habitats;</li> <li>• establish integrated GIS for CRM;</li> <li>• upgrade data filing and cataloguing system for libraries at NARA and CCD.</li> </ul>	\$1.3 million	Progress report	Close coordination between coastal communities and MFARD
<p>4.4 CERM interventions</p> <ul style="list-style-type: none"> <li>• establish CCCs to effect community-based participatory planning at 5 new sites and continue ongoing activities at 2 sites;</li> </ul>	\$8.0 million	Progress report	Close coordination between coastal communities and MFARD

Design Summary	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
<ul style="list-style-type: none"> <li>• establish awareness centers at 3 new sites;</li> <li>• promote sustainable ecotourism at 5 sites</li> <li>• minimize activities damaging to natural resources or the environment at 6 SAM sites;</li> <li>• develop/implement measures to help resolve user conflicts, improve water exchange in lagoons and canals, and for solid waste management at 8 sites;</li> <li>• develop/implement mechanisms for monitoring/mitigating impacts of industry or nearby natural areas; and</li> <li>• develop/implement programs for delivery of basic infrastructure (i.e., water and sewerage) to poor communities at 2 sites;</li> <li>• provision of skills training to coastal communities for engaging in livelihood development projects, such as fish drying, fish pickling, curd production, bakery, woodcraft production, among others.</li> </ul>	\$0.5 million	Progress report	Close coordination between coastal communities and MFARD
<p>4.5 Fisheries management</p> <ul style="list-style-type: none"> <li>• Introduce improved fisheries data collection and management as well as information dissemination system;</li> <li>• Strict enforcement of registration and licensing systems as well as fisheries laws and regulations, through the collaboration of coastal communities,</li> </ul>			

Design Summary	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
as tools of fisheries management.			
4.6 Quality enhancement and resource conservation <ul style="list-style-type: none"> <li>• Introduce improved fish handling, storage, delivery, and marketing methods;</li> <li>• Transfer of appropriate fish processing technologies to beneficiaries at the community level;</li> <li>• Encourage installation of refrigeration facilities in about 20% of the current multiday boat population by 2004.</li> </ul>	\$0.6 million	Progress report	Close coordination between coastal communities and MFARD
4.7 Fisheries infrastructure <ul style="list-style-type: none"> <li>• Rehabilitate and improve harbors and anchorages in 4 identified areas to provide year-round protection for multiday boats as well as provide hygienic fish handling conditions.</li> </ul>	\$14.7 million	Progress report	Close coordination between coastal communities and MFARD
4.8 MFARD capabilities strengthened <ul style="list-style-type: none"> <li>• Training of personnel of MFARD and its agencies, i.e., CCD, DFAR, and CFHC.</li> <li>• Enactment of a new law to provide a stronger legal basis for coastal resource management.</li> <li>• Institutional reform</li> <li>• Research activities</li> </ul>	\$0.4 million	Progress report	Close coordination between coastal communities and MFARD

BME = benefit monitoring and evaluation; CBO = community-based organization; CCAC = Coast Conservation Advisory Council; CCC = Community Coordinating Committee; CCD = Coast Conservation Department; CFHC = Ceylon Fishery Harbours Corporation; CRM = coastal resources management; CZMP = Coastal Zone Management Plan; DFAR = Department of Fisheries and Aquatic Resources; GIS = geographic information system; MCS = monitoring, control, and surveillance; MFARD = Ministry of Fisheries and Aquatic Resources Development; NARA = National Aquatic Resources Research and Development Agency; NGO = nongovernment organization; SAM = special area management.

**EXTERNAL ASSISTANCE TO THE SECTOR**  
(1990-present)

Project/Executing Agency	Funding Agency/ Type of Assistance	Implementation Period	Amount	Scope
<b>A. Loan</b>				
Fishery Sector Project (MFARD)	ADB (Loan 1201)	1993-1999	\$26 million	The project focus is on the rehabilitation of selected fishing harbors and anchorages to enable offshore and coastal fishing fleets to increase their fishing efforts and their economic efficiency. Improvement in the livelihood of fisherfolk and the communities also addressed.
<b>B. Technical Assistance</b>				
1. DANIDA Project (Stage I and II)	Denmark (TA grant)	1987-1992	DKr165 million	Development of coastline stabilization 16 km (Negombo and Moratuwa, Beruwela-Weligama) including revetments, groins, and breakwater as well as beach nourishment across 4 km of the coastline in Negombo
2. Marine Research (MFARD-NARA)	UNDP (TA grant)	1989-1996	\$1 million	Conduct of fisheries census
3. Strengthening of NARA-NHO	Germany (TA grant)	1990-1996	DM4 million	Training staffs of the NHO on offshore hydrographic survey
4. Institutional Strengthening of CCD	Germany (TA grant)	1990-1995	DM1.5 million	Strengthening CCD in developing database on coastal situation and wave measurement, training in maintenance of

Project/Executing Agency	Funding Agency/ Type of Assistance	Implementation Period	Amount	Scope
				coastline stabilization infrastructure
5. Coastal Zone Management Project	USAID (TA grant)	1990-1992	\$0.5 million	Formulation of coastal zone management plans (research and training)
6. Training for Fisherfolk	UNDP (TA grant)	1991-1996	\$0.6 million	Awareness in fisheries management and establish fisherfolk organization
7. Marine Fishery Management	UNDP (TA)	1992-1995	\$1 million	Formulation of fishery management plans and establish fishery management unit
8. Rehabilitation of Kirinda Fisheries Harbor	Japan (TA grant)	1992-1993	Yen 2 billion	Rehabilitate Kirinda Fishery Harbor to enable this facility to be utilized by southern fishery industry
9. Monitoring System for Catch of Artisanal Drift Net	FAO (TA grant)	1992-1996	\$0.1 million	Develop a database and methodology for data collection to monitor catch of artisanal drift net
10. Rationalization of Fish Harbor and other Charges (MFARD)	ADB (TA grant)	1993-1999 (ongoing)	\$0.5 million	Establish cost-recovery scheme as part of harbor management
11. Dredge for Fisheries Harbor Corporation Project	DFID (TA grant)	1994-1997	GBP1.9 million	Provide equipment for dredging
12. Installation of Navigation Equipment	Korea, Republic of (TA grant)	1996-1998	\$2 million	Install 250 SSB radios and install 350 satellite navigators Provision of test and maintenance equipment and training technician

<b>Project/Executing Agency</b>	<b>Funding Agency/ Type of Assistance</b>	<b>Implementation Period</b>	<b>Amount</b>	<b>Scope</b>
13. Aquaculture Development and Diseases Prevention (MFARD)	FAO (TA grant)	1997-1998	\$0.5 million	Establish database for planning in aquaculture and lab. equipment for diseases testing
14. Hambantota Integrated Coastal Zone Management	Norway (TA grant)	1998-2000 (ongoing)	NKr8.3 million	Development of zoning for Hambantota coastal area; conduct awareness campaign on coastal and marine protection and develop monitoring guideline for coastal and marine protection
15. Improvement of Fishing Quality Standards (MFARD)	Sweden (TA grant)	1998-1999 (ongoing)	SKr6.5 million	Establishment of national scheme and improvement of fish handling infrastructure to meet EU standards
16. Conservation of Biodiversity of Coastal Ecosystem (CCD-DWLC-IUCN)	UNDP-GEF (TA grant)	1999-2003 (under preparation)	\$0.8 million	Rehabilitation of coastal ecosystem with community involvement

ADB = Asian Development Bank; CCD = Coast Conservation Department; DANIDA = Danish International Development Agency; DFID = Department for International Development; DWLC = Department of Wildlife Conservation; EU = European Union; FAO = Food and Agriculture Organization; GBP = British pound; GEF = Global Environment Facility; IUCN = The World Conservation Union; MFARD = Ministry of Fisheries and Aquatic Resources Development; NARA = National Aquatic Resources Research and Development Agency; NKr = Norwegian kroner; SKr = Swedish kronor; UNDP = United Nations Development Programme.

## THE PROJECT AREA

1. Coastal erosion management activities are proposed to be undertaken to cover about 52 kilometers (km) of the coast in selected stretches. The seven sites were selected out of a list of key areas<sup>1</sup> and singular cases<sup>2</sup> in the Master Plan for Coastal Erosion Management (MPCEM), based on the following considerations: (i) geomorphologic settings; (ii) magnitude of erosion; (iii) utilities affected (e.g., roads, railway, church, mosque); (iv) resources degraded and threatened; (v) impact of human interference contributing to the problem (e.g., with poorly designed and unplanned protection structures); (vi) public/political demand or will for a solution; and (vii) feasibility to design an effective and efficient coast conservation concept. Of the seven sites, the coastal stretches of Maha Oya-Lansigama, Colombo North-Dickowita, and Payagala (Kalutara River mouth to Maggona Headland), altogether comprising a 31 km length, are the worst affected coastal reaches. The sites Wadduwa-Kalutara, Beruwela-Bentota, and Hikkaduwa-Galle need urgent consideration for coastal erosion management and possibly physical intervention. Beruwela-Bentota is a very important coastal stretch because it has the highest concentration of high-value tourist hotels and resorts; soft interventions seem to be required to avoid resource degradation of this vulnerable area. Hikkaduwa-Galle is an area with a high resource diversity (coral reefs, sea grass, fisheries, urban area, tourism). Although the stretch seems to have been rather stable during the last decade, it is highly vulnerable as records of shoreline variation during the last century show.

