



Technical Assistance Report

September 2007

TA 4814-IND: Technical Assistance Cluster for Project Processing and Capacity Development
(Financed by the Government of the United Kingdom)

Component Technical Assistance: Preparing the North Eastern Integrated Flood and Riverbank Erosion Management Project (Arunachal Pradesh)

Asian Development Bank

ABBREVIATIONS

| | | |
|----------|---|---|
| ADB | – | Asian Development Bank |
| AP | – | Arunachal Pradesh |
| APSG | – | Arunachal Pradesh state government |
| COBP | – | Country Business Operational Plan |
| CTA | – | component technical assistance |
| DPR | – | detailed project proposals |
| FREM | – | flood and riverbank erosion management |
| ha | – | hectares |
| IWRM | – | integrated water resources management |
| MDONER | – | Ministry of Development of North Eastern Region |
| MFF | – | multi-tranche financing facility |
| NEIFREMP | – | North Eastern Integrated Flood and Riverbank Erosion Management Project |
| PPWG | – | project preparatory working group |
| SC | – | steering committee |
| TA | – | Technical assistance |
| TAC | – | TA Cluster |
| WRD | – | Water Resources Department |

NOTE

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

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I. INTRODUCTION

1. The Asian Development Bank (ADB) has included in its Country Business Operational Plan (COBP) 2007–2009 for India a loan for the North Eastern Integrated Flood and Riverbank Erosion Management Project (NEIFREMP) covering Arunachal Pradesh (AP) and Assam. The NEIFREMP is to be prepared through two technical assistance (TA) studies: (i) a project preparatory TA for preparing the NEIFREMP (Assam), approved on 15 December 2006,¹ and (ii) a component TA (CTA) for preparing the NEIFREMP (AP) under the TA Cluster (TAC) No. 4814-IND: Project Processing and Capacity Development. A CTA fact finding mission was fielded from 23 January–9 February 2007, and held discussions with the representatives of the Government of India (the Government), Arunachal Pradesh state government (APSG), and stakeholders to reach an understanding on the objectives, scope, costs, and implementation arrangements.² Its design and monitoring framework is in Appendix 1.³

II. ISSUES

2. **Floods and Riverbank Erosion in India.** India is one of the most disaster-prone countries in the world. Floods and river erosion are major recurrent natural disasters, affecting on average 7.6 million hectares (ha), and causing damage of an estimated \$400 million annually between 1953 and 2003. The country has a flood-prone area of 46 million ha, which includes a quarter of its cultivable land. Vulnerability is high in the Ganges–Brahmaputra–Meghna river basins in Uttar Pradesh, Bihar, West Bengal, and North Eastern states, which have the lowest per capita incomes in India. The National Common Minimum Programme of 2004 has accorded priority to protection and development of these vulnerable low-income areas.

3. A comprehensive policy framework for flood control has been in place since 1954, and has promoted short- to long-term programs for both structural and nonstructural measures. Over the years, increasing emphasis has been placed on flood management recognizing that absolute physical control of floods and riverbank erosion is not feasible. The revised National Water Policy of 2002 further emphasized nonstructural measures, and incorporated an integrated approach with basinwide watershed management and stakeholder participation. Within this framework, 16 million ha of riverine land have been protected with flood embankments and other structures. A nationwide flood forecasting and warning system has also been set up.

4. **North Eastern Region, Brahmaputra Basin and AP.** India's Northeastern region consists of eight states covering about 26.2 million ha with a population of over 40 million. About 75% of the region's geographical area, including 97% of AP and 90% of Assam, the two largest states in the region, is located in the Brahmaputra River basin, mainly covered by mountainous and hilly terrains cut by narrow tributary river valleys in AP, and vast flat flood plains in Assam.⁴ Its one of the most significant problems, and the causes of significant flooding and riverbank erosion are the runoff from extremely heavy rainfall during the monsoon and high sediment

¹ ADB. 2006. *Technical Assistance to India for Preparing the North Eastern Integrated Flood and Riverbank Erosion Management Project (Assam)*. Manila.

² The TA first appeared in *ADB Business Opportunities* on 2 March 2007.

³ The component technical assistance is classified as general intervention for target classification; agriculture and natural resources (water resources management) for sector (subsector) classification; sustainable economic growth (developing rural areas); capacity development (institutional development); and environmental sustainability (natural resources management) for theme (subtheme) classification.

⁴ The Brahmaputra River is 2,880 km long and drains an area of 580,000 km², of which 51%, 8%, 34% and 8%, respectively, are in the People's Republic of China, Bhutan, India, and Bangladesh. About 42% and 36% of its catchment area in India is covered by Arunachal Pradesh and Assam, respectively.

loads from upper watersheds, which are geologically young and unstable, and susceptible to landslides and earthquakes. Watershed degradation due to shifting cultivation and deforestation is also widespread. The Brahmaputra is the fourth in the world in terms of maximum flood discharges, while its sediment transport, amounting to 0.5 billion tons per year, is second only to that of the Yellow River in the People's Republic of China. Some 0.3 million ha and 3.8 million ha of land suffers from flood and bank erosion damages in the highest flood years in AP and Assam, respectively, accounting for 4% and 49% of the state geographical area, respectively.⁵

5. AP is predominantly covered by mountainous and hilly terrains, and 81% of the total area is covered by forest. It has high social and cultural diversity with 64% of its population of 1.2 million belonging to scheduled tribes. Although the state has immense potential for development of hydropower, tourism, and other natural-resource based industries, it largely remains untapped. Its per capita income remains at 85% of the national average while poverty incidence (24%) is at par with that of the nation. The state's strategy for economic growth emphasizes improved intrastate and interstate connectivity, rural and agriculture growth, social development, and hydropower and tourism development, while preserving the social integrity and culture of the large tribal population.⁶ Effective flood and riverbank erosion management (FREM) in the state's scarce plain areas along the rivers is also essential, where key productive agriculture land, urban and township areas are located with population concentration.

