

**ASIAN DEVELOPMENT BANK**

**RRP: BAN 30032**

**REPORT AND RECOMMENDATION  
OF THE  
PRESIDENT  
TO THE  
BOARD OF DIRECTORS  
ON A  
PROPOSED LOAN  
AND  
TECHNICAL ASSISTANCE GRANT  
TO THE  
PEOPLE'S REPUBLIC OF BANGLADESH  
FOR THE  
SUNDARBANS BIODIVERSITY CONSERVATION PROJECT**

**November 1998**

## CURRENCY EQUIVALENTS

(as of 1 September 1998)

Currency Unit	–	Taka (Tk)
Tk1.00	=	\$0.02114
\$1.00	=	Tk47.30

In this Report a rate of \$1.00 - Tk47.30 is used. This was the rate generally prevailing during appraisal of the Project.

## ABBREVIATIONS

ADAB	–	Association of Development Agencies in Bangladesh
BCIC	–	Bangladesh Chemical Industries Corporation
BME	–	Benefit Monitoring and Evaluation
EIRR	–	Economic Internal Rate of Return
FAO	–	Food and Agriculture Organization
FD	–	Forest Department
FRMP	–	Forest Resources Management Project
GEF	–	Global Environment Facility
IRMP	–	Integrated Resource Management Plan
IUCN	–	World Conservation Union
KNM	–	Khulna Newsprint Mills
LGED	–	Local Government Engineering Department
MOEF	–	Ministry of Environment and Forests
MOI	–	Ministry of Industries
NGO	–	Nongovernment Organization
PKSF	–	Palli Karma-Sahayak Foundation
SAC	–	Stakeholders Advisory Council
SMU	–	Sundarbans Management Unit
SRF	–	Sundarbans Reserved Forest
SSC	–	Sundarbans Stewardship Commission
TA	–	Technical Assistance
TAG	–	Technical Advisory Group
UANDP	–	Upazila ( <i>Thana</i> ) Afforestation and Nursery Development Project
UNDP	–	United Nations Development Programme

## NOTES

- (i) The fiscal year (FY) of the Government ends on 30 June. FY before a calendar year denotes the year in which the fiscal year ends.
- (ii) In this Report "\$" refers to US dollars.

## GLOSSARY

<i>Bowali</i>	Wood cutter or collector.
Circle	The largest unit of territorial administration used by the Forest Department.
Coupe	Felling or harvest area.
Coppice	The process of forest regeneration, specific to certain species such as <i>Sal</i> , where, following the harvest of the trees, shoots emerge from the stump and grow to become the next rotation.
<i>Gewa (Excoecaria agallocha)</i>	Mangrove species—primary use is raw material for newsprint manufacture by the Khulna Newsprint Mills, preferred species for matchmaking, also used as low-value firewood and for other general purposes.
<i>Golpatta (Nypa fruticans)</i>	Stemless palm, the fronds of which are used for roof thatching.
<i>Goran (Ceriops decandra)</i>	Mangrove species that grows as a small tree or shrub—highly valued for firewood.
<i>Hantal (Phoenix paludosa)</i>	A slender, straight, small palm used for rafters, fences, and house posts.
Impact Zone	The 17 <i>thanas</i> adjacent and most dependent on the Sundarbans Reserved Forest (SRF).
<i>Mowali</i>	Honey collector.
Poldering	Reclaiming land from the water's edge by building embankments around the perimeter to prevent the entry of water, in this case, typically tidal waters.
<i>Sal (Shorea robusta)</i>	A valuable timber species once common in the drier uplands and deciduous forests of the north and northwest of the country.
<i>Shingra (Cynometra ramiflora)</i>	Used as firewood.
<i>Sundri (Heriteria fomes)</i>	Mangrove species, the most valuable timber resource in the SRF—large stems used as electricity power poles; sawn timber used for structural purposes; poles used for housing, bridges, jetties, and brushwood sold to the Khulna Hardboard Mill and used as firewood.
<i>Thana</i>	Bangladesh local administrative unit.
Top-dying	The gradual dieback of the topmost part of the <i>Sundri</i> tree, or early senescence as a result of disease, pests, or changing soil conditions.

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## LOAN AND PROJECT SUMMARY

<b>Borrower</b>	People's Republic of Bangladesh
<b>Project Description</b>	Comprising 6,000 square kilometers (km <sup>2</sup> ) in the southwest of the country, the Sundarbans Reserved Forest (SRF) offers storm protection to southwest Bangladesh and is a rich area of biodiversity and natural resources. It also offers subsistence to approximately 3.5 million people in the 17 <i>thanas</i> (subdistricts) of the impact zone, about 0-20 km outside the SRF border. To achieve long-term sustainable use and conservation of the SRF, the Project will introduce modern management systems that involve stakeholders. Community development initiatives in the impact zone will adopt a participatory approach.
<b>Classification</b>	Primary-Environment Secondary-Poverty reduction
<b>Environmental Assessment</b>	Category B. An initial environmental examination was undertaken, and the summary initial environmental examination was circulated to the Board on 1 June 1998.
<b>Rationale</b>	The Sundarbans is the world's largest remaining contiguous mangrove area. A globally significant ecosystem, the SRF features habitats for fish, shrimp, birds, and other wildlife, including the Bengal tiger. Regional towns rely on the Sundarbans for protection from adverse weather, and tourism benefits are also derived. The SRF is increasingly used by commercial wood processors, rural communities who live mainly in the 0-20 km zone around the border (the impact zone), artisanal fisherfolk, and fishing vessels from the Bay of Bengal. Under pressure from a growing number of users, biological resources are being depleted. The Khulna Newsprint Mills (KNM) complex, which uses Grewia as raw material for newsprint manufacture, also adds to pollution in the SRF. The Forest Department (FD) of the Ministry of Environment and Forests is responsible for management of the SRF. It urgently needs to change from a single-sector institution to one that is capable of managing a multidimensional resource. To stop and reverse the current trend to deforestation and loss of biodiversity will require additional financial resources, a significant improvement in institutional capacity, and a changed management approach based on appropriate research, community participation, and scientific planning.
<b>Objectives and Scope</b>	The immediate objective is to develop a sustainable management and biodiversity conservation system for all SRF resources on the basis of environmentally sound plans and the participation of all key stakeholders. The proposed Project

area includes the SRF itself and 17 surrounding *thanas* located in the impact zone. The Project will establish a participatory system for the conservation and sustainable management of the SRF as a multidimensional resource area. An integrated approach will be taken to (i) improve biodiversity conservation and forest management; (ii) improve institutional capacity to manage the SRF itself; (iii) reduce the poverty level of about 3.5 million people living in the impact zone by expanding economic opportunities, improving social infrastructure, improving organization for resource users, and facilitating stakeholder participation in resource management; and (iv) adopt a supportive set of policies, especially for charging economic prices for access to SRF resources. In addition, use of Gewa by KNM will be phased out.

### Cost Estimates

The Project cost is estimated at \$82.2 million equivalent, including about \$27.7 million in foreign exchange and approximately \$54.5 million equivalent in local currency costs.

### Financing Plan

Source	Foreign Exchange	Local Currency	Total Cost	Percent
	(\$ million)			
Bank	15.6	21.4	37.0	45.0
Government	-	16.1	16.1	19.6
Global Environment Facility	8.6	3.6	12.2	14.8
Nordic Development Fund	3.5	1.0	4.5	5.5
Palli Karma-Sahayak Foundation	-	6.8	6.8	8.3
Beneficiaries	-	3.7	3.7	4.5
Nongovernment Organizations	-	1.9	1.9	2.3
<b>Total</b>	<b>27.7</b>	<b>54.5</b>	<b>82.2</b>	<b>100.0</b>

### Loan Amount and Terms

The loan will be the equivalent in various currencies of SDR 26.981 million (\$37.0 million) from the Bank's Special Funds resources, for 40 years including a grace period of 10 years, with principal repayment and a service charge of 1 percent per annum payable semiannually. The Global Environment Facility has approved, in principle, a grant of \$12.2 million, to be administered by the Bank, for eligible expenditures under the Project. The Nordic Development Fund has indicated its intention to cofinance the Project on a parallel basis in an amount equivalent to approximately \$4.5 million.

### Period of Utilization

Until 31 December 2006

### Implementation Arrangements

As the Government agency legally responsible for administering the SRF, the FD will be the Executing Agency for the Project. A Sundarbans management unit (SMU), within the FD, will be set up in Khulna to decentralize decision-making authority and to be the main implementing agency. The unit will have the overall responsibility for administration, implementation, monitoring, reporting, and coordination of

activities in the SRF. The Sundarbans Stewardship Commission will be established to provide long-term vision for the SRF. The Surface Water Modeling Center, based in Dhaka, will monitor water quality. The World Conservation Union will be responsible for independent conservation monitoring activities. The Palli Karma-Sahayak Foundation (PKSF) will provide microcredit to support microenterprise development and sustainable resource use in the impact zone.

The implementation arrangements for the impact zone strategy are based upon cooperation between the SMU, resource user communities, participating nongovernment organizations (NGOs) that will be responsible for promoting microenterprises and other programs, and the Local Government Engineering Department (LGED), which will be the agency responsible for developing social infrastructure (e.g., village water supplies and sanitation). For microenterprise activities, PKSF will select NGOs and provide credit according to its own criteria. Coordination is expected to be provided through a committee set up at Khulna to monitor implementation of activities in the impact zone and through similar committees at the *thana* level.

#### **Executing Agency**

Forest Department within the Ministry of Environment and Forests

#### **Procurement**

Procurement of goods and services will be in accordance with the Bank's *Guidelines for Procurement*. Supply contracts for materials, equipment, and vehicles required by the Project will be procured under international competitive bidding procedures if the contract is estimated to cost \$500,000 equivalent or more, and under international shopping procedures if the contract is less than \$500,000 equivalent. Each supply contract for materials, equipment, and vehicles estimated to cost less than \$50,000 equivalent will be by direct purchase procedures. Minor civil works contracts may be awarded by the FD, in accordance with the Government's standard procurement procedures for local competitive bidding that are satisfactory to the Bank. Supply of inputs to small-scale village enterprise programs for the impact zone may be procured from local suppliers through direct purchase procedures. Contracts for services such as local training, ecotourism, and services to promote environmental awareness or specialized extension material estimated to cost \$5,000 equivalent, will be supplied by direct contracting arrangements with qualified domestic suppliers acceptable to the Bank.

#### **Consulting Services**

For consultants financed under the Bank's loan, the Government has requested and the Bank has agreed that, as an exception to the procedures set out in the Bank's *Guidelines on the Use of Consultants*, the Bank will directly shortlist, evaluate and rank consultants in consultation with the

Government. Consultants financed under the Global Environment Facility grant will be recruited by the Bank in accordance with the Bank's *Guidelines on the Use of Consultants*. Consulting services and training support are required to (i) establish a technical advisory group, which will establish baseline information and sustainable practices, draft integrated conservation and management plans, and assist in developing a self-sustaining management system; (ii) assist the FD in retraining its staff and helping to refocus its activities to more effectively conserve the SRF, and in serving the needs of its primary stakeholders; and (iii) train communities to engage in ecotourism-related activities. Specific training and institutional support will also be included under the Project for FD and NGO staff with respect to organization of resource user groups, gender sensitization, women in development issues, and specific conservation issues for women and women's groups. Seventeen consultancy positions are proposed for the technical advisory group, totaling 381 person-months, of which 240 person-months are for international consultants and 141 person-months for domestic consultants. A further 48 person-months of short-term consultancies are required for independent conservation monitoring and other priority work.

About 50 person-months of regional fellowships will be provided to train and develop a cadre of experienced staff who will be responsible for enabling the scientific and management reorientation of the FD. In addition, the international consultants in the technical advisory group will provide intensive in-country training for about 200 Project personnel, and a training program in computerization and monitoring of Project activities. These fellowships and the in-country training program will be available to selected participants from FD, LGED, participating NGOs, PKSF, and the impact zone community.

**Estimated Project  
Completion Date**

30 June 2006

**Technical Assistance**

An advisory technical assistance grant amounting to \$570,000 equivalent will be provided for a detailed options study of KNM. Based on the findings, a decision will be made regarding investments either to improve KNM's financial and economic viability with due regard to environmental and social issues, or alternatively to close the mill.

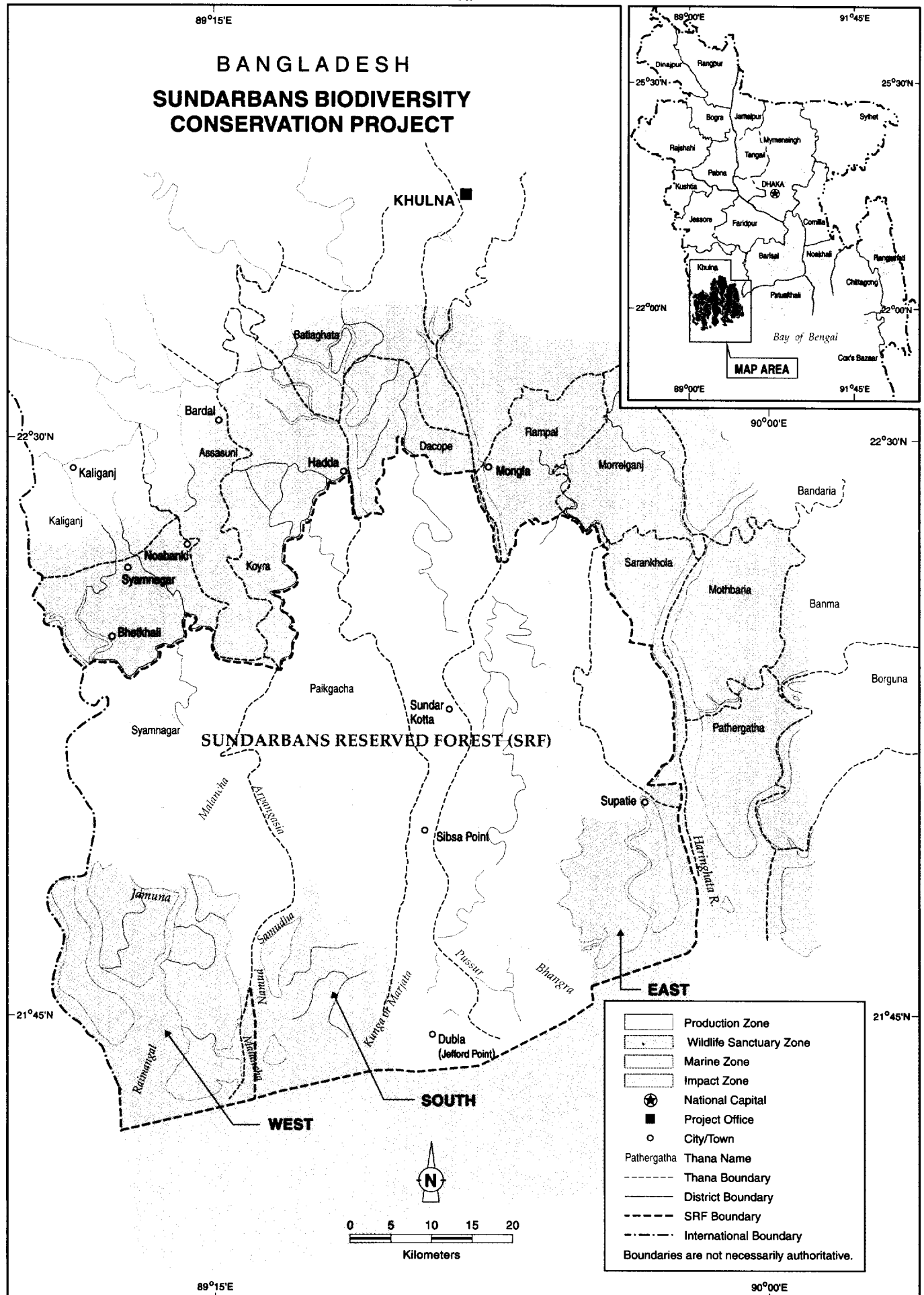
**Project Benefits**

The sustainable conservation of the SRF will have many benefits, including opportunities for (i) storm protection and flood control; (ii) subsistence and commercial use of timber and fuelwood; (iii) production of nonwood forest products, e.g., honey, beeswax, medicinal plants, and other products; (iv) habitat for marine and estuarine fisheries; (v) ecotourism; (vi) improved socioeconomic status in the impact zone through



alternative income-earning activities such as forestry from homestead and roadside plantations, village poultry programs, apiculture, and ecotourism; (vii) carbon sequestration; and (viii) habitat for a variety of animals in danger of local or global extinction, e.g., Bengal tiger, dugong, Ganges River dolphin, saltwater crocodile, and others.

The incremental financial benefits of the alternative income-generating activities in the impact zone are strongly positive, with returns per person-day worked that are significantly higher than agricultural wages in the area. For the Government, current annual revenues (approximately \$4.4 million) can be expected to double in real terms over a 25-year period through reducing resource losses and by charging economic rates for permits and licenses to use the SRF. The estimated economic returns from the Project are positive, and an overall economic internal rate of return of 13.9 percent has been calculated as the base case for the Project.



## I. THE PROPOSAL

1. I submit for your approval the following Report and Recommendation on (i) a proposed loan to the People's Republic of Bangladesh for the Sundarbans Biodiversity Conservation Project (the Project) and (ii) proposed administration by the Bank of technical assistance to be financed by the Global Environment Facility (GEF) on a grant basis for the Project. The report also describes the proposed advisory technical assistance (TA) for an options study of the Khulna Newsprint Mills (KNM), and if the proposed loan is approved by the Board, I, acting under the authority delegated to me by the Board, shall approve the technical assistance.

## II. INTRODUCTION

2. In 1996, the Country Assistance Plan for Bangladesh included TA<sup>1</sup> for the preparation of a project to conserve the Sundarbans Reserved Forest (SRF). Formulation of the Project was carried out by a team of international and domestic consultants that was based at Khulna in the proposed Project area. During fieldwork many interviews were carried out with subsistence-oriented users and commercial users of the SRF. Nongovernment organizations (NGOs), Government officials, and the private sector were also actively consulted during the preparation of the Project. Participatory processes were further enhanced through a stakeholder workshop held in Khulna in July 1997 and opened by the Minister of Environment and Forests (MOEF). The study report was received by the Bank on 15 November 1997, and the Bank fielded a Fact-Finding Mission from 23 November to 12 December 1997. To follow-up matters arising from loan fact-finding, the Bank fielded another mission 9-28 February 1998. On 30 March 1998, the Council of the GEF approved, in principle, a grant of \$12.2 million for cofinancing to support biodiversity conservation aspects of the proposed Project due to the global significance of the SRF.<sup>2</sup> A Preappraisal Mission was fielded (20 June to 4 July), and the Appraisal Mission<sup>3</sup> (6-20 August) completed the Project preparation process. The Project framework is provided in Appendix 1.

## III. BACKGROUND

### A. The Sundarbans Reserved Forest

#### 1. Area Biodiversity and Significance

3. Straddling the border between India and southwestern Bangladesh, the Sundarbans is the largest remaining contiguous block of mangrove ecosystem in the world, with a total area of approximately 10,000 square kilometers (km<sup>2</sup>). The SRF in Bangladesh comprises slightly over 60 percent of this area (6,017 km<sup>2</sup>), and sprawls across the ancient delta of the Ganges River. Lying within a zone of cyclonic storms and storm surges, which originate in the Bay of Bengal and periodically devastate coastal areas, the SRF provides a resilient buffer and protects the lives and assets of approximately 3.5 million people who live in the immediate vicinity, as well as offers protection to regional infrastructure and urban populations in major towns such as Khulna and the international shipping port of Mongla.

<sup>1</sup> TA No. 2724-BAN: *Biodiversity Conservation in the Sundarbans Reserved Forest*, for \$540,000, approved on 19 December 1996.

<sup>2</sup> The GEF is expected to accord formal approval for its financing portion by December 1998.

<sup>3</sup> The Mission comprised B. Carrad (Sr. Project Economist, Mission Leader), H. Aoki (Financial Analyst), S. Bajpai (Sr. Programs Officer), R. Dobias (Sr. Environment Specialist), S.T. Qadri (Sr. Environment Specialist), D. Teter (Project Economist), and R. Khan (Economist, BRM). M. Mitra, Social Development Specialist, provided assistance to the Mission.

4. The Sundarbans is also the most important remaining contiguous habitat in the world for the highly endangered Bengal tiger (*Panthera tigris tigris*),<sup>1</sup> and is a major pathway for nutrient cycling and pollution abatement. Both the Indian and Bangladesh portions of the Sundarbans have received national and international acknowledgement for high biodiversity value.<sup>2</sup> A total of 245 genera and 334 species of plants have been recorded in the SRF. It is the country's major habitat for wild shrimp, and is home to many species of fish, birds, and other wildlife. In Bangladesh, three wildlife sanctuaries covering 324 km<sup>2</sup> were established along the southern edge of the SRF in 1977. Including river channels and expansions since initial declaration, the sanctuary areas currently total 1,397 km<sup>2</sup>, or 23 percent of the SRF. Although not yet effectively managed and not representative of the Sundarbans as a whole, they represent potential core areas for biodiversity conservation. At the 21<sup>st</sup> session of the World Heritage Committee (1-6 December 1997), these sanctuary areas were declared a World Heritage Site with exceptional biodiversity and a significant example of delta formation, tidal influences, and plant colonization.

5. Due to its exceptional biodiversity, coastal beaches on the Bay of Bengal, the relatively pristine nature of the wildlife sanctuaries, and ancient cultural sites, tourists have been visiting the SRF for decades. Tourism in Bangladesh is in its infancy, with only approximately 50,000 foreign arrivals in FY1997, and the SRF has the potential to become an important destination for nature-based and educational tourism.<sup>3</sup> The Bangladesh Parjatan Corporation (the main Government agency responsible for promoting tourism) estimates that tourism growth will average 15 percent over the next decade. While only 350 foreigners visited the SRF in FY1997, 15,000 domestic tourists on vessels run by private operators visited the area, and an additional 40,000 domestic tourists made day trips from Khulna to a deer park on the fringe of the forest. Overall, the number of visitors to the SRF has doubled since 1993. A general lack of public education about the SRF, very limited international awareness, and a lack of basic public infrastructure (e.g., information centers, wildlife observation towers, and jetties) are constraints to further expanding tourism in the area. Careful planning is also required to avoid damage to the area, to ensure that its semiwilderness character is maintained and to give local communities the opportunity to participate in tourism growth. It is clear that water-based, conservation-oriented tourism, and not land-based mass tourism is required, and that an appropriate visitor fees structure needs to be developed.

6. The SRF accounts for over half of all reserved forest area in Bangladesh, and is the country's largest single source of forest products, supplying about 45 percent of all timber and fuelwood, and providing direct income and subsistence for at least half a million households living around the boundary. Harvests of key species—such as (i) *Sundri* (*Heritiera fomes*) the most dominant and abundant timber species, used for poles, timber, and hardboard manufacture; (ii) *Gewa* (*Excoecaria agallocha*), used in newsprint manufacture; (iii) fuelwood species such as *Goran* (*Ceriops decandra*); and (iv) nonwood forest products such as *Golpatta* (*Nypa fruticans*), used as a multipurpose traditional building material, as well as products such as honey and beeswax—have all traditionally made a significant contribution to the Government's revenues. In FY1996, for example, revenues received by the Government from the sale of licenses and other user fees for access to SRF resources totaled Tk190.3 million (\$4.4 million), compared with the annual operating budget of Tk115.7 million (\$2.7 million) for all Forest Department (FD) operations in the SRF. More broadly, it is estimated that the SRF contributes over

<sup>1</sup> The Bengal tiger population was most recently estimated in excess of 350 individuals (Tamang 1994), or approximately 10 percent of the population worldwide.

<sup>2</sup> The Bangladesh portion of the Sundarbans is a Ramsar site, under the Ramsar Convention on Wetlands of International Importance.

<sup>3</sup> The experience of subregional neighbors in promoting sustainable ecotourism is relevant, such as the Sundarbans area in West Bengal, India, and Nepal.

Tk4 billion (\$93 million) to annual gross domestic product, including ecotourism and wildlife (without valuing fuelwood). Most of this value currently comes from nonterrestrial sources, especially from the extensive shrimp breeding and nursery grounds, which underpin the \$400 million shrimp export industry.<sup>1</sup>

7. However, the abundant resources of the SRF are under increasing pressure, and most are now exploited at unsustainable levels. Recent inventories undertaken by the World Bank-financed Forest Resources Management Project (FRMP)<sup>2</sup> have shown that all key forest species are heavily overexploited because prices for licenses and permits have been set far below economic levels.<sup>3</sup> Rent-seeking practices by officials and very high interest rates charged by moneylenders who finance operations by resource extractors in the SRF have also led to overexploitation. Comparisons with earlier forest inventories show that the rate of forest degradation is rapidly increasing.<sup>4</sup> The magnitude of the problem, and the urgency of finding a viable solution, is illustrated by the following: (i) the number of *Sundri* trees has declined by 76 percent in the period 1959-1996 due to top-dying disease and overharvesting, and *Gewa* trees have declined by 88 percent over the same period due to unsustainable harvesting, mostly by the State-owned KNM; (ii) all fuelwood species are overexploited; and (iii) nonwood forest products such as *Golpatta*, are showing declining output trends. Despite past moratoriums on the exploitation of certain species, technical and scientific assessments indicate that sustainability criteria have not been followed.<sup>5</sup> For some forest products, including fuelwood, the FRMP studies are incomplete, but will be completed by June 2000. On the basis of the work done so far, forest conservation management is strongly recommended; plans for specific interventions will be further developed and implemented under the proposed Bank Project.

8. Overfishing and overexploitation of plant and wildlife species are also placing increasing stress on the viability of the ecosystem. Forty-six wildlife species indigenous to the Sundarbans are endangered (2 amphibians, 14 reptiles, 25 birds, and 5 mammals), and one species of turtle is endemic only to the Sundarbans. The local extinction of six important mammal species has been reported in recent times.<sup>6</sup> Aquatic resources are among the least studied biological resources. However, over 120 species of fish are regularly caught, plus at least 7 species of shellfish and mollusks, which are used for lime production.<sup>7</sup> Significant overexploitation has occurred in recent years, resulting from a rapid expansion of seasonal immigration for fisheries and increased use of unsustainable practices. While traditional fishing

<sup>1</sup> The multidimensional nature of the Sundarbans, its administration, and contribution to the economy of Bangladesh have been well described in the final report on a project funded by the United Nations Development Programme (UNDP) and the Food and Agriculture Organization (FAO). *Integrated Resource Management Plan of the Sundarbans Reserved Forest*, Final Report. February 1998.

<sup>2</sup> Integrated Forest Management Plan for the SRF, Draft Final Report. January 1998

<sup>3</sup> Royalties in the range of 20-35 percent of market prices have been recommended by the consultants engaged under the TA for the preparation of the Project (TA No. 2724-BAN). Currently, the actual charges decreed by the FD average only 10 percent of the recommended charges, or 2-4 percent of market prices.

<sup>4</sup> Earlier surveys were undertaken by Forestal I (1960), *Forest Inventory 1958-59. Sundarbans Forest*; and Overseas Development Agency (1985), *A Forest Inventory of the Sundarbans, Bangladesh*. Main Report.

<sup>5</sup> The Chakoria Sundarbans in eastern Bangladesh has been completely denuded over the last decade and replaced by shrimp-based aquaculture. Shrimp disease infestation has undercut the viability of aquaculture operations, as in many other parts of the region, leaving a degraded environment and an unprotected coastline.

<sup>6</sup> Extinct are the Javan rhinoceros (*Rhinoceros sondaicus*), one-horned rhinoceros (*Rhinoceros unicornis*), wild buffalo (*Bubalus bubalis*), swamp deer (*Cervus duvaucali*), gaur (*Bos gaurus*), and hog deer (*Axis porcinus*). The recent reports of the FRMP and the UNDP/FAO-funded Integrated Resource Management Plan of the SRF provide a useful baseline assessment.

<sup>7</sup> PPTA No. 2724-BAN: *Biodiversity Conservation in the Sundarbans Reserved Forest*, Feasibility Study, Final Report, October 1997. Of the nine most commercially important fish species, five are exploited at or beyond biologically sustainable limits.

craft and labor-intensive catching methods predominate, modern methods are rapidly being introduced, and many of these are highly destructive. For example, 20,000-25,000 shrimp fry collectors enter the SRF weekly, use fine mesh plastic nets to scoop up all aquatic biota, and destroy other species through the decimation of their larvae. The off-take of mangrove crabs has also dramatically increased, and there have been recent reports of poison fishing in the SRF. Aside from the ecological destruction of killing even unwanted species and the effects of residual poison at high tide being flushed into the main rivers, illnesses in humans occur from eating the poisoned fish. Baseline assessments for nonforest biological resources and conservation plans are needed to integrate the conservation needs of wildlife and forest resources.