2. The Coastal Environment and Resource Management (CERM) sites considered under the Project were selected from 23 sites identified in the Coastal Zone Management Plan (CZMP), 1997 as potential areas for application of the special area management (SAM) process as well as for limited interventions. Since 11 of these sites are outside the project area (i.e., from Kalpitiya in the northwest to Kirinda in the southeast), the remaining 12 sites were prioritized based on selection criteria developed by the consultant in collaboration with the Coast Conservation Department (CCD) and stakeholders, and the final list of nine CERM sites drawn up. The site selection criteria include the following: (i) presence of sensitive habitats/endangered species; (ii) degree of threat to environment or resource and need for protection or rehabilitation; (iii) opportunity for community participation, level of political will, and opportunities for building on past efforts or for synergies with other programs; and (iv) beneficiary population, potential for creation of livelihood opportunities, and improvement of the environment. The main problems affecting the nine sites selected for consideration under the Project are described briefly.

- (i) Negombo Lagoon supports a rich fishery industry and growing foreign and local tourism. Threats to the lagoon include an expanding population exerting pressure on the habitat for land and extraction of resources, user conflicts, and pollution due to industries, prawn farming, and siltation.
- (ii) Lunawa Lagoon is currently experiencing heavy pollution due to discharges of industrial and domestic wastes over the past years. The situation is aggravated by the disconnection of the lagoon from the sea due to the formation of sandbars at the opening to the sea. The lagoon is nearly devoid of fauna and flora and

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<sup>1</sup> Key areas are morphologically complex areas incorporating several characteristic morphological elements, and where diverse development pressure indicates the need for integrated solutions encompassing a coastal reach of several kilometers in length.

<sup>2</sup> Singular cases are areas that can be treated in isolation. They cover a limited coastal area where the processes causing erosion are self-evident and easily ascertained.

poses health threats with the reported increasing incidence of mosquito-related diseases.

- (iii) Madu Ganga Estuary and Lagoon recently gained importance for ecotourism and conventional recreation-based tourism such as speed boating and surfing. However, the recent increase in tourism activities has given rise to conflicts with fisheries resource use, posing a potential threat to both resource use activities and to the pristine nature of the habitat.
- (iv) Unawatuna Bay is a popular tourist site due to its beautiful scenery, beach, and coral reefs, and has been traditionally used for fishing. Tourism in the area has been adversely affected by unplanned construction on the beach and in the surrounding areas. Fishing is also under threat due to overfishing of ornamental fish in the reefs and the use of dynamite for offshore fishing. Close by is a unique biodiversity-rich habitat, Rummassala Hillock.
- (v) Kalametiya Lagoon is associated with wetlands rich in biodiversity and provides a habitat for migratory bird species. It is unique in its being a nesting area for migratory turtles. Threats to the lagoon habitat include altered water flows (change of salinity levels) to the lagoons due to upstream irrigation water use, overfishing, shell and coral mining, mangrove cutting, and poaching of turtle eggs.
- (vi) Mawella Lagoon is in close proximity to Kalametiya. Its habitat conditions, economic use, and potential threats are very similar to those at Kalametiya.
- (vii) Bar Reef is one of a few remaining coral reefs in Sri Lanka that are still in a relatively pristine condition. Although the area has been declared as a sanctuary, reef biodiversity is threatened due to inadequate management and fishing, particularly for ornamental fish for export.
- (viii) Hikkaduwa is a very popular tourist resort area due to its sandy beaches, shallow sea, and coral reefs. Although the Hikkaduwa coral reef area has been declared as a marine sanctuary, and attempts to manage it as a SAM site have been undertaken, there are still threats to this critical natural habitat which, if not addressed, will lead to the loss of biodiversity and further loss of revenue from tourism.
- (ix) The Tangalle-Hambantota area comprises a variety of important ecological and natural features, including extensive sand dunes and strand vegetation that support numerous birds and other wildlife. The area is affected by sand mining within the dune areas, unauthorized construction on the dunes, and unplanned disposal of solid waste in the more populated areas. The Government plans to undertake extensive development within the district, which include the construction of a port, a refinery, a new city, and highways, will need to be implemented keeping in mind the environmental impact on the area.

3. Fishery harbors/anchorages are proposed for development in areas where there is an urgent need to minimize environmental degradation resulting from the use of coastal habitats for fish landing and boat anchorage. These sites were selected from a long list of potential sites using evaluation criteria developed by the consultant in collaboration with the Ceylon Fishery

Harbours Corporation (CFHC), the Department of Fisheries and Aquatic Resources (DFAR), and Fisheries Sector Development Project (Loan 1201-SRI) funded by the Asian Development Bank. The criteria include geographical considerations, existing facilities, demand considerations, presence of support infrastructure facilities, and impacts on the environment. The sites are described briefly.

- (i) Chilaw harbor will be located on the western side of the lagoon channel in the area of the existing fish market on both sides of the bridge. Presently, a large fleet of 3,400 boats operate from Chilaw lagoon. Of the total fleet, 133 multiday boats, 110 day boats with inboard engines (IBE boats), and 1,457 fiberglass reinforced plastic (FRP) boats are badly in need of landing facilities, as the only landing area in use is at the fish market adjacent to the bridge over the lagoon channel. For lack of appropriate facilities, all boats have to be beached, and the place is heavily congested during peak hours. The existing auction hall is dark and dirty and does not provide the space and hygienic conditions required for proper handling of fish.
- (ii) Hambantota Bay has long been established as an anchorage and, although relatively unprotected, apparently provides some protection from the worst of the southwest monsoon storms. There is, however, a need to reconstruct the old jetty structures at the western end of the bay as fishers have to pass the zone of breaking waves to get their boats closer to the beach. This has resulted in numerous fatal accidents during times of adverse wave conditions, especially during the southwest monsoon. Rehabilitation of the brick retaining wall along the elevated road behind the beach, which has partly collapsed, is also required. About 600 fishers operate from Hambantota, and the local fleet is composed of 249 traditional crafts, 17 IBE boats, and 84 outboard engine (OBE) boats 6-8 meters long. There are presently no safe anchorage facilities for IBE boats between Tangalle and Kirinda. An estimated 361 multiday boats, 86 IBE day boats, and 521 FRP OBE boats operate from Tangalle. In addition, multiday boats from Hambantota berth at Tangalle for want of any facility in Hambantota. As a result, the Tangalle fishery harbor is overcrowded.
- (iii) Ambalangoda and Kalametiya anchorage sites were identified as high-priority sites and were selected based on a set of criteria that include the following: high demand for anchorage facilities, presence of support infrastructure facilities (i.e., roadways, freshwater supply, power facilities, market facilities, fuel, ice, and craft repair facilities). Sizable local fishing populations in these areas own small fishing craft and who, due to the nature of their craft, are not likely to be served by the additional anchorage capacity to be created by the ongoing Hikkaduwa harbor development and the existing Kirinda harbor. As in Hambantota, multiday boats as well as IBE boats are unable to berth at Kalametiya due to the lack of a harbor/anchorage there.

