

ASIAN DEVELOPMENT BANK

TAR: IND 34272

TECHNICAL ASSISTANCE
(Financed by the Government of United Kingdom)

TO

INDIA

FOR

**CONSERVATION AND LIVELIHOODS IMPROVEMENT
IN THE INDIAN SUNDARBANS**

December 2001

CURRENCY EQUIVALENTS

(as of 15 November 2001)

Currency Unit	–	Indian Rupee/s (Re/Rs)
\$1.00	=	Rs48.05
Re1.00	=	\$.02081

ABBREVIATIONS

ADB	–	Asian Development Bank
EA	–	executing agency
FD	–	Forest Department
GEF	–	Global Environment Facility
ICDP	–	Integrated Conservation and Development Plan
NGO	–	nongovernment organization
SAD	–	Sundarbans Affairs Department
SBCP	–	Sundarbans Biodiversity Conservation Project
SBR	–	Sundarbans Biosphere Reserve
SDB	–	Sundarbans Development Board
TA	–	technical assistance

NOTE

In this report, "\$" refers to US dollars.

I. INTRODUCTION

1. During the Country Programming Mission discussions in March 2000, the government of West Bengal, India, requested Asian Development Bank (ADB) technical assistance (TA) for Conservation and Livelihoods Improvement in the Indian Sundarbans.¹ This was supported by the Government of India, and the TA was included in the 2001 Country Program. The ADB Fact-Finding Mission visited India during 20 November–1 December 2000 and reached an understanding on the TA objectives, scope, approach, cost estimates, implementation arrangements, financing plan, and terms of reference (TOR) for consulting services, based on a multi-stakeholder consultation process.² The TA framework is attached as Appendix 1.

II. BACKGROUND AND RATIONALE

2. The Sundarbans cover about one million hectares of land and water across Bangladesh and India, comprising one of the three most extensive mangrove forests in the world. The Indian and Bangladesh Sundarbans are the most important areas in the world for the long-term survival of the globally endangered tiger. They are the nurseries for many coastal and oceanic species of fish that support important subsistence and commercial fisheries in the northern Bay of Bengal. The diverse vegetation of the Sundarbans forests includes about 36 mangrove species that provide a unique mix of habitats for wildlife, which includes turtles, terrapins, dolphins, estuarine crocodiles, and several species of birds, many of which are migratory.

3. The Indian Sundarbans lie at the apex of the Bay of Bengal and fall within the 24-Parganas district of the state. They are considered one of the most backward regions in West Bengal, and are home to about 4 million people, of whom 56 percent are landless. Literacy rates are below 35 percent, most communities do not have electricity or safe drinking water, and agricultural productivity is lower than the state average. Inadequate infrastructure, poor communication facilities, lack of access to clean drinking water and health and education services, and a fragile and limited natural resource base have contributed to a low level of development and high poverty incidence in the region.

4. A diminishing natural resource base is threatening the ecological integrity of the Sundarbans and the livelihoods of the inhabitants. People living in the Sundarbans, of whom 90 percent depend on agriculture, draw heavily on forest resources to meet their subsistence needs. The extinction in recent times of several mammal species including the Javan rhinoceros, swamp deer, gaur, and hog deer signals the alarming trends in the decline of biodiversity in the Sundarbans caused by increasing population pressures, poverty, and legal and illegal overharvesting of natural resources.

5. At present, the biggest threat to the aquatic ecosystem is the proliferation of shrimp farms. Thousands of women and children collect wild tiger prawn spawn for sale to shrimp farms. In recent years, the catch of these tiger prawn spawn has been decreasing, signaling the concurrent decrease in other fish species. Because the Sundarbans are the aquaculture nursery for the Bay of Bengal, this decline could result in loss of livelihoods for thousands of families dependent on artisanal and industrial fishing. The frequent breaches in the embankments along the riverbanks built to prevent inundation by tidal waters allow saline waters to inundate

¹ By complementing ADB's Loan 1643-BAN: *Sundarbans Biodiversity Conservation Project*, for \$37 million, approved on 27 November 1998, the TA will contribute to securing conservation of Sundarbans ecosystem as a whole.