9. Expansion of upstream agriculture, shrimp-based aquaculture, industries located on the Hoogley and Padma river systems, pollution from municipal wastes from Khulna City and Mongla port (which lies 85 km inland on the Pussar River but only 3 km from the northern boundary of the SRF), and industrial waste from the KNM complex pose serious threats to the ecosystem. Saline intrusion has increased alarmingly throughout the southwest of Bangladesh over the past several decades, and a wedge of saltwater now intrudes up to 200 km inland in the dry season. Widespread land poldering in the 1960s, construction of major upstream barrages, and deforestation have reduced natural drainage and flushing, and resulted in increased siltation. Results of recent siltation are the shift of international shipping from Khulna port further downstream to Mongla (which is itself increasingly silted), and, further to the north, the seasonal closure of the mouth of the Gorai River, which has significantly reduced freshwater flows to the Sundarbans. Further, although 30 percent of the Sundarbans area is covered by water, effective monitoring of water quality and pollution levels is markedly lacking.<sup>1</sup>

## 2. The Impact Zone

10. While there has been little permanent settlement inside the forest, a large number of people spend substantial portions of their lives inside the SRF in boats or in semi-permanent habitations along the borders, including the beaches. Approximately 3.5 million people live in the 17 *thanas* (administrative subdistricts) located approximately 0-20 km outside the border of the SRF, known here as the impact zone. It is an area of significant seasonal immigration, especially to exploit fisheries and aquatic resources. Dependency on SRF resources is high, and the main users are (i) *Bowalis* (wood cutters/*Golpatta* collectors); (ii) fisherfolk; (iii) crab and shell collectors; (iv) *Mowalis* (honey collectors); and (v) shrimp fry collectors, who are mainly women and children. The people who exploit the SRF are themselves exploited by moneylenders and others with vested interests. Apart from periodic licenses and permits issued by the FD, impact zone communities that are reliant on the SRF for subsistence and income have no formally recognized rights of access to the forest, nor do they act responsibly to care for the resources. Traditional user practices (e.g., seasonality of harvesting, gender roles, awareness of the need for regeneration, etc.) have largely broken down due to increased poverty and population pressure, lack of effective controls, and a perceived lack of viable alternatives. Common are high levels of indebtedness, very high interest rates on borrowings, and near bondage in terms of production arrangements that have been in place for generations. Poor people are concerned about personal security and threats from powerful interest groups, and women feel particularly at risk. The unsustainability of many current activities and the lack

<sup>1</sup> Oil-based wastes are a major pollution risk. Due to the prevailing southwest winds in the monsoon season, a major oil spill at the Hoogley River entrance (120 km from the Bangladesh border) from a collision involving Chittagong-bound oil tankers from the Gulf ports probably carries a greater risk to the SRF than does internal shipping. The Ports Efficiency and Access Improvement Project, a project proposed for Bank assistance to Bangladesh, includes provision for an oil spill contingency plan and related equipment.

of access to productive resources on fair terms lead directly to depletion of the SRF and to continuing poverty and inequity. Appendix 2 contains a social assessment and strategy for addressing these issues in the Project.

11. The incidence of poverty is high both in absolute terms and relative to Bangladesh norms. For example, the average household size (6.3 persons), female/male ratio (100:117), the incidence of skin diseases and diarrhea in children and adults alike, and food insecurity and landlessness are all higher than national averages. Comparing incomes with the Bangladesh poverty threshold income of Tk6,300 per capita shows that at least one third of the population lives in a state of severe poverty; Integrated Resource Management Plan (IRMP) studies indicate that the bottom third of households had an annual income of only Tk4,575 per capita in 1995.<sup>1</sup> The literacy rate in the impact zone is approximately 73.5 percent,<sup>2</sup> slightly higher than the national average. This is attributable to a relatively large number of NGOs operating in both the formal and informal education sectors. While notional access to primary schooling facilities may exist in rural areas, effective access is lacking on account of poverty as well as employment opportunities for children in the SRF. Access to safe drinking water is notably lower than at the national level, and there are local problems with arsenic contamination. Over 10 percent of the population drinks water from marshes and ponds, compared with only 2.5 percent nationally, and sanitation facilities are almost nonexistent. Basic rural roads are also lacking. Cattle manure, a common source of cooking fuel in Bangladesh, is less available now due to reduced animal numbers in recent years, another consequence of land being converted into shrimp ponds.

## **B. Key Sector Institutions and Issues**

### **1. The Forest Department**

12. MOEF, formed in 1989, is the apex organization for the Department of Environment (also set up in 1989) and the FD. The FD has administered the SRF since its demarcation in 1875 during the colonial period, and the Sundarbans Division of the FD was created in 1879. Keeping the SRF boundary virtually free from permanent human encroachment while enabling the area to contribute to the national economy over such a long period of time is a justifiable source of pride to the FD. The FD's existing organizational structure, however, has changed little from colonial times. It has a single-sector focus and a vertical chain of command, with little delegation of authority outside Dhaka. The existing structure is not conducive to participatory management of natural forests, afforestation of degraded lands, conservation of biodiversity, or promotion of social forestry. Lack of long-term forest management plans and weak information management have also contributed to the poor skill base within the FD to manage the complex demands of the SRF. The Government must build the capacity of the FD to fulfill its mandate, particularly in the context of the SRF.

13. While its traditional forest management and protection methods (which primarily emphasize regulation and enforcement) may have been adequate in the past, the FD now has to acquire the ability to effectively conserve the biodiversity of the SRF. The SRF requires management systems that are more sophisticated than traditional forest management methods

<sup>1</sup> Study undertaken by the Multidisciplinary Action Research Center (MARC), September 1995, for the FAO/UNDP-funded IRMP.

<sup>2</sup> IRMP. Draft Final Report. January 1998.

as practiced in Bangladesh.<sup>1</sup> For example, although the Sundarbans Division issues permits for the utilization of fisheries and aquatic resources in the SRF, the licensing system needs to be rationalized and actively monitored to incorporate biodiversity conservation principles, and staff with adequate training and experience in fisheries management are required. Under the FRMP, emphasis was placed on strengthening the FD's capacity in regard to wildlife conservation and management through establishment of the Environment Management Division. The FRMP also supported efforts to improve the FD's planning capacities and particularly to revise its forest management plan for the SRF. Attached to the Bank-financed Coastal Greenbelt Project<sup>2</sup> is a grant to finance an advisory TA<sup>3</sup> aimed at institutional strengthening of social forestry, including extension, communication, and integration of the FD's management information and monitoring and evaluation systems; these improvements will be necessary for the reforms required to improve the management of the SRF.

14. The Food and Agriculture Organization (FAO)-assisted task force report on institutional reform<sup>4</sup> noted the serious imbalance that exists between professional staff levels and support staff levels, not only in terms of the numbers but also workload. In order to manage Bangladesh's forests effectively, including the SRF, an increase in the core professional staff strength of the FD will be required.<sup>5</sup> Nationally, most of the required strength can be achieved through filling vacant positions and redeployment of staff, promotion of able staff, and training in additional skills. The existing FD structure for administering the SRF will be replaced to provide an appropriate setting for Project implementation. This will require certain institutional changes, including systems of procedures, delegated authority, a better balance in staffing and training to acquire new skills (for example, fisheries management and working with community groups), and integrated planning and operations. It will also require the elimination of potential conflicts of interest, a changed attitude, and increased staff motivation, especially when working with resource user groups and NGOs. The budget available for field operations is only approximately 20 percent of total budget with the remaining 80 percent being allocated for wages and salaries; a better balance is required with additional funds being allocated to increase field operations (especially for patrols).

## 2. Legal and Institutional Reforms

15. The Forest Act and its rules, regulations, and systems, which are used as the foundation of forest policy and management practices, have changed little since the Act was promulgated in 1927. As recommended by the recent FAO-assisted task force report on institutional reform,<sup>6</sup> legal and institutional reforms are needed to modernize the management of Bangladesh's forests and upgrade the capacity of the FD. While the laws relating to use of resources generally provide an adequate legal framework for achieving policy goals and international agreements, mechanisms of coordinated, people-oriented management planning process are lacking. The Environment Act of 1996 is inadequate for coordinated planning. The National Environment Committee, chaired by the Prime Minister, rarely meets. An amendment to the Forest Act (1927) is needed along with the associated rules and regulations to support

<sup>1</sup> For example, the annual cost of protecting areas where rhinoceros (*Diceros bicornis*) or elephant (*Loxodonta africana*) were threatened elsewhere in the world is estimated at approximately \$400 per km<sup>2</sup>. Effective tiger protection alone would cost the equivalent of \$2.4 million annually (89 percent of the annual budget to manage the SRF), if these international norms were applied.

<sup>2</sup> Loan No. 1353-BAN: *Coastal Greenbelt Project*, for \$23.4 million, approved on 2 March 1995.

<sup>3</sup> TA No. 2304-BAN: *Institutional Strengthening of Social Forestry in the Coastal Region*, for \$1.3 million, approved on 2 March 1995.

<sup>4</sup> FAO. *Support to Master Plan for the Forestry Sector*, Project Number: TCP/BGD/4553, March 1997.

<sup>5</sup> Professional staff designations are as follows: conservator of forests, deputy conservator of forests, subdivisional forest officers, assistant conservator of forests, range officers, and forest rangers.

<sup>6</sup> FAO. *Task Force on Institutional Reform*. Final Report. 1998.



social forestry activities on a national basis. The Bank-financed Forestry Sector Project<sup>1</sup> includes institutional capacity building and policy reform, and lays the foundation for the FD's institutional reforms. Such reforms will set the scene for the changes required in the Sundarbans, including the involvement of local traditional users in the impact zone. Other structural changes are also needed for the Sundarbans, such as (i) adequate oversight arrangements to ensure long-term conservation and sustainable resource use, (ii) delegation of responsibility to improve local-level management and accountability, and (iii) involvement of stakeholders in the management process.

### **3. NGOs and Other Organizations in the Impact Zone**

16. Currently, about 29 NGOs are working on the fringes of the impact zone. Mostly these organizations are small and locally based, but several of them are larger national and regional NGOs that are also involved in broad-based rural development programs, including microenterprise promotion for poverty reduction. However, no more than 15 percent of the villages in the impact zone are covered by such programs. There is only limited access to microfinance services offered through NGOs, and very little attention in existing NGO programs has been given specifically to users of the SRF. NGOs provide an effective and flexible alternative way of delivering services in Bangladesh, especially for reducing poverty and reaching out to isolated rural communities such as those in the impact zone. The institutional arrangements to implement a viable strategy for the impact zone need to be based upon constructive cooperation between the Project's Executing Agency (the FD) and NGOs working with SRF users. Appropriate arrangements to include other Government departments with proven capacity to implement social infrastructure development programs, such as the Local Government Engineering Department (LGED), are also needed.

### **4. Building Institutional Capacity**

17. Without dialogue and effective working arrangements between the legal custodian of the SRF (the FD) and its users (primarily the people living in the impact zone) to ensure conservation and sustainable management of the SRF, the current adverse trends will surely worsen. Institutional arrangements that fully involve all stakeholders will need to be evolved and implemented. The management systems of the Sundarbans in West Bengal (India) may offer insights into appropriate institutional arrangements as well as ideas for ecotourism strategies and training opportunities for FD staff and local communities.

18 To build a broad-based constituency in favor of biodiversity conservation and sustainable resource use, significant attitude changes are needed in the FD. To develop the internal capacity for reform, greater openness in reporting and managing the SRF and in working with the community of users and the wider national community are needed. It is also necessary to accept some tradeoffs between preserving wildlife and improving forest management. Specific changes are required to (i) introduce modern management based on rigorously researched data and plans that have been developed in a participatory manner; (ii) improve household incomes, raise awareness among user groups of the need to conserve the biodiversity of the SRF, and increase personal security in the impact zone; (iii) adopt and enforce coherent and consistent policies; (iv) charge economic prices for utilization of SRF resources and market-determined rates for access by tourists to the SRF; and (v) develop multi-disciplinary skills and enhance career opportunities for FD staff.

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<sup>1</sup> Loan No. 1486-BAN: *Forestry Sector Project*, for \$50.0 million, approved on 21 November 1996.

## 5. Khulna Newsprint Mills

19. KNM<sup>1</sup> is owned by the Government's Bangladesh Chemical Industries Corporation within the Ministry of Industries, and was established in 1959 to supply newsprint to the former East and West Pakistan. The sole domestic producer of newsprint in Bangladesh, KNM produces approximately 25,000 tons annually—half its design capacity, due to old equipment, poor quality products, and lack of raw materials. KNM is the single largest user of Gewa and the main cause of its depletion; it is also a major source of water pollution, discharging its effluent untreated upstream of the SRF. KNM employs approximately 2,000 people plus approximately 400 contract personnel to extract Gewa. The pulp/newsprint mill, the main facility at the complex, has not been well maintained, has accumulated financial losses of \$40 million and is not viable in its present form. The Government acknowledges the urgent need to commercialize KNM as an initial step toward eventual privatization. Historically 120,000 cubic meters of Gewa has been used annually by KNM, but the forest can only sustainably supply a maximum volume of 53,000 cubic meters.<sup>2</sup> A recent consultant's report financed by the Bank<sup>3</sup> indicated that for KNM to be financially viable and environmentally sustainable it must (i) replace Gewa with imported low cost industrial waste as the source of pulp for newsprint manufacture; (ii) install a new effluent plant; and (iii) upgrade the old paper-making machinery. The total cost of such investments is estimated at \$48 million, of which the effluent treatment plant would cost approximately \$4.5 million. The other options examined in this preliminary study include (i) combined use of Gewa and other pulp; (ii) other sources of domestic fiber for pulp (e.g., jute); and (iii) closure and compensation for displaced personnel. Of these other options, options (i) and (ii) were unacceptable on financial and environmental grounds. Option (iii) was the most economically efficient, but the Government has not as yet fully considered this option due to the potential social disruption through the closure of one of the areas largest employers. In the interest of the long term future of the SRF, advisory TA is needed and has been requested by the Government to further analyze the options for KNM (paras. 31 and 93).

### C. Government Policies and Plans

20. Environmental management provides an especially complex challenge for the institutional structure of Bangladesh. Major constraints are the slow pace of institutional reform, poor enforcement of various policies and programs (including participatory initiatives such as the people-oriented forestry programs), and weak environmental monitoring. The Government needs to effectively implement its national environmental strategy and related plans such as the National Environmental Management Action Plan.<sup>4</sup> In recent years, the Government in its determination to expand and conserve natural forests has recognized the need to develop an adequate policy and planning framework, including appropriate institutional mechanisms to promote people's involvement in forest management and conservation and enhance the role that local communities can play in the forestry sector. Accordingly, the Government promulgated the new National Forest Policy in October 1994, and launched the Forestry Sector Master Plan in 1995. The Plan calls for an ambitious investment program of \$2 billion over 20 years (1995-2015). Envisaged broad investment areas are: environment management (\$48 million), participatory forestry (\$351 million), production-directed programs (\$960 million), and institutional development (\$641 million).

<sup>1</sup> This complex comprises three mills: a pulp/newsprint mill, a hardboard mill, and a match factory, but only the newsprint mill is operational.

<sup>2</sup> FRMP estimate.

<sup>3</sup> Jaakko Poyry Consulting (1998), *Assessment of Options for the Khulna Newsprint Mills*.

<sup>4</sup> MOEF, Government of Bangladesh, Dhaka. 1995.

21. The Forestry Sector Master Plan and the National Forest Policy, and particularly their components for people-oriented programs to manage the environment, constitute the backbone of the current forestry sector strategy. Creating conditions under which people will benefit directly by participating actively in sustainable forest management will be the main challenge for the Government. In this sense, the major policy issue now is institutional and legislative reform to ensure implementation of the National Forest Policy's participatory management approach, as also identified by the FAO-funded task force report (para. 14).

22. Government expenditure on the SRF is primarily through budget allocations, which have shown a marked increase from Tk30.8 million in FY1992 to Tk115.7 million in FY1997. More significantly, the budget as a percentage of resources received from the SRF has increased from about 20 percent in FY1995 to almost 60 percent in FY1997, demonstrating the Government's emphasis on development of the SRF. The main development programs covering the SRF have been funded under the FRMP since 1992 and will be completed in 2000. These programs include construction of staff and visitor accommodation in several sanctuary locations, and inventories of key forest and nonforest product species.

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

23. The Bank's assistance to the forestry sector in Bangladesh started in December 1981 with a loan for the Community Forestry Project.<sup>1</sup> This project extended social forestry activities in 23 districts in the north and northwestern parts of the country. In March 1989, the Bank approved the Upazila (*Thana*) Afforestation and Nursery Development Project (UANDP).<sup>2</sup> Building on the awareness raised under the Community Forestry Project, the UANDP aimed at arresting depletion of the plantations and natural forests of the central and northern region of the country. Under the UANDP, a significant portion of available Government land and homestead land was brought under tree cover using participatory and benefit-sharing approaches. The UANDP demonstrated the effectiveness of participatory approaches to the protection and management of *Sal* forests and establishment of block plantations (woodlots) in forests that were severely degraded and encroached upon. The UANDP also strengthened the FD's institutional capacity and provided training in seedling production and tree planting and maintenance to a large number of field staff, NGOs, and participants.

24. The Coastal Greenbelt Project aims to promote tree planting to increase vegetative cover in coastal areas through social forestry. Other components include nursery development, seedling distribution, public awareness, and training. The Forestry Sector Project covers various forestation, conservation, and natural forest management activities in line with the Forestry Sector Master Plan. Its objectives are to enhance conservation of forests in selected protected areas, to increase wood production, and to institute sustainable management of forest resources through local community participation, institutional capacity building, and policy reform. The policy reforms are especially aimed at updating institutional arrangements to build a modern professional capacity in the FD, phase out subsidies on seedlings, and to support social forestry, including greater community involvement in forestry planning and implementation. Following extensive dialogue with the Bank during Project implementation, the Government in September 1998 gave its approval of the FD's reorganization, and the Bank expects that all agreements made under the Forestry Sector Project will be met by March 1999.

<sup>1</sup> Loan No. 555-BAN: *Community Forestry Project*, for \$11 million, approved on 3 December 1981 and closed on 20 July 1988.

<sup>2</sup> Loan No. 0956-BAN: *Upazila Afforestation and Nursery Development Project*, for \$43.5 million, approved on 30 March 1989 and closed on 31 December 1995.

25. Closely coordinating with the Bank's activities, the World Bank has assisted the forestry sector in Bangladesh since 1980. Its first loan was for the Mangrove Afforestation Project, aimed at afforestation of about 40,000 hectares (ha) along the Bay of Bengal, followed by the Second Forestry Project aimed at maintaining existing plantations and establishing 40,000 ha of mangrove plantations and 23,000 ha of industrial plantations on newly accreted land along the southern coast; developing management capability; establishing a resource information management system; and strengthening institutions, including educational institutions. The ongoing FRMP, 1992-2000, concentrates on developing forest management plans and strengthening the database for forestry activities. The most recent World Bank initiative is the Coastal Embankment Rehabilitation Project (1996-2002). The United Nations Development Programme and FAO have provided eight TAs to the forestry sector in Bangladesh over the last decade: of importance for the proposed Project was the one in 1992-1995 to the FD for the integrated resource management of the SRF and for the development of professional forestry education at the University of Chittagong. Further assistance has been provided by the World Food Programme and various bilateral agencies including the Swiss Agency for Development and Cooperation, the Norwegian Agency for Development Cooperation, and the Ford Foundation. Appendix 3 contains a list of previous external assistance projects in the forestry and biodiversity sectors.

## E. Lessons Learned

26. A review<sup>1</sup> of 23 integrated conservation and development projects in Asia, Latin America, and Africa drew the following key lessons: (i) implementing agencies must have clear legal authority over protected area boundaries, (ii) legal authority should be vested in a single agency, (iii) users must be involved in genuine decision-making concerning change and should not be treated as passive beneficiaries, (iv) budget allocations must realistically reflect goals, and (v) such projects require a long time to complete. In addition, projects that aim to conserve biodiversity in protected areas are likely to be most successful when they provide real and immediate alternative benefits to local people. Several lessons have emerged from ongoing Bank-financed integrated conservation and development projects in Indonesia:<sup>2</sup> in particular, they caution against a simplistic assumption about a direct relationship between improved biodiversity conservation and improved economic opportunities for the local population (i.e., the impact zone communities adjacent to the SRF). While economic growth is important, the need for a more collaborative and consultative approach that builds local institutional capacity and trust between stakeholders and institutions has been highlighted. Stress must be placed not only on the rights of local communities but on their responsibilities as well.

27. While the Forestry Sector Project took account of lessons learned in its design,<sup>3</sup> implementation of the recommendations was initially slow. Specifically, the project required that certain reforms in institutional and technical aspects of peoples' participation in forestry be undertaken, which included (i) setting up a tree-farming fund at the level of local community organizations; (ii) cost recovery in seedling production and replanting operations; (iii)

<sup>1</sup> Wells M. and Brandon K. 1993. The Principles and Practices of Buffer Zones and Local Participation in Biodiversity Conservation. *Ambio*. 22 (2-3): 157-62, cited in TA No. 2724-BAN. Feasibility Study, *Final Report*, October 1997.

<sup>2</sup> Loan No. 1187-INO: *Biodiversity Conservation in Flores and Siberut*, for \$24.5 million, approved on 12 November 1992, Loan No. 1351-INO: *Sulawesi Rainfed Agriculture Development*, for \$30.36 million, approved on 31 January 1995, and Loan No. 1378-INO: *Farmer Managed Irrigation Systems*, for \$26.30 million, approved on 21 September 1995.

<sup>3</sup> Including from the Community Forestry Project, as indicated in the Project Completion Report and the Project Performance Audit Report and endorsed in the Bank's *Country Synthesis of Postevaluation Findings in Bangladesh* (October 1997), the Project Completion Report for the Upazila Afforestation and Nursery Development Project and the *Forestry Sector Synthesis of Postevaluation Findings* (August 1994).

establishment of an apex body with NGO representation as a means to enhance NGO participation, monitor progress, increase transparency, and resolve conflicts; and (iv) institutionalizing the role of NGOs in forestry. While satisfactory preliminary actions on most of these reforms has been taken, it is absolutely essential that the reforms be implemented in the field to provide an appropriate institutional setting for participatory approaches to forestry in the country and pave the way for further international assistance, including assistance from the Bank.

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

28. The Bank's operational strategy for Bangladesh focuses on poverty reduction, a priority in line with the Government's development objective. This is to be achieved by concentrating on three strategic thrusts over the medium term: (i) promoting a faster rate of efficient economic growth through greater market orientation, augmentation of domestic resource mobilization, accelerated human development, and improved physical infrastructure; (ii) enhancing access for the poor to the employment opportunities generated by growth through improved health, education, training, population planning, basic services, and credit; and (iii) improving and protecting the environment by addressing the physical and human consequences of poverty as well as natural resource management.

29. The Bank's Policy on Forestry,<sup>1</sup> is founded on three basic principles: protection, production, and participation. The Bank's Policy on Fisheries<sup>2</sup> recognizes the increasingly important role that fisheries and aquatic resources play in food security. The participatory approach is emphasized as a necessary step toward sustainable development under both of these policies. The degree to which customary land rights and land tenure of forest dwelling and/or forest-dependent communities are satisfactory, and the need to develop and strengthen mechanisms by which these communities can be involved in land-use decisions are key areas under the forestry policy that the Project will address. Capacity building for integrated conservation, development, and resource management is seen by the Bank as an important aspect of reform. In the SRF, expanded institutional capacity to manage fisheries and aquatic resources is essential to the Project, as fisheries conservation and management in the SRF rests with the FD, not with the Fisheries Department. The involvement of village officials, school teachers, NGOs, educational organizations, elected local bodies, and other agencies will be encouraged, in line with Bank policies.

30. Given the high degree of dependence of impact zone communities on forest products and fisheries, the strategy for biodiversity conservation has to address the following key issues: (i) avoidance of mangrove habitat destruction, and the rejuvenation of mangrove habitats through reforestation; (ii) conservation of coastal fisheries, and minimizing the impacts of destructive fishing and pollution; and (iii) policy support for development of long-term sustainable natural resource use and integrated conservation management with emphasis on biodiversity conservation. The Bank's policies on forestry and fisheries guided the design of the Project, particularly because of the economic importance of these sectors to the SRF.

## **G. Policy Dialogue**

31. Ongoing policy dialogue with the Government has been a feature of the Bank's role in Bangladesh for many years in the forestry, fisheries, and environment sectors. Policy dialogue during Project preparation has so far focused on several key areas:

<sup>1</sup> R232-94. *ADB Forestry Policy* (Revision 1), February 1995.

<sup>2</sup> *The Bank's Policy on Fisheries*, October 1997.

- (i) **Outstanding conditionalities under the Forestry Sector Project.** Amendment of the Forest Act of 1927 and institutional reforms will be conditions of loan disbursement. The proposed amendments to the Forest Act were approved by the Cabinet in principle in September 1998, and final approval by the Government of the changes is expected by December 1998. In September, the Government also approved reorganization of the FD, and provided the core professional staff needed for effective functioning.
- (ii) **Sustainable management criteria for the SRF.** For forestry, fisheries, and other aquatic resources (all of which are currently overexploited) as well as for other biological resources, the Project will undertake baseline assessments from which sustainable management criteria and conservation plans will be prepared, reviewed with stakeholders, and implemented. The recently published forest inventory for the SRF draws comparisons with similar inventories undertaken in 1959 and 1983 (para. 7). The reduction in the standing volume of key forest species, due mostly to overexploitation, is now understood by the Government, as is the urgency of finding a viable solution. For wood products it has been agreed to (a) rebuild stocks by significantly reducing harvests, and increasing license fees for access to SRF resources to economic levels but without completely shutting down access to resources; (b) closely supervise all timber-felling operations; (c) introduce immediate curbs on illegal and destructive practices; and (d) identify, if possible, a solution to *Sundri* top-dying. For nonwood forest products strict limits and harvesting controls will be defined on the basis of yet to be completed FRMP studies, and additional work by the Project. Careful planning for primarily water-based ecotourism and setting tourist charges based on market-determined rates will also be done.
- (iii) **Phasing out the use of Gewa by KNM.** The Government has agreed to significant reductions in the annual allowable cut, in line with sustainable limits, and to completely phasing out the use of Gewa by KNM over a four-year period. A Bank-financed consultancy study of the options for KNM (para.19) has already demonstrated the financial viability of using imported waste for recycling as the source of pulp for newsprint manufacture. Bank support is proposed through an advisory TA to further analyze and develop options for KNM (para. 93). The Government acknowledges that commercialization is vital and that eventual privatization may prove possible, but it is reluctant at present to consider the closure option, which will also be analyzed by the accompanying TA. Following the TA in the first year of the Project, if the Government and the Bank agree that continued operations at KNM are feasible, Nordic Development Fund financing will become available to construct an effluent treatment plant (para. 57), which would introduce controls on effluent disposal for the first time at KNM.
- (iv) **Impact zone strategy.** The Government realizes that, without active and consultative user-group participation, effective management of the SRF cannot be achieved. The Bank and the Government have worked together to devise a strategy to promote conservation-friendly practices. Improving the knowledge and organizational capacity of local communities, and working largely through selected NGOs, the Project will raise conservation awareness, organize SRF resource users into stakeholder groups, provide training and microcredit to support alternative sources of income, and implement social development programs. The Project will also foster links between the FD, LGED, other

Government programs, and community groups to promote conservation and expand access to other programs of socioeconomic development.

- (v) **Transparency and accountability in SRF management.** The Bank and the Government together devised the reforms required to enable greater public awareness of the importance of the SRF in Bangladesh and accountability for its management.<sup>1</sup> The Project will establish improved management systems and equipment backed up by professional inspection services, and independent conservation monitoring by an international NGO specializing in natural resource and biodiversity conservation. In addition, it has been agreed that a Sundarbans stewardship commission comprising key Government agencies and distinguished citizens will provide long-term vision and oversight, and will be established by decree and notification in the Government Gazette by December 1998. A stakeholder advisory council will also be set up under the Project provide a forum for the views of all stakeholders.

## H. Global Environment Facility

32. The Global Environment Facility (GEF) operates as a financial mechanism for activities aimed at protecting the global environment. Although clearly committed to the conservation of the globally important biodiversity of the area, the main priority of the Government is the reduction of rural poverty and the development of alternative sources of income for the 3.5 million people that live in the impact zone. In addition, it is in the best national interest to attain sustainable levels of natural resource utilization within the SRF. If this natural resource base continues to deteriorate, poverty and social conflict will increase. Under the Project, the GEF will support activities that complement and build upon these objectives. The GEF support will strengthen the Government's capacity for biodiversity management over the long term, and assist the Government to implement its commitments under the Convention on Biological Diversity.<sup>2</sup> It will ensure the consolidation and protection of the three wildlife sanctuaries, which are the highest priorities from a biodiversity perspective. In the rest of the SRF, the GEF support will help ensure that biodiversity considerations are incorporated in sustainable forestry and fisheries activities and plans, as well as to undertake independent conservation monitoring. In addition, it will support full participation of all stakeholders in the dialogue to ensure biodiversity conservation while maximizing sustainable resource extraction. The GEF's role in the Project (Appendix 4) will be in line with its Biological Diversity Operational Program in coastal, marine and freshwater ecosystems, and forest ecosystems.