6. **Floods and Riverbank Erosion in AP.** Main challenges in AP include (i) riverbank erosion in floodplains and valley foot areas; (ii) river migration in the alluvial fans of tributaries due to a rising riverbed, resulting in floodwater spillover onto adjacent lands causing land degradation with heavy silt deposition; (iii) flashfloods in the tributary valleys caused by heavy local rains and failure of natural dams formed by landslides; and (iv) flooding in the flood plains caused by high flows in the major tributaries.⁷ Annual reported damage in 1998–2004 amounts to \$55 million. Efforts to address the problems were initiated relatively recently by the Water Resources Department (WRD), and have focused on structural works in critical locations such as towns and productive agriculture lands. So far 40 schemes including 19 town protection works have been implemented benefiting 54,000 ha of area, with revetments, spurs, and flood embankments. Nonstructural measures are yet to be operational, including centrally operated flood forecasting system for the Brahmaputra that reaches up to Assam only. Efforts are also made for watershed management, yet there is little integration with FREM programs.

7. Individual FREM schemes typically cost up to \$2 million, of which the predominant share is for riverbank protection. Simple standard designs using gabions (wire-mesh cages filled with boulders) have been developed that effectively use locally available materials and labor. However, they still require relatively high cost (up to \$1 million per km of bank protection), and the placement remains mostly ad hoc and reactive with little monitoring and maintenance, posing significant challenges in sustaining the impacts under highly unstable riverbed and

⁵ The following papers provide additional information: (i) Verghese, B.G., Development Options in a Cooperative Framework, Natural Resources, Water and the Environment Nexus for Development and Growth in Northeast India, Background Paper 1, World Bank. http://www.cprindia.org/admin/paper/Water_Resources.pdf; (ii) Wiebe, H., River Flooding and Erosion in Northeast India Exploratory Considerations of Key Issues, Northwest Hydraulic Consultants, http://siteresources.worldbank.org/intsaregotpwatres/Resources/Background_Paper_1.pdf; (iii) Sharma, U.C., Indigenous Techniques of Water Management for Resource Conservation and Sustainability: A Basis for Future Guidance, Centre for Natural Resource Management, Tarore, Jammu, India, <http://www.a-a-r-s.org/wseowm/download/Plenary3/India.pdf>; and (iv) Sharma, U.C. and Sharma, V., Water Resource Development, Management and Utilization in the Northeastern Region in India: Lessons from the Past and Future Strategies, <http://www.wrrc.dpri.kyoto-u.ac.jp/~aphw/APHW2004/proceedings/WRD/56-WRD-A118/56-WRD-A118.pdf>.

⁶ Social cohesiveness is high, having customs of mobilizing community resources for collective development actions.

⁷ Several towns in the hilly deposit areas are also affected by rapid soil erosion and deep gully formation.

channel conditions in AP. Much sounder management systems for planning, implementation, monitoring and maintenance are required, based on a firm understanding of the dynamic river processes, with flexibility for timely and adequate response. Substantial opportunities exist to enhance their cost-effectiveness through improved planning based on more rigorous surveys, exploration of lower cost designs, and higher implementation efficiency with transparency. Sustainability should be ensured by exploring more durable structural designs, engaging local communities for implementation, and routine maintenance building on their social cohesiveness, stockpiling of materials, and doing timely additional works based on effective monitoring. Financing gaps and measures to bridge those gaps should also be explored. These FREM works need to be combined with appropriate nonstructural measures and integrated with catchment management including soil conservation and forest management.

8. Over the longer term, coping with flooding and riverbank erosion problems calls for a regional and basin-wide approach involving a balanced combination of short- to long-term structural and nonstructural measures integrated with upper watershed management, given the intrinsic linkage between upstream catchment conditions and downstream flooding and bank erosion. From this perspective, the Government through the Brahmaputra Board is preparing regionally integrated master plans for the Brahmaputra basin while facilitating implementation by the concerned central and state agencies. However, its effectiveness is deemed limited with scope for improvement in terms of adopting a more bottom-up consultative and decentralized approach. Integration with watershed programs also remains limited. Further efforts are needed to promote regional cooperation for FREM while addressing these constraints and facilitating state-level dialogues for collaboration with the support of the Government.⁸

9. **Policy, Planning, and Institutional Basis.** On the basis of the initial progress made, APSG intends to develop a comprehensive framework and programs for FREM, following the relevant national policies and recommendations. The main recommendations envisage (i) developing integrated and river basin-based FREM plans incorporating catchment management; (ii) extending strategically structural measures in the critical areas of the state's economic interest; (iii) introducing non-structural measures including flood forecasting, warning systems, and flood zoning; and (iv) strengthening institutional capacity of WRD. In line with this initiative, APSG is also launching water sector reforms to introduce integrated water resources management (IWRM) at the state level, with schedules for preparing a state water policy and plan, and establishing a state water apex body and river basin organizations.