**DETAILED PROJECT COST SUMMARY**  
(\$ million)

Item	Foreign Exchange	Local Currency (Excl. Taxes)	Duties & Taxes	Total
<b>I. Investment Costs</b>				
A. Civil works				
1. Sand Nourishment (Coastal Stabilization)	12.98	3.24	-	16.22
2. Physical Structures (Coastal Stabilization)	2.50	9.99	-	12.49
3. Overhead (Coastal Stabilization)	2.66	-	-	2.66
4. Civil Works for CERM	1.96	1.93	0.04	3.93
5. Rehab Works for CERM	0.03	0.10	-	0.13
6. Civil Works for Harbors and Fisheries	5.38	7.20	-	12.58
<b>Subtotal (A)</b>	<b>25.51</b>	<b>22.46</b>	<b>0.04</b>	<b>48.01</b>
B. Surveys & Studies				
1. Sand Survey (Coastal Stabilization)	1.31	-	-	1.31
2. Bathymetric and Geotechnical Surveys (Coastal Stabilization)	-	0.20	0.03	0.23
3. Survey for Port	0.09	0.22	0.04	0.35
4. Survey for CERM	0.12	0.31	0.06	0.49
5. Survey for Livelihood (CERM)	-	0.02	-	0.02
<b>Subtotal (B)</b>	<b>1.52</b>	<b>0.75</b>	<b>0.13</b>	<b>2.40</b>
C. Equipment				
1. Vehicles	0.58	-	0.39	0.97
2. Audiovisual Equipment	0.03	-	0.02	0.05
3. Office Equipment	0.03	-	0.01	0.04
4. Electronic Equipment	0.32	0.01	0.05	0.38
5. Other Equipment	0.70	-	0.17	0.87
<b>Subtotal (C)</b>	<b>1.66</b>	<b>0.01</b>	<b>0.64</b>	<b>2.31</b>
D. Furniture				
	0.01	0.01	-	0.02
E. Consulting Services				
1. International consultants				
a. International specialists	5.10	-	-	5.10
b. Travel expenses for consultant	0.36	-	-	0.36
<b>Subtotal International consultants</b>	<b>5.46</b>	<b>-</b>	<b>-</b>	<b>5.46</b>
2. Domestic consultants				
	-	1.35	-	1.35
3. Short-term fellowship				
	0.13	-	-	0.13
<b>Subtotal (E)</b>	<b>5.59</b>	<b>1.35</b>	<b>-</b>	<b>6.94</b>
F. Beneficiary Contributions				
	-	0.08	-	0.08
<b>Total (I)</b>	<b>34.29</b>	<b>24.66</b>	<b>0.81</b>	<b>59.75</b>
<b>II. Recurrent Costs</b>				
	-	2.96	0.27	3.23
<b>Subtotal (I + II)</b>	<b>34.29</b>	<b>27.62</b>	<b>1.08</b>	<b>62.98</b>
Physical Contingencies	5.93	4.78	0.12	10.83
Price Contingencies	2.95	2.35	0.06	5.36
<b>Total Project Costs</b>	<b>43.17</b>	<b>34.74</b>	<b>1.26</b>	<b>79.17</b>
<b>Interest During Construction</b>	<b>0.83</b>	<b>-</b>	<b>-</b>	<b>0.83</b>
<b>Total Costs to be Financed<sup>a</sup></b>	<b>44.00</b>	<b>34.74</b>	<b>1.26</b>	<b>80.00</b>

<sup>a</sup> Total may not tally due to rounding.

CERM = Coastal Environment and Resource Management

## COMPONENTS, BY FINANCIER

Item	Bank		The Netherlands (Grant)		Project Beneficiaries		Government		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
A. Coastline Stabilization										
Coastline Stabilization: Part A	26.31	72.9	—	—	—	—	9.77	27.1	36.08	45.6
Coastline Stabilization: Part B	—	—	—	—	—	—	9.49	100.0	9.49	12.0
<b>Subtotal A</b>	<b>26.31</b>	<b>57.7</b>					<b>19.27</b>	<b>42.3</b>	<b>45.58</b>	<b>57.6</b>
B. Coastal Environment and Resources Management	—	—	8.57	90.4	0.09	1.0	0.82	8.7	9.48	12.0
C. Fisheries Management and Quality Improvement	12.67	67.5	—	—	—	—	6.10	32.5	18.77	23.7
D. Institutional Strengthening	0.19	3.6	4.19	78.6	—	—	0.95	17.8	5.33	6.7
<b>Total Disbursement</b>	<b>39.17</b>	<b>49.5</b>	<b>12.76</b>	<b>16.1</b>	<b>0.09</b>	<b>0.1</b>	<b>27.15</b>	<b>34.3</b>	<b>79.17</b>	<b>100.0</b>
Interest during Construction	0.83	100.0	—	—	—	—	—	—	0.83	
<b>Total Costs to be     Financed<sup>a</sup></b>	<b>40.00</b>	<b>50.0</b>	<b>12.76</b>	<b>16.0</b>	<b>0.09</b>	<b>0.1</b>	<b>27.15</b>	<b>33.9</b>	<b>80.0</b>	

<sup>a</sup> Total may not tally due to rounding.

## THE EXECUTING AGENCY

1. The overall responsibility for fisheries and coastal resource management in Sri Lanka is vested in the Ministry of Fisheries and Aquatic Resources Development (MFARD), which is headed by a cabinet minister assisted by a state minister and administered by a secretary and two additional secretaries. MFARD has two main departments: the Coast Conservation Department (CCD) and the Department of Fisheries and Aquatic Resources (DFAR). The ministry has functions related to all fishery matters, including administration, policy making, management, development, research, and monitoring and evaluation. The National Institute of Fisheries Training and the National Aquatic Resources Research and Development Agency (NARA) are other key agencies working under the administrative control of MFARD. MFARD has clear goals and its departments have elaborated their strategic plans. MFARD is currently planning a reorganization to improve its organizational efficiency through the setting up of three divisions within the ministry for policy making and monitoring, planning and development, and administration and finance. MFARD is increasingly becoming aware of the need to improve its institutional and technical capacities and is keen to develop the ability to efficiently manage the fisheries resources and reduce the emphasis on welfare activities. A number of other public and private institutions are involved in the sector. These include nongovernment organizations/community-based organizations, training institutes, and fisheries cooperatives, which are mostly active in providing needed services and support to fishing communities, particularly in the areas of small-scale credit, employment generation, and welfare activities.

2. CCD is the agency mandated to exercise overall responsibility for activities within the coastal zone. CCD originated as the Coast Protection Unit within the Colombo Port Commission in 1963, evolved into the Coast Conservation Division of MFARD in 1978, and was upgraded to a department with the coming into force of the Coast Conservation Act (CCA) in 1983. Its main functions, as provided in the CCA, are (i) the survey of the coastal zone and preparation of a coastal zone management plan; (ii) regulation and control of development activities within the coastal zone; and (iii) formulation and execution of schemes of work for coast conservation in the coastal zone. Since its creation, the core activity of CCD has been the regulation and control of development activities within the coastal zone by requiring permits to be obtained from the director of the department before any development in a specific coastal area is undertaken. CCD is organized into three operational divisions: (i) Planning, Research, and Design Division; (ii) Works Division; and (iii) Coastal Resources Management Division. CCD published its policy framework Coastal 2000 – Recommendation for a Resource Management Strategy for Sri Lanka's Coastal Region in 1992, and the Coastal Zone Management Plan in 1997. CCD plays a lead role in the formulation and implementation of special plans, programs, and projects (including multisector, interagency initiatives such as special area management (SAM)). CCD follows the guidelines and recommendations made in its strategic plans, but needs more trained staff at all levels to implement its policy. CCD has no field staff of its own and carries out its enforcement action using the district secretariat and the local police force. The Works Division undertakes most of the physical works for erosion protection.

3. DFAR is the largest of MFARD's functional organizations and is the main implementing agency for the administration, development, regulation, and monitoring of fisheries and living aquatic resources. It is also responsible for extension and other technical and welfare services to fishing communities. The department is charged with the administration and enforcement of the Fisheries and Aquatic Resources Act of 1991 (or the Fisheries Act) and related ordinances, policies, development and regulation of fishing through the issuance of licenses and permits, and inspection and monitoring of fishery activities in general. DFAR has four divisions:

(i) Industry, (ii) Management, (iii) Administration, and (iv) Finance. In the past, DFAR was mainly engaged in the provision of welfare services. Only in the last four years has DFAR been in charge of the administration and enforcement of the Fisheries Act (policies, licensing, regulation, monitoring). The Six-Year Fishery Development Program 1999-2004 proposes a better and efficient reorganization for a stronger and more autonomous DFAR to exclusively undertake regulation, enforcement, extension, and management.

4. NARA, the research arm of MFARD, was established under the NARA Act No. 54 of 1981, which emphasizes its responsibility for development and management of all living and nonliving aquatic resources. It was created as a semiautonomous institution within MFARD in 1981, and the research functions were transferred to it from the ministry in 1982. NARA is overseen by a governing board responsible for administration and general functions. Technical and scientific matters are supervised by a Science and Technical Committee.

5. The Ceylon Fishery Harbours Corporation (CFHC) established in 1972 under the State Industrial Corporations Act of 1957 is under the supervision of MFARD. CFHC is charged with the responsibility for construction, operation, and management of fishery harbors and related facilities which, up to that time, had been the responsibility of the Ceylon Fisheries Corporation. The main objectives of CFHC were amended in March 1997 to address a number of administrative difficulties. CFHC is now in charge of the operation and maintenance of seven fishery harbors and 22 anchorages, and is responsible for cost recovery of the services provided so that the harbors will ultimately be self-financing for operational purposes. CFHC is divided into six divisions: (i) Civil Engineering, (ii) Mechanical Engineering, (iii) Finance, (iv) Legal, (v) Supplies, and (vi) Administration. Since 1995 CFHC is more business oriented, and works towards cost recovery of the services provided. It published its Corporate Plan 1998-2002 in 1998.