## I. World Conservation Union

33. Founded in 1948, the World Conservation Union (IUCN) brings together government agencies and a diverse range of NGOs in a unique membership. The mission of IUCN is to influence, encourage, and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. Bangladesh joined IUCN as a state member in 1973. IUCN began a working association with Bangladesh in the mid-1980s with participation in important Government efforts to prepare a conservation strategy. An IUCN country office was established in 1991 to support the Government and NGOs on biodiversity conservation and sustainable

<sup>1</sup> The importance of public involvement and awareness is well illustrated in McNeely, Jeffrey A. 1998. *Mobilizing Broader Support for Asia's Biodiversity: How Civil Society Can Contribute to Protected Area Management*. Asian Development Bank.

<sup>2</sup> The Convention on Biological Diversity was ratified by the Government on 3 May 1994.

uses. The Project is an opportunity for IUCN to apply its technical expertise in biodiversity conservation monitoring in Bangladesh. IUCN's role in the Project will be to undertake independent conservation monitoring, and to prepare an annual environmental status report on the SRF.

#### IV. THE PROPOSED PROJECT

##### A. Rationale

34. The Sundarbans offers coastal protection to southwest Bangladesh, and is the world's largest remaining contiguous mangrove area. Within Bangladesh the SRF is a globally important ecosystem that includes habitats for fish, shrimp, birds, and other wildlife such as the endangered Bengal tiger. It also offers tourism and recreation benefits. The SRF is increasingly used by rural communities who live mainly in the 0-20 km zone along the northern and eastern border, and by commercial wood processors. Artisanal fisherfolk and industrial fishing vessels from the Bay of Bengal use the area in steadily growing numbers. Poverty in the impact zone is increasing due to population growth; as a result of conversion of agricultural land to shrimp ponds by landowners, impact zone communities are turning to the SRF as their major source of subsistence and income. Under the constitution of Bangladesh, the FD is responsible for management of the SRF; however, it is inadequately staffed and trained, and has inadequate budgetary resources to perform the task. The FD urgently needs to be modernized from a single-sector forestry institution to one capable of managing a multidimensional resource. The combination of increasing pressure from various users and inadequate management and control is directly causing depletion of the SRF's resources.

35. To stop resource depletion and loss of biodiversity will require additional financial resources, a significant improvement in institutional capacity, and a changed management approach based on appropriate research, community involvement, and scientific planning. Ways to ensure the financial sustainability of the conservation of the SRF also need to be found. The Government, in requesting assistance to facilitate these changes, has expressed its willingness to (i) adopt sustainable management criteria, including user charges that are set on an economic basis; (ii) closely collaborate with stakeholders using an integrated conservation and development approach; (iii) introduce institutional changes for improving management capacity and monitoring; and (iv) promote economic development and reduce poverty in the 17 *thanas* in the impact zone, which are heavily dependent upon the SRF for subsistence.<sup>1</sup> The Project will enable Bangladesh, a signatory to the Convention on Biological Diversity (1992), to gain access to additional resources and state-of-the-art technology in the field of biodiversity conservation, ensuring that the SRF retains the unique place in the world that it deserves.

##### B. Objectives and Scope

36. The overall objective is to develop a sustainable management and biodiversity conservation system for all SRF resources on the basis of rational plans and the participation of all key stakeholders. To achieve this objective, the Project will target (i) improved institutional capacity to manage the SRF; (ii) adoption of biodiversity conservation and sustainable resource management measures; (iii) reduction in the poverty level of the 3.5 million people living in the

<sup>1</sup> The Project *thanas* are Assasuni, Bandaria, Banma, Batiaghata, Borguna, Dacope, Kaliganj, Koyra, Mongla, Morrelganj, Mothbaria, Naserabad, Paikgacha, Pathergatha, Rampal, Sarankhola, and Syamnagar. The World Food Programme's Vulnerable Group Development Program Relative Food Insecurity Indicators, a commonly used composite index of relative poverty, groups the *thanas* as follows: 5 in the very high poverty category, 6 in the high category, 3 each in the moderate poverty and generally low poverty category. Some traditional SRF users visit for seasonal activities (mainly fishing) from as far as Chittagong.



impact zone through expanded economic opportunities, improved social infrastructure, improved organization for resource users, and facilitated stakeholder participation in resource management; (iv) ecotourism and environmental awareness programs, as well as basic public infrastructure and training; (v) significantly improved planning, monitoring, and applied research capacity; and (vi) reduction of pollution by effluents from KNM. The Project will promote a supportive set of policies, such as setting prices at economic values for access to SRF resources.

37. The Project area will be physically divided into four zones: (i) a production zone of the SRF to be managed for sustainable production of terrestrial and aquatic species;<sup>1</sup> (ii) a sanctuary zone of the SRF, covering the three existing wildlife sanctuaries, where only nonconsumptive uses (e.g., ecotourism) will be allowed; (iii) the impact zone, comprising the 17 *thanas* surrounding the SRF in Bagerhat, Borguna, Khulna, Pirojpur, and Sathkira districts; and (iv) a marine zone, covering the area inside the 20 km limit off-shore in the Bay of Bengal, which currently supports fisheries but also includes protected marine and terrestrial biodiversity, and where new islands often accrete. In total it is anticipated that about 170,000 households will be involved in the Project-supported rural development programs.<sup>2</sup>

## **1. Project Components**

38. The Project will consist of six parts, and will include an advisory TA to address the problems associated with KNM (paras. 57 and 93).

### **a. Part A: Effective Organization of the SRF**

39. Restructuring and strengthening the FD's organization and operations based at Khulna is fundamental to sustainable management of the SRF. (Appendix 5 provides the proposed institutional framework.) Part A will focus on establishing organizational capacity for sustainable management and on upgrading the infrastructure to make this possible. For example, a Project office will be provided, including a laboratory and related facilities, and the FD's dockyard in Khulna will be upgraded for vessel maintenance. Rehabilitation of other related FD infrastructure in Khulna, upgrading the FD's boats for patrolling and other operations, and provision of related equipment will be also be undertaken. Organizational capacity will be built up primarily through the establishment of three bodies, described as follows.

#### **i. Sundarbans Management Unit**

40. A Sundarbans management unit (SMU) will be established within the FD's new structure to make the critical transition to integrated natural resources management. The SMU will be the administrative vehicle for support services required for Project implementation, including contractual arrangements for environmental monitoring and inspection services. It will be headed by an appropriately qualified chief executive officer (Project director), equivalent to the rank of deputy chief conservator of forests.

41. Policy making will be through the Integrated Resource Management Policy/Program Committee, comprising the Project director, the head of the operational circle (para. 42), and the heads of the four functional units, namely the Liaison, Extension, and Education Unit; the Revenue Unit; the Administration, Finance, and Support Services Unit; and the

<sup>1</sup> With appropriate controls for protected species.

<sup>2</sup> Assuming that, on average, two persons per household will receive training and other benefits, a total of approximately 340,000 people will be directly involved.

Database Management, Monitoring, and Research Operations Unit. The Project will assist in reorganizing, modernizing, and strengthening administrative capabilities, and upgrading the present staff to the category of a full-service support group. The Project will also support establishment of an institutionalized database linkage to the existing Resource Information Management System.

42. Inside the SRF, a Sundarbans operations circle will have jurisdiction over the terrestrial forest and aquatic resources.<sup>1</sup> The terrestrial production zone will be reconstituted into two divisions, East Sundarbans (Mongla) and West Sundarbans (Khulna), with responsibility for the management of all wood and nonwood resources. Major attention will be placed on rehabilitation and supervision of forest resources utilization. Field operations will also be supported by improved communications, water transport, and related equipment.

43. The Sundarbans operations circle will comprise two divisions. The aquatic resources division will be responsible for all operations of aquatic resources management including development and implementation of aquatic resources management plans, and enforcement of aquatic and fisheries regulations based on sustainable resource utilization criteria, survey data, and analysis undertaken by the Project. The wildlife conservation and tourism promotion division will develop and implement wildlife resources management plans and enforce wildlife regulations based on sustainable management criteria, survey data, and analysis undertaken by the Project. It will also promote sustainable tourism.

## **ii. Sundarbans Stewardship Commission**

44. Oversight and long-term policy issues will be addressed through a Sundarbans stewardship commission (SSC). It will be chaired by the minister of environment and forests and will have up to 18 members who are representatives of key public and private sector institutions, and citizens chosen for their concern for the future of the SRF but without direct, vested interests in the outcome of management decision making. The SSC will be tasked with a long-term policy and advocacy role in protecting the Sundarbans from adverse external impacts caused by decision making by the Government, companies, or other influences that could affect the integrity of the ecosystem. The SSC is expected to be able to communicate with the Parliament and the National Environment Council in policy matters requiring high-level attention. A small secretariat, provided by MOEF, will prepare studies and policy briefs for SSC consideration and endorsement by Government. The SSC will receive regular reports from IUCN, which is expected to undertake independent conservation monitoring; IUCN will also prepare the annual "State of the Sundarbans" report, which will address the environmental status of the SRF. The SSC will be established by Government decree.

## **iii. Stakeholder Advisory Council**

45. The Project will institutionalize the present informal dialogue with the many stakeholders who have a genuine interest in the SRF. The Project will assist local NGOs in organizing local user groups to represent the key stakeholders (including wood cutters, fisherfolk, shrimp fry collectors, honey collectors, tour operators, women's groups, fuelwood collectors, etc.) and to offer socioeconomic development opportunities, including provision of microcredit. Representatives of the various local user groups will form a stakeholders advisory council (SAC) that will work with the SMU. Membership of the SAC will remain flexible to allow representatives of user groups to join as they become organized. The liaison, extension, and education unit of the SMU will be the link through which the SAC will communicate with the

<sup>1</sup> A forestry circle is the largest unit of territorial administration used by the FD.

SMU. In order to effectively project the views of the SAC, a representative of the SAC will also be a member of the SSC.

**b. Part B: Biodiversity Conservation and Sustainable Resource Management**

46. To effectively manage the forest, aquatic and wildlife resources of the SRF, the Project will adequately equip and assist the FD. A technical advisory group (TAG) will assist operational staff in preparing and applying targets for sustainable use of all key resources (para. 53). The four principal areas of activity under Part B are described below.

47. **Forest Resources.** FRMP forest inventories will be reviewed, and the Project will update them where necessary to develop a baseline for deriving sustainable targets for off-take of timber and nontimber forest resources, and for future planning. Curbs on illegal harvests and enforcement of regulations will be implemented and supported by expanded FD operational facilities, training and supervision to ensure that forest harvests fall within sustainable limits, and that conservation practices are followed. A total of about 17,000 ha will be covered by enrichment plantings and assisted in actual regeneration of key forest species, as well as silviculture trials and sampling plots. Patrols and improved monitoring operations will be supported in accordance with management plans.

48. **Aquatic Resources.** Strengthening the capacity of the FD to effectively manage the SRF's aquatic resources will require baseline assessments of selected stocks, analysis of existing exploitation levels, and better understanding of the habitats of endangered species. From these assessments comprehensive fisheries management plans will be developed, including sustainable use criteria. Regular patrols will ensure that the plans are implemented and that SRF fisherfolk are fully aware of modern fisheries management and conservation practices. Regulations, enforcement methods, and ways of working in cooperation with resource users will be introduced. The Project will train FD staff in all aspects of fisheries and aquatic resources management, including conservation awareness, and appropriate gear and catching methods.

49. **Wildlife Resources.** As there is little current understanding of wildlife populations including how to protect their habitats, how best to conserve existing stocks, or how to reintroduce recently extirpated species, wildlife management represents a significant challenge for the Government. Although protection of all wildlife is nominally undertaken by the FD throughout the SRF, and especially in the three existing wildlife sanctuaries, poaching is common. The Project will develop an approach that integrates the needs of all four zones of the Project area (the production zone, the sanctuary zone, the impact zone, and in the offshore marine zone). The Project will evaluate the FRMP's conservation plan for the sanctuaries<sup>1</sup> and further develop specific interventions.<sup>2</sup> The role of tourism (para. 52) is closely linked to wildlife conservation, and therefore will be carefully considered in the Project and integrated into overall conservation management plans.

50. **Integrated Conservation Management Planning.** Based on the plans for forestry, aquatic resources, wildlife, and tourism (para. 52), an integrated conservation management plan will be developed, including an overall zoning scheme for the SRF, and will

<sup>1</sup> *The Conservation Management Plan of the Wildlife Sanctuaries of the Sundarbans Reserved Forest*, Final FRMP Report, August 1997.

<sup>2</sup> One of the changes required will be the establishment of a transition zone, or corridor, between the South and East sanctuaries to protect wildlife and wildlife habitat while allowing nonextractive human use.

be rigorously implemented. Project staff will liaise with the management of the Sundarbans in West Bengal (India) to coordinate conservation efforts.

**c. Part C: Socioeconomic Development of the Impact Zone**

51. The Project will follow a two-pronged approach in the impact zone. First, it will work through NGOs to organize resource users/extractors into viable groups that will then (i) participate in SRF-related planning and implementation of activities; (ii) regulate their own extraction practices (according to agreed norms set up in consultation with the SMU) and stop unsustainable practices; and (iii) gain access to new sources of microfinance services from the Palli Karma-Sahayak Foundation (PKSF), as well as improved access to markets. Second, the Project will support livelihood development activities through community-based groups. Resource user groups will also enjoy improved access to social services and rural infrastructure through community-based planning and implementation, supported by the Project with the assistance of LGED. The TAG's expertise will also assist to implement the Project's impact zone strategy. The Project will improve social conditions and reduce the poverty of approximately 170,000 households by providing, for example, clean drinking water facilities, sanitation, rural roads, and improved access to formal and informal education. Alternative income-earning activities that have proved to be effective in reducing poverty in Bangladesh, e.g., apiculture, poultry, and handicrafts, will be encouraged to reduce dependency on the SRF. The SMU, working through selected NGOs, will promote the social forestry activities in the impact zone.

**d. Part D: Ecotourism and Environmental Awareness**

52. The Project will provide local communities with training and material support to become meaningfully involved in Sundarbans tourism, both as economic beneficiaries and ecotourism managers. Assistance will be provided to the FD, in close consultation with all stakeholders, to prepare and implement a tourism management plan that carefully regulates SRF tourism in a phased manner, using the results of environmental monitoring and evaluation. With the assistance of the TAG, the Project will organize a local tourism partnership, involving the FD, the Bangladesh Parjatan Corporation, and private operators to assist in plan preparation and implementation, prepare tourism promotional strategies, and train staff. Public environmental awareness activities will include support for a Public Information and Education Center, which may be leased on a cost-sharing basis with a suitable organization in Khulna, mangrove interpretation sites, and media campaigns. The Project will also construct and upgrade basic public infrastructure, e.g., jetties, wildlife observation towers, information boards, facilities for waste disposal in carefully selected locations, and related services. The Project will also establish an Internet website for exchanging information on the Sundarbans, including news on ecotourism opportunities. The TAG will also provide advice on an appropriate tourist fees structure.

**e. Part E: Technical Advisory Group, Monitoring, and Research Studies**

53. **Technical Advisory Group (TAG).** The TAG will focus on improved overall administration and management, integrated conservation management planning (including terrestrial resources and aquatic resources) and plan implementation, and ecotourism, environmental awareness, and impact zone development. The TAG will (i) establish baseline information and criteria for sustainable practices, draft forestry, aquatic resources, wildlife and tourism sector plans and integrated conservation and management plans, and assist in developing a self-sustaining management system, including the development of market-based instruments for access to SRF resources; (ii) help the FD retrain its staff and help focus its

activities to more effectively conserve the SRF and serve the needs of its primary stakeholders; and (iii) train resource users and community representatives to engage in ecotourism-related activities. Specific training and support will also be included for FD, LGED, and NGO staff with respect to organization of resource users into groups, women in development issues, and specific conservation issues. The TAG will require 381 person-months (240 person-months of international and 141 person-months of domestic) of consulting services (Appendix 6).

54. **Conservation Monitoring.** To maintain a high level of both national and international credibility regarding the quality of the environment and the sustainability of SRF resource use, external monitoring will be undertaken by IUCN. IUCN will also prepare an independent annual "State of the Sundarbans" report. Hydrological aspects of the SRF and its upstream catchments will also be studied for pollution monitoring and control and for development of a remote sensing system for monitoring ecological changes.

55. To further enforce environmental management safeguards, it is proposed to initially engage a suitably qualified firm offering inspection services to an international standard to assist in designing an independent certification and inspection system. This firm will advise on the establishment of a system for checking on the issuance of permits, verification of revenue collections, and adherence to utilization rules. The firm will report to the SSC. Following consideration of the report and consultations with the SMU, the SSC will recommend an appropriate and permanent capacity for this work, probably in the form of a small certification and inspection unit.

56. **Research Studies.** Research studies and analysis by the TAG, other consultants, and contracted agencies in Bangladesh will be undertaken on topics critical to the development of sustainable management strategies and operations in the SRF. These will include (i) forestry research into *Sundri* top-dying disease to assist in understanding and possibly counteracting the widespread natural degeneration, as well as research into mangrove regeneration, habitat adaptability, and regeneration (ii) studies of animal ecology as inputs for wildlife planning; and (iii) studies of visitors for ecotourism planning. Summary information on the scope of this work is in Appendix 6.

#### **f. Part F: Khulna Newsprint Mills Effluent Treatment**

57. To reduce industrial pollution from KNM, effluent treatment and sludge handling/disposal equipment and related technical services are required at KNM. Following the advisory TA proposed for review of KNM's operations and identification of alternatives to using Gewa, a decision will be made by the Bank and the Nordic Development Fund in consultation with Government regarding Project support for effluent treatment.

### **2. The Role of the GEF**

58. The GEF will contribute to five of the six Project components. The TAG will be an important vehicle for the GEF's contribution, as well as for the Project overall. The GEF will participate in the Project by supporting (i) institutional capacity building related to mainstreaming biodiversity conservation; (ii) sustainable forestry, fisheries, and wildlife resource management; (iii) scientific advice to the Project on biodiversity conservation and ecotourism; and (iv) environmental awareness and sustainable ecotourism investments. A summary of the GEF's role in the Project is presented in Appendix 4.

## C. Cost Estimates

59. The Project cost is estimated at \$82.2 million, comprising about \$27.7 million (34 percent) in foreign exchange including \$1.2 million for the service charge for the Bank loan, and approximately \$54.5 million equivalent (66 percent) for local currency costs (Table 1). Further details of the Project costs are provided in Appendix 7.

**Table 1: Project Cost Estimates**  
(\$ million)

Component	Foreign Exchange	Local Currency	Total Cost
<b>A. Base Cost</b>			
1. Part A: Effective Organization of the Sundarbans Reserved Forest	4.0	9.5	13.5
2. Part B: Biodiversity Conservation and Sustainable Resource Management	3.9	9.4	13.3
3. Part C: Socioeconomic Development in Impact Zone	2.1	22.6	24.7
4. Part D: Ecotourism and Environmental Awareness	0.9	1.8	2.7
5. Part E: Technical Advisory Group, Monitoring, and Research Studies	8.8	0.8	9.5
6. Part F: Khulna Newsprint Mills Effluent Treatment Plant	3.1	1.3	4.4
<b>Subtotal (A)</b>	<b>22.8</b>	<b>45.2</b>	<b>68.1</b>
<b>B. Contingencies</b>			
1. Physical Contingencies <sup>a</sup>	2.1	2.4	4.5
2. Price Escalation <sup>b</sup>	1.6	6.9	8.4
<b>Subtotal (B)</b>	<b>3.7</b>	<b>9.2</b>	<b>12.9</b>
<b>C. Service Charge on Bank Loan</b>	<b>1.2</b>	<b>-</b>	<b>1.2</b>
<b>Total</b>	<b>27.7</b>	<b>54.5<sup>c</sup></b>	<b>82.2</b>

<sup>a</sup> Based on 10 percent of base cost for most items, not including credit amount in Part C.

<sup>b</sup> Based on annual escalation factors of 2.5 percent (foreign); 5 percent (1998), and 4.5 percent thereafter (local).

<sup>c</sup> Includes duties and taxes estimated at \$6.8 million.

Note: Figures may not add up to totals because of rounding.

## D. Financing Plan

60. Details of the financing plan are shown in Appendix 7. A loan from the Bank's Special Funds resources in an amount of \$37.0 million equivalent is proposed to finance approximately \$15.6 million in foreign exchange costs (56 percent of total foreign exchange costs), and \$21.4 million equivalent of local currency costs (39 percent of total local currency costs). The loan will have a repayment period of 40 years, including a grace period of 10 years, and a service charge of 1 percent per year (Table 2).

61. The GEF will cofinance the Project through a grant that will be administered by the Bank.<sup>1</sup> A Memorandum of Agreement between the Bank and the World Bank (acting as trustee for the GEF grant) has been drawn up. The GEF grant will be in an amount not exceeding \$12.2 million, of which \$8.6 million is in foreign exchange (31 percent of total foreign exchange costs) and \$3.6 million equivalent in local currency costs (7 percent of total local costs). Subject to the outcome of the TA, the Nordic Development Fund has indicated its intention to cofinance the Project through parallel financing in an amount equivalent to \$4.5 million, of which \$3.5 million is in foreign exchange costs, and \$1.0 million equivalent in local currency costs (2 percent of total local costs).

62. The Government will finance 30 percent of the local currency costs by contributing the equivalent of \$16.1 million (20 percent of total Project costs). PKSf will contribute its own funds for microcredit for alternative income-generation activities and planned resource extraction activities—through participating NGOs that meet its criteria for partner organizations—equivalent to \$6.8 million (8 percent of Project costs). Beneficiaries will

<sup>1</sup> GEF financing is subject to final endorsement by the GEF.

contribute the equivalent of \$3.7 million as equity for the income-generating activities in the impact zone. NGOs will contribute the equivalent of \$1.9 million (over 2 percent of Project costs).

**Table 2: Financing Plan**  
(\$ million)

Source	Foreign Exchange	Local Currency	Total Cost	Percent
Bank	15.6	21.4	37.0	45.0
Government	-	16.1	16.1	19.6
Global Environment Facility	8.6	3.6	12.2	14.8
Nordic Development Fund <sup>a</sup>	3.5	1.0	4.5	5.5
Palli Karma-Sahayak Foundation	-	6.8	6.8	8.3
Beneficiaries	-	3.7	3.7	4.5
Nongovernment Organizations	-	1.9	1.9	2.3
<b>Total</b>	<b>27.7</b>	<b>54.5</b>	<b>82.2</b>	<b>100.0</b>

<sup>a</sup> Subject to the outcome of the advisory technical assistance.

63. Bangladesh's fiscal circumstances warrant continued Bank assistance to meet the local currency costs of development projects, including this Project. Since the early 1990s, the Government has been carrying out a comprehensive program of structural reforms to liberalize the foreign trade and exchange rate regimes, restructure the industrial sector, strengthen fiscal and monetary management, encourage private sector participation, and privatize State-owned enterprises. As a result, macroeconomic stability has been gradually restored with a higher growth rate, lower inflation rates, smaller fiscal and current account deficits, and higher exports. Despite these improvements, the pace of reforms is slow, and macroeconomic stability remains fragile. Recent major flooding has displaced millions of people, and significantly damaged infrastructure and agriculture lands, and could have severe impacts on short-term economic growth, widening fiscal and current account deficits and increasing inflation.

64. These matters continue to be the subject of dialogue with the Bank. The Government needs to make stronger efforts, but the pressures it must deal with also merit recognition. More importantly, Bangladesh remains a Group A country with structural constraints on stronger resource mobilization efforts. The social and economic circumstances of the country warrant continued Bank financing of local costs.

## **E. Implementation Arrangements**

### **1. Project Organization and Management**

65. As the Government agency legally responsible for administering the SRF, the FD will be the Executing Agency for the Project. The SMU will be set up within the FD and be based at Khulna. It will have the overall responsibility for administration, implementation, monitoring, reporting, and coordination of activities in the SRF and the impact zone. The Government will appoint an appropriately qualified full-time chief executive officer (Project director) acceptable to the Bank and funded under the Bank loan.<sup>1</sup> The Project director will have adequate delegated responsibility and authority to manage the Project personnel and Project funds, including recruitment of consultants and contract negotiations within the existing

<sup>1</sup> The candidates for this position must have appropriate university-level qualifications and extensive experience in the implementation of foreign-assisted projects. All senior Project staff will be selected on the basis of eligibility criteria agreed upon with the Bank.

regulations of the Government of Bangladesh. A key advantage of this approach is that decision-making authority will be available locally through delegation, and not centralized in Dhaka. The Surface Water Modeling Center, based in Dhaka, will monitor water quality. Close coordination between the SMU, participating NGOs, PKSf, and LGED will be required for organization and management of the Project. The SMU will maintain close and effective links with IUCN (responsible for independent conservation monitoring), the SSC, the SAC, and other key institutions.

66. LGED will be the lead agency in the impact zone responsible for the rural social infrastructure development program. For microcredit services to support microenterprise development in the impact zone, PKSf will take the leading role in selecting and supervising NGO microcredit activities.

67. The implementation arrangements for the impact zone are based upon the cooperation arrangements between the FD, the Association of Development Agencies in Bangladesh (ADAB), and the Bank under the Bank-assisted Forestry Sector Project, except for the infrastructure development program and microcredit services. The Khulna chapter of ADAB will coordinate the consensus-building process among local and national NGOs regarding selection of areas and programs to be implemented by NGOs. Proposals will be finalized by the ADAB Khulna chapter in consultation with ADAB Dhaka, to be discussed with and approved by the SMU.

## **2. Coordination Arrangements**

68. A Project coordination committee will be organized in Khulna to provide technical and management guidance to the Project. It will be headed by the Project director; and its members will include senior officials from the FD, PKSf, the participating NGOs, and LGED. The committee will meet at least quarterly. Close coordination and cooperation between participating NGOs, LGED, and the FD is critical to the success of the Project. A Project office will be established at Khulna, and a small liaison office will also be set up at FD headquarters in Dhaka. To ensure transparency and address grievances, including for example matters relating to NGO selection, a Project Steering Committee will be set up in Dhaka. It will be headed by the secretary of MOEF, and comprise the Project director and representatives of FD, PKSf, participating NGOs, and LGED.

69. At the *thana* level coordination will be provided by a *Thana* coordination committee chaired by the *Thana Nirbahi* officer, with representatives from NGOs and local concerned government agencies such as LGED and FD. This committee will meet on a monthly basis and will coordinate the implementation of Project activities, review problems that may arise, and report to the Project Coordination Committee at Khulna. PKSf will be the implementing agency for microcredit activities under the Project. The assistant conservator of forests (social forestry) will also be a member of the *Thana* coordination committee.

## **3. The Impact Zone**

70. In the impact zone the Project will place emphasis on working with NGOs and local communities in developing environmentally substantial microenterprises and tourism. A two-pronged impact zone strategy will be built on a close partnership between local SRF-dependent communities and SRF resource users/extractors, NGOs working in the area, NGOs at the national level, the SMU, and other stakeholders. NGOs will be primarily responsible for social mobilization, group formation, and training through service contracts with the SMU. Project activities will be started at the village level by NGOs, which will be fully familiarized with



the Project approach at a start-up workshop to be organized by ADAB's Khulna chapter. There will be four stages of social development implementation, as set out in para. 101. The social infrastructure program and microcredit services in the impact zone will be implemented through LGED and PKSf, respectively, as mentioned above in para. 66.

#### **4. Microcredit Lending Terms and Conditions**

71. From its own resources and established criteria, PKSf will lend to participating NGOs at an interest rate of not more than 6.25 percent per annum, as determined under previous World Bank and Bank-financed projects. Participating NGOs will pass on the proceeds of the loan from PKSf for relevant activities and microenterprises at the prevailing market rate (currently 16-20 percent), keeping a margin of 10-13 percent to cover the relatively high costs of social mobilization, group formation and social awareness training, skills training, monitoring of loan collection and extension activities, other operating costs, allowance for bad debts, and profit. Under PKSf's current guidelines, annual service charged rates to partner organizations are in the range of 2-5 percent, and rates charged by partner organizations to the final borrowers are based on market rates.<sup>1</sup>

#### **5. Implementation Schedule**

72. The Project will be implemented over a period of seven years and is expected to be completed by June 2006. Consultant recruitment for the TAG will be an important activity in the first year, as will training of FD, LGED, PKSf, and other staff; NGO selection; the commencement of participatory processes; and arrangements for construction of the SMU office and other Project-supported infrastructure. For microcredit in the impact zone, some larger NGOs and PKSf already have considerable relevant experience with a range of small-scale enterprises suitable for poverty reduction, including training programs, and they have adequate technical staff. By the beginning of year four, a comprehensive midterm review of the Project will be carried out (Appendix 8).