² The TA first appeared in ADB *Business Opportunities* in February 2001.

agricultural lands, destroy crops, and render the soil infertile. The vulnerability of the region to periodic cyclones that result in high human mortality and production losses also increases the threat to the Sundarbans forests. During these natural calamities the local communities have no other resource but the forest to meet their food and shelter needs. Other threats to the Sundarbans include overextraction of wood and nonwood products such as palm leaves, honey, and fuelwood. Low material and technological inputs are constraining agriculture, crab farming, bee keeping, and honey production. Similarly, lack of market information and marketing skills constrains the realization of the full potential of products like high-protein algae. These constraints on local production and productivity accentuate livelihood insecurity and poverty.

6. The Indian Sundarbans were recognized as a World Heritage site in 1989. Both the national and the state governments recognize the Sundarbans as a conservation and development priority, and several initiatives were taken in the past few decades to enhance conservation and development in the area. In 1973, 2,585 square kilometers (km²) of mangrove forest situated in the eastern part and the adjoining area in Bangladesh was declared as a Project Tiger Area. In 1976, three wildlife sanctuaries were created, and in 1984, most of the core of the Project Tiger area was converted into the Sundarbans National Park. The Sundarbans Biosphere Reserve (SBR) was established in 1989 over an area of 9,630 km². These initiatives are backed by an enabling policy and regulatory framework, which provides for community involvement in mangrove forest protection and management, and for regulating fisheries. However, effective enforcement of rules and regulations suffers from lack of interagency coordination and insufficient enforcement capacity.

7. The extreme poverty in the area led the state government to form the Sundarbans Development Board (SDB) in 1973. The Sundarbans Affairs Department (SAD) was created in 1994 to give further impetus to socioeconomic development in the area, and SDB is now under this department. During 1981-1990, SDB implemented a \$9 million integrated rural development project funded jointly by the International Fund for Agriculture and Development and the state government. In 2000, SDB's \$4 million development budget focused on civil works and infrastructure development, afforestation, agriculture, fisheries, and small-enterprise development. The Forest Department (FD) implements central and state-sponsored schemes focusing on mangrove forest rehabilitation, fuelwood and fodder development, and community development. Other state departments including irrigation, public works, public health engineering, and several nongovernment organizations (NGOs) focus on socioeconomic development, mangrove forest restoration, and wildlife conservation. The United Nations Development Programme and World Wide Fund for Nature have proposed initiatives to focus on reproductive health and population issues related to Sundarbans conservation; fostering stronger cross-border cooperation, and collaboration between conservation managers in India and Bangladesh; and tiger conservation.³

8. However, the sectoral mode of functioning and lack of coordination among and within SAD, SDB, FD, and other line agencies have resulted in limited information on the scope and impact of past, ongoing, and planned initiatives and projects. There is very little sharing of information between the different development organizations, and knowledge of each other's activities is very limited. There is no centralized database on either the organizations or their programs. Although many research projects have been undertaken in the Indian Sundarbans, there is minimal dissemination of the results because of inadequate information management

³ Relevant ADB programs include TA 3539-IND: *Resettlement and Environmental Assessment for the West Bengal Corridor Development Project*, for \$150,000, approved on 13 November 2000; TA 3423-IND: *Environmental Management at the State Level*, for \$3.62 million, approved on 2 March 2000; and TA 3089-IND: *Calcutta Environmental Improvement*, for \$1,000,000, approved on 16 October 1998.

and dissemination capacity. Furthermore, current management procedures and practices are inadequate for effectively dealing with the administrative complexity arising from the ever-changing stream channel patterns, coastal landforms, and forest boundaries. SDB was created to be a multidisciplinary department capable of formulating an integrated program for the effective use of local resources, and to coordinate and monitor the different plans and projects in the Sundarbans. However, it continues to function like a single sector and traditional institution like the FD. On the other hand, FD is attempting to diversify into development activities, resulting in programmatic and operational overlap and duplication. Furthermore, there is insufficient capacity among the key institutions for integrated conservation and development planning and management. The TA, while avoiding duplication, will maximize complementarities and synergies with ongoing or planned national and international initiatives to maximize impact.