**CONTRACT PACKAGES**  
(\$'000)

Item	Base Cost	Total Cost (Including Contingency)	
<b>A. Coastline Stabilization</b>			
1. Civil Works: Stabilization Works Section A			
Maha Oya-Lansigama	13,202.0	16,712.8	
Colombo North	3,564.0	4,722.0	
Moratuwa-Koralawela	308.0	411.3	
Wadduwa	843.0	1,125.6	
Kalu Ganga-Maggonna	5,736.0	7,556.7	
<b>Subtotal (A1)</b>	<b>23,653.0</b>	<b>30,528.4</b>	<b>ICB contract</b>
2. Civil Works: Stabilization Works Section B			
Beruwela-Bentota	3,692.0	5,048.0	
Hikkaduwa	3,286.0	4,445.5	
<b>Subtotal (A2)</b>	<b>6,978.0</b>	<b>9,493.5</b>	<b>ICB contract</b>
3. Sand Investigation (all 7 sites)	575.0	655.5	
4. Sand Deposit Study (all 7 sites)	700.0	797.9	
	<b>1,275.0</b>	<b>1,453.4</b>	<b>ICB contract</b>
5. Bathymetric Survey and Investigation	75.0	83.5	LCB contract
6. Geotechnical Survey	150.0	167.0	LCB contract
<b>B. Fisheries Management</b>			
1. Civil Works: Fisheries Harbors and Anchorages	1,027.0	1,228.1	LCB contracts as needed
a. Improvement to Existing Landing Facilities: For establishment of auction halls and improved fish handling systems in various harbors under construction or rehabilitation with Bank assistance			
b. Chilaw Harbor:			
Site preparation, dredging and excavation	343.0	410.0	
Reclamation	107.0	127.9	
	<b>450.0</b>	<b>537.9</b>	LCB contract
Auction hall	85.0	101.6	LCB contract
Jetty/Quay hall	186.0	222.4	LCB contract
Shore facilities	143.0	171.0	LCB contract
Equipment	146.0	174.5	IS
<b>Subtotal B(1b)</b>	<b>1,010.0</b>	<b>1,207.4</b>	
c. Hambantota Harbor:			
Site preparation, dredging and excavation	386.0	461.5	
Breakwater	2,314.0	2,766.4	
Jetty/Quay wall	857.0	1,024.5	
	<b>3,557.0</b>	<b>4,252.4</b>	<b>ICB contract</b>
Auction hall	50.0	59.8	LCB contract
Shore facilities	143.0	171.0	LCB contract
Access road	14.0	16.7	LCB contract
<b>Subtotal B(1c)</b>	<b>3,764.0</b>	<b>4,499.9</b>	

Item	Base Cost	Total Cost (Including Contingency)	
d. Ambalangoda Anchorage:			
Site preparation, dredging and excavation	221.0	264.2	
Breakwater	2,190.0	2,618.1	
	<b>2,411.0</b>	<b>2,882.3</b>	ICB contract
Auction Hall	14.0	16.7	LCB contract
Jetty/Quay wall	214.0	255.8	LCB contract
Shore facilities	86.0	102.8	LCB contract
Access road	286.0	341.9	LCB contract
<b>Subtotal B(1d)</b>	<b>3,011.0</b>	<b>3,599.5</b>	
e. Kalametiya Anchorage:			
Site preparation, dredging and excavation	243.0	290.5	
Breakwater	1,900.0	2,271.4	
Jetty/Quay wall	457.0	546.3	
	<b>2,600.0</b>	<b>3,108.2</b>	ICB contract
Shore facilities	114.0	136.3	LCB contract
Access road	288.0	341.9	LCB contract
<b>Subtotal B(1e)</b>	<b>3,002.0</b>	<b>3,586.4</b>	
2. Site Surveys	350.0	399.0	LCB contract

ICB = international competitive bidding; IS = international shopping; LCB = local competitive bidding  
Source: Staff estimates.

## **OUTLINE TERMS OF REFERENCE FOR CONSULTING SERVICES**

1. Consulting services from firms will be utilized to support project implementation as well as institutional strengthening, research, and training. For the implementation of the coastline stabilization component, 211 person-months of consulting services (81 international and 130 domestic) will aid in the design, management, and supervision activities. For the Coastal Environment and Resource Management (CERM) component, consulting services totaling 105 person-months will be needed: 18 international and 87 domestic. For the harbor subcomponent of the fisheries management and quality improvement component, 50 person-months will be provided: 30 international and 20 domestic. Institutional strengthening, research and training activities will utilize 296 person-months: 78 international and 218 domestic. Overall, the Project is expected to use 207 (international) and 455 (domestic) person-months of consulting services.

### **A. Package 1—Implementation of Coastal Stabilization: Design, Management, and Supervision (Financed by the Bank)**

2. The consultants will

- (i) review/analyze existing data and establish the level of confidence that can be placed in existing data that can be used in the final design;
- (ii) analyze site-specific problems;
- (iii) identify significant coastal trends that may indicate coastal process changes versus the ones already established at the preliminary level;
- (iv) confirm the set of surveys and investigations to carry out so as to develop the final design;
- (v) prepare the terms of reference (TOR) for all studies needed for final design;
- (vi) prepare the TOR for the sand studies;
- (vii) supervise the development of sand studies and determine the reliability of the results obtained;
- (viii) prepare tender documents;
- (ix) prepare structural designs for all hard and soft works required by the solutions at each project site;
- (x) analyze and elaborate possible alternative concepts for coast stabilization, in case of surprise conditions;
- (xi) define the final form of the coastal scheme at each project site and ensure that it will be approved by Coast Conservation Department (CCD);
- (xii) prepare and submit the Design Report;
- (xiii) assist CCD in the public awareness campaign;
- (xiv) establish the complementary data needed for coastal modeling;
- (xv) set up a math model for the project site of most coastal complexities to include simulation of sand prognosis and associated coastline dynamics; and
- (xvi) predict, on the basis of the model, the most probable behavior of each coastal scheme and the parameters of the maintenance interventions.

### **B. Package 2—Implementation of CERM (Financed by the Netherlands Government)**

3. The consultants will undertake these principal elements of this work:

- (i) assist in the establishment of community coordinating committees (CCCs) at selected sites to promote community participation and support for the coastal resources management (CRM) process;
- (ii) develop special area management (SAM) plans or review existing plans;
- (iii) implement management interventions designed to protect, rehabilitate, and utilize in a sustainable manner the resources in coastal habitats (coral reefs, sea grass beds, mangrove areas, wetlands, and lagoons), including measures that promote sustainable livelihood development;
- (iv) develop and implement measures to protect areas that support high biodiversity;
- (v) explore methods to enhance lagoon fisheries and involve lagoon fisher associations in maintenance of lagoons and improving fish and prawn stock;
- (vi) actively pursue lagoon tourism in consultation with all stakeholders and explore support available through the tourist industry;
- (vii) assist in the establishment of solid waste disposal systems;
- (viii) assist project management office, the field project implementation units, and CCCs in the formulation and establishment of detailed guidelines and mechanics for implementing microenterprise activities;
- (ix) conduct microenterprise training activities that focus on introducing environment-friendly livelihood options;
- (x) prepare an income-generating program for community management of fish landing sites to include postharvest loss, fish-processing activities, and use of insulated fish boxes, targeting poor women as beneficiaries;
- (xi) in association with nongovernment organizations/community-based organizations/credit institutions, develop income-generating opportunities for poor fisher families; link training programs to demand and assist participants to link up with potential employers;
- (xii) review requirements and make recommendations for sustaining CCCs involvement in CRM activities, particularly at SAM sites; and
- (xiii) work with the social development unit to develop livelihood programs in the project areas; explore the opportunities for financing beneficiaries to be trained in food processing as a small business, targeting the low-income groups.

**C. Package 3—Implementation of Harbor Construction (Financed by the Bank)**

4. The consultants will have the following tasks and responsibilities:

- (i) prepare a site investigation program with specific regard to sediment transport and oceanographic, bathymetric, and subsoil data collection;
- (ii) review site investigations, model studies, and designs;
- (iii) prepare the TOR for the various work elements including those for site investigations, model studies, environmental impact assessments, design, costing and contract documentation, construction, and supervision;
- (iv) schedule and program the various work elements to initiate their early implementation and coordinate the activities of the various site investigations, model study packages, and study works;
- (v) supervise the preparation of standard documents for invitation and prequalification of consultants, consultant contracts, evaluation criteria, and contract tenders for investigations, studies, and construction;
- (vi) coordinate the procurement of equipment and materials and construction of physical facilities in the harbor and anchorage subprojects;
- (vii) prepare preliminary designs and cost estimates;

- (viii) prepare final designs, drawings, and tender documents for specific structures or dredging proposals; and
- (ix) evaluate contractors' tenders and preparation of detailed cost estimates based on current construction costs.