#### **6. Procurement of Goods and Services**

73. Procurement of goods and services will be in accordance with the Bank's *Guidelines for Procurement*. Supply contracts for materials, equipment, and vehicles required by the Project will be procured under international competitive bidding procedures if the contract is estimated to cost more than \$500,000 equivalent, and under international shopping procedures if the contract is \$500,000 equivalent or less. Each supply contract for materials, equipment, and vehicles estimated to cost less than \$50,000 equivalent will be by direct purchase. Civil works contracts, for example, for constructing the Project office for the SMU, observation towers, walkways, and jetties inside the SRF may be awarded by the FD, in accordance with any Government standard procurement procedures for local competitive bidding satisfactory to the Bank. Supply of inputs to small-scale village enterprise programs for the impact zone may be procured from local suppliers. Contracts for services such as local training or the production of specialized environmental education activities and extension material estimated to cost, in the aggregate, the equivalent of \$5,000 will be awarded by direct contracting arrangements with qualified domestic institutions acceptable to the Bank.

<sup>1</sup>

The current interest rate for small-scale poor farmers who are members of NGOs working with PKSf is 16 percent annually. The conditions are similar to those applied under the World Bank-financed Poverty Alleviation Micro-Finance Project (1996), and the Bank-financed Loan No. 1524-BAN: *Participatory Livestock Development Project*, for \$19.7 million, approved in June 1997. PKSf agreed to participate in the Project in a letter to the Bank of 15 September 1998.

## 7. Consulting Services, NGO Services, and Training

74. Substantial consulting services and training support through establishment of the TAG to (i) help the FD retrain its staff and refocus its activities to more effectively conserve the SRF and serve the needs of its primary stakeholders, and (ii) train communities to engage in ecotourism-related activities. The TAG will establish baseline information and sustainable practices, draft integrated conservation and management plans, and assist in developing a self-sustaining management system. Specific training and support will also be included under the Project for FD, LGED, and NGO staff with respect to organization of resource user groups, gender sensitization, women in development issues, and specific conservation issues for women and women's groups. IUCN will be contracted to undertake independent conservation monitoring activities. To provide the necessary specialized support through the TAG, 17 long-term consultancy positions are proposed, totaling 381 person-months of which about 240 person-months are for international consultants and about 141 person-months may be domestic consultants (Appendix 6). Additionally, about 48 person-months of short-term consultants will be required for independent conservation monitoring (36 person-months) and other priority work (12 person-months).

75. About 50 person-months of regional fellowships will be provided to train and develop a cadre of experienced staff who will help change attitudes in the FD and support participatory processes. In addition, the international consultants in the TAG will provide intensive in-country training for about 200 Project personnel as well as a training program in computerization and monitoring of Project activities. These fellowships and the in-country training program will be available to staff of FD, LGED, participating NGOs, PKSf, and members of the community. Selection criteria have been agreed between the Government and the Bank.

76. Under the loan, the Bank will finance 83 person-months of international consultants and 121 person-months of domestic consultants. The GEF will finance 193 person-months of international consultants (including 36 person-months for independent conservation monitoring), and 20 person-months of domestic consultants. The Bank will select, negotiate, and enter into contracts with consultants financed by the GEF grant in accordance with the Bank's *Guidelines on the Use of Consultants*. In the case of consultants financed by the Bank's loan, the Government has requested that, as an exception to the procedures set out in the Bank's *Guidelines on the Use of Consultants*, the Bank directly undertake the short-listing, evaluation, and ranking of consultants in consultation with the Government. Taking into account the number of consultants to be engaged and the necessity to accelerate the recruitment of consultants for this Project, the Bank has accepted this request. However, contract negotiations and signing of contracts for this Project will remain the Government's responsibility. As IUCN is well established in Bangladesh and known to be capable in the field of conservation monitoring, the Government and the Bank have agreed that IUCN will be engaged as the independent conservation monitoring agency. The NGOs will be selected according to the procedures and criteria agreed upon with the Bank under the Forestry Sector Project. However, for those NGOs utilizing microfinance, PKSf will select the NGO partner organizations according to the established criteria for microfinance.

## 8. Accounts, Reports, and Audit

77. The FD and LGED will maintain separate financial accounts under the Project. These accounts will be audited annually by an independent auditor acceptable to the Bank. The audited reports will be forwarded to the Bank not later than 12 months after the close of each fiscal year. In addition, the FD and LGED will furnish the Bank with semiannual progress reports during each year of Project implementation. The report for the six months ending 31 December each year will show the cumulative progress during the entire year. Within three months after

completion of the Project, FD, LGED, and PKSf will coordinate and prepare a Project completion report for submission to the Bank.

78. For the GEF grant, reporting will be in compliance with GEF requirements and will be undertaken by the Bank as agreed between the Bank and the World Bank in the Memorandum of Agreement signed by the respective parties.

## **9. Imprest Accounts**

79. To ensure effective Project implementation and timely disbursement of the loan, the Government will establish two imprest accounts in dollars in the Bangladesh Bank or in a commercial bank acceptable to Bangladesh Bank and the Bank upon loan effectiveness. The two imprest accounts—one for LGED and one for the FD—may be in a commercial bank acceptable to the Bangladesh Bank and the Bank. With these accounts, funds will be released to assist LGED and the FD in carrying out their respective responsibilities. The two accounts will be established, managed, replenished, and liquidated in accordance with the Bank's *Loan Disbursement Handbook* (June 1996) and detailed arrangements agreed upon by the Bank and the Government, as will the statement of expenditures procedures used to reimburse eligible expenditures for the Project and to liquidate advances into the two accounts.

## **10. Benefit Monitoring and Evaluation**

80. Three forms of monitoring and evaluation will be carried out by the Project to form an integrated system: (i) benefit monitoring and evaluation to be conducted according to the Bank's guidelines, responding to the administrative requirements of the Bank and the Government, and using TAG consultants reports, Project surveys, and NGO baseline studies to also comply with the GEF's requirements; (ii) performance monitoring utilizing the recording and evaluation systems already in place with PKSf; and (iii) independent conservation monitoring to be provided by IUCN, which will prepare an annual "State of the Sundarbans" report for use by the Government, civil society in Bangladesh, and other Project financiers.

## **11. Project Reviews**

81. Annual monitoring reviews will be carried out jointly by the Government, the Bank, and other funding agencies. Initially, these reviews will be carried out at least twice a year and will determine if all of the proposed participatory processes are in place and effective, and if the Project is progressing as planned. The Bank will ensure that the scope and content of these previous reports meet the requirements of the GEF and other cofinanciers. A comprehensive midterm review will be carried out at the beginning of the fourth year of implementation to critically evaluate the accomplishment of Project objectives, implementation procedures, procurement methodology, benefit monitoring and evaluation activities, management and coordination functions and related activities of PKSf and the implementing NGOs, the performance of the consultants, and related matters. The Implementation, Monitoring, and Evaluation Division of the Ministry of Planning and the SAC will participate in the midterm review, and a special session of the SSC will be convened to consider recommendations and provide feedback to the review team. Following the review, measures will be introduced to remedy any identified weaknesses.

## **12. Advance Procurement Action**

82. To facilitate timely implementation, the Bank approved advance procurement action to (i) issue invitation for consulting services proposals funded under the loan; (ii) prepare documentation for procurement of maps, aerial photos, and satellite imagery for inventory and

mapping; (iii) develop and prepare plans for consultations with NGOs in the impact zone; (iv) initiate preparation of layout plans, designs, estimates, and tender documents for all civil works; (v) initiate selection of national and international institutions and universities and of appropriate candidates for in-country and external training, including preparation of documentation for clearances, etc.; and (vi) initiate the procurement process for the urgently needed service vehicles, materials, and equipment, and complete the approval processes. The Bank's approval of such advance procurement action does not in any way commit the Bank to approve the Project.

## **F. The Executing Agency**

### **1. The Forest Department**

83. The FD<sup>1</sup> will be the Executing Agency for the Project. From 1971 to 1989, the FD was under the Ministry of Agriculture, but was transferred in 1989 to the newly formed MOEF. In addition to the FD, MOEF includes the Bangladesh Forest Industries Development Corporation, the Department of Environment, and the Bangladesh Forest Research Institute and National Herbarium. The FD's existing organization is based on traditional administration-oriented management, and accountability focuses mainly on adherence to budget allocations. In the SRF professionally qualified staff, management and planning skills, as well as operational capacity, are needed to manage the multidimensional nature of the resource. Significant skills upgrading will be needed in integrated conservation and development, including ecotourism. The FD also needs help building its capacity for development planning and programming, environmental management, fisheries management, wildlife management, monitoring and evaluation, modern methods of surveys and inventories, and resource information management. The Project provides the technical support, training, and operational support needed for the FD to fulfill its role in conserving the biodiversity of the SRF.

### **2. Other Associated Agencies**

84. LGED of the Local Government Division of the Ministry of Local Government, Rural Development and Cooperatives will be the Implementing Agency responsible for the overall planning, supervision, and monitoring of rural infrastructure construction (e.g., village water supplies and sanitation, rural education, other rural infrastructure) in the impact zone. LGED has successful experience in implementing Bank-financed projects, and is highly regarded for its grassroots orientation and community relationships. LGED has a well-equipped regional structure based at Khulna including excellent training facilities, and has good ongoing relationships with the FD and local NGOs in southwest Bangladesh, making it an ideal implementing agency for the Project. A senior civil engineer will be assigned from LGED staff as the Project director for rural infrastructure, with a small team of officials and support staff to assist. In addition, the executive engineer (covering the five Project districts) and the *thana* engineers in the 17 Project *thanas* will be actively involved in coordination with participating NGOs, the SMU, and other agencies and beneficiaries, as well as in the implementation of construction activities, including tendering, evaluation of bids, awarding contracts for civil works, monitoring, reporting, and other related activities.

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<sup>1</sup> FD is headed by a chief conservator of forests (CCF), assisted by three deputy chief conservators of forests and seven conservators of forests (CFs). The forest divisions are headed by divisional forest officers who work under the overall supervision of the CFs. The structure of FD relies extensively on the CCF for control, direction, and guidance. As at June 1998, there were 11,481 approved posts in the FD, of which over 4,000 were externally funded. Only approximately 4 percent of staff were assistant conservators of forests or above, and over 60 percent were forest guards. Significantly, only 150 staff were in the professional cadre (permanent staff, paid from the Revenue Budget).

85. PKSF will be responsible for channeling funds and microfinancial services to participating NGOs under the Project. PKSF has adequate experience for this role, and is the institution for providing similar services for poverty reduction under the Bank-financed Participatory Livestock Project (para. 71). PKSF also has adequate funds from its own resources, and has agreed to participate in the Project.<sup>1</sup> Recovery rates have been satisfactory (over 95 percent), for microenterprise loans for petty trading and other activities. However, for SRF resource users/extractors, who are often away from their home base for long periods in the forest (seasonal activities such as fishing can last for several months), specific lending and recovery norms will need to be developed between PKSF and Partner Organizations. PKSF will designate, within one month after the Bank loan becomes effective, a full-time supervisor to be based in the SMU's office in Khulna, with qualifications and experience suitable to implement the microfinance services required under the Project. The Project will cover the salary costs of this appointee, office support costs, and a motorcycle for operational work.

## **G. Environmental and Social Measures**

### **1. Environment**

86. The Project is classified as environmental category B. An initial environmental examination was conducted during Project preparation, and a summary initial environmental examination was prepared and circulated to the Board on 1 June 1998. The summary indicates that only a small number of proposed activities could have potentially adverse environmental impacts, e.g., localized impacts from construction of ecotourism facilities, but that they can be mitigated by known methods and technologies. The Project will ensure that the maximum annual allowable harvest of SRF resources remain within the following sustainable levels as estimated by FRMP: *Sundri* (43,000m<sup>3</sup>) and *Gewa* (53,000m<sup>3</sup>). MOEF and the Ministry of Industries will agree, within six months of loan effectiveness, on a four-year plan to phase out completely the use of *Gewa* by KNM. Further, KNM will be managed and operated in such a way that the use of any SRF resources by KNM is within these limits. Licensing for use of SRF resources will be limited to annual sustainable levels. Fees for the use of such resources will be set on the basis of economic rates, (including for KNM) and on the basis of market-determined rates for tourism. Plans for forestry, aquatic resources, wildlife, tourism and integrated conservation management will be prepared with the assistance of TAG, and will be reviewed by the Government in consultation with the Bank. The final plans, as agreed upon between the Government and the Bank, will be implemented, and advisory TA for KNM will be completed within the first year of the Project. Additional important measures will include (i) establishment and use of a community-based participative process; (ii) introduction of a public awareness and monitoring process, including independent conservation monitoring by IUCN; (iii) promulgation and enforcement of new management regulations and incentive mechanisms; and (iv) improved management of the SRF ecosystem, with emphasis on transparency and participation.

### **2. Social Analysis**

87. Fifty percent of Bangladesh's 120 million people live on incomes of less than a dollar a day. Rural communities are poorer than their urban counterparts. According to the 1995/96 survey by the Bangladesh Bureau of Statistics, 56.7 percent of the rural population of Bangladesh are below the upper poverty line.<sup>2</sup> The comparable figures for Khulna and Barisal

<sup>1</sup> There are approximately 18 NGOs in the Khulna area that already borrow from PKSF to support microenterprise promotion activities on behalf of their members, and the current volume of PKSF credit (approximately \$4.4 million equivalent) has trebled in the last three years.

<sup>2</sup> The Bureau defines the upper poverty line as the calorie equivalent of expenditure of Tk6,300 per annum.

divisions are 60.6 percent (higher than the national average) and 51.5 percent (marginally lower than the national average), respectively. On average, 56 percent of the rural population of these two divisions are below the upper poverty line, or about the national average.

88. Through participatory rural appraisals conducted during the preparation of the Project, issues related to specific groups of resource users and extractors from the SRF were identified. Resource users were categorized as either owners of capital, boats, and gear, (traders and intermediaries based in urban trading centers or petty village-based moneylenders) or nonowners (those who work in the SRF for a living in all types of resource extraction activity and who borrow from moneylenders to support their work). Production relationships are dominated by indebtedness and near bondage. Access to markets for most SRF produce is mediated through traders, including direct creditors and owners of vessels and gear, or others who may be financing significant parts of the industry or the trade. Those who provide the labor for resource extraction, and who live in the impact zone, can be classified as poverty groups. Those who control the financing and the trade may be found well outside the SRF area, as far away as Chittagong and Dhaka. A second categorization is on the basis of the types of resources that are collected and used, and includes honey collectors, wood cutters/*Golpatta* collectors, fisherfolk, crab and shell collectors, and shrimp fry collectors consisting mainly of women and children. The different groups of resource extractors and users each have problems specific to their trades, but also some common problems: the unsustainability of their current activities, lack of access to productive resources on fair terms, and continuing poverty and inequity. Appendix 2 provides further details.

89. From participatory meetings and workshops, the issues faced by the different groups were analyzed. The Project addresses each of these issues (paras. 51, 101), and will make a positive contribution to socioeconomic development. None of the activities proposed are expected to result in disruptive social impacts. Baseline socioeconomic surveys of the 17 impact zone *thanas* will be carried out and followed by community meetings by NGO staff to explain the Project approach and objectives, group formation (including women's groups), and informal resource user/extractor groups. In addition, formation of local community organizations (LCOs), such as women's groups and village development groups, will also be undertaken by NGOs. NGO and the SMU will ensure development of microenterprise activities, and PKSF will provide credit to group members (including both resource user/extractor groups and LCOs), along with parallel savings activities. The SMU will enter into formal agreements with the resource user/extractor groups, using the model agreements developed under the Forestry Sector Project as guidelines. LCOs will be registered under appropriate legislation, to enable them to receive funds, and carry out works agreed upon by LGED and the communities, for village infrastructure development and maintenance. Training will be provided for resource user/extractor groups and community groups in areas such as SRF protection, including sustainable resource management (e.g., conditions for licensing, levels of extraction, permissible equipment), self-regulation, management of activities, alternative livelihood development, and community participation. The training will be by the SMU, TAG, and NGOs. PKSF and NGOs will offer training in microcredit management and microenterprise development. Environmental awareness education among the communities will be provided by NGOs working closely with SMU. Monitoring of group development, microcredit management, microenterprise development, poverty reduction, gender and development, levels of social development, resource extraction norms and social enforcement, will be done by the agencies involved in the Project and local research institutions. The SAC will provide a venue and a voice for a wide range of stakeholder interests in SRF management and biodiversity conservation.

90. **Role of Women.** Throughout Bangladesh, coping with poverty is a responsibility that rests disproportionately on women. In the impact zone, a 1995 Multidisciplinary Action Research Center survey showed that 37 percent of women in Bangladesh are illiterate compared with 24 percent of men. Women are responsible for most of the postharvest work that takes place in the homestead; they process resources taken from the SRF, keep livestock and poultry, and manage a range of vegetable and fruit-growing enterprises. Many work as part-time or seasonal laborers in the homesteads of others, and an increasing number are involved in the collection of shrimp fry. The economic contribution of women is largely unrecorded, but it is substantial. However, the rising incidence of landlessness has exposed women to serious economic pressures; consequently, women are moving out of the confines of the household in search of jobs, and many put their children to work. In Satkhira alone, 60,000 women are employed in shrimp processing plants.

91. Gender issues in the impact zone arise from a division of labor in which women are wholly responsible for raising families, but have only a limited role in the monetary economy. Women are also largely responsible for processing of the goods that are extracted from the SRF by the men, drying, storing of wood, *Golpatta*, weaving of mats, etc. While these activities are labor intensive, they do not generate sufficient income. Women and girl children traditionally did not enter the SRF for work, but since the emergence of the shrimp industry, they have also joined the men, a shift that has had a disruptive effect on the education of girls. Women also suffer from all the disadvantages resulting from lack of access to safe drinking water, sanitation, and health services; thus, they are more vulnerable to disease, malnourishment, and exhaustion from labor-intensive work. Part C of the Project is designed particularly to address those needs prioritized by the women's groups that participated in the Project design. It is estimated that about 50 percent of the beneficiaries of microcredit will be women. Experience from other microcredit programs suggests that women will have considerable control over earnings from productive microenterprises. In addition, women are expected to participate in the village groups that will be set up during Project implementation. NGOs are expected to recruit a large number of women for Project-related activities.

#### H. Policy Issues

92. Policy dialogue to date (para. 31) has focused on the crucial issues surrounding the sustainable management of the SRF. First, cutting back commercial exploitation to a level compatible with the biological needs of the ecosystem is a major challenge. It will require deferring consumption by reducing harvests to allow regeneration of the ecosystem and enable higher sustainable yields in the future. Second, discussions relating to the institutional changes proposed to reform the organizational structure of the FD and the management ethos, will be continued. The Project includes specific institutional structures (e. g., the SAC and the SSC) that will bring all stakeholders together to discuss how to resolve such issues. The TAG will draw on specialist consultants to facilitate cooperation and information flows between the stakeholders, and to build general support for conservation of the Sundarbans through public education campaigns. Third, the welfare and socioeconomic development possibilities for poor traditional users—the people living in the impact zone—need to be adequately addressed. The Project follows a strategy that will require a close partnership between local SRF-dependent communities and SRF resource users/extractors; NGOs to assist them in organization, representation, and socioeconomic development; and the SMU. Finally, the Project includes measures to reduce pollution caused by KNM through effluent treatment, and includes commitments from the Government for reduction in extraction of Gewa.

## I. Advisory Technical Assistance

93. Advisory TA will be provided by the Bank on a grant basis to address the issues related to phasing out KNM's harvesting of Gewa from the SRF as its source of pulp for paper manufacture. The objective of the TA is to assist the Government in assessing the future options for KNM. Following on from the work recently undertaken by Bank-financed consultants (para. 19), the TA will analyze the financial and economic viability of KNM without subsidies and other forms of protection, organization/management structure, commercialization and privatization options, environmental management, and social mitigation measures in the event of significant downsizing or closure. The total cost of the TA is estimated at \$720,000 equivalent, comprising foreign exchange costs of \$468,000 and a local currency cost of \$252,000 equivalent. The Bank will finance \$570,000, including the entire foreign exchange cost and \$102,000 equivalent of local currency cost on a grant basis from the Bank-funded TA program. The cost estimate includes seminars and workshops and meetings with officials of KNM, other relevant Government institutions, and the private sector on various aspects of the recommended strategy arising from the TA. The Government will finance the balance of \$150,000 equivalent in the form of remuneration of counterpart staff, office accommodation, translation, and other administrative costs (Appendix 9). The consultants will be engaged in accordance with the Bank's *Guidelines on the Use of Consultants*.

## V. PROJECT JUSTIFICATION

### A. Financial and Economic Analyses

94. The economic rationale for the Project is based on reducing resource losses and achieving sustainable management of the SRF, and on improving economic growth in the impact zone. Further natural resource and biodiversity losses, if they cannot be prevented, will have adverse local, regional, and global ramifications (Appendix 10). To succeed will require (i) reducing the current levels of use—especially stopping illegal extraction of forest products—and introducing modern fisheries management; (ii) improving economic policies and the institutional framework by removing distorting price signals, introducing participatory management, and improving public awareness to build support for preventing further loss of biodiversity; and (iii) reducing poverty in the impact zone where most users live. Recognizing that pressure on the resources of the SRF is directly linked to the socioeconomic situation in the surrounding communities, the Project will address poverty reduction through socioeconomic interventions, including improved organization and representation of the interests of SRF users, expanded access to credit for microenterprise development, and an expanded role for NGOs in support of these activities.

#### 1. Financial Analysis

95. The Project will provide alternative income-earning opportunities for approximately 170,000 households in the impact zone. This will include microenterprise development such as integrated poultry production systems (as proven successful for poverty reduction elsewhere by leading NGOs), social forestry, apiculture, charcoal making on a pilot basis, and support for sustainable resource extraction activities, such as fishing and firewood gathering. Approximately 50 percent of the direct beneficiaries in the impact zone will be women; experience from other microcredit programs suggests that women have considerable control over the earnings from their production enterprises, leading to higher household expenditures on social priorities, such as food and education for children. For the Government, current annual revenues (approximately \$4.4 million) can be expected to double in real terms



over a 25-year period if illegal offtake is eliminated and economic rates are levied for permits or other fees for use of the SRF.

96. The incremental incomes from nine selected microenterprises (Appendix 10) are in the range Tk48 (fish selling) to Tk356 per day (social forestry), expressed in terms of incremental returns per day worked.<sup>1</sup> All offer daily returns that are higher than the average agricultural daily wages in the area (Tk30/day). Of these activities, an important one will be poultry key rearers, the typical entry-level activity of the integrated production system that is practiced by leading rural development NGOs. While incremental incomes and returns to additional labor are relatively small, this needs to be considered within the context of the third of the impact population whose annual incomes are less than Tk5,150 (\$113).

## 2. Economic Analysis

97. The economic analysis includes the opportunity cost of reducing timber harvests through protection and better management. These short-term revenue losses are offset by long-term sustainable harvest revenues under a rationalized cutting regime. Logging reductions will enable the forest to recover, over time, from previous destruction. Forest preservation ensures the continued provision of nonwood goods and services, including (i) valuable commercial and subsistence-level fisheries, (ii) apiculture and other forest products, (iii) storm protection and flood control, (iv) carbon sequestration, (v) habitat for endangered species, and (vi) ecotourism. The Project also provides rural development benefits by promoting microenterprises in the impact zone.

98. The most recent forest inventories indicate that the SRF has lost at least 0.5 percent annually of the growing stock of *Sundri* (a total of 7 percent between 1983 and 1996). The situation for *Gewa*, one of the most important tree species, is much more critical: *Gewa* growing stocks declined by 58 percent between 1983 and 1996, an average annual decline of 4.5 percent, indicating a much faster annual rate of depletion than in the period 1959-1996 (para. 7).<sup>2</sup> Without intervention, *Gewa* will be totally depleted within 12 years. The Project aims to reduce official harvests in production forests to sustainable levels and to eliminate illegal harvests within four years. A small portion of net carbon sequestered by intervention is included as a national benefit of the Project. The analysis assumes that protection of the forest provides proportional protection of other natural resources that require the healthy function of the mangrove ecosystem, including fisheries, other nonwood forest products, and endangered species. Loss of forest cover also makes a wider area vulnerable to storm damage. The storm protection now provided by the SRF is valued at its replacement cost, i.e., the annual investment necessary to replant denuded areas. The economic analysis also includes the direct economic benefits of the microenterprises, social forestry, and sustainable resource extraction activities that will be supported under the Project, net of the costs of training, NGO capacity building, and social infrastructure improvement investments. These benefits will significantly increase household incomes and reduce the level of poverty in the impact zone for the 170,000 target households. Finally, incremental benefits arising from ecotourism have been restricted to only 20 percent of the level estimated in the project preparatory TA Final Report, due to the reduced scope of this component.

<sup>1</sup> Potential microenterprises include, for example: poultry key rearer (the main activity of eight integrated activities as promoted by leading rural development NGOs), social forestry, net puller, fish seller, fish processor, local tourist boat, private forest nursery, firewood gathering, honey cultivation, cottage industries, and horticulture.

<sup>2</sup> Integrated Resource Management Plan for the SRF, Draft Final Report, January 1998.

99. The base case economic internal rate of return (EIRR) for the Project is 13.9 percent. The EIRR is most sensitive to cost overruns, but also to the assumed linkage between forest protection and the provision of nonwood benefits. Many environmental benefits of the Project are difficult to quantify and value, and therefore were not included in the analysis; this biases the EIRR downward. A 25 percent increase in Project benefits yields an EIRR of 20.4 percent. The EIRR is not very sensitive to implementation delays.

## **B. Environment**

100. The SRF is arguably Bangladesh's most important biological resource. The Project will focus on conservation and natural resource management in the SRF, the country's largest tract of reserved forest. The goal of the Project is to protect the integrity of the SRF's environment and biodiversity. The current depletion of its natural capital (wood products, fisheries, nonwood products, and wildlife) is being caused by (i) lack of administrative commitment, lack of technical skills, and inadequate budgetary resources to effectively conserve the SRF's important biodiversity; (ii) underinvestment in resource management; and (iii) increasing pressure by both traditional and commercial users from surrounding areas who themselves are under increasing pressure from vested interest groups, primarily those associated with the lucrative shrimp, fish, and timber industries. The Project will involve all stakeholder groups, introduce scientific plans and monitoring, support socioeconomic development and alternative microenterprises in the impact zone, promote environmental awareness and encourage reorientation of the FD so that each of these concerns can be effectively addressed.

## **C. Social Dimensions**

101. The Project strategy for social progress in the impact zone is both participatory and flexible. A blueprint for action is not needed, but rather an approach that can be process oriented and further developed during the Project. A fourfold approach will be followed: (i) collection and analysis of baseline data on socioeconomic conditions of communities and households living in the impact zone; (ii) mobilizing and organizing the resource users into viable producer organizations that will provide them with a collective and legally recognized voice in planning and decision making regarding SRF management and their own activities inside the SRF; (iii) accessing alternative sources of finance for microcredit programs to be taken up with resource users and especially women in SRF-dependent communities; and (iv) facilitating, through the producer groups and community-based microcredit groups, identification of the SRF-dependent communities and their priorities in terms of access to social services and infrastructure. Approximately 170,000 households and SRF resource users will be mobilized in 17 *thanas* to participate in the Project. Microfinance services will be provided by PKSf to support microenterprise development through NGO and LCO programs. Social infrastructure will also be improved (e.g., sanitation facilities, clean water supplies, rural roads, schools), as well as nonformal education and adult literacy programs.

## **D. Risks**

102. The proposed Project is designed to achieve a reduction in the consumption of SRF resources to enable faster regeneration of the ecosystem. Overharvesting by commercial and subsistence users, and illegal operations, must be controlled to enable the SRFs biodiversity to be conserved for future generations. It is necessary to ensure that KNM will comply with the limits set on annual harvests of Gewa. The Project will reduce these risks through a combination of market-based incentives (resource use permits set at economic rates), independent conservation monitoring (by IUCN), greater environmental awareness locally and

in society generally, strict annual limits on harvesting of key species (e.g. *Gewa* and *Sundri*), and the long term oversight by the SSC at the national level. The TAG will provide expertise to support these changes. The second main risk arises from the existing institutional setup: the FD may not readily come forward to share property rights with other stakeholders (including NGOs), and its established working style and staff attitudes may not support the participatory design approach. The delegation of responsibilities to the local level, the roles intended for the SSC, SAC, and SMU, and the training and fellowships programs to build conservation awareness and professionalism are critical for coordinated management of the SRF and will significantly reduce this risk.

103. Indirect risks arise from changing hydrological regimes and water based pollution, the effects of which are often difficult to judge. While the emerging international agreements on watersharing in the Ganges Basin could prove beneficial, continued poldering, embankments, and interventions that alter the natural flow of the fresh and tidal waters (even well beyond the boundaries of the SRF itself) could inadvertently damage the ecosystem. Regular water quality and environmental monitoring under the Project and upstream effluent treatment at KNM will help mitigate water pollution risks.