10. WRD remains a key organization within APSG to support the above FREM framework and programs as well as IWRM reforms. While it has a strong leadership and engineering skills to implement FREM infrastructure works, its institutional functions, structure, resources and management systems need to be adjusted to support these developments. This should be addressed with (i) strengthening FREM management systems including data and knowledge base and infrastructure maintenance; (ii) defining suitable state-level institutional arrangements for IWRM and WRD's specific roles and functional arrangements; (iii) integrating community participation in FREM operations; and (iv) strengthening social and environmental safeguards management. Likewise, effective collaboration arrangements to operationalize holistic FREM integrated with catchment management should be defined, building on the existing setup of emergency disaster management and in line with emerging IWRM institutional arrangements.

⁸ Significant scope exists to strengthen and exchange data and knowledge on basin-wide hydrology and geomorphology that could provide systematic analytical basis to support the state level flood and riverbank erosion management operations.

11. Within this backdrop, the APSG submitted a project proposal to establish and implement a comprehensive FREM framework and programs at the state level for possible ADB financing. It includes a prioritized list of short-term FREM infrastructure, a range of non-structural FREM measures, and associated strengthening of policy, planning, and institutional capacity. Building on the proposal, an investment project needs to be prepared that is ready for prompt implementation and can result in substantial reduction of annual flood and riverbank erosion damages. The TA will support this process by assessing the most effective way of addressing the aforementioned issues. It is also in line with ADB's Water Policy as well as the COBP for India 2007–2009 which aims, among other objectives, to upgrade infrastructure and facilitate rural development for broad-based economic growth and employment creation.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

12. The CTA impact is enhanced readiness for implementing a project to reduce flood damage and loss of land by riverbank erosion and river migration through comprehensive, cost-effective, sustainable and adaptive structural and nonstructural measures, their improved management systems, and associated institutional capacities including participatory mechanisms. The CTA outcome is the design of the AP components of a sector-type project covering both AP and Assam agreed upon by the Government, APSG, and ADB. The ensuing project will possibly use a multi-tranche financing facility (MFF).⁹

13. To meet the MFF criteria, the CTA outputs will comprise (i) an institutional development roadmap to operationalize the relevant policy principles including comprehensive FREM and IWRM and sustainable infrastructure maintenance, and a sound investment program with a list of proposed subprojects; (ii) appraised sample subprojects to provide comprehensive FREM and associated programs with baseline surveys, stakeholder analysis, and assessment of cost-effective, affordable, and sustainable infrastructure; (iii) a design for non-structural programs at state and subproject levels; (iv) institutional arrangements to facilitate timely and effective planning and implementation of FREM programs to cope with dynamic natural river processes; and (v) support programs to implement the Project with necessary institutional strengthening.¹⁰

B. Methodology and Key Activities

14. The CTA will prepare its outputs with utilization of available technical capacities and draft detailed project proposals (DPRs) of WRD, and data and analytical outputs of the Government such as the Brahmaputra Board. Complementary support is provided through consulting services to (i) explore more cost-effective and sustainable FREM options, and (ii) undertake necessary non-engineering tasks for subproject planning and associated policy and institutional studies. A consultative approach will be taken through seminars and workshops, and a series of field-level planning, option selection, and design meetings with beneficiaries. Close coordination will also be maintained with the separate TA to prepare investment components for Assam with mutually consistent TA work plans, exchange of draft outputs, and joint workshops. The activities are broadly divided into two components to prepare the aforementioned outputs.

⁹ It may comprise (i) participatory scheme planning; (ii) range of FREM infrastructure and nonstructural measures; (iii) complementary support to enhance growth and poverty impacts; and (iv) institutional strengthening and project management including strengthening of the policy and planning framework for FREM and IWRM.

¹⁰ About 6–10 sample subprojects will be appraised and the selection criteria for the remaining subprojects will be identified under the TA. A process-type approach will be justified based on conducive policy framework, institutional strengthening and investment plan, and exclusion of subprojects having major safeguards implications.

15. **Preparing FREM Strategy and Action Plan, Institutional Development Roadmap, and Investment Programming.** This component will (i) undertake FREM sector review for AP including the performance of ongoing interventions, and policy, strategy, and investment priority and plans; and (ii) prepare a FREM strategy and action agendas to bridge any gaps with the required framework including all the agendas as defined in the issues section above. Based on their discussion at the state workshop, the CTA will (i) undertake detailed institutional analyses to address those agendas which will culminate in an institutional development action plan and roadmap, and (ii) prepare FREM sector investment programs for AP with necessary scoping of the required investments and assessment of the required resources.

16. **Sample Subproject Selection and Feasibility Studies.** Implemented in parallel to the above, this component will (i) select sample subprojects while preparing selection criteria and fully exploring lower cost and more durable FREM infrastructure design options; (ii) undertake baseline surveys, stakeholder analysis, option finalization, feasibility studies and subproject planning in close consultation with the beneficiaries; (iii) assess social and environmental safeguards and prepare required action plans; and (iv) formulate a social development strategy and programs (the initial poverty and social analysis is in Appendix 2). Appropriate institutional arrangements for Project implementation will be defined including capacity strengthening.

C. Cost and Financing

17. The total cost of the CTA is estimated at \$875,000 equivalent. It will be financed by the Government of the United Kingdom for \$700,000 equivalent on a grant basis which will be administered by ADB. The APSG will finance the remaining \$175,000 equivalent through provision of office space, counterpart staff, surveys, data and analyses including DPRs. Specific cost estimates and a financing plan are shown in Appendix 3. The Government has been informed that approval of the CTA does not commit ADB to finance the ensuing project.