**D. Package 4—Institutional Strengthening (Financed by the Netherlands Government)**

**1. Master Plan for Coastal Erosion Management and Coastal Zone Management Plan Update**

5. The consultants will

- (i) review and analyze existing data/information for the larger coastal areas and specific sites;
- (ii) analyze site-specific problems within the context of the larger coastal stretch and long-term coastal development strategies;
- (iii) determine additional required investigations and studies for a better understanding of the problem and coastal processes;
- (iv) develop alternative concepts of stabilization, including preliminary cost estimates;
- (v) present alternative concepts for discussion with and approval of CCD and other concerned institutions, agencies, and individuals (private and public) engaged in coastal development;
- (vi) consult with local communities, the tourist sector, and others;
- (vii) recommend site-specific stabilization schemes, including site plans;
- (viii) conduct training activities such as workshops and seminars in the appropriate subject areas that target domestic technical counterparts at the various agencies as well as policy-level decision makers and community participants at the local level;
- (ix) help in national-level CRM planning, culminating in the revision of the National Coastal Zone Management Plan by 2002; and
- (x) help address water flow problems in Negombo, Lunawa, Mawella, and Madu Ganga lagoons and assist in the conduct of design studies to divert irrigation water away from Kalametiya Lagoon.

**2. Fisheries Management and Quality Improvement**

6. The specialists' tasks will be to

- (i) review the existing registration licensing system and identify the requirements;
- (ii) design a system for fishing operation licensing and registration of fishing boats and fishers;
- (iii) train registration licensing officers;
- (iv) test registration and licensing systems in selected districts;
- (v) review existing procedures for surveillance and enforcement;
- (vi) prepare a training program on fisheries law enforcement;
- (vii) implement training and follow-up training programs for fisheries inspectors and Coast Guard personnel on fisheries law enforcement;
- (viii) evaluate present onboard storage performance of existing offshore/oceanic multiday boats of various sizes and design vis-a-vis postharvest losses incurred by these boats;

- (ix) conduct training on fish handling, quality control, and preservation, onboard handling, and icing;
- (x) provide expert advice in the design of awareness and education programs;
- (xi) provide technical advice in the development of value-added products and their marketing; and
- (xii) undertake a corporate training exercise for the Ministry of Fisheries and Aquatic Resources Development (MFARD), CCD, Department of Fisheries and Aquatic Resources (DFAR), and Ceylon Fishery Harbours Corporation (CFHC).

### **3. Information and Database Management**

7. The consultants will help to strengthen programs for data storage and retrieval. They will be required to

- (i) assess the existing condition of library and database resources at CCD, DFAR, CFHC, and National Aquatic Resources Research and Development Agency (NARA) libraries;
- (ii) review and assess the existing data collection system and identify the requirements for planning and monitoring and evaluation of all activities of MFARD and other institutions under it;
- (iii) propose and reach agreement with CCD, DFAR, CFHC, and NARA on the requirements and specifications of their respective data collection and management centers;
- (iv) consult these agencies on the procurement of the hardware and software requirements;
- (v) install the hardware and software with the assistance of the suppliers and make sure that all warranty requirements are fulfilled;
- (vi) design the data collection scheme, data entry, retrieval, compilation, analysis, reporting, and publication following statistical principles;
- (vii) train data collectors on data collection and data management in collaboration;
- (viii) train MFARD personnel in data compilation, analysis, and publication;
- (ix) propose the work responsibilities of CCD, DFAR, CFHC, and NARA officers;
- (x) set up the archive for the existing information (plans, aerial photographs, reports) and train the existing library staff;
- (xi) develop a manual for the use of the system;
- (xii) supervise updating and upgrading of computerized records;
- (xiii) ensure that formats for storage of digitized data are compatible with those of other national, regional, and international databases;
- (xiv) supervise the upgrading of cataloguing and storage of printed resource materials;
- (xv) develop an organized system to track the lending of library materials; and
- (xvi) develop proposals for strengthening the capabilities of NARA, DFAR, and CCD to publish information of importance to the scientific community and the public at large, especially relating to coastal environment and resources management.

## INITIAL SOCIAL ASSESSMENT

### A. Introduction

1. To assist in the design of the proposed Coastal Resource Management Project (CRMP), particularly its coastal environment and resource management (CERM) component, a rapid social assessment (RSA) of target beneficiaries was conducted within the identified project area. To generate the desired information on the socioeconomic conditions and needs/demands of the target beneficiaries, the RSA of 750 households employed a combination of structured surveys and stakeholder workshops and focus group discussions (FGDs) among selected communities within the identified project sites. The results of the RSA surveys and FGDs were analyzed and, together with other pertinent secondary information from the district and divisional secretary division (DSD) offices, discussed with representatives of local institutions and selected coastal communities and districts within the project area.

2. The RSA was conducted to

- (i) identify the potential beneficiaries, including women, children, and vulnerable groups, likely to be affected by the Project;
- (ii) identify and describe the status of the target beneficiaries to describe their physical location and present socioeconomic characteristics and conditions. The information will serve as benchmark against which future improvements could be compared;
- (iii) analyze the target populations' need or demand for the project and gauge the level of contribution they are willing to make to become involved in it;
- (iv) generate information to be used as inputs in the design of project activities and implementation arrangements that will permit community participation and involvement; and
- (v) provide the basis for the analysis of the social dimensions of the proposed Project, including gender issues and concerns, beneficiary participation, and possible involvement of nongovernment organizations (NGOs) and community-based organizations (CBOs) in implementation, and for the design of measures to prevent negative economic or social impacts of the proposed project components and activities on the target beneficiaries.

### B. Overview of the Project Area

3. The proposed project area extends from Puttalam district in the northwest to Tangalle district in the south. Home to nearly half of the country's population, the area (mainly coastal areas in the six districts) is heavily populated and has a significant marine fishing population. According to the 1996 census, active fishers number around 50,000 between Kalpitiya in the northwest and Kirinda in the southeast, and there may be around 60,000 fishers in the rest of the country (east and north). The percentage of active fishers in the population of each fisheries district varies within a narrow range of 22.4 percent in Kalmunai to 27 percent in Puttalam. The average fisher household has 4.8 members (range=4.4-5.1), with on the average 1.2 fishers per household. Fishers with fishing crafts in each district vary between 2.2 in Chilaw and 8.4 in Kalmunai, with the overall average at around 4.0. Fishers are predominantly male (99 percent) and 15 percent are typically migrant fishers. The distribution of households in the project area by annual income is in Table A10.1. Table A10.2 gives the distribution of occupations for the different districts.

**Table A10.1: Households in the Project Areas, by Annual Income**

Annual Income Range (SLRs)	Number of Households	Percent for All Sites
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	Chilaw	Negombo	Lunawa	Unawatuna	Madu Ganga	Kalametiya	All Sites	
>100,000	1,380	3,487	590	2,590	1,256	1,891	11,194	11
80,001-100,000	1,642	4,755	738	2,822	1,675	1,560	13,192	13
63,001-80,000	2,015	6,149	758	3,959	2,405	2,143	17,429	17
45,001-63,000	2,967	6,434	1,107	4,675	3,229	3,357	21,769	22
30,001-45,000	1,877	4,152	694	2,738	1,486	1,828	12,775	13
18,001-30,000	1,849	3,487	556	1,853	1,594	2,112	11,451	11
9,001-18,000	1,090	2,092	300	1,411	1,175	1,434	7,502	7
<9,000	980	1,141	177	1,011	689	1,434	5,432	6
<b>Total households</b>	<b>13,800</b>	<b>31,697</b>	<b>4,920</b>	<b>21,058</b>	<b>13,509</b>	<b>15,759</b>	<b>100,744</b>	<b>100</b>
Target beneficiaries as percentage of total households	78	74	73	73	78	78	76	

Table A10.2: Households, by Occupational Category (%)

Category of Occupation	Puttalam	Gampaha	Colombo	Kalutara	Galle	Hambantota
Fishery and fishery-related	16	44	-	-	48	12
Trading/Nonfishery	-	5	5	6	5	8
Agriculture	12	1	9	4	-	26
Tourism	-	-	-	-	1	-
Employment (Government/Private Sector)	30	15	34	40	10	40
Self-employment	16	-	-	-	2	14
Foreign employment	10	-	5	-	-	-
Others (unskilled labor, skilled labor, etc.)	16	35	47	50	34	-
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

### C. Basic Infrastructure and Social Services

4. The project area has a well-developed network of roads, which facilitates access to the markets. A main highway runs along the coast from north to south and serves as the main link among the districts. A railway from Colombo to Matara, runs parallel to the road along the coast. While there are internal feeder roads, most of the fishing industry use the main road. The coast provides a source of livelihood to the majority of the coastal population, other sources of employment being agriculture and manufacturing in the more industrialized areas. The tourism sector, which is largely built around the splendid beaches and marine sanctuaries, is crucially linked to the coastal environment. As a result, demands from the fishing industry and the tourist trade compete for the existing infrastructure. The available infrastructure for the fisherfolk is rudimentary. The ongoing Fisheries Sector Development Project funded by the Bank is the only project providing support for the rehabilitation of old and establishment of new landing and infrastructure facilities. Still, ice and other support services like repair of boats are difficult to access. As a result, the main demand of the population is for more infrastructure facilities in the project area.