104. Risks from contamination from industrial sources or oil spills due to marine shipping in the nearby rivers will be addressed through the proposed Ports Efficiency and Access Improvement Project, in the Bank's pipeline for Bangladesh. Offshore, and possible inshore (including within the SRF itself) exploration for oil and gas will need to be carefully regulated and scrutinized for environmental impact. There is a risk that the presently weak capabilities for environmental oversight of development and industrial projects in Bangladesh could expose the SRF to risks of this type. Monitoring of the SRF in the way proposed under the Project, greater public awareness and building a long-term conservation perspective through the SSC, supported by the Project, will mitigate these risks.

## VI. ASSURANCES

### A. Conditions for Loan Effectiveness

105. Prior to loan effectiveness, the following will be completed:

- (i) The SMU will be staffed and will start functioning in Khulna.
- (ii) The SSC, properly broad based and representational as set out in para. 44, will be established and will hold its first meeting.
- (iii) The GEF will endorse its portion of the financing plan.

### B. Specific Assurances

106. The Government agrees to provide the following other assurances:

- (i) The restructuring and redeployment plan for the FD as agreed between the Bank and the Government will be implemented by 31 March 1999.
- (ii) The Government will take all necessary steps to introduce the amendments as agreed upon with the Bank to the Forest Act (1927) in Parliament within six months of loan effectiveness.
- (iii) Starting from loan effectiveness the maximum annual allowable harvest of SRF resources will be within the following sustainable levels as estimated by FRMP: *Sundri* 43,000 m<sup>3</sup>, *Gewa* 53,000 m<sup>3</sup>. These levels will be verified, and if

- necessary, will be adjusted by the TAG. For all other natural resources, including forest products, nonforest products and aquatic resources, the sustainable annual extraction levels will be determined by the TAG.
- (iv) The Government will ensure that KNM is managed and operated in such a way that the use of SRF resources by KNM is within the sustainable limits specified in (iii) above.
  - (v) MOEF and the Ministry of Industries will agree, within six months of loan effectiveness, on a 4-year plan to phase out completely the use of Gewa by KNM.
  - (vi) The plans for forestry, aquatic resources, wildlife, tourism and integrated conservation management to be prepared with the assistance of TAG will be reviewed by the Government in consultation with the Bank. The final plans, as agreed between the Government and the Bank, will be implemented by the Government.
  - (vii) The licensing for use of SRF resources will be limited to the annual sustainable levels referred to above. The fees for the use of such resources will be set on the basis of economic rates, including for KNM, and on market determined rates for tourism.
  - (viii) The technical assistance for KNM will be completed within the first year of the Project.
  - (ix) The NGOs for Part C of the Project will be selected according to the procedures and criteria agreed upon with the Bank under the Forestry Sector Project. However, for those NGOs utilizing microfinance for income-generation activities, PKSf will select the NGO partner organizations according to its established criteria for microfinance.
  - (x) Independent conservation monitoring under Part E will be conducted by IUCN.
  - (xi) In order to ensure accurate verification and inspection of SRF resource exploitation as designed in the Project, a recognized international inspection and certification agency will be employed by the SMU to design a verification and inspection system.
  - (xii) The FD will ensure that the SMU is delegated responsibility and authority to manage Project personnel and Project funds as well as administration, implementation, monitoring, recruitment of consultants, and contract negotiations to implement the Project, as agreed upon with the Bank (para. 65).

## VII. RECOMMENDATION

107. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Bank and recommend that the Board approve: (i) the loan in various currencies equivalent to Special Drawing Rights 26.981 million to the People's Republic of Bangladesh for the Sundarbans Biodiversity Conservation Project, with a service charge at the rate of 1 percent per annum and with an amortization period of 40 years, including a grace period of 10 years, and other such terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board; and (ii) the administration of technical assistance to be financed by the GEF on a grant basis in an amount not exceeding the equivalent of \$12,200,000, to the Government of the People's Republic of Bangladesh for the Sundarbans Biodiversity Conservation Project.

## APPENDIXES

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## SUPPLEMENTARY APPENDIXES

(available upon request)

- A Detailed Cost Estimates
- B The Role of the Global Environment Facility in the Project
- C Detailed Financial and Economic Analyses
- D Organization and Management of the Project

## PROJECT FRAMEWORK

1. Design Summary	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
<p><b>1.1 Goal</b></p> <p>To secure the integrity of the environment and biodiversity of the Sundarbans Reserve Forest (SRF) in Bangladesh</p>	<ul style="list-style-type: none"> <li>Human-induced degradation of SRF reversed by 2003. Biodiversity losses in SRF reduced by 2001.</li> <li>Sound management achieved by 2002.</li> <li>Environmental awareness of SRF improved in society by 2005.</li> <li>Sustainable and participatory community activities established by 2003.</li> <li>Economic and social indicators improved in 17 <i>thanas</i> of impact zone by 2004.</li> <li>Effluent disposal from Khulna Newsprint Mills (KNM) controlled by 2001.</li> <li>Financial and economic sustainability of SRF achieved by 2005.</li> </ul>	<ul style="list-style-type: none"> <li>Annual independent conservation monitoring by World Conservation Union (IUCN).</li> <li>Existing baseline surveys from Integrated Resource Management Program (FAO/UNDP), and Forestry Resources Management Project, (World Bank) and studies by Technical Advisory Group (TAG).</li> <li>Water quality and pollution monitoring by Surface Water Modeling Center.</li> <li>Innovative research and socioeconomic surveys by Project.</li> <li>Benefit monitoring and evaluation (BME) system; Project Completion Report.</li> </ul>	<ul style="list-style-type: none"> <li>Civil society and high-level political commitment to SRF.</li> <li>SRF management will be multisector and multidisciplinary.</li> <li>Stakeholders accept the Project plans.</li> <li>Nongovernment organizations (NGOs) and local community organizations (LCOs) participate in community development in the impact zone.</li> <li>Shrimp controls introduced to prevent further loss of agricultural land.</li> <li>KNM phases out Gowa over 4-year period.</li> </ul>
2. Purpose	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
<p><b>2.1 Effective organization and management of SRF</b></p>	<ul style="list-style-type: none"> <li>Sundarbans Management Unit (SMU), Sundarbans Stewardship Commission (SSC), Stakeholder Advisory Council (SAC) all set up.</li> <li>Environmentally sound biodiversity conservation by 2001. Sustainable SRF management practices, based on sector plans and integrated conservation management plan, in place by 2002.</li> </ul>	<ul style="list-style-type: none"> <li>BME reports; review missions; TAG reports.</li> <li>BME reports and review missions; TAG reports; integrated conservation management plans; annual "State of the Sundarbans Report" by IUCN.</li> </ul>	<ul style="list-style-type: none"> <li>Accurate scientific information is available and sound conservation management plans are implemented.</li> <li>Strong interest in conserving SRF resources, including three wildlife sanctuaries. Public environmental education and tourism are expanded.</li> <li>Adequate financial resources to sustain investments.</li> </ul>
<p><b>2.2 Reduce poverty, improve living standards, promote sustainable development in the impact zone; and promote ecotourism, and environmental awareness</b></p>	<ul style="list-style-type: none"> <li>Legally recognized organizations of SRF resource users that meet members needs and enforce agreed user practices.</li> <li>Improved lifeskills and creation of options in the impact zone.</li> <li>Improved access to social infrastructure and services in the impact zone by 2005.</li> <li>Average household income increased 30%; poverty reduced 30% in the impact zone by 2004.</li> <li>Tourist numbers expanded 50% by 2005.</li> </ul>	<ul style="list-style-type: none"> <li>Government statistics, NGO reports, and independent academic studies on 17 <i>thanas</i> in impact zone.</li> <li>Socioeconomic studies.</li> <li>Reduced dependency on SRF, diversification of income sources.</li> <li>Local Government Engineering Department (LGED) programs and reports.</li> <li>BME reports, review missions.</li> <li>Bangladesh Parjatan Corporation (BPC) reports.</li> </ul>	<ul style="list-style-type: none"> <li>NGOs and LCOs participate effectively with the Project in socioeconomic development of impact zone.</li> <li>LGED is appointed to implement social infrastructure program and to coordinate with NGOs/LCOs and stakeholders.</li> <li>BPC and private operators fully involved in Project.</li> </ul>

3. Outputs	Performance Targets	Monitoring Mechanisms	Assumptions and Risks
<b>3.1 Effective organization of SRF</b> 3.1.1 SMU  3.1.2 SSC  3.1.3 SAC	<ul style="list-style-type: none"> <li>SMU set up by December 1998. Fully functional for forestry, fisheries, wildlife conservation operations by 2003.</li> <li>SSC established, on broad-based principles incorporating civil society's participation, by March 1999.</li> <li>SAC set up by June 1999 and representing views of stakeholders in effective manner.</li> </ul>	<ul style="list-style-type: none"> <li>Review missions.</li> <li>Minutes of SSC meetings; review missions.</li> <li>Minutes of SAC meetings; review missions.</li> </ul>	<ul style="list-style-type: none"> <li>SMU works effectively with stakeholders.</li> <li>High-level commitment to the role of the SSC and the Project.</li> <li>All user groups are effectively represented on SAC.</li> </ul>
<b>3.2 Biodiversity conservation and sustainable resource management</b> 3.2.1 Forestry  3.2.2 Aquatic Resources  3.2.3 Wildlife  3.2.4 Integrated Conservation Management Planning	<ul style="list-style-type: none"> <li>Forest management plan by 2001. 5,000 hectares (ha). enrichment planting, 10,000 ha assisted natural regeneration, 2,000 ha <i>Golpatta</i> planting, 800 ha silviculture trials; 35 permanent sampling plots—all in SRF by 2006.</li> <li>Mangrove arboretum, 2 range offices, 20 temporary camps, 7 jetties, 9 pontoons, training established.</li> <li>Fisheries/aquatic resources management plan and introduction of fisheries management in SRF by 2001.</li> <li>Wildlife management plan prepared (2001), especially for 3 sanctuaries.</li> <li>Integrated plan prepared and operationalized by 2002.</li> </ul>	<ul style="list-style-type: none"> <li>Project reports and review missions.</li> <li>BME reports; World Heritage Site reports; review missions.</li> <li>SWMC monitoring reports; review missions.</li> <li>Project reports and review missions.</li> <li>Plans and review missions.</li> </ul>	<ul style="list-style-type: none"> <li>Sufficient expertise and resources are available to gather and analyze the required data, and implement the sector plans and the integrated plan.</li> <li>SRF user charges set at economic levels, and are directly used to conserve the Sundarbans.</li> <li>Appropriate measures, including upstream pollution controls, and mitigation measures re urban, ports and shipping, and industry sources. Suitable controls on shrimp-based aquaculture.</li> </ul>
<b>3.3 Socioeconomic development of the impact zone</b>	<ul style="list-style-type: none"> <li>Mobilization and organization of 170,000 households and resource users into viable LCOs by 2005.</li> <li>\$6.8 million for microcredit by 2005 for alternative income sources and sustainable SRF resource use.</li> <li>Social infrastructure constructed comprising village water supplies, sanitation, schools, rural roads, etc. in 17 <i>thanas</i>.</li> <li>Improved environmental awareness and education about SRF in schools in 17 <i>thanas</i>, plus nonformal education and adult literacy programs.</li> </ul>	<ul style="list-style-type: none"> <li>Expanded NGO coverage in 17 <i>thanas</i>.</li> <li>NGO and BME reports</li> <li>Review missions.</li> <li>Palli Karma-Sahayak Foundation reports on microcredit.</li> <li>LGED reports, review missions.</li> <li>NGO reports, review missions.</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate NGO selection process. NGOs participate in mobilization, training, and set up of LCOs.</li> <li>NGOs establish programs in the impact zone. Credit reaches target households and leads to increased incomes.</li> <li>LGED leads a coordinated approach.</li> </ul>

<b>Outputs</b>	<b>Performance Targets</b>	<b>Monitoring Mechanisms</b>	<b>Assumptions and Risks</b>
3.4 Ecotourism and environmental awareness	<ul style="list-style-type: none"> <li>Modern tourism strategy and plan developed, and training program implemented.</li> <li>Public infrastructure built and policy framework to support private sector plans and development.</li> <li>NGO/LCO participation in training/ development.</li> <li>Environmental Information and Education Center operational in Khulna.</li> <li>National, local environmental awareness campaigns.</li> </ul>	<ul style="list-style-type: none"> <li>Tourist numbers, receipts; BPC reports.</li> <li>Review missions.</li> <li>Review missions.</li> <li>Press, media coverage of Sundarbans.</li> </ul>	<ul style="list-style-type: none"> <li>Modern, private sector tourism is not dominated by public sector. Appropriate policy framework is adopted.</li> <li>Network with Asian locations is established.</li> <li>Tourism opportunities can be created, and risks can be mitigated.</li> <li>Public education program is successful.</li> </ul>
3.5 TAG, monitoring, and research studies	<ul style="list-style-type: none"> <li>TAG team established and supporting conservation planning, plan implementation, training.</li> <li>IUCN monitoring.</li> <li>Other studies contracted.</li> <li>Fellowships program implemented.</li> <li>Inspection and certification system designed.</li> </ul>	<ul style="list-style-type: none"> <li>IUCN and TAG reports.</li> <li>Annual "State of the Sundarbans" reports.</li> <li>Contract for services.</li> <li>Number of fellowship holders.</li> <li>Consultant's report.</li> </ul>	<ul style="list-style-type: none"> <li>Innovative research and monitoring are used for effective management.</li> <li>Government implements the recommendations.</li> </ul>
3.6 Effluent treatment	<ul style="list-style-type: none"> <li>KNM effluent treatment system installed and operating well.</li> </ul>	<ul style="list-style-type: none"> <li>BME; review reports.</li> <li>Water quality monitoring reports.</li> </ul>	<ul style="list-style-type: none"> <li>Discharge levels are environmentally acceptable.</li> </ul>
3.7 Advisory technical assistance (TA) for KNM	<ul style="list-style-type: none"> <li>TA will include organization/management structure, commercialization and privatization options, environmental management, and social mitigation measures in the event of KNM's closure.</li> </ul>	<ul style="list-style-type: none"> <li>TA report.</li> <li>Policy changes adopted, commercialization, and management changes.</li> </ul>	<ul style="list-style-type: none"> <li>KNM, Ministry of Industries, and Ministry of Environment and Forests agree to phase out Gewa from SRF and use imported waste.</li> <li>Financing is available for KNM's rejuvenation based on imported waste for recycling as a source of pulp for newsprint manufacture.</li> </ul>
<b>4. Inputs</b>	<b>Performance Targets</b>	<b>Monitoring Mechanisms</b>	<b>Assumptions and Risks</b>
4.1 Consultants	<ul style="list-style-type: none"> <li>Consultants \$11.6 million</li> </ul>	<ul style="list-style-type: none"> <li>Project implementation progress reports.</li> </ul>	<ul style="list-style-type: none"> <li>Consultants are competent.</li> </ul>
4.2 Equipment and software	<ul style="list-style-type: none"> <li>Equipment and software \$6.9 million</li> </ul>		<ul style="list-style-type: none"> <li>Local contractors are competent.</li> </ul>
4.3 Civil works	<ul style="list-style-type: none"> <li>Civil Works \$26.8 million</li> </ul>	<ul style="list-style-type: none"> <li>Project accounts.</li> </ul>	<ul style="list-style-type: none"> <li>Counterpart budget is available on a timely basis.</li> </ul>
4.4 Microenterprise investment, including credit	<ul style="list-style-type: none"> <li>Microenterprise Investment, including credit \$11.3 million</li> </ul>		<ul style="list-style-type: none"> <li>Counterpart staff are available.</li> </ul>
4.5 Training	<ul style="list-style-type: none"> <li>Training \$9.4 million</li> </ul>		
4.6 Marketing	<ul style="list-style-type: none"> <li>Marketing \$1.4 million</li> </ul>		
4.7 Salaries/Others	<ul style="list-style-type: none"> <li>Salaries/Others \$13.6 million</li> <li>Service Charge \$1.2 million</li> </ul>		
	<b>Total \$82.2 million</b>		



## SOCIAL ASSESSMENT AND STRATEGY

### A. The Context

1. The Sundarbans Reserved Forest (SRF) is being seriously depleted through overexploitation by commercial interests, traditional users, and through inadequate management by the Forest Department (FD). Most of the resource users of the SRF are seriously disadvantaged by their poverty, lack of organization and information, lack of access to productive resources such as land, capital, boats and gear, as well as by their low levels of effective access to social services and infrastructure. They have little direct access to markets, and are not organized to voice their views in any manner regarding the state of the SRF or its management at present. While there are approximately 29 NGOs working in the Greater Khulna area, a review of their programs shows that there is little focus on biodiversity conservation or sustainable management of SRF resources. Without dialogue and effective working arrangements between the legal custodians of the SRF (the FD) and its users (mostly the poor around the SRF boundary), the current alarming trends will surely continue. It is within this context that participatory management strategies fully involving all stakeholders will need to be developed and implemented.

2. The resource user and extractor population, numbering approximately 3.5 million people who largely depend upon the SRF for their survival, live in a zone of about 0-20 kilometers around the border of the forest. The area is covered by 15 *thanas* located within the 0-20 kilometer range and 2 additional *thanas* in Pirojpur district, a total of 17 *thanas*.<sup>1</sup> For purposes of the proposed Project, this area is called the "impact zone," where participatory approaches for organizing the resource user/extractor groups into viable organizations, as well as improving their access to productive resources, social services, and social infrastructure will be implemented under the Project.

### 2. Poverty Levels

3. With a population of approximately 120 million, Bangladesh has 50 percent of its population living on income levels of less than a dollar a day. Rural communities are poorer than their urban counterparts. The Government's poverty line, defined as a recommended intake of 2,122 kilocalories /day/person, shows that about 50 percent of rural households live below this poverty line. The Poverty Monitoring Survey by the Bangladesh Bureau of Statistics (BBS), 1995/96, converted this calorie intake into expenditure on food and estimated it at Tk440 per month or Tk5,275 per annum. According to this survey 56.7 percent of the rural population of Bangladesh is below the upper poverty line<sup>2</sup>. The comparable figures for Khulna and Barisal divisions are 60.6 percent (higher than the national average) and 51.5 percent (marginally lower than the national average), respectively. On average, 56 percent of the rural population of these two divisions are below the upper poverty line, or about the national average.

4. Criteria for determining indicators of relative poverty at the subdistrict (*thana*) level were jointly developed in 1996 by the World Food Programme and the Government of Bangladesh. These criteria are based on the following indicators of poverty at the *thana* level: (i) incidence of natural disasters; (ii) food grain deficit; (iii) agricultural wage rate; (iv) proportion of households not owning agricultural land; (v) proportion of unemployed persons; (vi) proportion of widowed, separated, and divorced women; and (vii) proportion of literate women. Taking these

<sup>1</sup> The impact zone districts and *thanas* are given in Table 1.

<sup>2</sup> The upper poverty line is defined by the Bureau as the calorie equivalent of Tk6,300 per annum.

criteria into account, *thana* level poverty has been defined in four categories, very high, high, moderate, and low. Of the 17 Project *thanas*, 5 were in the very high category (29 percent), 6 were high (35 percent), 3 were moderate (18 percent), and 3 were low (18 percent) (see Table 1). In the very high and high food insecure *thanas*, Dacope, Koira, Syamnagar, Mongla, and Kaliganj, high food grain deficits, lack of household land ownerships, and a high proportion of unemployed persons, are all due to the conversion of agricultural land on a large scale for shrimp farming.

### 3. The Impact Zone

5. Socioeconomic characteristics of the SRF-dependent households include the following: (i) of high levels of landlessness and marginal farms; (ii) high poverty levels in terms of incomes, illiteracy, prevalence of child labor, and limited access to basic social services and infrastructure; (iii) high interest rates, lack of free access to markets, and long-term indebtedness to traditional money lenders; (iv) prevalence of creditors and traders who adopt monopolistic practices; (v) vulnerability of SRF-dependent groups to risks pertaining to unpredictable and declining resource availability, sudden loss of life on account of accidents and attacks by unlawful elements; (vi) low level of well-being due to limited access to basic social services such as safe drinking water, low access to health services, poor communications infrastructure, and lack of knowledge of preventive health and sanitation practices; and (vii) gender issues pertaining to low levels of access of women to incomes, livelihood, education and health, clean water and sanitation. The emergence of shrimp fry collection as a new occupation for women has introduced new gender issues such as violence perpetrated against women workers inside the SRF, and the increasing use of female child labor in shrimp fry collection. There is currently no organization of SRF resource extractors in order for their rights to be recognized as stakeholders in SRF planning and management.

6. The richest households have incomes six times higher than those of the hard core poverty groups. Agricultural land ownership is low, with 49 percent of the population being landless. Among the poorest households, 65 percent are landless. However, the possession of land does not guarantee security of livelihood or food security even in partial terms, due to conversion of agricultural land into shrimp ponds.<sup>1</sup> This process has been initiated by absentee landowners in collaboration with outside business interests. As a result, local communities have lost their coconut, mango, date palms, and other fruit trees, and cattle and buffalo numbers are also low due to lack of feed resources.

### C. Demography, Education, and Health

7. The average household size comprises 6.3 persons, higher than the national average. The high adverse sex ratio (100 females:117 males) shows temporary male in-migration for work in the area. Temporary male migrants include fisherfolk, shrimp fry traders, and other SRF resource extractors. The dependency ratio was low with children of the age group 0-4 being fewer than children in age group 5-9. The declining population growth rate appears to have resulted from a high rate of contraceptive use<sup>2</sup>.

8. While school enrollment rates for both boys and girls are relatively high, a major problem is high dropout rates and low attendance rates. Although the literacy rate is only 36.5 percent, there are significant gender differentials at junior and high school levels. Boys of poor households are sent to work for several months of the year as helpers and apprentices in fishing

<sup>1</sup> Shrimp ponds require saline water for 7-8 months per year.

<sup>2</sup> Integrated Resource Management Plan, 1997.

and fish processing as well as in the collection of other nonwood forest products (NWFP). Girls work along with their mothers in the collection of shrimp fry for which the demand has been rising with the growth of the shrimp industry.

9. The prevalence of severe malnutrition among children is comparable with national figures. However, the level of disabilities affecting children is notably higher in the districts of Khulna, Pirojpur, and Barguna. The impact zone districts have very high levels of diarrhea among both children and adults. Immunization rates have improved but are notably low in Satkhira and Barguna districts. Effective access to health services at village level is impeded both by poor communications as well as poverty, and the lack of reserves to tide over illness and loss of incomes. Access to safe drinking water is a major problem, being notably lower than at the national level. More than a quarter of the population in Khulna, Bagerhat, and Pirojpur districts still drink water from marshes and ponds. Nineteen percent of the population of Satkhira and seven percent of Barguna have similar water sources. This contrasts strongly with only 2.5 percent of population using such sources at the national level. Sanitation facilities are almost non-existent. Domestic fuel consists of wood from the SRF.

#### **D. Consultations with the Community and NGOs**

10. During the preparation of the Project detailed consultations were held with the community in the impact zone. A multi-level approach was taken, combining participatory rural appraisal and rapid rural appraisal techniques in 16 sample villages in Khulna, Bagherhat and Satkhira districts. A total of 174 semi-structured interviews were conducted with male and female stakeholders, as well as 14 focus group discussions. NGO members of ADAB's Khulna chapter were fully involved in fieldwork and consultations involved throughout the process. In July 1997, the Minister of Environment and Forest opened a major workshop in Khulna, which brought together over 200 representatives of stakeholders, NGOs, and the FD to ensure all views were expressed. In addition, the Bank engaged a staff consultant to undertake further fieldwork in February-March 1998, as part of the preparation of the impact zone strategy. Two days of workshops were held with twenty-nine Khulna based NGOs, and rapid social assessments and individual interviews were conducted in 5 villages in the impact zone.

#### **E. Needs Assessment**

11. Through the use of participatory rural appraisals, issues related to specific groups of resource users and extractors from the SRF became clear. The Resource users/extractors can be categorized in two ways. First, there is a clear difference between the owners and non-owners of capital, boats and gear. Owners range from traders and middlemen based in urban trading centers, to petty village based moneylenders. The nonowners of resources are those who work in the SRF for a living, in every type of resource extraction activity. All such persons have to depend on borrowing of capital and equipment for their ability to work in the SRF. The issues that dominate the production relationships are those of indebtedness, usury, and near bondage. These factors characterize the dealings between the workers in the SRF and their creditors. They are tied to them, sometimes for generations. Their access to markets for most SRF produce is mediated by layers of middlemen ranging from the direct creditor and owner of the means of production, to other elements who may be financing significant parts of the industry and the trade. Thus, the issue of the origins of the SRF dependent population goes well beyond the immediate borders of the SRF. Those poverty groups who provide the labor for resource extraction and use, as well as the first and primary source of credit and gear to extractor workers, mainly live in these areas identified during the study. Those who may control the financing and the trade may be found well outside the SRF area, as far away as Chittagong, and Dhaka.

12. The second differentiation is on the basis of the types of resources that are collected and used by the target group. The problems of the different groups of resource extractors and users, while specific to their trades, are also common: the unsustainability of their current activities, as well as their lack of access to productive resources on fair terms clearly lead to the depletion of the SRF, as well as to the continuing poverty and inequities that characterize the lives of those who labor inside the SRF.

#### **F. The Target Group**

13. Most of the traditional resource extractors (wood and nonwood forest product collectors, honey collectors, fisherfolk) are poor, and work as wage labor for the moneylenders and traders. The moneylenders and the traders are the owners of the means of production, and finance and control resource extraction activities in myriad ways. The target group will include the SRF resource extractors from the following poverty groups: *bowalis* (firewood collectors), *mowalis* (honey collectors), fisherfolk, crab collectors, shrimp fry collectors, marginal farmers, the landless poor, and women, and children. More than 50 percent of the target population will be women. Female-headed households will be particularly targeted, as they are disadvantaged and particularly vulnerable.

#### **G. Issues Highlighted by Stakeholders**

14. During participatory meetings and workshops, the issues faced by the different groups were analyzed. In addition to the issues noted in para. 5, stakeholders highlighted the following: (i) rent-seeking practices at different levels leading to increased pressure on the resource base; (ii) illegal destruction of trees; (iii) lack of direct access to markets as most resource extractors do not have the right to sell their produce directly in the market; (iv) profits go to the owners of capital and gear; (v) seasonality of employment in the SRF and lack of alternative economic activities and outlets; (vi) financial dependence upon the moneylenders and traders not only for production capital but also consumption expenses of households during lean periods; and (vii) lack of agricultural land for food production due to induced conversion of land into shrimp farms.

#### **H. Gender Issues**

15. Gender issues stem from women's relative lack of access to services, resources, and decision-making. Women are in addition fully responsible for processing of the SRF goods that are collected. While these activities are labor intensive and value adding, they are not regarded as such. Women are also engaged in working as farm labor, household labor, and as family labor in petty enterprises. Women and girl children traditionally did not enter the SRF. But since the emergence of the shrimp industry, and the increasing demand for shrimp fry, they have entered this activity, thereby disrupting girls' education, and exposing women to new dangers of being kidnapped and raped by illegal elements operating inside the SRF. Their families are unable to effectively protest on account of the prevailing gender ideology and lack of security, as well as their social exclusion and powerlessness. Female headed households are typically more disadvantaged than male headed households and their incomes are approximately 40 percent less than those households headed by men. Women heads of households are disadvantaged doubly by their absolute lack of access to resources, as well as their vulnerability in a work environment and habitat where a frontier culture still operates, and women as a gender group are particularly vulnerable.

## I. Project Strategy

16. The socioeconomic strategy for the impact zone is based upon the foregoing analysis, which emphasizes the poverty and resourcelessness of the resource users/extractors, as well as their lack of economic alternatives, which in turn is responsible for unsustainable practices within the SRF. Not being organized into viable producer organizations capable of upholding the interests and monitoring the activities of members, as well as facilitating access to new knowledge, training, credit and the means of livelihood, as at present, effectively renders SRF users incapable of responsible participation in SRF management as genuine stakeholders, or of having rights as workers and microentrepreneurs. The stakeholder advisory council (SAC) is a key group which will express the views of the impact zone target groups and stakeholders. The SAC will participate in project reviews and a SAC representative will be a member of the Sundarbans Stewardship Committee. The Technical Advisory Group will also assist in the implementation of impact zone activities, especially with regard to ensuring that biodiversity conservation aspects are effectively implemented.