D. Implementation Arrangements

18. The Department of Economic Affairs is the overall EA for the TAC, whereas AP WRD will be the CTA implementing agency, and Ministry of Development of North Eastern Region (MDONER) will be the coordinating agency for preparing NEIFREMP for the two states. WRD will appoint a TA director at the level of senior superintending engineer. APSG will form (i) a secretary level TA steering committee (SC) chaired by Chief Secretary,¹¹ and (ii) a project preparatory working group (PPWG) including WRD staff (in planning, survey, quality control, and monitoring) and those nominated by other line departments participating in the SC. The TA will also seek the advice of the concerned Government agencies at key stages.¹² A highly participatory approach will be followed at the field level.

19. The TA will be implemented for six months from October 2007 to March 2008. Consulting services will be provided which will comprise a team of international and national consultants, and an international river engineering advisor. The team will comprise 10.5 person-months (pm) of international consultants and 36 pm of national consultants. Outline terms of reference are shown in Appendix 4. The team will be engaged by ADB through an international firm in association with national consultants through quality and cost based selection based on simplified technical proposal procedure, whereas an international river engineering advisor will be engaged individually by ADB to provide 1 pm of inputs to externally advise on the FREM infrastructure options explored and finalized under the CTA. All consultants will be recruited

¹¹ Including planning, finance, disaster management, land, rural development, forestry, and agriculture.

¹² Including Brahmaputra Board, Central Water Commission, Ministry of Water Resources, and MDONER.

following ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time) and other arrangements satisfactory to ADB for selecting and engaging national consultants.

20. The consultant team will prepare inception, draft FREM sector review and strategy reports, draft finals, and final reports within 3 weeks, 1.5 months, 5 months, and 6 months of fielding, respectively. To facilitate the effective preparation of the NEIFREMP covering AP and Assam while facilitating dialogues for possible regional cooperation, the following workshops will be organized, possibly as joint events of APSG, Assam state government, and the Government, and with a range of stakeholders including the non-government organizations: (i) inception workshop in month 1, (ii) second workshop to discuss the draft sector review and strategy report in month 2, and (ii) third workshop to present the draft final report in month 6. ADB will intensively monitor and supervise the TA by fielding inception and three review missions.

DESIGN AND MONITORING FRAMEWORK

| Design Summary | Performance Targets/Indicators | Data Sources/ Reporting Mechanisms | Assumptions and Risks |
|--|--|--|--|
| <p>Impact Enhanced readiness of implementing a project to reduce flood damage and loss of land by riverbank erosion and river migration through comprehensive, cost effective, sustainable, and adaptive structural and nonstructural measures in the tributaries of the Brahmaputra River in AP through integrated FREM</p> | <ul style="list-style-type: none"> • Reduced flood damage and loss of land by riverbank erosion and river migration (to be quantified in the CTA) • Institutional strategy and actions strengthened for effective FREM and IWRM • Sound institutional arrangements set up for FREM management systems • Sustained maintenance funding of FREM infrastructure established • Institutional actions taken to operationalize IWRM including state water policy and water plan formulation • Above targets achieved within the time frame of the ensuing loan project | <ul style="list-style-type: none"> • The Government and APSG statistics • Baseline and periodic monitoring reports • Other mechanisms to be determined during the CTA | <p>Assumptions</p> <ul style="list-style-type: none"> • The APSG will accept the terms and conditions offered by the Government for the follow-on investment project. • The recommended structural and nonstructural measures for FREM are implemented as designed with verification of the technical robustness. <p>Risk</p> <ul style="list-style-type: none"> • Morphological and other risk factors such as abnormal floods and earthquakes are beyond the anticipated level reflected in the design. |
| <p>Outcome An MFF project proposal suitable for ADB financing that would</p> <p>(i) reduce flood damage and riverbank erosion through comprehensive, cost-effective, sustainable, and adaptive structural and non-structural works with stakeholder participation; and</p> <p>(ii) strengthen the policy and institutional bases for effective FREM, such as (a) WRD in planning and providing programs with stakeholder participation and interagency coordination; and (b) statewide policy, planning, and coordination framework from an IWRM perspective.</p> | <ul style="list-style-type: none"> • Agreement reached on FREM strategy and action agendas within 2 months of the start the CTA • Agreement reached on the proposal elaborating the project design – objective, scope, implementation arrangements, and financing plan within 6 months of the start of the CTA • Agreement reached on the institutional roadmap and investment programs toward effective FREM operation with IWRM perspective within 6 months of the start of the CTA | <ul style="list-style-type: none"> • APSG and Government confirm the AM of the review mission to finalize action agendas. • The APSG and Government confirm the AM of the final tripartite review mission and endorse CTA final report. • The APSG and the Government confirm the AM of the separate TA design to enhance implementation readiness of the ensuing project | <p>Assumptions</p> <ul style="list-style-type: none"> • The APSG and beneficiaries will support the selection of sample subprojects, alternative design options, and feasibility study findings. • All stakeholders will accept the action plan to put into operation effective FREM and sustainable maintenance funding mechanisms. • Effectiveness of the identified FREM design options is verified through pilot testing. • The APSG will, where impacts are unavoidable, accept ADB's safeguard requirements on resettlement, environment, and indigenous peoples. • Beneficiaries will show willingness to sustain the adopted FREM options and enhance economic activities. |
| <p>Outputs 1. An integrated FREM strategy, institutional development roadmap, and investment programming 1-1. Sector review, FREM strategy and action agendas including participatory strategy</p> | <ul style="list-style-type: none"> • CTA agreement signed in July 2007 and initiated by October 2007 • Sector review, strategy, and action agenda report finalized in 2 months of the CTA start strategy | <ul style="list-style-type: none"> • Inception report • Sector review and strategy report • AM of ADB inception and review missions | <p>Assumptions</p> <ul style="list-style-type: none"> • Overall monitoring and quality support systems of the CTA are effectively operated. • Local political and security conditions are conducive to the field activities of the CTA. • Buy-in to proposed policy and institutional reform measures by APSG and Government. |