5. Housing exists for the fishing communities, but the quality varies widely throughout the project area, with permanent houses only for the more affluent fishing families. In many areas the fishing community live in shanties and have little or no essential services like water and sanitation. The communities that depend on the lagoons and wetlands encroach on the lagoons and are a cause of water pollution and destruction of the mangroves. While there is adequate availability of basic services like health and education (as evidenced by the high literacy rates) in the project area, there is a demand for additional sanitary facilities and safe drinking water facilities. There is no apparent shortage of food or malnutrition. In fact, many of the households enjoy luxury items like refrigerators and television sets. Table A10.3 gives details on infrastructure and other services in the different districts.

**Table A10.3: Availability of Infrastructure and Other Services**

Infrastructure and Facilities	Degree of Availability by District (%)					
	Puttalam	Gampaha	Colombo	Kalutara	Galle	Hambantota
Health Center	86	84	95	63	92	72
Hospital	90	93	97	59	97	64
School	98	95	94	91	97	85
Community Center	63	53	74	32	30	36
Sports Center	40	51	68	30	34	33
Piped Water	44	75	78	48	74	56
Electricity	88	84	92	74	85	82
Community Facility	62	57	69	55	65	63
Roads	91	87	94	84	96	92

6. Credit is provided by a variety of agencies: commercial banks, credit cooperatives, NGO institutions, etc. Different types of credit programs have been launched by the Government to encourage a process of economic development and to create employment opportunities. Response to credit for small and medium-scale enterprises has been very encouraging. Credit for microenterprise and self-employment has also been extended by rural banks, credit cooperatives, and the NGOs. These institutions have largely served the fishing community as general experience shows that the poorer fishing communities do not find it easy to access credit from commercial banks because of procedures and the need for collateral. Agencies such as SANASA and Sarvodaya Economic Enterprises Development Services have been successful in delivering microcredit and small loans to this group. Repayment is, on the whole, reportedly satisfactory.

#### **D. Livelihood Activities**

7. Unemployment in the project area cannot be said to be widespread even though many families received State aid. Partial employment is the main reason for the low income levels. The RSA found that many fishing families enjoyed income only from the men's work. The women contributed little to the family income. Seasonal factors affecting the fishing industry, and lack of suitable alternative livelihood activities are a major cause of poverty in the coastal areas. As a result, the population resorts to destructive extraction methods, which deplete resources. Depending on whether the district is near Colombo or not, there is potential for industrial employment (in garments factories etc), which many prefer but only a few can get. The Social Development Division of the Ministry of Fisheries and Aquatic Resources Development (MFARD) conducts training programs for women and assists them to find employment or establish new businesses. MFARD has several programs to develop low-cost housing for fishing communities. A major portion of its capital budget for 1999 is allocated for new housing development. Through the training and skills development

program, the Project will provide training to fisherfolk, particularly women, to enhance their employment opportunities. The Project will target poor households and link training to meet the employment demand in the different locations.

8. While the Government recognizes that alternative livelihood activities must be encouraged to relieve the pressure on the coastal resources, there is limited potential for this. Therefore two types of action are called for. First, there must be a way of educating the population about the need for conservation and the benefits to be derived from reducing postharvest losses through adoption of better fish-handling methods. Second, there is a need for concerted efforts to identify activities to supplement family income, especially since a majority of the poorer families depend on fishing income and even the relatively higher income families receive supplemental income from remittances from abroad. Skills development through training and adequate marketing facilities in addition to credit are essential prerequisites for such efforts to succeed.

### **E. Beneficiary Involvement and Voluntary Organizations**

9. A number of CBOs and NGOs are operating in the project area. They can be broadly classified as welfare organizations, credit societies, lagoon fisher societies, and community development institutions. Many are local organizations and some are branches of national-level institutions. Interestingly, many provide extension-type support alongside government agencies. Generally the institutions seem to work in close cooperation with government agencies and externally funded projects. The NGOs seem to have broad-based membership, but not all members appear to be actively involved in day-to-day matters. There seem to be an awareness of the usefulness of CBOs and willingness to participate in development programs through such bodies. But financial support is still expected from the government. Lagoon fisher societies expressed a willingness to manage lagoons if the government assisted with canal clearance, dredging, and zoning.

10. The RSA found a readiness on the part of the fishing community to share in the costs of establishing landing facilities. The Government, based on the recommendations of a Bank-financed TA grant, has introduced user fees in some of the fishing harbors and expects to introduce this nationwide in due time. The fishing community seems willing to pay for the operation and maintenance (O&M) costs of maintaining these facilities, in view of the obvious advantages they bring. The management of one of the fishing harbors in Beruwela is also being undertaken by the stakeholders through the formation of an advisory committee, and a model may evolve for adoption in other ports and harbors.

11. The RSA concluded that there is minimal interest generally in the issues of conservation and even coastal erosion is not seen as a major problem by those who are inland. One explanation for this lack of interest in environmental degradation and resource depletion could be that the lack of basic amenities and services for the fishing industry is seen as a more immediate problem. At the same time, the experience of the Government in special area management (SAM) planning has mixed results. In Rekawa, where the combined results of organizing the local community through the Rekawa Foundation and the implementation of measures recommended by the SAM process have produced visible results, there is a commitment to the need for better resource management among the beneficiary population. As the population has already suffered due to environmental degradation, there is greater ownership of regeneration efforts. The conclusion, from the RSA and FGDs and the stakeholder workshops, is for the Government to pursue the SAM process vigorously and undertake steps to organize and involve the local beneficiaries in the process to ensure long-term sustainability.

12. Several agencies are already working in the project areas. There are international organizations such as the World Conservation Union and some other agencies specializing in environment protection activities. In addition, several local institutions involved in community

development activities command the confidence of the local population and have established themselves on a sustainable basis. These agencies have expressed keen interest in being associated with project implementation activities.

#### **F. Gender Issues**

13. Women in the coastal areas are engaged in a variety of tasks, the primary ones being housekeeping and child rearing, which they have to perform before they could engage in other activities. While men are generally involved in economic activities, women spend much time carrying out domestic chores, implying a delineation of responsibilities within the household. Men are typically expected to be the main breadwinner (engaging in fishing, processing, and trading activities) while the women attend to domestic duties/activities and in limited income-augmenting activities such as fish drying, vending, and some agriculture-related activities.

14. Women have recently become actively involved in the establishment of women's groups concerned with community affairs and welfare and, thus, have the potential to become a significant social force in the community. There is increasing need for women to contribute to household income; however, they lack the required skills. Women in the coastal communities show a high level of awareness of shared problems, which indicates a willingness to cooperate and work toward common development goals. In some areas, women's groups have been purposely organized by NGOs for credit assistance, development of income-generating activities, skills training, and provision of social infrastructure.

## ECONOMIC ANALYSIS

### A. Basic Approach and Framework

1. The Project is intended to address the problem of severe coastal erosion along the west coast of Sri Lanka as well as introduce sustainable coastal resource management into the area. In addition to the economic analysis of the Project as a whole, this appendix focuses on the viability of investments in the various project components, namely: (i) coastline stabilization, (ii) coastal environment and resources management, and (iii) fisheries management and harbor construction/rehabilitation. The economic analysis was carried out following the Bank's *Guidelines for Economic Analysis for Projects*.

2. All costs and benefits were broken down into their traded, nontraded, labor, and tax factors and converted to world price values. Traded goods were expressed in economic terms using an exchange rate of SLRs70.81 against the US dollar (as of the summer of 1999). Non-traded goods and services were converted to economic values using a standard conversion factor (SCF) of 0.9. Labor costs were also expressed in economic terms using a shadow wage rate of 0.8 and SCF of 0.9.<sup>1</sup> Project implementation is planned for a period of five years and the life of the Project is assumed to be 20 years including the time of implementation.

### B. Economic Analysis<sup>2</sup>

#### 1. Coastline Stabilization

##### a. Costs

3. Coastline stabilization efforts are to be carried out in seven segments (totaling 52 kilometers) on the southwestern coast of Sri Lanka. The works will include a substantial element of sand nourishment, some dredging, and the construction of a variety of physical structures such as breakwaters, groins and revetments. A breakdown of these costs is shown in Table A11.1. In addition, maintenance costs will be incurred throughout the life of the Project once the physical interventions have been completed.

**Table A11.1: Civil Works for each Project Site**  
(\$ million)

Project Sites	Beach Nourishment and Dredging	Physical Structures	Overhead	Total
Maha Oya	9.83	2.49	0.88	13.20
Colombo North	0.41	2.73	0.43	3.57
Moratuwa		0.28	0.03	0.31
Wadduwa	0.77		0.07	0.84
Kalu Ganga	2.27	2.88	0.59	5.74
Beruwela	0.91	2.44	0.34	3.69
Hikkaduwa	1.64	1.38	0.26	3.28
<b>Total</b>	<b>15.83</b>	<b>12.20</b>	<b>2.60</b>	<b>30.63</b>

<sup>1</sup> Investment costs both with and without the Project were similarly converted into economic values.