17. The Project strategy will be both participatory and flexible. A blueprint for action is not needed, but rather an approach which can be process-oriented, and further developed during implementation. A fourfold approach will be taken:

- (i) **collection and analysis of baseline data on socioeconomic conditions** of communities and households living in the impact zone. The data collection will be done by NGOs under contract to the Sundarbans management unit (SMU), and working in close collaboration with appropriate local research institution, e.g., the University of Khulna. The data collection will be done through surveys which will be updated annually through representative samples, to measure indicators such as access to services, access to institutional finance, group formation, non formal education, incomes and livelihoods, and overall quality of life;
- (ii) **mobilizing and organizing the resource users/extractors** into viable producer organizations which will act as their collective voice in planning and decision making regarding SRF management and their own activities inside the SRF. Over time they will develop and enforce collective norms of behavior for resource users/extractors, based upon both indigenous knowledge and technical advice and training provided by the SMU; provide access for members to institutional sources of finance (PKSF) for their SRF-related activities, and develop mechanisms for responsible borrower behavior, peer group solidarity, accountability, and develop direct access of members to markets; provide access to members to new sources of technical advice and training for alternative livelihoods development (e.g., poultry, social forestry, energy saving stoves, apiculture, handicrafts, homestead gardening (where feasible), livestock rearing, among others); facilitate the access of members, to non formal education programs emphasizing literacy, numeracy, life skills training, as well as awareness and conscientization programs to be conducted by NGOs working in the area. Such resource extractor/user groups are expected to federate into larger organizations. Membership of such organizations will be essential in order to access permits to extract SRF resources. The minimum conditions to be attached to membership of such groups will evolve through a participatory process guided by NGOs working with the local communities. However, it is expected that the minimum conditions would include the following: (a) that the resource extractor/worker should have been working in the SRF for a period of at least two years prior to the start of the Project; (b) personal involvement in laboring

inside the SRF, (c) a resident of the *thanas* identified as the impact zone; (d) be willing to abide by the collective behavioral norms developed by the Project for resource extraction activities inside the SRF; and (f) willing to participate in all activities undertaken by the organization including training programs, non formal education among others.

- (iii) **access to alternative sources of finance** for microenterprise programs to be taken up with resource extractors/users, and women members of SRF dependent communities. Such programs will be developed by NGOs working /extending their activities into the impact zone as partner organizations of PKSf. NGOs will need to do the following activities in the impact zone: (a) mobilization of community based microcredit groups; (b) training in credit management; (c) promotion of savings habits; (d) development of collective behavioral norms for members of microcredit groups; (e) delivery of credit through developing and implementing linkages with institutional financing sources (e.g., PKSf); (f) development of alternative economic activities through training programs; and (g) provision of extension services, marketing assistance and strategies.
- (iv) **facilitating, through the producer groups and community based microcredit groups, the identification by the SRF dependent communities themselves, and their priority needs in terms of access to social services and infrastructure.** This will be done through the process of mobilization and organization, and training, all of which is aimed at capacity building and empowering the groups at present socially excluded, so they will be able to improve their habitat and give the future generation a chance to access new opportunities and improved life chances. The process is likely to consist of the development of community based organizations (CBOs) by NGOs working as catalysts, which through the process of community participation will identify community priorities e.g. safe drinking water, communication facilities, improved schooling facilities, non formal education, health services, energy saving stoves, environmental education among others. For social infrastructure such as drinking water, nonformal education, extension of schooling facilities, rural roads, etc., Project funds will be used to develop such infrastructure and services through the Local Government Engineering Department (LGED). For others it may be necessary to facilitate linkages with ongoing government programs, by bringing them into the villages in the impact zone, so as to improve the quality of life and reduce pressure on the SRF.

18. Gender Issues will need particular attention. In addition to mobilizing women members of the communities, and organizing them into SRF resource extractor groups, as well as microcredit groups, it will be important for NGOs to deal specifically with gender sensitization, and empowerment of women. Women will need particular training aimed at capacity building for group formation, articulation of their views in gender specific and neutral venues such as workshops, training programs, as well as training in how to access modern financial services for savings and credit. They will need to be provided literacy and numeracy and accounting skills. They will also need programs on women's health requirements and issues, as well as knowledge regarding their rights and responsibilities. Gender sensitization training programs will need to be carried out by NGOs at different levels including the communities, staff of the SMU, LGED, and where necessary among NGO staff themselves.

## J. Organization and Management Arrangements in the Impact Zone

19. The organization and management chart, given as Appendix 4, shows the structure of the key proposals under the Project. The impact zone arrangements are an important part of the Project and the role of the SAC and SSC will be vital to integrate the interests of impact zone communities in overall Project management.

**Table 1: Project Area, *Thana* Poverty, and Existing NGO Operations**

District Name	<i>Thana</i> Name	Name of NGO	No. of Unions	1995 Population	<i>Thana</i> Poverty Level <sup>a</sup>	Number of VGD <sup>b</sup> Cards
Khulna	Batiaghata**	GSS, BRIDGE, Unnayan, Manabik Adhikar Unnayan Prakaipa, PPC, MEC, Saptagram Nari Shownirvar Parisad, Rapantar	7	151,000	High	280
	Dacope*	GSS, Nizera Kori, BRIDGE, JJS, World Vision, Heed, Rapantar, CCEC	9	170,000	Very High	360
	Koyra*	Pradipan, JJS, SUS, ADORE	7	196,000	High	210
	Paikgacha*	Nizera Kori, Uttaran, BRAC, Nabarun Sangsad, SUS, Kapatakha	10	266,000	Moderate	400
Sathkira	Assasuni**	Uttaran, BRAC, Rupali, Pallichettana	10	242,000	Moderate	400
	Kaliganj**	Uttaran, Sushilan	12	247,000	High	480
	Syamnagar*	Uttaran, Sushilan, SETU, ADORE	12	291,000	Very High	360
Bagerhat	Morrelganj*	GSS, Proshika (MUK), Life Association	16	356,000	Low	480
	Rampal**	CARITAS, BRIDGE, Rapantar	10	185,000	Very High	300
	Sarankhola*	Noboloke Parisad, Agradul Club, RUSTIC, Deyala Uharpara Mahila Samity	4	119,000	Very High	120
	Mongla*	CARITAS, BRIDGE, World Vision, Rapantar	6	153,000	Very High	180
Pirojpur	Bandaria***	BRAC	4	161,000	High	210
	Mothbaria*	—	11	276,000	Low	330
	Naserabad***	—	5	223,000	High	300
Borguna	Banma**	—	4	73,000	Moderate	120
	Borguna**	—	10	241,000	Low	300
	Pathergatha*	—	7	148,000	High	210
		<b>Total Estimated Population</b>	<b>144</b>	<b>3,498,000</b>		

— = no data available

\* = *Thanas* falling within 0-10 km of SRF border.

\*\* = *Thanas* falling within 10-20 km of SRF border.

\*\*\* = Bandaria and Naserabad *thanas* are outside the 0-20 km zone, but are heavily dependent on the SRF.

<sup>a</sup> World Food Programme (WFP) in Bangladesh (1996) derived poverty index at the *thana* level. This index of relative poverty groups the *thanas* as follows: 5 were very high, 6 were high, 3 were moderate, and 3 were low. Even in *thanas* with low poverty overall, there are pockets of very high poverty.

<sup>b</sup> Vulnerable Group Development Program, administered by WFP.

Source: TA No. 2724-BAN: *Biodiversity Conservation in the Sundarbans Reserved Forest Project* Final Report, WFP/Government of Bangladesh-Vulnerable Group Development Program Relative Food Insecurity Indicators.

# EXTERNAL ASSISTANCE TO THE FORESTRY AND BIODIVERSITY SECTORS

Project Name/Number	Duration	Country/ Source	Project/TA Amount	Project Objectives
<b>Bank-Assisted Projects/Technical Assistance (TA)</b>				
1. Forestry Sector Project (Loan No. 1486)	1996-2003	ADB	\$92 million	To enhance conservation of forests, increase wood production, and institute sustainable management of forest resources.
2. Coastal Greenbelt Project (Loan No. 1353)	1995-2002	ADB/Norwegian Agency for Development Cooperation	\$30.8 million	To improve the socioeconomic condition of the rural poor, improve the role and status of women in rural enterprises, diversify and supplement farm incomes, introduce substitution of locally produced coconut for imported oil, and enhance environmental quality.
3. Forestry Sector Master Plan (TA No. 1355)	1991-1992	ADB/United Nations Development Programme (UNDP)	\$1.71 million	To prepare a framework for the preparation and development of the country's forest resources.  To identify areas for involvement of women, nongovernment organizations (NGOs), and the private sector in the development and management of forestry resources.
4. Upazila (Thana) Afforestation and Nursery Development Project (Loan No. 956)	1989-1995	ADB/UNDP	\$50.4 million	To (i) arrest depletion of the tree resources, (ii) enrich planting of the depleted sal forest, (iii) bring all available suitable lands, under participatory plantations, (iv) raise community awareness for forestry development and create a permanent institutional capacity for forestry, and (v) improve land-use practices and increase production of biomass fuels and timber.
5. Community Forestry Project (Loan No. 555)	1981-1987	ADB/UNDP	\$16.8 million	To augment supplies of fuelwood, timber, fruits, fodder, by involving the local poor people.
<b>World Bank-Assisted Projects/TAs</b>				
6. Coastal Embankment Rehabilitation Project	1996-2002	World Bank (International Development Association [IDA])	\$87.8 million	To protect from cyclone damage, improve agricultural production, and improve protection works.
7. Forest Resource Management Project	1992-2000	World Bank (IDA)	\$49.6 million	To (i) establish and maintain a forest management system that is fully responsive to economic, environmental, and social goals of the country; (ii) improve the productivity of Government-owned forest; and (iii) protect the country's environment.



Project Name/Number	Duration	Country/ Source	Project/TA Amount	Project Objectives
8. Second Forestry Project	1985-1992	World Bank (IDA)/UNDP	\$36 million	Project components included: (i) establishment of mangrove plantations, and maintenance of existing plantations; (ii) establishment of industrial plantations, and maintenance of existing plantations; (iii) establishment of resource management systems for mangrove plantations and other forest resources; (iv) support of mangrove afforestation research; and (v) training of forestry personnel and improvement in forestry education and training facilities.
9. Mangrove Afforestation Project	1980-1985	World Bank (IDA)	\$7 million	Afforestation of new land accretion in the coastal belt.
<b>Other Aid Agency-Assisted Projects/TAs</b>				
10. Genetic Diversity and Propagation of Mangroves	1997/98 to 1999/00	Australian Agency for International Development	A\$645, 197	To develop the capability to produce and disseminate high-quality germ plasm (of known genetic lineage) to meet replanting needs in Bangladesh.
11. Village Forest Inventory	1979-1981	Food and Agriculture Organization (FAO)/UNDP	Tk9.7 million	To develop capabilities to record and analyze data of village forests for future supplies.
12. Pilot Project for Agroforestry Research and Demonstration	1992-1994	Ford Foundation	\$208,000 (Tk8.33 million)	To (i) develop participatory agroforestry models in the sal forests; (ii) create facilities for agroforestry research; (iii) develop a mechanism for monitoring and evaluating agroforestry practices; (iv) create an agroforestry information base; (v) improve training in agroforestry, rural development, and mass mobilization; (vi) document and disseminate information on agroforestry; and (vii) support the agroforestry component of other programs.
13. Environmental Impact of Shrimp Farming	1997-1999	Norway	Tk11.50 million	To ensure that shrimp farming develops in a sustainable way with minimum harmful ecological effects
14. Action Programme on Ecological Balance in the Bhawal-Madhupur Forest Tract	1995-1997	Norway	Tk57 million	Sustainable development through ecological balance and production-oriented activities aimed at poverty reduction.
15. National Conservation Strategy Implementation Project 1	1994-1999	Norway	Tk80 million	Institutional strengthening, environmental awareness and biodiversity conservation.
16. Inventory Survey of Forest Resource of Sundarbans Forests	1981-1983	Overseas Development Administration	\$590,000 (Tk23.57 million)	To update information on the level of stocking and productivity by inventory of the available forest resources.
17. Forestry Development Training Center, Kaptai	1976-1981	Swedish International Development Cooperation Agency	Tk61 million	To provide services in terms of development works and training to forestry organizations and projects and to carry out small-scale plantation and pilot projects.
18. Village and Farm Forestry Program	1997-2000	Switzerland	Tk147 million	To establish nurseries and extensive promotional activities to create awareness/mobilize tree planting for income generation and environmental improvement.

Project Name/Number	Duration	Country/ Source	Project/TA Amount	Project Objectives
19. Environmental Capacity Building in Environmental Assessment and Policy Analysis, Including Industrial Pollution	1998-2002	World Bank-executed, UNDP-funded	\$4-5 million	Policy and capacity-building including (i) training in environmental assessment and project review; (ii) review of the environmental impact of sectoral policies; (iii) oil, gas, and power sector environmental guidelines; and (iv) land management support to the National Task Force on Land Use Policy. Industrial pollution management program.
20. Global Environment Facility	1994	UNDP	\$3 million	A reserve and multiple-use management program for the protection, sustainable management, and integration of at least three priority coastal and freshwater biodiversity sites.
21. Integrated Resource Management Plan of the Sundarbans Reserved Forest	1992-1995; Final Report 1998	UNDP/FAO	\$2.9 million (Tk116.5 million)	To (i) formulate a plan for the integrated resources management and development of the Sundarbans Reserved Forest (SRF); (ii) plan, monitor, and evaluate the ecological changes; (iii) develop management practices and prescriptions for sustained maximum economic yield of timber products; (iv) improve communication system in the SRF; and (v) strengthen institutional capabilities of the Forest Department for the integrated management and development of the SRF.
22. Assistance to Forestry Sector	1987-1990	UNDP	Tk25 million	To improve sector economic analysis and investment planning and to assist rehabilitation and land use planning, particularly sal forest lands in Dhaka, Tangail, and Mymensingh.
23. Strengthening the Forestry Development and Training Center, Kaptai	1982-1987	UNDP	\$1.24 million (Tk49.72 million)	To strengthen the operational and pedagogical capabilities of the center.
24. Inventory survey of forestry resources of Chittagong and Chittagong Hill Tracts	1981-1985	UNDP	\$688,000 (Tk27.5 million)	To take stock of the forests of Kassalong, Reing Kheong, and Sita Pahar Reserve forests and pulpwood.
25. Development of forestry resource (Management and Product Branch)	1980-1985	UNDP	\$1.3 million (Tk51.92 million)	To carry out research to increase forest productivity and to develop efficient management technique of the forests.
26. Food assistance to afforestation program	1987-1998 - regular program	World Food Programme	N.A.	Create forestry-based income generating opportunities in rural areas.

## SUMMARY OF THE GLOBAL ENVIRONMENT FACILITY'S ROLE IN THE PROJECT

### A. Background and Rationale

1. The Project addresses a globally important ecosystem under serious threat. The overall goal of the Project is the sustainable conservation of the biological diversity and ecological integrity of the Sundarbans Reserved Forest (SRF) in Bangladesh. Although clearly committed to the conservation of biodiversity, the main priority of the Government is the reduction of rural poverty and the development of alternative sources of income for the 3.5 million people who live around the SRF. However, these goals are interrelated, because if the natural resource base continues to deteriorate, poverty and social conflict will increase.

2. The Global Environment Facility (GEF) will support the Project and focus on biodiversity conservation in the SRF through the GEF's Biological Diversity Operational Program in coastal, marine and freshwater, and forest ecosystems. The GEF's role in the Project was proposed by the Government and endorsed as a national priority.<sup>1</sup> It will (i) ensure the conservation of three existing wildlife sanctuaries that have global biodiversity significance, (ii) directly promote and strengthen human resources and skills and promote the utilization of local expertise, (iii) address the root causes of global environmental deterioration by redressing institutional and policy weaknesses, (iv) build capacity within the local community and institutions to manage sustainable resource use, (v) assist Bangladesh in fulfilling its obligations under the Convention on Biological Diversity,<sup>2</sup> (vi) integrate biodiversity conservation into forestry management, and (vii) promote the sustainability of Project benefits.

3. The GEF will support activities that have global benefits which are incremental to the key objectives of the overall Project. Currently, the Forest Department (FD) has insufficiently trained staff and institutional weaknesses that do not allow for effective ecosystem management with global biodiversity objectives in mind. The GEF support will enable the Government to strengthen its capacity for biodiversity management. It will ensure the conservation of the three wildlife sanctuaries, which are the highest priorities. The sanctuaries will be used as protected nature reserves where the only allowable activities are scientific research and ecotourism under sustainable conditions. Outside the wildlife sanctuaries but within the SRF, the GEF support will ensure that biodiversity considerations are incorporated in sustainable livelihood programs. In addition, the GEF will support full participation of all stakeholders in the dialogue to determine the best configuration of management that ensures biodiversity conservation while maximizing sustainable resource extraction. The GEF will also cover the costs associated with environmental education and community awareness activities throughout the Project area. Finally, the GEF will support a monitoring and evaluation system that operates at two independent levels: project specific and area specific.

### B. The GEF Components

4. The GEF will finance, on a grant basis, technical assistance to be administered by the Bank. The GEF will contribute to five of the six Project components, playing an integrating role in the overall Project. The Technical Advisory Group (TAG), described in Part E of the Project, will be a critical vehicle for implementing the GEF components, as well as for the Project overall. In brief, the GEF components are as follows:

<sup>1</sup> The Government requested GEF support for the Project in a letter dated 7 January 1998.

<sup>2</sup> The Convention on Biological Diversity was ratified by the Government on 3 May 1994.

6. **Part A.** GEF support will be earmarked for capacity building, especially for training of Project staff in the new functional units of the Sundarbans management unit, in setting royalties and revenue-collection systems, policy development, and sanctuary interpretation services. The GEF will also support increased operations and patrols to ensure biodiversity conservation in the wildlife sanctuaries (including provision of patrol vessels). Honoraria will be provided for members of the Sundarbans stewardship commission to attend meetings, and funding will be provided for meetings and workshops related to the work of both the stakeholder advisory council and the independent conservation monitoring by the World Conservation Union.

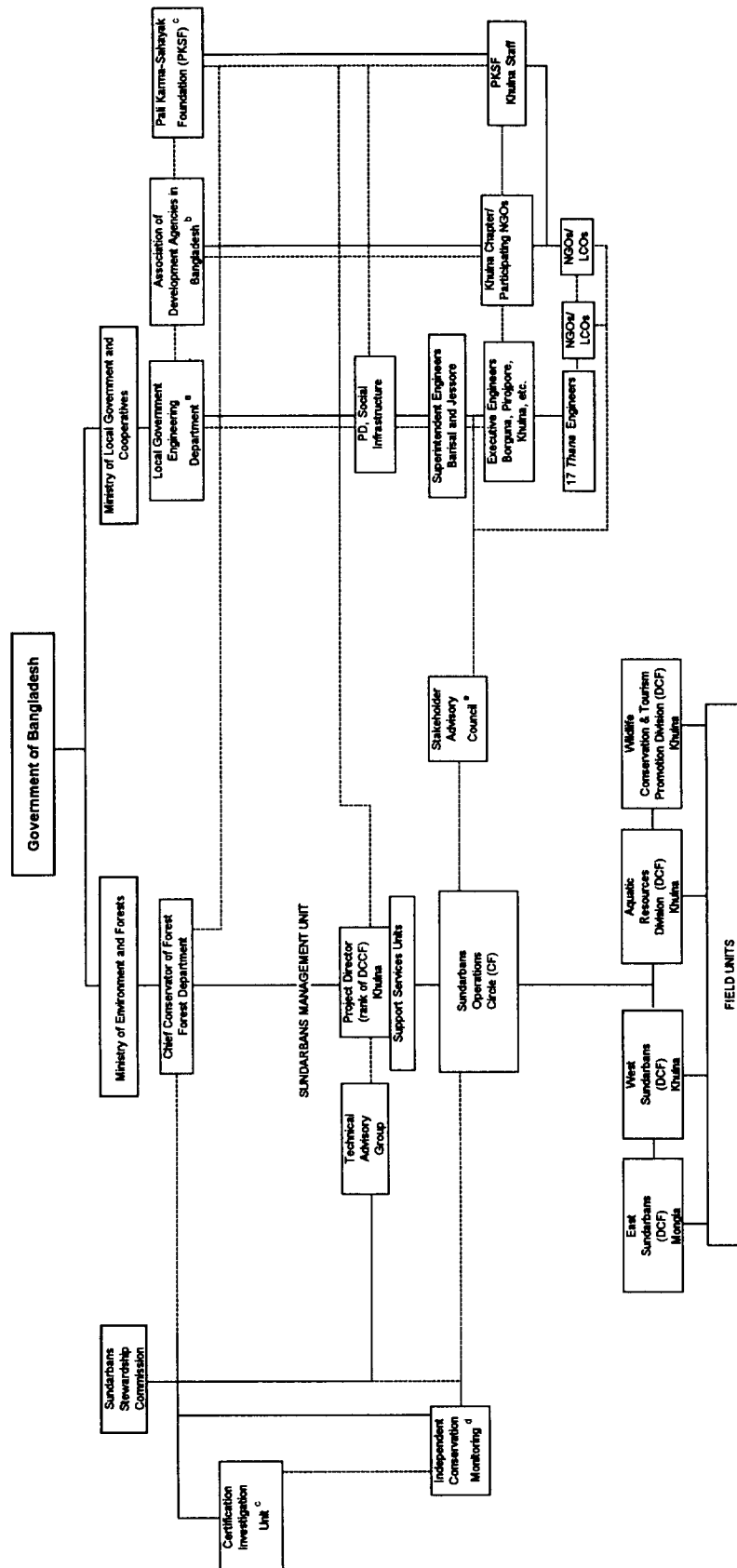
7. **Part B.** The Project will use GEF funding to promote better planning and management of forest resources, fisheries, and wildlife. A mangrove arboretum will be included and biodiversity conservation principles will be incorporated into the FD's operations for sanitation harvesting of *Sundri* trees affected by top-dying disease. Sustainable fisheries management will be established, including monitoring and surveillance; field equipment will be provided, and a field laboratory and office will be established. Wildlife conservation policy and regulations will be developed, operations to protect wildlife will be undertaken, and related infrastructure (e.g. drinking ponds) will be provided. The Project will also conduct a participatory stakeholder review of existing management plans and their adoption and implementation by the Government.

8. **Part C.** The GEF will finance the costs of mainstreaming biodiversity issues into the programs of nongovernment organizations selected for participation in the Project.

9. **Part D.** Under the GEF component, an environmental information and education center will be established in Khulna to provide a focal point for tourists to learn about the SRF. The GEF will also provide for observation towers and jetties, protective netting, mangrove interpretation centers, barracks for the East sanctuary, and sanctuary boundary demarcation. Training of Project staff and local communities will be conducted on marketing, interpretive planning, and tourism. The GEF will support visits to the SRF by international conservation experts, and advise on tourism planning, research studies, and tourism operations. Media campaigns for environmental awareness will be conducted to generate wider civil society support for conserving the area. Other community-based conservation activities will be supported as needed.

10. **Part E.** GEF support for the TAG will focus on integrated (i.e., terrestrial plus aquatic resources) conservation management planning and plan implementation and on promoting ecotourism, building environmental awareness, and the biodiversity aspects of the impact zone socioeconomic development program. For biodiversity conservation, particular emphasis will be placed on the wildlife sanctuaries within the Project area. Project staff and stakeholders will be trained in biodiversity-related aspects of conservation and management. GEF support will also be used for independent conservation monitoring, and research studies such as *Sundri* Top-dying disease, remote sensing for forestry and land use, water resources monitoring, tiger and other animal ecology, biodiversity inventories, etc.

# PROPOSED INSTITUTIONAL FRAMEWORK



<sup>a</sup> The Local Government Engineering Department (LGED) will be responsible for the social infrastructure program.

<sup>b</sup> PKSF will be the microfinance apex organization.

<sup>c</sup> To be designed by an international inspection and certification company, unit may be set up within the Office of the Auditor General.

<sup>d</sup> Conservation monitoring will be undertaken by IUCN (World Conservation Union).

<sup>e</sup> Membership will include representatives of the following stakeholders: fisheries, woodcutters, honey collectors, tour operators, Forest Department staff, industry representatives, timber merchants, shrimp farmers, local residents, women's groups, and others.

Source: Appraisal Mission.

— = line of command  
 - - - = line of communication

CF = Conservator of Forests; DCCF = Deputy Chief Conservator of Forests; DCF = Deputy Conservator of Forests;  
 DFO = Divisional Forest Officer; GIS = Geographical Information System; NGO = Nongovernment Organization;  
 LCO = Local Community Organization; PD = Project Director.

## OUTLINE TERMS OF REFERENCE FOR CONSULTING SERVICES, RESOURCE MONITORING, RESEARCH STUDIES, AND FELLOWSHIPS

### A. General

1. Project implementation will be supported by consulting services comprising a Technical Advisory Group (TAG) and other inputs. The TAG will require a total of 381 person-months of consultancy services (240 of international consultants, and 141 of domestic consultants). The TAG will be selected in accordance with the Bank's *Guidelines on the Use of Consultants*. It will be based in the Sundarbans Management Unit (SMU) Project Office (Khulna) and will work closely with the Project director/chief executive officer and other staff. Another 48 person-months of international consulting services will be required: 36 for independent conservation monitoring by the World Conservation Union (IUCN) and 12 unallocated for other consultancies. In addition, the Project will provide support for remote sensing, water resources and quality monitoring, the design of a certification and inspection system, and a small number of applied research studies (para. 23). Emphasis will be placed on working with contracted service providers to complement the core biodiversity conservation and management capacity that needs to be created in the SMU. To support this a fellowship program is also included (para. 24). Table 1 provides a summary of consultant inputs, including the source of funding for each position.

### B. Technical Advisory Group

2. The TAG will consist of a core group of consultants with an international consultant as its team leader.

#### 1. International Consultants

3. The consultants will concentrate their activities on the SRF with a focus on (i) improved overall administration and management; (ii) integrated conservation management planning (including terrestrial resources and aquatic resources) and plan implementation; and (iii) ecotourism, environmental awareness, and impact zone development. For biodiversity conservation aspects, particular emphasis will be placed on the three wildlife sanctuaries within the Project area. The TAG specialists will coordinate their respective activities with the relevant Forest Department staff, nongovernment organization (NGO) staff, and other officials and with the help and active cooperation of local communities where necessary. Training of relevant staff and stakeholders, as well as supporting related conservation monitoring and research studies (including arrangements to contract service providers), will be important functions. Relevant postgraduate academic qualifications will be required, preferably to doctorate level, as well as a minimum of 10 years international professional experience in developing countries. The following inputs will be required:

#### a. Improved Administration and Management Subgroup

4. **Management Adviser.** To assist in the start-up of the new administrative and management arrangements for the SRF (as outlined in Appendix 4), the management adviser will advise the Project director and the management staff of the SMU regarding (i) all administrative and financial functions of the Project, including revenue collection, financial management and administration; (ii) prepare a draft operations manual for SMU staff, including

essential reporting formats; (iii) develop a human resources development program for SMU staff, including the functional units and the Sundarbans Operations Circle, and outline short duration courses for each of the different staff levels; (iv) assist senior Forest Department staff in delivering these short courses; (v) review the adequacy of the equipment, materials, supplies, and funding and budget requirements for the SMU and advise the Project director regarding the allocation of resources for essential Project functions; and (vi) through close collaboration with the independent conservation monitoring team, the proposed certification and inspection unit, and other TAG members, establish a system for ensuring continuous feed-back of information for SRF management.

**Table 1: Overview of Consulting Services Inputs**  
(person-months)

Position	Funding	1999- 2000	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05	2005- 06	Total
<b>A. Technical Advisory Group</b>									
1. International Consultants									
a. Improved Management and Administration									
i. Management Adviser	Loan	9	12	12	3	2	-	-	38
ii. Management Information Systems Specialist	Loan	0	12	3	3	-	-	-	18
<b>Subtotal a</b>		<b>9</b>	<b>24</b>	<b>15</b>	<b>6</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>56</b>
b. Integrated Conservation Mgt. Planning									
i. Protected Area Management Specialist (Team Leader)	GEF	6	12	9	3	2	1	-	33
ii. Fisheries Management Specialist	GEF	6	12	4	3	2	1	-	28
iii. Biodiversity Specialist (Wildlife Mgt.)	GEF	6	12	4	3	2	1	-	28
iv. Nonwood Forest Product Specialist	GEF	6	12	4	3	2	1	-	28
v. Forest Resource Economist	Loan	-	12	6	-	-	-	-	18
<b>Subtotal b</b>		<b>24</b>	<b>60</b>	<b>27</b>	<b>12</b>	<b>8</b>	<b>4</b>	<b>-</b>	<b>135</b>
c. Ecotourism, Environmental Awareness and Impact Zone									
i. Ecotourism Specialist	GEF	3	12	3	2	1	-	-	21
ii. Information, Educ., & Communication Spec'lst	GEF	3	6	-	-	-	-	-	9
iii. Community Development Specialist	Loan	3	6	-	-	-	-	-	9
iv. Common Property Resource Specialist	GEF	3	3	2	2	-	-	-	10
<b>Subtotal c</b>		<b>12</b>	<b>27</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>-</b>	<b>49</b>
<b>Subtotal (1)</b>		<b>45</b>	<b>111</b>	<b>47</b>	<b>22</b>	<b>11</b>	<b>4</b>	<b>-</b>	<b>240</b>
2. Domestic Consultants									
a. Project Coordination Specialist	Loan	9	12	12	12	6	3	-	54
b. Fisheries Processing/Marketing Specialist	Loan	6	6	6	6	-	-	-	24
c. Information, Educ. & Communication Spec'lst	GEF	-	6	4	4	-	-	-	14
d. Community Development Specialist	Loan	3	6	4	4	4	3	1	25
e. Socioeconomist	Loan	6	6	6	-	-	-	-	18
f. Natural Resource Legislation Specialist	GEF	-	6	-	-	-	-	-	6
<b>Subtotal (2)</b>		<b>24</b>	<b>42</b>	<b>32</b>	<b>26</b>	<b>10</b>	<b>6</b>	<b>1</b>	<b>141</b>
<b>Subtotal (1+2)</b>		<b>69</b>	<b>153</b>	<b>79</b>	<b>48</b>	<b>21</b>	<b>10</b>	<b>1</b>	<b>381</b>
<b>B. Resource Monitoring and Surveillance</b>									
1. Independent Conservation Monitoring (IUCN)									
Conservation Monitoring Experts	GEF	6	6	6	6	6	6		36
2. Remote Sensing System									
3. Surface Water Modeling	GEF	Contract over 5 years							
4. Inspection and Certification System									
-Design Study	Loan	Contract over 1 year			-	-			
<b>C. Research Studies and Other Consultancies</b>									
1. Internet Website, other ecotourism community video, etc.									
	Loan		2	2	2	2	2	2	12
2. Research Studies : e.g., Tiger Ecology and Sundri Top-dying									
	GEF	Contracts							
<b>D. Fellowship Program</b>									
	Loan	50 Regional Fellowships							

GEF = Global Environment Facility; IUCN = World Conservation Union  
Source: Appraisal Mission.