| Design Summary | Performance Targets/Indicators | Data Sources/ Reporting Mechanisms | Assumptions and Risks |
|--|---|--|--|
| <p>1-2. Institutional development road map stipulating actions and programs to put into operation integrated FREM, including sustainable maintenance funding, steps toward operating IWRM, and institutional strengthening of WRD and other agencies involved in FREM</p> <p>1-3. Medium-term investment program for the AP including the programs supported under the ensuing project and other state level programs</p> <p>2. Fully appraised sample subprojects to provide comprehensive structural and nonstructural FREM and associated programs.</p> <p>2-1. Subproject selection criteria defined, and sample subprojects selected with baseline survey and stakeholder analysis, and with cost-effective and durable FREM design alternatives explored</p> <p>2-2. Appraised subprojects with detailed program implementation plans, safeguard assessments and action plans, social development strategy, and effective participatory arrangements</p> <p>3. MFF project package including objective, scope, cost and financing plan, procurement plan, and institutional arrangements (including advance actions for recruiting consultants and procurement) to facilitate timely, proactive, and effective planning and implementation of FREM programs that are responsive to dynamic natural river processes</p> | <ul style="list-style-type: none"> • CTA interim report laying out the directions submitted in 2 months of CTA start • CTA draft FR stipulating the specified output submitted in 5 months and FR in 6 months of the start of the CTA • Same as above • CTA interim report laying out the draft outputs submitted in 2 months of the CTA start • Agreement reached on the selection of alternative design options • CTA draft FR stipulating the specified output submitted in 5 months and FR in 6 months of the start of the CTA • Agreement reached on feasibility and safeguards assessment and action plans • CTA draft FR stipulating the specified output submitted in 5 months and FR in 6 months of the start of the CTA • Agreement reached on the project package | <ul style="list-style-type: none"> • CTA interim report • Draft FR and FR • AM of review missions and final review mission confirmed • Same as above • CTA interim report • AM of interim review mission confirmed • Draft FR and FR • AM of review missions and final review mission confirmed • Draft FR and FR • AM of final review mission confirmed | <ul style="list-style-type: none"> • Buy-in to proposed interventions by beneficiaries with enhancement of economic activities. • EA and support agencies provide necessary support, particularly data, information, and analyses. • Information and analyses on innovative FREM options are readily available to the reasonable extent. • The TA steering committee will be effective in coordinating CTA activities and successfully mobilize line agency support. • Representatives of the Brahmaputra Board, Central Water Commission, and North East Hydraulic and Allied Research Institute will contribute to the CTA. • Participatory process for subproject planning is duly followed by all concerned. • Consultants perform as expected. • Various stakeholder groups participate in CTA consultative activities. • Beneficiaries and local institutions provide support to join participatory planning process. |

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| <p>Activities with Milestones</p> <p>A. By ADB</p> <ul style="list-style-type: none"> (i) Recruit consultants in coordination with the Government and APSG (ii) Monitor and supervise CTA activities regularly (iii) Guide the CTA activities through inception and review missions (iv) Facilitate necessary coordination and participatory processes <p>B. By APSG and the Government</p> <ul style="list-style-type: none"> (i) Appoint counterpart staff and form PPWG and interdepartmental TA steering committee (prior to CTA start) (ii) Appoint counterpart staff (prior to CTA start) (iii) Prepare detailed DPRs of representative schemes (iv) Supervise CTA activities regularly with active coordination with the consultants (v) Provide office space, data/information and documents, DPRs of representative schemes (and other inputs as appropriate), and other support to the CTA (throughout CTA period) <p>C. By Consultants</p> <p>Undertake designated CTA activities in close interaction with APSG, the Government, stakeholders, and ADB:</p> <ul style="list-style-type: none"> (i) State-level integrated FREM strategy and action agenda (within 2 months of the CTA start) (ii) Preparation of subproject selection criteria, selection of sample subprojects, and exploration of alternative FREM design options (within 2 months of the CTA start) (iii) Participatory subproject planning and feasibility studies with safeguards assessment and action plans, and social development strategy (within 6 months of the CTA start) (iv) Institutional road map including action plans and capacity strengthening programs (within 6 months of the CTA start) (v) Investment program and MFF project package as draft final report (within 6 months of the CTA start) <p>D. By Stakeholders</p> <ul style="list-style-type: none"> (i) Participate in CTA workshops and other consultations organized at various stages (ii) Participate in DPR and feasibility study preparation process | <p>Inputs</p> <ul style="list-style-type: none"> • ADB will provide (i) CTA inception and review missions; (ii) ongoing support from ADB HQ and the India Resident Mission; and (iii) mobilization of \$700,000 in grant financed from the DFID Trust Fund. • The APSG will provide in-kind contributions estimated at \$175,000 equivalent comprising provision of (i) office space, (ii) counterpart staff, (iii) draft DPRs of candidate schemes and other information and materials, and (iv) other counterpart support. • The Government and local stakeholders will contribute their time to participate in CTA workshops and other consultations. • Consultant inputs comprising (i) 10.5 person-months of international and 36 person-months of national consultants engaged through a team, and (ii) 1 person-months of international river engineering advisor for external review and advice. |
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ADB = Asian Development Bank, AM = aide memoire, APSG = Arunachal Pradesh state government, DFID = Department for International Development of the United Kingdom, DPR = detailed project report, EA = executing agency, FR = final report, FREM = flood and riverbank erosion management, HQ = headquarters, IWRM = integrated water resources management, MFF = multitranches financing facility, PPCG = project preparatory working group, TA = technical assistance, WRD = Water Resources Department.