III. THE TECHNICAL ASSISTANCE

A. Objectives

9. The overall goal of the TA is to secure biodiversity conservation in the Sundarbans ecosystem as a whole, and improve the livelihoods of local communities. The immediate objective is to prepare a comprehensive integrated conservation and development plan (ICDP) for the Indian Sundarbans. The TA will (i) define biodiversity conservation and a management framework for the Indian Sundarbans; (ii) identify effective measures, investment needs and priorities to reduce poverty and promote sustainable livelihoods and ecosystem conservation; and (iii) propose an institutional setup for effective management of integrated conservation and development of the Indian Sundarbans.

B. Scope

10. The TA will cover 19 administrative blocks of the Sundarbans in 24-Parganas district of West Bengal. The TA has three components: (i) conservation that will contribute to improving the effectiveness of ongoing and planned conservation and development initiatives, (ii) livelihoods assessment and development, and (iii) institutional strengthening and capacity building. The conservation component will focus on (a) analyzing macro- and micro-level threats to biodiversity and baseline activities related to biodiversity conservation, and identifying threat management strategies; (b) identifying improved protected area management strategies; and (c) developing a landscape-level conservation and management framework for the Indian Sundarbans. The framework will integrate livelihoods improvement and poverty reduction considerations into conservation planning, resulting in the formulation of an ICDP for the Indian Sundarbans. Investment needs and priorities for upgrading park management capacity and for ICDP implementation will be identified. Participatory ecotourism development opportunities that will benefit the local communities will be assessed.

11. The TA will also assist in preparing a proposal that is eligible for Global Environment Facility (GEF) assistance for the Indian Sundarbans in consultation with other funding agencies and initiatives. The GEF grant proposal will focus on upgrading and upscaling (i) ecological inventory, monitoring, and research; (ii) mangrove ecosystem management and restoration; and (iii) strategies and plans for dealing with proximal and distal threats and causes of loss of globally significant species, with special emphasis on the Bengal tiger.

12. The livelihoods component will identify investment needs and priorities for sustaining and securing livelihoods of the local communities in selected island and mainland communities

impacting ecosystem integrity and sustainability. Livelihoods activities will focus on (i) livelihoods analysis to study the assets, capabilities, and activities required for sustaining and securing livelihoods, and building on the strengths of the poor; (ii) a disaster management plan for the selected communities; (iii) pisciculture or mariculture to improve this key sector of local livelihoods and to modify the present environmentally destructive methods of shrimp farming; (iv) gender and equity to promote the participation of all sections of society and to ensure that benefits from interventions reach the poor and the disadvantaged; and (v) marketing and credit to increase income through value-addition, and remove delivery system inefficiencies. The livelihoods improvement strategies and interventions will maximize complementarities and synergies with the integrated conservation and development framework.

13. The institutional strengthening component will enhance the institutional capacity for effective planning and management of integrated conservation and development programs and projects. It will support local communities in effective implementation of integrated conservation and strategies and plans for livelihood improvement. This will involve undertaking a multistakeholder participatory institutional analysis of the key departments and NGOs, and rationalizing and harmonizing inter- and intra-sectoral regulatory enforcement procedures and practices. Coordination structures and mechanisms to enhance the effectiveness of ongoing conservation and development initiatives will be identified, and an institutional structure for effective implementation of ICDP will be proposed. A computerized management information system for promoting learning and knowledge sharing for effective and efficient ICDP implementation and management will be designed. In addition, an environmental awareness and communication strategy to highlight the global value of the Sundarbans both within and outside the area will be developed.