5. **Management Information Specialist.** The specialist will (i) identify, gather, review, and assess all the available data and information on the Sundarbans Reserved Forest (SRF), the wildlife sanctuaries, and the impact zone; (ii) consult with potential service providers to gain further insights into the issues and to assess the capacity to deliver; (iii) coordinate with other members of TAG regarding the research, development, and implementation program; (iv) establish a comprehensive database system such as the Biodiversity Information Management System that incorporates a geographical information system (e.g., ARCInfo) and database management (e.g., MS FoxPro); (v) input key digital data on important factors or issues to the SMU from existing sources, and other issues; (vi) identify training/capacity building needs and coordinate training provision; and (vii) review and refine the program providing analyses for policy, planning, and scientific uses.

**b. Integrated Conservation Management Planning Subgroup**

6. **Protected Area Management Specialist (Team Leader).** The specialist will (i) lead subgroup members to conduct a multidisciplinary review of the existing management plans for the three wildlife sanctuaries; (ii) lead the TAG in developing the integrated conservation management plan (incorporating sector plans for forestry, fisheries/aquatic resources, wildlife, and ecotourism); (iii) coordinate all aspects of stakeholder participation in discussions for the preparation of final plans; (iv) followup with the appropriate Government agencies for approval of these plans; (v) process the information gathered by other team members to update management plans and develop annual operational plans; (vi) assess the institutional capability of potential service providers for the implementation of activities, concentrating particularly on NGOs; (vii) coordinate the external and in-country training of staff and participants; (viii) organize periodic dissemination meetings to stakeholders, and Government officials, and others; and (ix) coordinate the preparation of annual reports on the Project.

7. **Biodiversity Specialist (Aquatic Resources Management).** The specialist will (i) gather, collate, review, and assess all available research reports and data on the fish stocks of the Sundarbans; (ii) lead in preparing the fisheries/aquatic resources management plan; (iii) consult with the relevant Government departments, research institutes, and private sector experts to determine and prioritize the data and other information gaps; (iv) design and support a catch monitoring and recording scheme to ensure that comprehensive and accurate time-series data become available; (v) assess the institutional capability of potential service providers for the monitoring and catch-recording activities, concentrating particularly on NGOs; (vi) develop and implement a training program to improve institutional capacity in fisheries, including a program to develop sustainable fisheries management rules and regulations in the SRF, including the marine zone; (vii) assess the institutional capability of potential contract fisheries research and development service providers; (viii) formulate a research and data collection program to meet priority needs; (ix) package this program as a series of discrete output areas suitable for contracting it out as a research program; (x) coordinate the tendering and selecting of bidders for the contract research; (xi) monitor and support the research program and, where needed and time permits, participate in this work; and (xii) coordinate the provision of training to service providers.

8. **Biodiversity Specialist (Wildlife Management).** The specialist will (i) formulate a research and management program aimed at obtaining the quantitative data necessary for the preparation of a mammal habitat management plan (especially for tiger, spotted deer, wild boar, monkeys, and birds); (ii) determine and report on the current status and relative importance of aquatic vertebrate concentration (especially crocodiles, lizards, turtles, and dolphins in the



Sundarbans, with particular attention to the three Wildlife Sanctuaries) identifying management, monitoring, sustainable utilization, and enforcement measures required; (iii) conduct field research and report on the long-term management and sustainable use of the Sundarbans mammal and bird populations and habitat, including habitat alteration and human disturbance; (iv) critically review existing resource inventories, forest management plans, and development plans; (v) assess the representativeness and conservation value of the existing wildlife sanctuaries and identify potential additional core conservation areas and corridors between existing sanctuaries; (vi) if sustainable harvests are considered feasible, prepare, with TAG, a comprehensive plan analyzing investment, infrastructure, training, marketing and legal implications, and its impact on wildlife populations in SRF; (vii) review available information on species known to have been extirpated from the SRF and assess current habitat suitability and the rationale for their reintroduction (e.g., conservation value, sustainable use, ecotourism, availability of genetically similar stock etc.); and (viii) identify management deficiencies in the environmentally sensitive areas, core conservation sanctuaries and use zones, and prepare an optimum management model for integrating biodiversity conservation with sustainable levels of resource utilization. The specialist will also identify appropriate institutions to undertake specific research parts of this work on contract, as necessary (para. 23).

9. **Nonwood Forest Product Specialist.** The specialist will (i) make recommendations for incorporation and management of nonwood forest products activities within the SRF; (ii) review available research and information on the nonwood forest products species in the SRF and recommend sustainable harvest and management practices; (iii) review the current harvest permit system and recommend improvements to promote resource sustainability, including pricing and harvest monitoring (working with the Forest Resource Economist); (iv) develop alternative nonwood forest products resource management strategies through agroforestry development, as well as improved management of the natural mangrove forest in the SRF to be implemented by individuals and community groups of the impact zone; and (vi) working with other TAG members, disseminate this information through various mass media (brochures, radio, extension activities, etc.).

10. **Forest Resource Economist.** The economist will (i) review the current status of the resource base in the Sundarbans and advise on charges for access to SRF resources based on economic principles, including charges for ecotourism; (ii) review existing practices and methodologies for the collection and analysis of resource assessment data for multisector management planning and economic valuation; (iii) conduct economic valuation of the natural resource base of the SRF including the current and potential value of both the individual resources and the ecosystem as a whole based on sustainable extraction; (iv) identify alternative resource use scenarios with each alternative maximizing the use of a single resource (fisheries, ecotourism, natural protection services, etc.); and (iv) identify the scenarios generating the highest total net economic benefit from the ecosystem. Training of counterpart staff will also be done.

c. **Ecotourism, Environmental Awareness, and Impact Zone  
Development Subgroup**

11. **Ecotourism Development Operations Specialist.** The specialist will (i) advise on the implementation of all Project-supported ecotourism activities; (ii) prepare a training program for tourism guides reflecting the training standards of international wildlife tourism programs and assess, in detail, the training capabilities of the local institutions; (iii) evaluate likely gender issues, particularly with reference to potential areas for women's participation and

interest in tourism as a potential career path; (iv) identify and supervise the firm, institution, or individuals who will prepare ecotourism training curriculum material, and assist in training NGOs and possible private operators of ecotourism ventures; (v) work with selected communities to develop their tourism products and services, and assist local communities in preparing village-level conservation projects of interest to tourism; (vi) prepare appropriate employment standards including employee benefits, gender equity, and working conditions; (vii) assess the financial costs and returns, with the help of other members of TAG, on any tourism investments; (viii) help TAG develop mechanisms for effective and efficient transfer of tourism revenues to cover recurrent costs of protected area management after the Project is completed; and (ix) assist the Bangladesh Parjatan Corporation in organizing and preparing the tourist plan marketing strategy, and in advertising the Sundarbans as a tourist destination.

12. **Information, Education, and Communication Specialist.** The specialist will (i) advise on the implementation of all Project-supported aspects of public information and environmental education related to the Sundarbans, including the establishment and operations of the Environmental Information and Education Center to be set up on a cost-sharing basis in Khulna and managed on contract; (ii) consult widely (with focus groups, gender groups, NGOs, civil society members, workshops, etc.) to gain consensus on the role and functions of the Project relative to the community; (iii) facilitate the development of a strategic approach as to how the Project will fulfill its role and carry out its functions; (iv) identify the stakeholders and determine how they can be best reached through community education programs with a biodiversity and natural resource conservation messages; and (v) prepare a practical program related to education about the SRF and biodiversity conservation for use nationally, and with local communities in the Sundarbans and for schools/colleges, including nonformal education.

13. **Community Development Specialist.** The specialist will (i) advise on the implementation of all Project-supported activities directed at community development, including microenterprise activities; (ii) work with concerned SMU staff and participating NGOs to develop strategies for organizing local community organizations of specific resource users, gender-specific groups, their constitution and formalization, roles and responsibilities vis-a-vis the SRF; (iii) provide training to SMU staff on stakeholder participation, gender issues, and preparation of curriculum; (iv) work with selected communities to identify the cultural heritage interpretation opportunities and design programs that can be delivered locally; (v) prepare ground rules for nonwood forest product extraction and management on sustainable basis; and (vi) plan focused study tours for NGOs, local community organizations, SMU staff to NGO-led community-based programs in the mangrove areas in the Subcontinent and elsewhere in the region.

14. **Common Property Resource Specialist.** The specialist will work with communities to organize common property resource user groups, design appropriate organizational arrangements, including frameworks for common property resource agreements incorporating appropriate user rights and responsibilities. The specialist, in close association with the SMU, NGOs, and other agencies and civil society groups, will facilitate the emergence of framework arrangements and agreements for SRF resource user groups.

## 2. Domestic Consultants

15. Domestic consultancy services are required in the following disciplines, for which relevant graduate/postgraduate academic qualifications are required, plus a minimum of five years relevant professional experience:

16. **Project Coordination Specialist.** The specialist will (i) identify and establish the linkages and key relationships required to coordinate planning, scheduling, activities, and training; (ii) build working relationships between Project implementing agencies, beneficiaries, and service contractors supplying inputs; (iii) liaise closely with the Bank; (iv) provide regular monitoring reports to the SMU, the Bank, and the participating institutions regarding implementation, especially identifying problems and possible solutions; and (v) other duties as required.

17. **Fisheries Processing/Marketing Specialist.** The specialist will work with the international Fisheries Management Specialist to (i) determine the amount and type of data required to successfully implement a sustainable fisheries processing and marketing program; (ii) recommend the processing methods most suitable to sustaining the catch and minimizing waste; (iii) develop suitable marketing strategies to stimulate demand in the local, national, and international markets; (iv) assess the institutional capability of potential contract fisheries processing and marketing service providers; (v) formulate a detailed processing and marketing program to meet priority needs; (vi) package this program as a series of discrete output areas suitable for tendering out under a contract; (vii) coordinate the process of tendering and selecting successful bidders; and (viii) monitor performance of contracts.

18. **Information, Education, and Communication Specialist.** The specialist will work with counterpart international consultant to (i) advise on the implementation of all Project-supported aspects of public information and environmental education; (ii) consult widely (with focus groups, gender groups, NGOs, civil society members, workshops, etc.) to gain consensus on the role and functions of the Project relative to the community; (iii) facilitate the development of a strategic approach; (iv) identify the stakeholders and determine how they can be best reached through community education programs with biodiversity and natural resource conservation messages; and (v) in consultation with communities and NGOs, develop the structure of local community organizations to be formed under the Project.

19. **Community Development Specialist.** The specialist will work with the international consultant to (i) advise on the implementation of all Project-supported activities directed at community development, including microenterprise activities; (ii) work with concerned SMU staff and participating NGOs to develop strategies for organizing local community organizations of specific resource users; (iii) provide training to SMU staff; (iv) prepare and implement a practical program related to education about the SRF and biodiversity conservation for use with local communities; (v) prepare ground rules for nonwood forest product extraction and management on sustainable basis; and (vi) plan focused study tours for NGOs, local community organizations, SMU staff to NGO-led community-based programs in the mangrove areas in the Subcontinent and elsewhere in the region.

20. **Socioeconomist.** The socioeconomist will (i) review existing socioeconomic data for the *thana* and villages in the impact zone and, as needed, conduct rapid appraisal surveys; (ii) prepare initial socioeconomic profiles for each *thana*; (iii) identify potential beneficiaries in the selected areas by using participatory rural appraisal techniques; (iv) make an assessment of community relationships at the village level; (v) collect and analyze information on household incomes, malnutrition, infant mortality, illiteracy, migration, other relevant processes and trends having significant bearing on the well-being of local communities; (vi) collect and analyze data on land tenure and access to other resources, and on incidence of poverty; (vii) collect information on resource exploitation in the SRF, proportion of population involved, estimates of volume and value, and seasonality; (viii) identify formal and informal village organizations in the

impact zone; (ix) present and discuss the information on socioeconomic research activities at district-level workshops and formulate appropriate recommendations for action; and (x) formulate strategies for socioeconomic development with appropriate mobilization and involvement of NGOs, local community organizations, and women groups.

21. **Natural Resource Legislation Specialist.** The specialist will advise the Forest Department and the Bangladesh Parjatan Corporation in legal and regulatory arrangements for tourist operators, giving special consideration to minimum safety and environmental aspects for tourist boats, establishment, collection of tourist fees and taxes, and registration of tourism boat owners allowed to provide services in the SRF. The specialist will work with other TAG team members and SMU staff to (i) identify any adjustment of existing natural resource legislation (forest, fisheries, wildlife) necessary to reform SRF conservation and promote effective management; (ii) develop proposed mechanisms for effective and efficient transfer of tourism revenues to cover recurrent costs of protected area management after the Global Environment Facility grant expires; and (iii) prepare draft legislation and other legal documentation necessary for the above; (iv) other duties related to SRF reform.

### C. Resource Monitoring and Surveillance

22. Independent conservation monitoring and the preparation of an annual "State of the Sundarbans" report to the Sundarbans Stewardship Commission will be undertaken along with monitoring of the health of key ecosystem components and species. The timeliness of conservation activities will be compared with established benchmarks on an annual basis. A remote sensing system for forestry, land use and aquatic use (e.g., mapping, digital elevation models, change detection) will be introduced. The Surface Water Modeling Center in Dhaka will monitor water resources, detect pollution, and make operational recommendations. An inspection and certification system will be designed by a professional inspection and certification company of international repute.

### D. Research Studies and Other Consultancies

23. Priority has been given for applied research on *Sundri* top-dying disease, tiger and ungulate ecology, and biodiversity inventories. The TAG will undertake part of this work, and the rest will be contracted to appropriate international NGOs and other qualified institutions. Other consultancies will include Internet site development, community video production, and ecotourism training.

### E. Fellowships

24. In addition to the short-term in-country and external training programs, 50 regional fellowships will be available. These will enable selected participants from the participating Government agencies, NGOs, local community organizations, and the community to gain academic and technical qualifications abroad, as well as an understanding of mangrove ecosystem management and community development in the areas required for long-term SRF conservation management.

## COST ESTIMATES AND FINANCING PLAN

Table 1: Cost Estimates  
(\$ million)

Component	Foreign Exchange	Local Currency	Total Cost
Part A. Effective Organization of the SRF			
1. Establish Organization Capacity	3.71	8.16	11.87
2. Upgrade Infrastructure	0.32	1.29	1.61
<b>Subtotal (A)</b>	<b>4.03</b>	<b>9.45</b>	<b>13.48</b>
Part B. Biodiversity Conservation and Sustainable Resource Management			
1. Forestry	2.85	8.17	11.02
2. Aquatic Resources	0.58	0.69	1.28
3. Wildlife	0.25	0.29	0.54
4. Integrated Management Planning	0.23	0.21	0.44
<b>Subtotal (B)</b>	<b>3.92</b>	<b>9.36</b>	<b>13.28</b>
Part C. Socioeconomic Development of the Impact Zone			
1. NGO Social Mobilization, Microenterprise, Management, and Training	-	5.39	5.39
2. Social Forestry	0.14	0.48	0.62
3. Rural Development	1.97	16.68	18.65
<b>Subtotal (C)</b>	<b>2.11</b>	<b>22.56</b>	<b>24.66</b>
Part D. Ecotourism and Environmental Awareness			
1. Ecotourism	0.95	0.93	1.88
2. Public Awareness Program	-	0.81	0.81
<b>Subtotal (D)</b>	<b>0.95</b>	<b>1.75</b>	<b>2.70</b>
Part E. Technical Advisory Group, Monitoring, and Research Studies			
<b>Subtotal (E)</b>	<b>8.75</b>	<b>0.79</b>	<b>9.53</b>
Part F. KNM Effluent Treatment Plant			
<b>Subtotal (F)</b>	<b>3.07</b>	<b>1.32</b>	<b>4.39</b>
<b>Total Base Costs</b>	<b>22.82</b>	<b>45.22</b>	<b>68.05</b>
Physical Contingencies <sup>a</sup>	2.10	2.43	4.53
Price Contingencies <sup>b</sup>	1.58	6.85	8.43
Service Charge on Bank Loan	1.23	-	1.23
<b>Total Project Cost</b>	<b>27.74</b>	<b>54.50<sup>c</sup></b>	<b>82.24</b>

KNM = Khulna Newsprint Mills; NGO = Nongovernment organization; SRF = Sundarbans Reserved Forest.

<sup>a</sup> Based on 10 percent of base cost for most items, not including credit amount in Part C.<sup>b</sup> Based on annual escalation factors of 2.5 percent (foreign); 5 percent (1998), and 4.5 percent thereafter (local).<sup>c</sup> Includes duties and taxes estimated at \$6.77 million.

Source: Mission estimates.

**Table 2: Financing Plan**  
(\$ million)

Component	NDF	PKSF	Beneficiaries	NGO	Government	Bank	GEF	Total
<b>Part A. Effective Organization of the SRF</b>								
1. Establish Organization Capacity	0	0	0	0	4.27	8.83	1.55	14.65
2. Upgrade Infrastructure	0	0	0	0	0.78	1.14	0	1.92
<b>Subtotal (A)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5.05</b>	<b>9.97</b>	<b>1.55</b>	<b>16.57</b>
<b>Part B. Biodiversity Conservation and Sustainable Resource Management</b>								
1. Forestry	0	0	0	0	5.26	8.79	0.15	14.20
2. Aquatic Resources	0	0	0	0	0.33	0.61	0.63	1.57
3. Wildlife	0	0	0	0	0.14	0	0.54	0.68
4. Integrated Management Planning	0				0.13	0	0.41	0.54
<b>Subtotal (B)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5.86</b>	<b>9.40</b>	<b>1.72</b>	<b>16.99</b>
<b>Part C. Socioeconomic Development of the Impact Zone</b>								
1. NGO Social Mobilization, Microenterprise Management and Training	0	0	0	0.65	0.65	5.01	0.16	6.47
2. Social Forestry	0	0	0	0.13	0.19	0.49	0	0.81
3. Rural Development	0	6.77	3.76	1.13	3.22	5.85	0	20.73
<b>Subtotal (C)</b>	<b>0</b>	<b>6.77</b>	<b>3.76</b>	<b>1.91</b>	<b>4.06</b>	<b>11.35</b>	<b>0.16</b>	<b>28.01</b>
<b>Part D. Ecotourism Development and Environmental Awareness</b>								
1. Ecotourism	0	0	0	0	0.26	0.79	1.24	2.28
2. Public Awareness Program	0	0	0	0	0.21	0	0.80	1.01
<b>Subtotal (D)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.46</b>	<b>0.79</b>	<b>2.04</b>	<b>3.29</b>
<b>Part E. Technical Advisory Group, Monitoring, and Studies</b>								
	0	0	0	0	0.11	4.26	6.73	11.10
<b>Subtotal (E)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.11</b>	<b>4.26</b>	<b>6.73</b>	<b>11.10</b>
<b>Part F. Effluent Treatment Plant</b>								
	4.52	0	0	0	0.53	0	0	5.05
<b>Subtotal (F)</b>	<b>4.52</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.53</b>	<b>0</b>	<b>0</b>	<b>5.05</b>
<b>Service Charge</b>								
	0	0	0	0	0	1.23	0	1.23
<b>Total</b>	<b>4.52</b>	<b>6.77</b>	<b>3.76</b>	<b>1.91</b>	<b>16.07</b>	<b>37.00</b>	<b>12.20</b>	<b>82.24</b>

GEF = Global Environment Facility; KNM = Khulna Newsprint Mills; NDF = Nordic Development Fund; NGO = nongovernment organization; PKSF = Palli Karma-Sahayak Foundation; SRF = Sundarbans Reserved Forest.

Source: Mission estimates.

## PROJECT IMPLEMENTATION SCHEDULE

Activity	1999	2000	2001	2002	2003	2004	2005	2006
Part A: Effective Organization of the SRF								
Sundarbans Management Unit (SMU)								
Sundarbans Stewardship Commission								
Stakeholder Advisory Council								
Upgrade Infrastructure								
Part B: Biodiversity Conservation and Sustainable Resource Management								
Forestry								
Aquatic Resources								
Wildlife								
Integrated Conservation Management								
Part C: Socioeconomic Development of the Impact Zone								
Nongovernment Organization Social Mobilization, Microenterprise Management, and Training								
Social Forestry								
Rural Development								
Part D: Ecotourism and Environmental Awareness								
Construction of Basic Public Infrastructure								
Environmental Awareness Program								
Part E: Technical Advisory Group, Monitoring, and Research Studies								
Part F: Khulna Newsprint Mill (KNM) Effluent Treatment Plant <sup>a</sup>								
Advisory Technical Assistance - Options Study of KNM								
Annual Review	*	*	*	*	*	*	*	*
Midterm Review								
Completion Review								*

<sup>a</sup> Subject to results of the technical assistance.

## Major Activities During Initial Implementation Stage

Activity	1998	1999
1. Office setup for SMU		
2. Advance procurement of vehicles, equipment, and materials		
3. Selection of consultants		
4. Selection of institution for in-country and external training		
5. Preparation of design and costing for civil works		
6. Preparation of consultation plans with NGOs in the impact zone		

## ADVISORY TECHNICAL ASSISTANCE – STUDY OF FUTURE OPTIONS FOR THE KHULNA NEWSPRINT MILLS

### A. Introduction

1. Khulna Newsprint Mills (KNM) is a fully owned subsidiary of the State-owned Bangladesh Chemical Industries Corporation (BCIC), within the Ministry of Industries (MOI). The mill was established in 1959, originally to supply newsprint to the former East and West Pakistan, and is the sole domestic producer of newsprint in Bangladesh. Employing over 2,000 people, KNM has not achieved a positive financial position since the mid-1980s due to sales prices being regulated by Government, the opening of the newsprint market to international competition in the mid-1990s, old equipment, and the poor operating efficiency and technical condition of the mill. The raw material used for KNM's operations is the *Gewa* tree (*Excoecaria agallocha*), a key species in the mangrove ecosystem now seriously in danger of being lost from the Sundarbans Reserved Forest (SRF). KNM is also a major source of water pollution in Khulna and the SRF due to the absence of effluent treatment at the mill.

2. At loan appraisal, the Government confirmed its request to the Bank for advisory technical assistance (TA) to analyze the future options for KNM.

### B. Background and Rationale

#### 1. Background

3. Historical *Gewa* consumption by KNM has been approximately 100,000 to 120,000 cubic meters per year, compared with a recent estimated sustainable yield in SRF of 40,000-50,000 cubic meters per year. Recent forest inventories have shown that, as a result of this intense harvesting pressure, *Gewa* growing stocks within SRF have declined by 58 percent from 1983 to 1996 and will be exhausted within 13 years at current harvest levels. In addition, KNM releases untreated wastes into the Bhairab River, which winds through Khulna and eventually drains into rivers passing through the SRF. This results in extremely high effluent loads entering the river. To address this, the Project includes an effluent treatment plant. During the processing of the Project, the Government and the Bank agreed that KNM could no longer rely on *Gewa* from the SRF as supplies had drastically fallen due to past overexploitation. Further, and most importantly, continued cutting was undermining the viability of the whole ecosystem. As *Gewa* is far less plentiful than previously, and as the need to conserve the SRF is widely accepted in Government, low cost imported waste as a source of pulp for newsprint manufacture was seen as a potentially viable alternative.

4. Until recently, KNM's production of newsprint was approximately 50,000 tons per year. Since 1995, production has been substantially lower due to the opening of the newsprint market to imports and the inferior quality of KNM production compared with imported newsprint. However, quality improvements undertaken at the mill, combined with the recently introduced import quota system,<sup>1</sup> have improved the position of KNM and production is recovering. KNM currently consists of the following main production units: (i) *Gewa* wood handling, consisting of intake of wood from the SRF, manual debarking, and intermediate storage; (ii) chemi-mechanical pulp mill for *Gewa* wood with two chemical pretreatment possibilities—cold soda and peroxide—and mechanical pulping with grinders using 4-foot-long *Gewa* logs; (iii) paper

<sup>1</sup> Since July 1998, duty-free newsprint may only be imported in a quantity equal to that purchased from KNM. All other imports are dutiable at 15 percent.



mill, including three 3.6-meter-wide newsprint paper machines; (iv) repulping of purchased chemical pulp; (v) experimental green jute mechanical pulping; (vi) steam and electric power production; and (vii) raw water intake and treatment. There is no effluent treatment plant at the mill.

5. The Government, aware of the need to make changes, requested the Bank to include in its loan for the proposed Project about \$15 million for effluent and de-inking equipment, so that KNM can import waste and finally secure a reliable and cheap source of raw materials for pulp production. A Bank-financed study<sup>1</sup> confirmed the financial viability of an imported waste-based process for newsprint and recommended an investment of \$48 million to rehabilitate KNM, of which about \$21 million was for de-inking and effluent treatment, and the remaining \$27 million was to rehabilitate the existing newsprint production lines. However, despite the report's projections of the financial viability of the rehabilitation option, significant other questions remain, including KNM's continued protection, ownership structure, poor past performance, comparative advantage, and financing of rehabilitation.

6. In addition, the Bank indicated to the Government that the most economically efficient option was to close the mill, compensate KNM staff, and allow free trade in newsprint. Although an indicative compensation plan showed that the KNM could be closed and full compensation provided to staff for approximately \$5-6 million, the Government has not yet fully considered this option because of the potential social disruption that might be caused by the closure of one of the largest employers in the southwest of the country, and because in the Government view, there are potentially viable options for turning the plant into a profitable enterprise while also improving environmental quality.

7. The preliminary analysis contained in the 1998 consultant report included the following four development options for KNM, as follows.

- (i) **Option 1: Modernization/Pulp Combination.** This would permit use of only the sustainable annual cut of Gewa wood (less than 50,000 tons), combined with (a) provision of a new recycled fiber de-inking plant using imported wastepaper; (b) modernization of the mill to achieve international newsprint quality; and (c) provision of an effluent treatment plant. The investment cost of this option is \$48 million, and it aims to promote sustainable forest use while also achieving KNM profitability. Profitability would require expansion of the mill. As the mill reaches international quality levels, exports of newsprint could again be considered in order to offset the foreign currency requirements of wastepaper imports. This option would contribute to the Project's conservation objectives and is financially viable (financial internal rate of return [FIRR] of 15 percent).
- (ii) **Option 2: No Gewa Use.** This is the consultant's preferred option, and will stop all Gewa tree harvesting by KNM by substituting the use of imported wastepaper as the sole source of fiber. Pollution control investments would be provided. The investment cost (\$48 million, of which proposed Bank financing will amount to approximately \$21 million) is the same as Option 1, but the FIRR is higher at 19.4 percent.
- (iii) **Option 3: Domestic Fiber.** Under this option, Gewa wood fiber would be replaced by pulp produced with a new green jute chemi-mechanical line. In this way, Gewa

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<sup>1</sup>

Jaakko Poyry Consulting (1998), *Assessment of Options for the Khulna Newsprint Mill*.

consumption would allow for sustainable forest utilization. Pollution control would be provided. This option, costing \$32 million, is not feasible because it would be unprofitable with a negative 19.1 FIRR, and because its environmental benefits would be inferior to those of Option 2.

- (iv) **Option 4: Deactivation of the Mill.** From the perspective of the end users of newsprint in Bangladesh (newspaper and periodicals producers), this appears to be the preferred option. This would involve closing the mill and compensating KNM staff, and is the most economically efficient and environmentally sound solution.

## 2. Rationale

8. An advisory TA is proposed to be provided with the Project to make an assessment of the problems facing KNM, including environmental and social mitigation measures relating to the options for (i) organization and management structure, (ii) international competitiveness in the absence of import protection, (iii) KNM closure, and (iv) commercialization and privatization under possible new investment. The recommended KNM-specific measures will be placed within the context of the Government's industry policy, including the incentive structure and environment for private sector development. There is also a need to reconcile private sector views, which are opposed to any protection for KNM.