INITIAL POVERTY AND SOCIAL ANALYSIS

A. Linkages to the Country Poverty Analysis

| | | | |
|---|---|--|---|
| Is the sector identified as a national priority in country poverty analysis? | <input type="checkbox"/> Yes <input type="checkbox"/> No | Is the sector identified as a national priority in country poverty partnership agreement? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <p>Contribution of the sector or subsector to reduce poverty in Arunachal Pradesh (AP):</p> <p>While the process of development in Arunachal Pradesh (AP) is recent, the state of development is encouraging. Income per head has increased and the rate of growth of income is high compared to the national average. The literacy rate has increased from 25% in 1981 to 54% in 2001. Along with growth of literacy and income, the health status has also improved. Nevertheless, overall the North East has higher incidence of poverty with Assam among the states with lowest per capita income. The Human Poverty Index (HPI)¹ for AP is estimated at 39.47% as compared to the national HPI of 33%. According to the 2001 Census, the Scheduled Tribes (ST) population constitutes about 65% of the total population of 1,098,000 people, the rest belonging to the General category. AP is also characterized by linguistic diversity and as many as 42 languages are spoken there. The people have an innate knowledge of the environment and the cultural practices passed down from generation to generation have helped to protect the rich biodiversity of the State. Social cohesion and a strong sense of community spirit still persist.</p> <p>Over 90% of AP consists of mountainous and hilly terrain cut by narrow tributary river valleys. A third of the net state domestic product comes from the primary sector, agriculture. Except for a few tribes with land in river valleys where paddy cultivation is done on mostly rain fed terraced land during the monsoon season, most agricultural production is based on shifting cultivation or jhum for subsistence purposes only. Poverty ratio is higher in rural areas (27%) whereas it is 12% in urban areas. The state's strategy for economic growth emphasizes improved intrastate and interstate connectivity, rural and agricultural growth, social development, and hydropower and tourism development, while preserving the social integrity and culture of the tribal population.</p> <p>Effective flood and riverbank erosion management (FREM) in the state's scarce plain areas along the river is essential, where productive agricultural land and urban and township areas are located with population concentration. Causes of significant flooding and river erosion are the runoff from extremely heavy rainfalls during monsoon which may coincide with floods in the main stem rivers and high loads of silt from the upper watersheds in the Himalayas, Tibet, where the Brahmaputra originates. Sudden breaching of temporary dams formed by landslides in the upper reaches of the tributaries also contributes to sudden devastating flash floods. There is no operational flood warning, system operational. Watershed degradation due to shifting cultivation and deforestation is widespread.</p> <p>The economic costs and social disruption associated with flooding have been rising. This is in part due to increasing human occupation and associated economic activity in the scarce floodplains. In-migration, an inflow of population into the State is indicated by rising figures of the "general" population as compared to the tribal population settling in the risky flood plains for agricultural production purposes much in the same way as they do in the floodplains of the Brahmaputra and on char (sandbar) islands. The inflow of migrant labor led to the introduction of new technology in agriculture. Migrant workers brought with them the knowledge of wet rice cultivation and this has meant the extension of permanent cultivation in many river valleys and plateaus. Only a few tribes such as the Apatani, the Singpho, and the Kamptis of Lohit district practice permanent cultivation or cultivated paddy on terraced land as opposed to jhum shifting cultivation. It is believed that these migrant workers are an important segment of the peasantry extending the permanent cultivation of land which earlier remained uncultivated.</p> | | | |

B. Poverty Analysis Targeting Classification: General Intervention

| |
|---|
| <p>What type of poverty analysis is needed?</p> <p>Participatory social and economic analysis is required to analyze specific segments of disadvantaged groups, including tribal people, sharecropping tenants from other states, and women in the project area; and to develop specific strategies to meet their development needs and priorities. As AP is a special category state, the role of development processes, and the involvement of the Government and local community participation practices will be examined to determine sensitive, non-disruptive, social, and cultural sensitive implementation modalities.</p> <p>Key questions of the development process in AP will be land tenure and land ownership of the tribal population and the changing pattern in the gender division of labor. While the challenge for the tribal population will be land titling under a communal land holding system, the challenge for women and particularly tribal women will be to secure land ownership. The social analysis will also look into the communal land holding structure and to what extent the project will affect traditional land holding patterns. Most project activities will be undertaken on riverbanks which are regarded as communal land where access is guided by usufruct land rights.</p> |
|---|

¹ The Human Poverty Index measures deprivation in health, education, and economic provision as outlined in UNDP's Human Development Report of 2002.

C. Participation Process

Is there a stakeholder analysis? Yes No

Is there a participation strategy? Yes No

The technical assistance (TA) will undertake a stakeholder analysis and suggest a participation strategy based on the realities and the special development needs of AP, taking into account the special political and economic situation of the state and the rights of the tribal population to land and participation in project activities. It is believed that through active participation of community groups, drawing on strong community spirit, ownership of and support for the project will be strong. How to best involve community action in flood and erosion control for structural and non-structural measures will be explored in detail, taking into account that structural measures such as river embankments, revetments, and spurs require regular maintenance and need complementary non-structural measures to be made more effective.