C. Cost Estimates and Financing Plan

14. The total cost of the TA is estimated at \$565,000 equivalent, comprising \$270,000 in foreign exchange cost and \$295,000 equivalent in local currency cost. The Government requested ADB to provide TA of \$450,000 equivalent covering the entire foreign exchange cost of \$270,000 and \$180,000 equivalent of the local currency cost, to be financed by the Government of United Kingdom on a grant basis.⁴ The Government will contribute the remaining \$115,000 equivalent by providing experienced counterpart staff, office space, and utilities and administrative support. The detailed cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

15. SDB will be the Executing Agency (EA) for the TA and will be responsible for overall monitoring of TA implementation. FD, NGOs such as Tagore Society for Rural Development, and institutions of excellence will be involved in TA implementation. FD will be primarily responsible for implementing the conservation component, and will provide counterpart support and transportation within the protected area. SDB will be responsible for implementing the institutional strengthening and livelihoods component, and local NGOs will be involved in social analysis, and livelihoods and poverty assessments. Stakeholder workshops will be organized during implementation to incorporate stakeholders input and to disseminate the main findings of the emerging ICDP. A steering committee chaired by the secretary of SAD and with members from concerned departments, NGOs, and individuals and institutions of excellence will be established to provide guidance on TA implementation. SDB will provide office space to the TA team in the SDB office complex.

⁴ From the Department for International Development (DFID) Trust Fund.

16. The TA will be implemented over about nine months commencing in February 2002 with completion in October 2002. ADB will recruit a team of international and domestic consultants through a consulting firm, in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements for engaging domestic consultants. In view of the need for timely completion of the fieldwork prior to the onset of the cyclone season lasting from May to September, advance action will be taken to recruit the consultants on a noncommittal basis. The simplified technical proposal procedure will be adopted for selecting consultants. A total of 43 person-months of consulting services will be required: 10 international and 33 domestic. The domestic consultants and international consultants in the same technical area will work together to build capacity among the domestic consultants and implementation partners. Using a multistakeholder participatory approach, and in collaboration with the EA and the implementation partners, the consultants will prepare an inception report within one month of TA implementation. An interim report summarizing progress and outlining a continuing work program will be discussed in an interim workshop within five months of the start of the TA. A final workshop to discuss the draft ICDP will be held in the ninth month of implementation.

17. The terms of reference for consulting services are outlined in Appendix 3. ADB will monitor and periodically review TA progress through the (i) inception, interim, and final workshop reports; and (ii) review missions and participation in the workshops. A web page will be established to disseminate information about TA implementation and to secure stakeholder input and participation. ADB will be responsible for procuring equipment and materials in accordance with *ADB's Guidelines for Procurement* and other arrangements for procurement.

IV. THE PRESIDENT'S DECISION

18. The President, acting under the authority delegated by the Board, has approved the ADB administering technical assistance to the Government of India, in an amount not exceeding the equivalent of \$450,000, to be financed by the Government of United Kingdom on a grant basis, for the purpose of Conservation and Livelihoods Improvement in the Indian Sundarbans, and hereby reports such action to the Board.

TECHNICAL ASSISTANCE FRAMEWORK

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions/Risks
<p>Goal</p> <p>To secure ecosystem biodiversity in Indian Sundarbans and improve livelihoods of local communities in and around the area</p>	<ul style="list-style-type: none"> • Reduced mangrove forest loss and degradation • Stable populations of flagship plant, animal, and aquatic species • Number of people living below poverty line reduced 	<ul style="list-style-type: none"> • Global and national ecosystem and species monitoring and inventory reports • Government and nongovernment organization (NGO) reports and assessments 	<ul style="list-style-type: none"> • Government and civil society is committed to Sundarbans conservation. • Population pressures, poverty, and commercial interests remain within sustainable levels. • National and state development plans Sundarbans ecosystem friendly and environmentally responsible
<p>Purpose</p> <p>Preparation of a comprehensive Integrated Conservation and Development Plan (ICDP) for Indian Sundarbans</p>	<ul style="list-style-type: none"> • Increased capacity of Sundarbans Development Board (SDB), Forest Department (FD), and key stakeholders for integrated conservation and development planning • Rationalized and harmonized conservation and development planning, implementation procedures, and practices • ICDP used as primary planning and management framework by Government of West Bengal 	<ul style="list-style-type: none"> • TA implementation review missions workshop reports • SDB, FD, NGO annual plans of operations • State and local program and project implementation reports 	<ul style="list-style-type: none"> • Sufficient mutual trust and cooperation between government agencies and local people • Willingness to adopt and adapt to a collaborative and cooperative mode of functioning
<p>Outputs</p> <ol style="list-style-type: none"> 1. ICDP prepared. 2. Livelihoods and conservation improvement and investment needs assessed and prioritized 3. Institutional capacity of stakeholders assessed and strengthened 	<ul style="list-style-type: none"> • Completion: May 2002 • Completion: May 2002 • Completion: May 2002 	<ul style="list-style-type: none"> • Consultant work plans and reports • EA and stakeholder feedback and workshop reports • Review missions • TA web page 	<ul style="list-style-type: none"> • Timely procurement and mobilization of consultants • Cooperation of SDB and FD field staff • No major shift in external and national investment and operational practices • No major natural disasters and/or emergencies