<sup>2</sup> Additional details of the economic analysis can be found in Supplemental Appendix A.

4. The level of coastal erosion and degradation in the project area is severe. Even without the Project, the Government and the private sector will incur substantial costs in attempts to protect particular locations. The Government gives high priority to facilities such as schools, roads, railways, telecommunication facilities, religious places, and historical sites, while private property owners will try to preserve homes, hotels, and industrial premises. Without the Project, the methods of emergency protection are likely to continue to be the unconnected use of revetments, dredging, etc. Such methods are expected to merely move the problem to adjacent parts of the coast and merely delay the damage to the site. Interventions planned for the Project, on the other hand, are intended to stabilize the entire length of coast without shifting the problem elsewhere. One benefit (or cost decrease) of the Project, then, is the elimination of the more haphazard methods of various site protections that would take place without the Project.

5. Based on past investment efforts by both the public and the private sectors and depending on the extent of the erosion, certain levels of combined without-Project investment of both public and private sectors are assumed at each site. Since the erosion situation is particularly serious in Maha Oya-Lansigama, it is expected that the without-Project investment at this site would double in the second year (of what would have been the project cycle) and increase at 15 percent annually until the 10th year. For the other six sites, the total capital investment is assumed to increase at 50 percent initially, about 33 percent in the third year and 10 percent per year thereafter.

#### **b. Benefits**

6. Direct benefits of the coastal stabilization subcomponent are assumed to be derived from land that would be saved by the intervention (but not saved in the without-Project scenario). These benefits include (i) houses and buildings on the land to be saved; (ii) avoidance of removal and administration costs, which would have been incurred if the land had eroded; (iii) avoidance of the interruption of people's work that would have been caused by the erosion; and (iv) the opportunity cost of the land.

7. Estimates were made of the amount of land expected to be saved each year by the Project and of the value of buildings (per unit of that land) at each of the seven sites. The removal and administration costs were estimated at 15 percent of the economic value of the buildings. It was assumed that people who would have been affected by the projected erosion through the loss of their home or other building would lose three months of work and income if the erosion were to take place. On agricultural land, the Project would prevent the loss of net income from coconut trees and rice paddy. Beach erosion causes the destruction of coconut trees and a rise in salinity damaging to rice cultivation along a coastal belt. Net economic benefits from coconut cultivation have been calculated at SLRs27,972 per hectare and those from paddy at SLRs42,161 per hectare.

8. While not specific to any site, the overall coastal stabilization subcomponent is expected to have significant impacts on the tourism industry, the second largest foreign exchange earner in Sri Lanka. Without the Project, erosion will not be effectively prevented and the beaches will be increasingly covered with revetments. As beaches are perhaps one of the most prominent features of the country's tourist industry, a major quality decrease in the coastal area is likely to reduce the number of tourist arrivals as well as reduce per tourist spending in the country as high-income travelers choose other vacation destinations. A conservative estimate is that both tourist arrivals and per tourist spending would decrease by 1 percent if the beaches were to deteriorate as expected without the Project. Forecasts indicate that in 2005, tourist arrivals are expected to be between 410,000 and 450,000 and per tourist spending between \$630 and \$650

(in constant prices). If so, the potential loss prevented by the Project is about \$5.1 million per year.

### c. Economic Internal Rate of Return

9. The economic internal rate of return (EIRR) for the coastal stabilization subcomponent is 17.2 percent. Without the tourism benefits, the EIRR would be only about 5 percent.

## 2. Coastal Environment and Resource Management (CERM)

10. The CERM subcomponent is designed to address the unsustainable and conflicting uses of coastal and marine resources in eight selected sites along the southwest coast. The investment activities involve mainly the planning and implementation of strategies to maintain coastal and marine resources use at present levels and avert further degradation and unsustainable use of the resources.

### a. Costs

11. Investment costs for the CERM sites are in Table A11.2.

**Table A11.2: CERM Investment Cost for Each Project Site**

<b>Project Sites</b>	<b>Investment Cost (\$ million)<sup>a</sup></b>
Negombo Lagoon	1.81
Lunawa Lagoon	1.63
Madu Ganga Estuary and Lagoon	0.31
Unawatuna Bay	0.16
Kalameiya <sup>b</sup>	0.93
Bar Reef	0.19
Hikkaduwa	0.14
Mawella	0.46
<b>Total</b>	<b>5.63</b>

<sup>a</sup> Does not include investments at the national level.

<sup>b</sup> This site actually includes two locations, Tangalle and Hambantota, which are combined in this analysis due to their proximity and similarity to each other.

12. The incremental benefits of CERM investments arise from the difference between resource use with the Project and the predicted nonsustainable resource use that will continue to develop without the Project. It is assumed that the nonsustainable use without the Project will lead to an incremental loss of 1 percent per year of the habitat/resource value. This assumed level of normal loss is well below the 2.5 percent to 3 percent rate of deforestation in Sri Lanka and about equal to the annual loss of coral cover in the Hikkaduwa area.<sup>3</sup>

13. Only some of the CERM benefits can be reasonably quantified and valued for inclusion in this analysis. Depending on the site, these include sustainable utilization of mangrove vegetation-based products and fisheries products, sustainable recreation uses, and ecotourism

<sup>3</sup> White, A.T., V. Barker, and G. Thanthirigama. 1995. *Joining Economics and Integrated Coastal Management to Conserve Tourism and Biodiversity Resources in Sri Lanka*. Coastal Resource Management Project, Sri Lanka.

benefits associated with the preservation of mangrove, wetland and reef biodiversity.<sup>4</sup> Additional nonquantifiable benefits (not included in the analysis) are expected at some locations. These include the protection of scarce turtle nesting habitats, and the benefits from avoided health damage and some increased amenity and property values.

### b. Economic Internal Rate of Return (EIRR)

14. The EIRRS for the CERM component are in Table A11.3. The results indicate that, except for the Mawella and Bar Reef sites, CERM investments are economically justifiable at all sites --- with EIRRs above 12 percent. In the case of Mawella, the most important benefit arising from managing the natural resources is the uniqueness of the area for turtle nesting, which has not been valued. The Bar Reef area, with EIRR at 11 percent, is marginal. The EIRR for the overall CERM investment is 21 percent, suggesting the economic viability of CERM investments. For all of the CERM sites (including Bar Reef and Mawella) only those aspects of possible benefits that are quantifiable were included in the EIRR calculations. Other biodiversity and environmental benefits that may occur but are not quantifiable were not calculated.

**Table A11.3: Results of the CERM Economic Analysis**

Site	EIRR (%)
1. Negombo Lagoon	31
2. Lunawa Lagoon	30
3. Madu Ganga Estuary	38
4. Unawatuna Bay	40
5. Kalametiya Lagoon	16
6. Bar Reef	11
7. Hikkaduwa	32
8. Mawella Lagoon	7
<b>Overall CERM Component</b>	<b>20.6</b>

### 3. Fisheries Management and Fish Quality Improvement

15. This project component comprises two subcomponents: (i) harbor and anchorage establishment, and (ii) programs for fisheries management and fish quality improvement.

#### a. Harbors and Anchorages

16. Two fishery harbors are to be developed in Chilaw and Hambantota, while two anchorages will be constructed in Ambalangoda and Kalametiya. These facilities will provide services to both boats with inboard engines (IBEs) and smaller boats with outboard engines (OBEs). The proportion of boats capable of multiday fishing trips is expected to increase due to the Project, reducing the pressure on the fisheries close to the shore.

17. **Costs.** Construction will include the building of breakwaters, quays, and various shore facilities at the various sites. Capital costs (excluding contingencies) in Chilaw, Hambantota, Ambalangoda, and Kalametiya were estimated at \$1.24 million, \$3.88 million, \$3.35 million, and \$3.09 million, respectively. All prices are expressed in 1999 constant terms. All four subprojects

<sup>4</sup> Information on resource values was obtained from a variety of sources. For more information, see Supplemental Appendix A.

will be developed over a period of two to three years, beginning in year 2001. The foreign exchange component of the capital cost is assumed to be 45 percent.

18. Staff costs for harbor masters, assistant harbor masters, clerical, security and labor staff have been calculated for each facility. An overhead of \$440/month has been estimated to cover utilities and other overheads. Staff costs and overheads are assumed to be phased in over the first five years. Maintenance costs that will be incurred in the regular maintenance of structures and equipment are assumed at 1 percent of the civil works cost and 3 percent of the cost of capital goods. In addition, it is assumed that capital goods will be replaced every seven years. A sum of \$11,000 will be invested in periodic dredging (every three years).

19. **Benefits.** In Chilaw, the harbor capacity for IBE boats is expected to rise from 243 to 300—but with a change in composition emphasizing multiday boats (rising from 133 to 250 while one-day boats will decrease from 110 to 50). OBE boats are expected to stay the same. At Hambantota, IBE boats are expected to rise from 11 to 150 (though some of these may simply be transferred from a nearby area). Ambalangoda anchorage has been designed to accommodate 55 IBE boats and 60 OBE boats, while Kalametiya will provide for anchorage space for 60 IBE and 70 OBE boats.