9. The switch to imported waste as a source of raw materials for newsprint pulp would send a strong signal that the long-term industrial misuse of the forest will be no longer tolerated. The Ministry of Environment and Forests (MOEF) and the Forest Department are of the view that if KNM continues its operations, it must do so on the basis of (i) immediately reduced consumption of Gewa in line with sustainable resource management; and (ii) a planned phasing out of Gewa by KNM, with no further use being permitted after a four-year period. MOEF supports KNM's switch to recycling, as this would immediately free the SRF from industrial uses.

## C. The Terms of Reference

### 1. Objectives

10. The objectives of the TA are to assist the Government in assessing the future options for KNM. The TA will expand upon the preliminary work undertaken in the consultant report mentioned above, and will cover additional financial, economic, and social analysis. The following issues internal to KNM and BCIC will be examined: (i) detailed evaluation of KNM's financial position with and without reform (including an analysis of options for dealing with the approximately \$40 million of accumulated losses); (ii) detailed financial analysis of BCIC's past and projected financial position as the owner of KNM, including outstanding debt structure and debt servicing history; and (iii) assessment of KNM's management capacity. Issues external to KNM will include (i) industry policy including protection measures, (ii) the need for Gewa harvests to be kept safely within sustainable limits, and (iii) growth in demand for newsprint. A detailed plan for assessing the social costs of KNM closure will be prepared, including a compensation package for Bank financing.

### 2. Consultants' Responsibilities

11. The TA will involve the provision of five international consultants: an industry economist (team leader), pulp and paper mill specialist, financial analyst (pulp and paper),

social compensation specialist, and legal specialist. The international specialists will work in a team with four domestic consultants: two financial analysts, a legal specialist, and an environment specialist. The consultants will advise the Government and the Bank regarding the future options for KNM. The consultants should have extensive experience in industry economics and trade issues, pulpmill operations for newsprint manufacture, feasibility studies, and financial management of milling operations and be capable of working with Government and mill officials to collect the necessary information with little supervision.

12. **Industry Economics.** The industry economist will address all aspects of newsprint and newspaper industry policy, including trade policy commitments under international conventions, demand for newsprint in Bangladesh, and private sector preferences for sourcing newsprint.

13. **Pulp and Paper Processing.** The pulp and paper processing mill specialist will examine the existing KNM complex (pulp, hardboard, and matches), its facilities, the quality of its products and effluent levels resulting from operations. The specialist will also briefly review other paper mills owned by the BCIC and privately owned newsprint recycling mills in Bangladesh. Based on this review and existing proposals and plans for the KNM, discussions with industry and Government officials, and considering the technical alternatives for the KNM complex, the consultant will examine and further define the recommended options in the existing consultant's report. With the financial analyst, further technical and management details will be developed. Examination of other reports and discussions with informed persons regarding the possibilities for profitable operations at KNM will be held. Additional investments to reduce pollution at the existing facility will be examined and recommendations will be made.

14. **Financial Analysis.** The analyst will produce the team's financial report. The consultant will lead the two domestic financial analysts in examining the current production costs of KNM, including the cost of raw materials, and a breakdown of costs by key cost components (e.g., pulpwood, other inputs, labor, chemical inputs, energy, operation and maintenance, depreciation, debt servicing). These costs will be compared with international standards and with other mills in Bangladesh, including commercial newsprint recycling companies. On this basis, and working with the processing engineer, the consultant will analyze the main factors limiting KNM's competitiveness, and make recommendations for the future, including recommendations on the steps KNPM can take to improve its financial viability. This will include an assessment of the current and forecast debt-equity ratio. This will be used to develop recommendations, if appropriate, for more effective financial management of the mill. The conversion of debt to equity needs to be addressed with the relevant Government authorities.

15. The consultant will also (i) examine the viability of any existing proposals or plans to rehabilitate KNM, (ii) prepare detailed cost estimates of alternative potential investment options, (iii) prepare projections of revenues, (iv) prepare projected financial statements showing the viability of the various options, and (v) recommend alternative management and ownership options. As part of this exercise the consultant will estimate the financial viability, including the FIRR, of any recommended investments. Financing options will also be specified, including private investment, commercial finance and Bank finance.

16. **Environmental Aspects.** Working with KNM management and Project staff in Khulna, the specialist will examine all environmental impacts during design and construction and during operations of the rehabilitation of KNM, including: (i) assist the team and the KNM management to carry out an energy, chemicals inputs and water audit/assessment; and (ii)

introduce appropriate measures for materials handling, spill and leak prevention to increase the efficiency of input use (water, oil, chemicals), and waste and pollution minimization. Also examined will be options for effective pulp washing, fiber recovery, establishment of an appropriate water balance, prevention of accidental discharges, reduction in equipment breakdowns, spill collection, treatment, and reuse of black liquor and heat recovery.

17. **Legal Aspects.** The international legal specialist will lead the domestic legal specialist in examining all aspects related to existing contracts for input supplies and sales contracts as well as existing industry laws and regulations governing manufacturing operations in the public sector. Staff entitlements in terms of salaries and allowances, and other forms of compensation will be described and compared with private sector manufacturing operations. Possible ownership alternatives including divestment of shares, joint venture options, management contract options, and other arrangements for commercialization and privatization will be examined, and drafts of relevant documentation and contracts will be produced.

18. **Social Compensation.** To assist the Government in understanding the closure option, a social compensation plan will be prepared covering (i) employees by number of years in service, years to retirement, salary and pension benefits; (ii) calculation of compensation, based on the Government's existing separation scheme, known as the Gratuity and Contributory Provident Fund; (iii) reference, for comparative purposes, to other similar compensation schemes in Bangladesh; (iv) quantification of the savings from closing KNM; and (v) recommendations regarding training, phasing in of compensation, etc.

### 3. Outputs

19. The consultants will submit an inception report, a draft final report, and a final report to the Government and the Bank, with adequate copies for all participants. There will be continuing consultations with Bank staff during all report preparations. The final report will include a detailed set of recommendations, including a policy matrix for reforms and a critical path diagram showing the timing for key future actions.

### 4. Cost Estimates and Financing Plan

20. The total cost of the TA is estimated at \$720,000 equivalent, comprising foreign exchange costs of \$468,000 and a local currency cost of \$252,000 equivalent. The Bank will finance \$570,000, including the entire foreign exchange cost and \$102,000 equivalent of local currency cost on a grant basis from the Bank-funded TA program. The cost estimate includes a seminar and meetings with officials of KNM, other relevant Government institutions and the private sector on various aspects of the recommended strategy arising from the TA. The Government will finance the balance of \$150,000 equivalent in the form of remuneration of counterpart staff, office accommodation, translation, and other administrative costs. The detailed cost estimates and financing plan are in Table 1.

**Table 1: Cost Estimates and Financing Plan  
(\$'000)**

<b>Item</b>	<b>Foreign Exchange</b>	<b>Local Currency</b>	<b>Total</b>
<b>A. Bank Financing</b>			
1 Consultants			
a. Remuneration			
International Consultant	330		330
Domestic Consultant		42	42
b. Per Diem			
International Consultant	55		55
Domestic Consultant		16	16
c. Travel			
International Consultant	18		18
Domestic Consultant		3	3
2 Communication	5		5
3 Vehicle Rental and Office Supply		10	10
4 Workshops		5	5
5 Report and Translation		10	10
6 Cost of Government Representative at Contract Negotiations	5		5
7 Contingency	55	16	71
<b>Subtotal (A)</b>	<b>468</b>	<b>102</b>	<b>570</b>
<b>B. Government financing</b>			
1 Counterpart Staff, including Support Staff		50	50
2 Office Space, Furniture and Equipment		57	57
3 Data Collection		20	20
4 Seminars		20	20
5 Local Travel		3	3
<b>Subtotal (B)</b>	<b>0</b>	<b>150</b>	<b>150</b>
<b>Total</b>	<b>468</b>	<b>252</b>	<b>720</b>

## **5. Implementation Arrangements**

21. MOI will be the executing agency for the proposed TA. MOI will closely coordinate all activities with KNM, BCIC, MOEF, Forest Department, and other relevant Government agencies. KNM and BCIC, operating through MOI, will provide counterpart staff and ensure provision of all information and data required by the consultants for carrying out the study.

22. The Bank and MOI are committed to a participatory approach in the implementation of the TA. Accordingly, the consultants will confer with KNM, BCIC, MOEF and Forest Department, private sector companies involved in the paper industry, including newspaper and journal owners, newsprint importers and other informed persons, as well as with other State-owned paper companies in Bangladesh and other interested parties.

23. The consultants will be recruited for a total of 40 person-months, of which 20 person-months will be for domestic consultants. They will be selected in accordance with the Bank's *Guidelines on the Use of Consultants* and other arrangements acceptable to the Bank for selection of domestic consultants, using the simplified technical proposal format. The TA is proposed to commence in mid-April 1999 and be completed by the end of September 1999. The consultants should be adept in working with both word processing and spreadsheet software and be able to produce a report with the necessary supporting tables while in the field. The international consultants should each have their own laptop computers for the assignment.

## FINANCIAL AND ECONOMIC ANALYSES

### A. Introduction

1. The Sundarbans Reserved Forest (SRF) in Bangladesh is one of the country's most economically important biological assets and is a globally significant ecosystem. The SRF provides (i) protection against cyclonic storms from the Bay of Bengal for approximately 3.5 million people; (ii) major habitat for wild shrimp, and many species of fish, birds, and other wildlife; (iii) the most important remaining habitat for the rare Bengal tiger, as well as several other endangered animals; (iv) tourism and recreation; and (v) nutrient cycling and pollution abatement benefits. The SRF also accounts for over half of all reserved forest area in Bangladesh, and is the largest single source of timber and nonwood forest products. It is estimated that the Sundarbans contributes over Tk4 billion (\$93 million) to annual gross domestic product, including ecotourism and wildlife (without valuing fuelwood).

2. Recent inventories show that all key forest species are overexploited. Forest product overexploitation is encouraged by prices for licenses and permits set well below economic levels, and exacerbated by illegal logging. Current levels of use may lead to the destruction of the SRF within 30-40 years. The loss of forest area directly reduces the flow of benefits from the SRF, as has happened in the Chakoria Sundarbans in eastern Bangladesh.<sup>1</sup>

3 The economic rationale for the Project is based on reducing resource losses and achieving sustainable management of the SRF, and on achieving economic growth through microenterprise development in the impact zone. This will require a reduction in legal harvest to sustainable levels, and the elimination of illegal logging. Further, the Project will improve economic policies and reform the institutional framework of SRF management by removing distorting price signals, introducing participatory management, and improving public awareness to build support for preventing further loss of biodiversity. Finally, the Project will mitigate pressure on the SRF from bordering communities by reducing poverty in the 17 *thanas* surrounding the SRF through a program of socioeconomic interventions.

### B. Main Assumptions

4 The following main assumptions are used in this appendix:

- (i) Agricultural daily wages are Tk30/day on the basis of actual daily wages paid for rural laborers in the Project area; an opportunity cost of labor of 80 percent of the financial wage is assumed in the economic analysis due to the part-time nature of much of the work.
- (ii) The analysis covers a range of typical microenterprises suitable for poverty reduction for the impact zone, and assesses the incremental production and incomes arising from these investments. These microenterprises include integrated poultry and livestock systems developed in Bangladesh and proven successful in reducing poverty—especially for women—at the household level.

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<sup>1</sup> Without the Project, such a scenario is a realistic possibility. The Chakoria Sundarbans in eastern Bangladesh, another mangrove ecosystem, was completely denuded over the last decade and replaced by shrimp-based aquaculture.

- (iii) All values are expressed in taka in constant 1998 prices. Economic border prices are used in the economic analysis, where available. A standard conversion factor of 0.86 is used to derive economic prices of nontradables.
- (iv) The economic life of the Project is assumed to be 25 years, including 7 years of implementation.
- (v) Prices of internationally-traded commodities are based on World Bank commodity price projections as used in the final report of the Project preparatory technical assistance<sup>1</sup> consultants.
- (vi) The economic analysis covers the impact zone and the conservation of the SRF, plus the Project overall. It includes full or partial estimation of the incremental benefits flowing from sustainable management of the SRF and microenterprises for poverty reduction in the impact zone.

### C. Subsidies

5. The Government has agreed to eliminate direct and indirect subsidies. These currently occur in (i) prices of licenses and permits to the many users of the SRF for timber and fuelwood extraction, fishing, etc.; (ii) permits for tourism that are also below the willingness to pay, especially by international visitors, to comparable areas; and (iii) low contract price for Gewa wood supplied by the Forest Department to the State-owned and loss-incurring Khulna Newsprint Mills (KNM). Until recently, subsidies for paper production and tariff barriers encouraged inefficient use of wood for newsprint production. The Government and the Bank have agreed that KNM's access to Gewa will be phased out over a four-year period.<sup>2</sup>

### D. Financial Analysis

6. The Project will provide alternative income-generating opportunities for approximately 170,000 households in the impact zone. The activities will include microenterprise development such as integrated poultry production systems proven successful for poverty reduction by leading nongovernment organizations (NGOs), social forestry, apiculture, charcoal making on a pilot basis, and support for sustainable resource extraction activities such as fishing and firewood gathering. Approximately 50 percent of the direct beneficiaries in the impact zone will be women. Experience from other microcredit programs suggests that women would have considerable control over the earnings from their production enterprises.

7. Table 1 gives indicative financial returns from different microenterprises. Although incremental incomes and returns to additional labor are small in absolute terms, they must be compared with average annual incomes of less than Tk5,150 (\$113) for a third of the impact zone population. The bulk of the Project beneficiaries will be drawn from this target group. Survey evidence from similar projects indicate that incremental incomes of this

<sup>1</sup> TA No. 2724-BAN: *Biodiversity Conservation in the Sundarbans Reserved Forest*, for \$540,000, approved on 19 December 1996. Feasibility Study, *Final Report*, October 1997.

<sup>2</sup> Advisory technical assistance will examine the options for reforming KNM, including: (i) rehabilitation through a switch to imported low cost recycled waste as the source of pulp for newsprint manufacture; and (ii) closure and compensation for redundant staff.

magnitude have a large impact on beneficiary households by improving food security and nutrition, and by increasing school attendance of children.

**Table 1: Financial Returns from Microenterprises in the Impact Zone**

Microenterprise Model	Annual Gross Margin (Tk) <sup>a</sup>	Return to Labor <sup>b</sup> (Tk/day)
Poultry Key Rearer	3,696	101
Social Forestry	4,749	356
Net Puller	40,233	70
Fish Seller	7,681	48
Fish Processor	11,850	146
Tourist Country Boat	48,188	321
Private Nursery	177,625	99
Firewood ( <i>Goran</i> ) Boat	11,039	74
Fishing Boat	11,140	74

<sup>a</sup> Incremental annual margin, in constant 1998 taka, before debt service.

<sup>b</sup> Social forestry is on a per hectare, annualized basis.

8. Of these microenterprises the most important for income diversification purposes may be integrated poultry. NGO programs for these microenterprises have been proven highly successful for poverty reduction among women in Bangladesh. Within the eight key activities comprising this integrated system, the key rearer activity will impact most poultry beneficiaries. An indicative financial model is given in Table 2.

**Table 2: Key Rearer Poultry Model and Financial Cash Flow<sup>a</sup>**  
(constant 1998 taka)

	Year 1		Year 2	
	Mo. 1-6	Mo. 7-12	Mo. 1-6	Mo. 7-12
Investment Cost	1833			
Operating Cost	907	1204	2207	1204
Revenue	1627	3498	3388	3498
Cash Flow Before Financing	-1113	2294	1181	2294
Margin per Month (annual average)		98		290
Return to Labor (annual average) (Tk/day)		32		95
	First two years onward		Year 3	
Cash Flow After Debt Service:				
Average Monthly Surplus	98		290	
Average Daily Surplus	32		95	

<sup>a</sup> Key rearers comprise approximately 95 percent of the poultry enterprises.

9. Key rearers are the typical entry-level activity, from which successful participants eventually move on to other livestock enterprises, either within the NGO structure, or independently. Credit repayments for the initial investment are phased over two years, or approximately 3-4 batches of *desi* (traditional) and improved variety day-old chicks. During years 1-2, after debt service returns are approximately Tk32 per day, rising to Tk95 per day by



year 3, once the investment loan is repaid. By the third year, the owner is able to operate independently of microcredit services.

## **E. Economic Analysis**

10. The economic analysis includes benefits from reducing the rate of deforestation in the SRF through protection and reduced official offtake of timber and wood products. Without project intervention, it is assumed that the SRF will shrink according to recent patterns of unsustainable resource extraction. Project preservation of forests also preserves carbon, habitat for a wide range of animals including endangered species, storm protection and flood control, and the ecosystem functions that are crucial to fisheries output, apiculture, and other natural resources. The Project also provides rural development benefits from microenterprise promotion to reduce the incidence of poverty in the impact zone, and ecotourism opportunities. Supplementary Appendix C includes details of the economic analysis.

### **1. Timber and Wood Products**

11. A significant loss of timber stocks has occurred in the SRF over the past 100 years. The most recent forest inventories indicate a 7 percent decline in *Sundri* stocks from 1983 to 1996. The situation for *Gewa* is more critical: *Gewa* growing stocks declined by 58 percent over the same period, and will be exhausted within 12 years at current rates of extraction. The Project aims to reduce official harvests of *Sundri* and *Gewa* and to eliminate illegal harvests. The Government has agreed to phase out *Gewa* use in KNM, but the economic analysis assumes other users retain access to the forest, and are constrained to sustainable harvest levels by the Forest Department.<sup>1</sup>

12. Reduced harvests initially represent a cost of preservation, in terms of foregone timber revenues. Foregone revenues are adjusted downward by a depletion premium, because under the current cutting regime, the nation would have to turn to costly external sources to meet wood needs as SRF stocks are depleted. The benefits of preservation include long-term revenues from logging on a sustainable basis, and the flow of nontimber goods and services that require a healthy forest.

### **2. Carbon Sequestration**

13. Carbon emissions contribute to global warming. Without the Project, continued logging, land degradation and land conversion would release existing carbon stores and reduce carbon sequestration in the SRF. With Project intervention, forest stocks will recover and expand, increasing carbon storage in the SRF. Carbon sequestration is valued by the average global damage avoided per ton of carbon, based on conservative values from a range provided by the Intergovernmental Panel on Climate Change. Bangladesh's share of this global benefit is derived using a simple population ratio, and is included in the analysis because the nation suffers disproportionately from the effects of climate change in panel forecasts.

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<sup>1</sup> The Government has agreed to phase out *Gewa* use by KNM over a four year period, but the economic analysis assumes other users retain access to the forest and are constrained to sustainable harvest levels by the Forest Department.

### 3. Fisheries

14. There is a direct relationship between mangrove ecosystems and estuarine and marine fisheries that rely on them for spawning grounds, shelter, sediment filtration, and nutrient cycling. The destruction of mangrove forests elsewhere has resulted in dramatic losses in associated fisheries (e.g. see para. 3). Preserving this protective function is thus valued at the avoided loss of fisheries productivity. This analysis uses an average net value of Tk1,752 per hectare for fish and shrimp fry harvests, applied to the incremental area of forest protected through Project activities.<sup>1</sup> This estimate is quite conservative because actual fish and shrimp catch certainly exceed official records.

### 4. Nonwood Forest Products

15. As with fisheries, the preservation of forest areas also ensures the continued flow of benefits from nonwood forest products, such as medicinal plants, honey and wax, *Golpatta*, *Hantal*, grasses, shells for the production of lime, and oysters. Per hectare average net values for these resources, adjusted by the standard conversion factor, are used in the economic analysis.<sup>2</sup>

### 5. Storm Protection and Flood Control

16. Healthy mangrove forests provide natural protection from storm surges and a drainage basin for flood waters, both crucial to the well-being of communities in southern Bangladesh, a region marked by seasonal cyclones. The cost of replacing this protective function through replanting and embankment programs is estimated to be Tk23,749 per hectare.<sup>3</sup>

### 6. Rural Development

17. The Project produces direct economic benefits through microenterprises, social forestry, and sustainable resource extraction, net of the costs of training, NGO capacity building, and investments to improve social infrastructure. These components will significantly increase household incomes and reduce the level of poverty in the impact zone for 170,000 target households.

### 7. Ecotourism

18. Incremental benefits arising from ecotourism are included. Due to a reduction in the scope of this component, these benefits are estimated at only 20 percent of the level assumed in the Project preparatory technical assistance final report.

### 8. Unquantified Benefits

19. The Project will have various direct benefits, such as improved health and nutrition arising from better access to social infrastructure (e.g., village water and sanitation facilities) and higher household incomes, improved public education programs, and by-products of the poultry program, for participants in the impact zone. Although the economic value of these

<sup>1</sup> Mitchell, Andrew. 1995. *Draft Report on Natural Resource Economics. Integrated Resource Management Plan of the Sundarbans Reserved Forest*. Bangladesh. Khulna: FAO/UNDP. Mitchell's fishery yield and value data were adjusted to 1998 prices and converted to per hectare equivalents.

<sup>2</sup> Ibid.

<sup>3</sup> TA No. 2724-BAN: *Biodiversity Conservation in the Sundarbans Reserved Forest*, for \$540,000, approved on 19 December 1996. Feasibility Study, *Final Report*, October 1997.

activities could be fairly large, they are not specifically assessed and are not included in the economic analysis. The Sundarbans provides habitat for a variety of species at risk of extinction or extirpation, including the Bengal tiger, leopard cat, dugong, saltwater crocodile, and Ganges River dolphin. Without intervention, loss of habitat will lead to a reduction of biodiversity for future generations as well as option and existence values associated with this diversity. In particular, the analysis does not attempt to quantify the value to Bangladesh of preserving the Bengal tiger, a prominent national treasure.

## 9. Economic Internal Rate of Return

20. The base case economic internal rate of return (EIRR) for the Project is 13.9 percent. A summary cash flow for the Project appears in Table 4.

## 10. Sensitivity Analysis

21. A 25 percent increase in costs reduces the EIRR to 8.1 percent. A 25 percent reduction in overall benefits for the life of the Project yields an EIRR of 6.4 percent. In fact, many environmental benefits have not been valued (para. 19), biasing the EIRR downward. A more likely scenario of a 25 percent increase in actual benefits yields an EIRR of 20.4 percent.

22. The analysis assumes that the economic and environmental productivity of the SRF is directly linked to forest cover and health, in a one-to-one relationship (100 percent linkage), and that log harvests will fall by 30 percent per year until sustainable targets are reached. These assumptions are relaxed in Table 3 to test a weaker ecosystem linkage and different rates of harvest reduction. Slower attainment of log harvest targets is conceptually the same as delaying project implementation.

**Table 3: EIRR Sensitivity to Key Assumptions**

EIRR (%)		Rate of Reduction in Timber Harvests		
		40% per year	30% per year	20% per year
Ecosystem Linkage	100%	14.4	13.9	13.2
	80%	11.8	11.5	11.0
	60%	9.1	8.9	8.5

23. The EIRR for this Project is not very sensitive to implementation delays, but is sensitive to the assumed linkage between preservation and benefits. However, evidence from degraded mangrove areas supports the claim that the integrity of these forests is crucial to the provision of related goods and services.

Table 4: Summary Economic Flows

(in TK million by project year)		1	2	3	4	5	6	7	8	9	10	15	20	25
Item	sources	1	2	3	4	5	6	7	8	9	10	15	20	25
<b>Economic Costs</b>														
A. Effective Organization of the Sundarbans Reserved Forest														
1. Establish Organisation Capacity		28.5	151.7	83.8	57.6	50.2	49.7	58.2						
2. Upgrade Infrastructure		1.7	47.6	17.3	0.2	0.0	0.0	0.0						
B. Biodiversity Conservation and Sustainable Resource Management														
1. Forestry		1.1	56.4	126.2	91.2	75.9	71.7	35.2						
2. Aquatic Resources		0.3	15.6	10.0	8.5	7.4	7.4	5.2						
3. Wildlife		0.1	5.0	4.5	3.4	3.3	3.1	3.1						
4. Integrated Management Planning		0.0	3.8	6.0	3.8	3.8	3.8	0.0						
C. Socioeconomic Development of the Impact Zone														
1. NGO Social Mobilization, Microenterprise Management, and Training		12.8	27.7	42.6	44.7	44.7	29.8	14.9						
2. Social Forestry		0.5	1.9	3.9	6.6	7.4	3.4	2.0						
3. Rural Development		24.2	110.3	118.6	118.6	118.6	118.6	95.7						
D. Ecotourism and Environmental Awareness														
1. Ecotourism		3.0	19.2	20.3	12.2	12.0	10.4	9.1						
2. Public Awareness Program		0.2	11.3	4.8	4.8	4.8	4.8	2.2						
E. Technical Advisory Group, Monitoring, and Studies														
1. Technical Advisory Group, Monitoring, and Studies		66.2	180.5	102.2	58.7	44.2	22.7	10.1						
F. Khulna Newsprint Mill Effluent Treatment Plant		0.0	197.8	0.0	0.0	0.0	0.0	0.0						
G. Other														
1. Ongoing Incremental Recurrent Costs									82.2	82.2	82.2	82.2	82.2	82.2
2. Ongoing Microenterprise Costs	<sup>b</sup>	39.9	8.7	36.7	100.6	163.4	203.5	214.3	214.3	214.3	294.6	294.6	294.6	294.6
3. Foregone Logging Revenues	<sup>c</sup>	0.0	105.3	109.7	105.1	100.4	95.7	91.3	87.9	86.7	90.5	113.8	112.2	109.4
<b>Total Project Costs</b>		<b>178.6</b>	<b>942.7</b>	<b>686.5</b>	<b>616.1</b>	<b>636.0</b>	<b>624.6</b>	<b>541.4</b>	<b>384.4</b>	<b>383.2</b>	<b>467.3</b>	<b>490.6</b>	<b>489.0</b>	<b>486.2</b>
<b>Economic Benefits</b>														
A. Sustainable Harvests	<sup>d</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	147.5	147.5	147.5
B. Carbon Sequestration (national benefits only)	<sup>e</sup>	0.0	1.7	3.4	4.4	5.4	6.4	7.3	8.3	9.2	10.1	12.8	17.2	22.3
C. Biodiversity Protection (fisheries and nonwood forest products)	<sup>f</sup>	0.0	8.0	21.3	38.1	56.5	76.2	97.1	118.7	140.8	163.2	263.8	337.5	421.3
D. Storm Protection and Flood Control	<sup>g</sup>	0.0	76.7	126.7	153.0	171.5	185.1	195.2	202.7	207.7	210.1	155.6	156.2	156.2
E. Rural Development	<sup>h</sup>	0.0	14.4	61.2	167.7	272.3	339.2	357.1	357.1	357.1	491.0	491.0	491.0	491.0
F. Ecotourism	<sup>i</sup>	0.2	0.5	1.0	1.7	2.7	4.1	5.9	7.9	8.4	8.6	9.8	11.8	15.1
<b>Total Project Benefits</b>		<b>0.2</b>	<b>101.4</b>	<b>213.6</b>	<b>365.0</b>	<b>508.4</b>	<b>611.0</b>	<b>662.6</b>	<b>694.6</b>	<b>723.2</b>	<b>882.9</b>	<b>1070.5</b>	<b>1161.1</b>	<b>1253.4</b>
<b>Economic Cash Flow</b>														
		-178.4	-841.3	-472.9	-251.1	-127.6	-13.7	121.3	310.2	340.0	415.7	579.9	672.2	767.2
NGO = nongovernment organization	<b>EIRR</b>	<b>13.9%</b>												

**Sources:**<sup>a</sup> Economic costs are derived from detailed Project tables in COSTAB.<sup>b</sup> Mission estimates, based primarily on Project Preparatory Technical Assistance (PPTA) Final Report.<sup>c</sup> To preserve the SRF, logging activities are curtailed, resulting in a loss of logging revenues.<sup>d</sup> Foregone revenues decline because unsustainable harvest deplete the forest growing stock, resulting in a depletion allowance.<sup>e</sup> By reducing log harvests, the Project ensures a perpetual stream of logging revenues, beginning in year 4.<sup>f</sup> Damage avoided by preserving carbon storage and sequestration services; values from low range provided by Intergovernmental Panel on Climate Change.<sup>g</sup> By protecting the biodiversity of the SRF ecosystem, the Project ensures a sustainable flow of natural resources, including fish and shrimp fry, apiculture, etc.<sup>h</sup> Excludes natural resources that are not directly used by local communities or are not priced in markets.<sup>i</sup> Valued at the replacement cost of these functions, through a shadow project that would replant the forest and build embankments. Cost estimates based on PPTA Final Report.<sup>j</sup> Mission estimates, based on field work and PPTA Final Report.<sup>k</sup> Assumed at only 20% of level used in PPTA Final Report, due to significant reduction in costs of this component.