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions/Risks
<p>Activities</p> <ol style="list-style-type: none"> 1. Conservation framework and Sundarbans Biosphere Reserve (SBR) protection plan prepared 2. Ecotourism strategy developed 3. Global Environment Facility (GEF) project proposal finalized 4. Institutional plan to operationalize ICDP prepared 5. Flood protection strategy developed 6. Fisheries/mariculture strategy developed 7. Environmental extension (EE) plan developed 8. Mangrove conservation plan prepared 9. Marketing and credit strategy developed 10. Agriculture development plan prepared 11. Ecological monitoring and research strategy developed 12. Livelihoods improvements strategy developed 13. Management information system developed 14. Village microplans prepared 15. Integrated conservation and development and investment plan prepared 	<p>4 months after start of TA</p> <p>3 months after start of TA</p> <p>4 months after start of TA</p> <p>4 months after start of TA</p> <p>4 months after start of TA</p> <p>4 months after start of TA</p> <p>6 months after start of TA</p> <p>6 months after start of TA</p> <p>6 months after start of TA</p> <p>6 months after start of TA</p> <p>6 months after start of TA</p> <p>6 months after start of TA</p> <p>6 months after start of TA</p> <p>6 months after start of TA</p> <p>6 months after start of TA</p> <p>8 months after start of TA</p>	<ul style="list-style-type: none"> • Consultant work plans and reports • Workshop reports • Review missions • TA web page 	<ul style="list-style-type: none"> • Timely mobilization of international and domestic consultants • Effective coordination and arrangements of logistics • Stable climatic and operational conditions • Access to needed data and sites provided in a timely manner
<p>Inputs</p> <ol style="list-style-type: none"> 1. International consultants' level of effort 2. Domestic consultants' level of effort 3. Total costs involved <ul style="list-style-type: none"> - ADB financing - State Government 	<ul style="list-style-type: none"> • 10 person-months • 33 person-months <p>\$550,000</p> <p>\$450,000</p> <p>\$115,000</p>	<ul style="list-style-type: none"> • Consultant procurement and mobilization schedules • Consultant inception report, work plans, and workshop reports • TA expenditure and disbursement reports • Review missions 	<ul style="list-style-type: none"> • Required expertise available for the TA • Timely recruitment and deployment of consultants • Adequate and timely provision of counterpart staff and facilities

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank Financing^a			
1. Consultants			
a. Remuneration and Per Diem			
i. International Consultants	200	0	200
ii. Domestic Consultants	0	110	110
b. International and Local Travel	30	14	44
c. Reports and Communications	3	0	3
2. Equipment and Office Supplies	2	8	10
3. Workshops and Surveys	0	20	20
4. Miscellaneous Administration and Support Costs	0	5	5
5. Representative for Contract Negotiations	5	0	5
6. Contingencies	30	23	53
Subtotal (A)	270	180	450
B. Government Financing			
1. Office and Administrative Support	0	30	30
2. Remuneration and Per Diem of Counterpart Staff	0	70	70
3. Local Transportation for counterpart staff	0	15	15
Subtotal (B)	0	115	115
Total	270	295	565

^a Financed by the Government of United Kingdom.

Source: ADB estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The consultants' inputs are shown in Table A3.