D. Gender Development

Strategy to maximize impacts on women:

The challenge for women and particularly tribal women in the development process ahead of them will be to secure land ownership. A result of increasing population density and intensification of agriculture, shifting cultivation systems with collective ownership over land are usually transformed into a system of peasant production of private landownership using animals for land cultivation and transport. These changes may have significant impact on the position of women, as private landownership may lead to the transfer of land to males and marginalization of women in production activities which in turn leads to their marginalization in society and the household. Although there is no matriarchy in AP, women hold a high and respectable position. They work on equal terms with the men in jhum and make their influence felt in the tribal councils.

The TA will develop a gender action plan to ensure that women, particularly tribal women will participate and equally benefit from project activities. It will also analyze the changes in the communal land holding structure and to what extents the project will affect traditional land holding patterns and mitigation measures will target women.

Has an output been prepared? Yes No

E. Social Safeguards and Other Social Risks

| Item | Significant/ Not Significant/ None | Strategy to Address Issues | Plan Required |
|----------------------|--|---|---|
| Resettlement | <input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None | <p>While no physical dislocation is anticipated, flood and river erosion mitigation measures might cause land acquisition. The TA will prepare a comprehensive Resettlement Framework under multi-tranche financing facility (MFF) lending arrangements and a short resettlement plan for subproject/loan 1 of the MFF. Land acquisition and compensation falls under the jurisdiction of the Land and Revenue Department. Agricultural land is communally held and is not cadastrally surveyed. After the enactment of a Bill on Land Settlement and Revenue in 2001, preparations are being made for a cadastral survey. Land ownership data is not available. The rules and institutional mechanisms that govern access to land vary from tribe to tribe and place to place. Riverbanks are being used by farmers for agricultural purposes under usufructuary rights. The TA fact finding mission observed that land was donated freely for embankment construction purposes and it is likely that community spirit of donating for the cause of flood mitigation will prevail.</p> | <input type="checkbox"/> Full <input checked="" type="checkbox"/> Short <input type="checkbox"/> None |
| Affordability | <input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None | | <input type="checkbox"/> Yes <input type="checkbox"/> No |

| Item | Significant/ Not Significant/ None | Strategy to Address Issues | Plan Required |
|---|---|---|---|
| Labor | <input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None | | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Indigenous Peoples | <input checked="" type="checkbox"/> Significant (positive impacts) <input checked="" type="checkbox"/> Not significant (negative impacts) <input type="checkbox"/> None | <p>The tribal population is estimated at 65% and inhabits the hills and mountain areas of the State. An Indigenous People Development Framework under the MFF lending modality will be developed, if necessary. However, as the majority of target beneficiaries of the project will be tribal, their right to inclusion and development should be reflected in the participatory strategy for subproject/loan 1.</p> <p>The TA will look carefully at the impact of the proposed interventions on the tribal population, their equal benefit sharing, and their equal participation in project activities.</p> | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Other Risks and/or Vulnerabilities | <input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None | | <input type="checkbox"/> Yes <input type="checkbox"/> No |

COST ESTIMATES AND FINANCING PLAN
(\$'000)

| Item | Foreign Exchange | Local Currency | Total Cost |
|--|---------------------|-------------------|---------------|
| A. Government of the United Kingdom Funding^a | | | |
| 1. Consultants | | | |
| a. Remuneration and Per Diem | | | |
| i. International Consultants | 271 | 0 | 271 |
| ii. Domestic Consultants | 0 | 162 | 162 |
| b. International and Local Travel | | | |
| i. International Travel | 29 | 0 | 29 |
| ii. Local Travel ^b | 0 | 36 | 36 |
| c. Reports and Communications | 0 | 7 | 7 |
| 2. Surveys and Studies | | | |
| a. Technical Surveys ^c | 0 | 30 | 30 |
| b. Other Surveys and Studies | 0 | 20 | 20 |
| 3. Workshops, Seminars, and Training ^d | 0 | 45 | 45 |
| 4. Administrative and Support Services | | | |
| a. Office Operation and Maintenance | 0 | 14 | 14 |
| b. Equipment and Furniture ^e | 10 | 10 | 20 |
| 5. Contract Negotiations | 6 | 0 | 6 |
| 6. Contingencies | 30 | 31 | 60 |
| Subtotal (A) | 345 | 355 | 700 |
| B. Government Financing | | | |
| 1. Administrative Support | 0 | 15 | 15 |
| 2. Counterpart Staff | 0 | 20 | 20 |
| 3. Local Travel and Vehicles for Counterpart Staff | 0 | 30 | 30 |
| 4. Studies, Surveys, Data Analysis, and Reports | 0 | 110 | 110 |
| Subtotal (B) | 0 | 175 | 175 |
| Total (A+B) | 345 | 530 | 875 |

Note: figures may not add up to total because of rounding off.

^a Financed on a grant basis by the Government of the United Kingdom (\$700,000), to be administered by the Asian Development Bank.

^b Includes vehicle rental and operation and local airfares.

^c Includes satellite pictures and subsoil investigation.

^d Includes workshops on TA inception, interim, and draft final outputs, a seminar on innovative riverbank protection techniques, and staff training. Regional workshops and seminars will be organized as appropriate.