20. The number of fishing trips depends largely on weather conditions. Without suitable anchoring and berthing facilities, the operation of multiday boats is restricted to nine months of the year, with an average of three to four trips per month. Day boats make, on average, 12 trips/month during the monsoon period (six months) and 20 trips/month during the remainder of the year, totaling about 192 trips/year. With harbor facilities, it is assumed that multiday boats could operate for 10 months, averaging 30 trips/year. The number of trips made by day boats during the monsoon period is expected to increase to 15, increasing the total number of trips by a boat to 210/year.

21. The typical catch per trip by a multiday boat is assumed to be 1.5 tons (t), whereas the catch by a day boat is assumed to be 0.2 t. The catch per trip will remain unchanged with the Project. These trip and catch statistics apply to all four harbors/anchorages.

22. The Project will result in an increase in fish landings due to the larger number of boats, the higher proportion of multiday boats, and the greater number of annual trips each boat will be able to make (on average). The economic value of incremental fish landings was calculated as the difference between the beach value of the fish and the corresponding operation and maintenance (O&M) costs of boats (including the crew share). The beach value of fish applicable to the economic analysis is the free on board price adjusted to the site (i.e., port gate price) by deducting the cost of harbor fees, processing, transport, and handling, and was estimated at SLRs118.31/kg of fish. By subtracting the economic value of the O&M cost of boats, the value added from the incremental fish landings is calculated at SLRs22.31/kg.

23. **EIRR.** A summary of the calculated EIRRs for the various harbors and anchorages is in Table A11.4. In the costing of the harbors, certain figures have been segregated by the individual harbor. These costs have been used in the individual harbor EIRR calculations. There are additional overall costs of this subcomponent that cannot be easily separated by the individual harbor. These are costs supervision, survey and equipment and the international consultants for implementation. These costs have been included in the EIRR calculation for the overall component as stated in para. 28.

**Table A11.4: EIRR of Harbor and Anchorage Subprojects**

Site	EIRR (%)
1. Chilaw	24
2. Hambantota	16
3. Ambalangoda	14
4. Kalametiya	12

#### **b. Fisheries Management and Fish Quality Improvement**

24. **Costs.** The cost of all activities under this subcomponent was estimated to be \$845,000. These expenditures will be spread over the five years of project implementation.

25. **Benefits.** The fisheries management and fish quality improvement activities are expected to generate three broad benefits: (i) increase in the harvest of fish; (ii) reduction of losses during fish handling, transport, and marketing; and (iii) an incremental increase in the value of fish due to its improved quality. The increase in fish harvest is a result of the shift in effort from offshore fishing to deepsea fishing, and is not a result of an increase in the absolute fishing effort. Reduction in losses and the consequent increase in value of landed fish will result primarily from fish quality improvement activities.

26. The increase in fish yield due to the Project was determined after first projecting the nationwide annual fish landings up to year 2011 based on national-level statistics. Having considered the trend in fish landings over the past 25, 10, and 5 years, the latter period was selected to project trends through year 2011. A key assumption in the analysis is that 0.1 percent of national fish landings will be affected by project interventions. Since the project interventions target many locations along the western and southwestern coastal belt, the assumption is considered conservative.

27. **EIRR.** The EIRR calculated according to the above assumptions yields a value of 30 percent.

#### **c. Calculated Returns for the Full Component (Harbors plus Fisheries)**

28. The combined EIRR for the full fisheries management and fish quality improvement component (including both the harbor subcomponent and the fisheries subcomponent) is estimated at 12.1 percent.

### **4. Economic Analysis of the Whole Project**

29. For the Project as a whole, the 20-year net benefit streams of each of the three components were combined. In addition, the costs of institutional strengthening and project administration were included. The resultant full-Project EIRR is calculated as 15.3 percent (Table A11.5).

30. Sensitivity analyses were conducted for the overall Project as well as for the three components. The results are in Table A11.6.

31. For the Project as a whole, either an increase in costs or a decrease in benefits by 20 percent reduces the EIRR to just over the acceptable level of 12 percent. If both costs are raised and benefits are decreased (by 20 percent), the EIRR falls to a weak 9.7 percent. A two-year delay in benefits (keeping costs constant) results in an EIRR of 11.5 percent. For the coastline stabilization component, only a simultaneous 20 percent increase in cost and decrease in benefits results in an EIRR of 12.1 percent. The coastal environment and resource management component results are robust under all of the sensitivity analysis scenarios. The harbors and fisheries management component, on the other hand, has an EIRR of well under 12 percent in each of the four sensitivity scenarios. This component is the most susceptible to poor results if anything goes wrong.

### **C. Other Benefits**

32. The Project is expected to have numerous nonquantifiable benefits not included in the above analysis. The principal such benefits are (i) institutional strengthening of MFARD and its key agencies directly involved in the implementation of project-related activities; (ii) enhancement of interagency linkages through cooperation in the coordination and implementation of coastal resource management plans and activities; (iii) improved and effective resource management and protection; (iv) enhanced beneficiary participation in resource management and project implementation; (v) establishment of strong partnerships among local government, the communities, and NGOs/CBOs in community-based resource management; (vi) increased food supply, improved nutrition, and health; and (vii) improved community welfare. Other nonquantifiable benefits include the retardation of coastal resource depletion and degradation through effective environmental protection and resource management as well as the promotion of beneficiary participation in community-based coastal resource management and in project implementation.

**Table A11.5: Total Project EIRR**  
(SLRs million)

Base Case											
Year	Coast Stabilization			CERM			Harbors and Fisheries			Institutional	Project
	Costs	Benefits	Net Benefits	Costs	Benefits	Net Benefits	Costs	Benefits	Net Benefits	Costs	Net Benefits
1	177.0	-	(177.0)	38.4	4.9	(33.5)	49.2	0.0	(49.2)	(37.0)	(296.8)
2	226.8	1.0	(225.7)	89.9	11.4	(78.5)	130.4	0.0	(130.4)	(96.3)	(530.9)
3	871.8	4.9	(866.9)	197.6	18.2	(179.4)	292.4	0.0	(292.4)	(83.3)	(1,422.0)
4	422.0	8.7	(413.3)	111.7	26.9	(84.8)	307.2	95.6	(211.7)	(51.7)	(761.4)
5	260.5	11.4	(249.1)	70.4	35.6	(34.8)	224.8	112.6	(112.2)	(18.9)	(415.0)
6	(95.1)	372.9	468.0		82.5	82.5	4.8	136.0	131.2		681.7
7	(147.0)	373.3	520.3		97.6	97.6	4.8	144.9	140.1		758.0
8	(126.5)	373.8	500.3		110.0	110.0	7.6	146.0	138.4		748.7
9	55.0	374.2	319.2		122.5	122.5	4.8	147.4	142.6		584.3
10	(144.4)	374.6	519.0		134.9	134.9	4.8	149.2	144.4		798.3
11	(125.7)	375.1	500.8		147.3	147.3	4.8	151.3	146.5		794.6
12	(127.3)	375.5	502.8		159.8	159.8	7.6	153.8	146.2		808.8
13	(210.2)	375.9	586.1		172.2	172.2	4.8	156.9	152.1		910.5
14	(158.8)	376.4	535.2		184.7	184.7	4.8	156.9	152.1		872.0
15	(10.5)	376.8	387.3		197.1	197.1	4.8	156.9	152.1		736.5
16	(179.8)	377.2	557.0		209.5	209.5	7.6	156.9	149.3		915.9
17	(197.3)	377.6	574.9		222.0	222.0	4.8	156.9	152.1		949.0
18	(124.8)	378.1	502.8		234.4	234.4	4.8	156.9	152.1		889.4
19	(147.8)	378.5	526.3		246.8	246.8	4.8	156.9	152.1		925.3
20	(179.8)	875.8	1,055.6		259.3	259.3	7.6	156.9	149.3		1,464.2
<b>EIRR</b>			<b>17.2%</b>			<b>20.6%</b>			<b>12.1%</b>		<b>15.3%</b>

## Notes:

- Coastline stabilization costs (\$1 = SLRs70.81) include with-Project costs of construction and operation and maintenance less expected without-Project costs of haphazard coastline repair.
- Coastline stabilization benefits include tourism benefits for the affected coastline in addition to more site-specific benefits. In year 20, a residual value of the physical structures is included.
- Year 1 is the year 2000.

**Table A11.6: Sensitivity Analysis (%)**

Item	Coastline Stabilization	CERM	Harbors & Fisheries	Project
Increase cost by 20%	14.5	17.6	9.1	12.6
Decrease benefits by 20%	14.7	16.9	8.3	12.5
Both raise costs, decrease benefits	12.1	14.2	5.7	9.7
Delay benefits for two years	13.5	15.0	8.3	11.5