Table A3: Consulting Services Inputs

Expertise	Person-months for Activities		
	(i) ^a	(ii) – (iv) ^a	Total
A. International			
1. Ecosystem Specialist/ Deputy Team Leader	2.0	1.0	3.0
2. Mangrove Specialist	1.0		1.0
3. Pisciculture/Mariculture Specialist	2.0		2.0
4. Ecotourism Specialist		1.0	1.0
5. Institutional Specialist	1.0	1.0	2.0
6. Livelihoods Specialist		1.0	1.0
Subtotal	6.0	4.0	10.0
B. Domestic			
1. Chief Planner/ Team Leader	2.5	6.5	9.0
2. Protected Area Specialist	1.0		1.0
3. Mangrove Specialist		1.0	1.0
4. Pisciculture/Mariculture Specialist		1.0	1.0
5. Ecological Monitoring and Research Specialist	2.0	1.0	3.0
6. Institutional Specialist		2.0	2.0
7. MIS Expert and System Specialist	2.0	3.0	5.0
8. Poverty and Livelihoods Specialist	1.0	3.0	4.0
9. Agriculture/Farming System Specialist		2.0	2.0
10. Marketing and Credit Specialist		2.0	2.0
11. Environmental Education Specialist	1.0	2.0	3.0
Subtotal	9.5	23.5	33.0
Total	15.5	27.5	43.0

MIS=Management information system.

^a (i) Integrated ecosystem conservation and management framework; (ii) livelihoods assessment and development; (iii) institutional assessment and capacity building; and (iv) integrated conservation and development plan (ICDP).

Source: ADB estimates.

A. Integrated Ecosystem Conservation and Management Framework

2. The consultants will assess the current ecosystem conservation and management initiatives, plans, and practices identifying strengths, weaknesses, threats, and opportunities for improving the Sundarbans ecosystem protection and management. The consultants, in collaboration and cooperation with the executing agency and implementing partners, local nongovernment organizations (NGOs), and key stakeholders such as Botanical Survey of India, Calcutta will prepare a conservation and management profile for the Indian Sundarbans. Using a participatory diagnosis and design approach involving stakeholder workshops, the consultants will formulate an integrated ecosystem conservation and management framework for the Indian

(Reference in text: page 5, para. 17)

Sundarbans. The framework will include specific measures for protecting and conserving the Bengal tiger and its habitat. The key activities of the consultants would include the following:

- (i) Review and assess present regulatory framework including the Wildlife Protection Act of 1972, available Sundarbans conservation and development plans and documents.
- (ii) Review and assess the present system of pisciculture and shrimp farming, and suggest implementable methods to control the present destructive method of collecting tiger prawn spawns.
- (iii) Review and assess the current mangrove management practices and the state of mangrove plantations; identify the gaps in the present management systems and suggest methods of upgrading.
- (iv) Analyze the threat to ecosystem conservation, and consistent with integrated coastal management approach, identify comprehensive response strategies for threat management, and suggest methods of upgrading the present park and ecosystem management.
- (v) Identify methods to improve wildlife management with special emphasis on the Bengal tiger, identify threat management strategies, and steps to curb poaching.
- (vi) Design a mangrove ecosystem conservation and restoration plan for the Indian Sundarbans.
- (vii) Identify training and other needs for the protected area staff to implement improved management methods.
- (viii) Identify infrastructure and equipment upgrading and upscaling needs.
- (ix) Review and analyze current biodiversity monitoring systems including those used in Sundarbans Biodiversity Conservation Project (SBCP). Identify gaps, suggest improvements in the present system, and suggest system monitoring indicators.
- (x) Identify the potential for including local people in the ecological monitoring process and the methods for involving them.
- (xi) Design an ecological monitoring strategy and a plan for an environmental audit for the Indian Sundarbans.
- (xii) Suggest key areas for support of research including the human impact on protected areas and socioeconomic research.
- (xiii) Finalize a Global Environment Facility (GEF)-eligible project proposal for the Indian Sundarbans after consulting stakeholders and other sources.
- (xiv) Based on (i)-(xiii), SBCP experience and consistent with the existing forest and wildlife regulatory and management framework, develop an integrated conservation and management framework using a landscape approach.

B. Livelihoods Assessment and Development

3. The consultants will identify the investment needs and priorities for sustaining and securing the livelihoods of the local communities, and identify means for integrating them in the integrated conservation and management framework. The key activities of the consultants will include the following:

- (i) Analyze the livelihoods assets, vulnerability context, and opportunities for interventions for a few sample communities (in the islands and in the mainland).
- (ii) Carry out social analysis in close cooperation with NGOs such as the Tagore Society.
- (iii) Assess the current agriculture sector technologies and programs of the state and NGOs, and independent innovative farmers.

- (iv) Study the present marketing system for agricultural produce for farmers and other organized groups in the islands and the mainland, and identify the weak linkages in the systems. Suggest methods to improve the system.
- (v) Study the present marketing system used for nonagricultural produce by independent entrepreneurs, NGOs, and state-supported enterprises and make recommendations as appropriate.
- (vi) Identify opportunities for adding value to the agricultural produce at the local level.
- (vii) Select the most appropriate farming technologies for the islands and mainland.
- (viii) Assess the potential for induced spawning of tiger prawn in brackish water, with due consideration to the environmental impacts.
- (ix) Identify priority products with marketing potential, and outline production and marketing plans tailored to different enterprises and products.
- (x) Draw a marketing plan for sample communities in the islands and in the mainland.
- (xi) Review the existing credit studies and make recommendations as appropriate.
- (xii) Design the microplanning framework for the TA and undertake microplanning exercises in selected islands and communities.
- (xiii) Review the 1992 Netherlands consultancy report and recommendations on flood protection, and suggest a plan for managing periodic “shocks” due to the annual storms and cyclones that cause loss of lives and assets.
- (xiv) Design an operational strategy for agriculture and livelihood improvement for the selected target areas, including training and human resource needs.
- (xv) Prepare an operational plan and budget estimate for a livelihoods improvement program.

C. Institutional Assessment and Capacity Building

4. The consultants will assess the current institutional arrangements and their business processes, and identify institutional arrangements and practices for effective integrated conservation planning and management in the Indian Sundarbans. The key activities will include the following:

- (i) Assess strengths, weaknesses, resources and resource management capacities, staff levels, constituent demands, compatibility of conservation, and development goals among different stakeholder institutions.
- (ii) Analyze the present lack of coordination between key departments and NGOs.
- (iii) Propose a structure for rationalizing and harmonizing planning and management practices, to achieve integrated planning and coordinated implementation.
- (iv) Propose simple administrative clearance and decision-making processes to avoid delays between planning and implementation.
- (v) Design a management information system for the Indian Sundarbans with special emphasis on Integrated Conservation and Development Plan (ICDP) implementation.
- (vi) Design an environmental education and awareness strategy and action plan for ICDP implementation.
- (vii) Prepare a web page for TA implementation, conservation impact monitoring, and information dissemination.
- (viii) Specify the clear identity, mandate, and financial and administrative powers of each partner in ICDP implementation.

D. Integrated Conservation and Development Plan

5. Based on the outcome of the conservation, livelihoods, and institutional assessments; stakeholder consultations and workshops; and in close communication and consultation with the government of West Bengal and interested external funding agencies, the consultants will formulate the Integrated Conservation and Development Plan (ICDP) for the Indian Sundarbans. Activities will include the following:

- (i) Review policies and regulations relevant to ICDP implementation.
- (ii) Identify plan and program priorities and activities.
- (iii) Develop a conservation framework based on a landscape approach.
- (iv) Undertake microplanning in selected development units.
- (v) Develop a disaster management strategy along with an operational plan.
- (vi) Prepare an environmental education and awareness plan.
- (vii) Identify institutional arrangements with clear roles for each partner.
- (viii) Rationalize and harmonize inter- and intra-sectoral regulatory enforcement procedures and practices.
- (ix) Identify and assess investment needs and priorities, component costs, and project interventions for external funding agencies including the Asian Development Bank and GEF.