^e Includes 6 hand-held GPS, 8 desktop/laptop computers and peripherals, a photocopier, broadband network connection, and office furniture.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

I. GENERAL

1. The technical assistance (TA) will support the preparation of the Northeastern Integrated Flood and Riverbank Erosion Management Project (NEIFREMP) for Arunachal Pradesh (AP),¹ with four components: (i) sector review, strategy and action plan preparation for integrated flood and riverbank erosion management (FREM) at the state level; (ii) sample subproject selection and feasibility studies; (iii) institutional development and investment roadmap; and (iv) investment packaging. The consulting services will include the experts in the table below, and will undertake the tasks outlined here which may be adjusted by the Asian Development Bank (ADB) as needed, in consultation with Arunachal Pradesh state government (APSG) and the Government of India (the Government). The inputs of the consultants are shown below.

Table A1. Consulting Services Inputs

| | |
|--|-------------|
| A. International | |
| River Management Specialist/ TL | 4.5 |
| Flood Management Specialist | 2.0 |
| Project Economist | 2.0 |
| Environment Specialist | 1.0 |
| Institutional Specialist | 1.0 |
| Advisor River Engineering ^a | 1.0 |
| Subtotal | 11.5 |
| B. Domestic | |
| Flood Management Specialist/ Deputy TL | 5.5 |
| River Engineer | 5.0 |
| Geo-morphologist | 3.0 |
| Project Economist | 4.0 |
| Sociologist | 4.0 |
| Water Resources Institutional Specialist | 3.0 |
| Environment Specialist | 4.0 |
| Resettlement Specialist | 2.0 |
| Other Specialists ^b | 5.5 |
| Subtotal | 36.0 |
| Total | 47.5 |

FREM = flood and riverbank erosion management; TL = team leader.

^a Individual consultant to be engaged

^b Geotechnical specialist, watershed specialist, agriculture specialist,

II. SCOPE OF SERVICES

2. The consultants will support the development of a comprehensive framework for FREM, adopting an integrated approach on the basis of river basins in AP, and incorporating regional perspectives. Investment programs should ensure improvement in management systems from scheme identification to maintenance with beneficiary participation, with an emphasis on higher cost effectiveness, efficiency, transparency, and sustainability. This should also be supported by appropriate non-structural programs along with strengthening of policy and institutional framework.

¹ The Northeastern Integrated Flood and Riverbank Erosion Management Project will cover Arunachal Pradesh and Assam, and the technical assistance (TA) will prepare the components for Arunachal Pradesh. A separate TA having a similar scope is undertaken for Assam in parallel to the present TA.

3. The consultants should effectively use the data, materials, and analysis provided by the APSG and the Government including the detailed development report (DPR) while collecting primary data on subproject-specific socio-economic data. Extensive consultation is needed to ensure full ownership of the processes and outputs provided by the APSG agencies. Close coordination will be maintained with the project preparatory TA for the NEIFREMP for Assam. The consultants should also maintain contacts with the relevant Government agencies including the Department of Economic Affairs, Ministry of Development of North Eastern Regions, Ministry of Water Resources, Brahmaputra Board, and the Central Water Commission.

A. Sector Review and Preparation of Strategy and Action Plan

4. The consultants will (i) undertake a sector review of FREM and watershed management; (ii) review existing policies, strategies, and plans of the Government and APSG on FREM and integrated water resources management (IWRM); (iii) assess the state-level performance in FREM objectives and approach, comprehensiveness of structural and non-structural measures, soundness of management systems, and participatory systems; (iv) assess nonstructural FREM measures and hydrological data management systems; (v) assess existing catchment management programs and possibilities for including activities within the NEIFREMP that can be cofinanced by Global Environment Facility; (vi) support Water Resources Department (WRD) in identifying possible agendas for regional dialogues; (vii) synthesize and assess the institutional setup and arrangements for FREM, including roles and coordination arrangements with concerned agencies, as well as the structure, functions, staffing, skills mix, other assets, and management systems of WRD; (viii) recommend framework, appropriate strategies, and action agendas for an integrated FREM; and (ix) organize workshops with and among local experts and stakeholders.

B. Sample Subproject Selection and Feasibility Studies

5. **Sample Subproject Selection and Exploration of Design Options.** The consultants will (i) review and evaluate the DPRs at the pre-feasibility level; (ii) prepare sample subproject selection criteria that would support the selection of feasible schemes, and select about 6–10 schemes for detailed assessments under the TA in consultation with APSG, the Government and ADB; (iii) prepare standard formats for subproject planning with feasibility studies; (iv) deliver short training to the WRD staff on flood risk management planning and required analyses for feasibility studies; (v) support data collection and undertake background analysis relevant to performance and implementation of FREM works; (vi) assess existing design standards and their application and performance; (vii) identify and recommend design principles and options for most appropriate designs based on international and Indian practice; and (viii) review and recommend measures for cost-effectiveness and efficiency in design and implementation.

6. **Beneficiary Participation and Social Assessments.** The consultants will (i) undertake baseline survey and stakeholder analysis of the proposed interventions; (ii) prepare a socio-economic profile as baseline survey data; (iii) assess community willingness to participate in subproject works and recommend participatory mechanisms for planning, designing, implementing, monitoring, and maintaining FREM works; (iv) establish local FREM working group/committee to participate in the subproject planning process; (v) conduct public meetings and dialogues, to assess stakeholders' priorities (including non-FREM related priorities) and potential impacts of the identified FREM options in particular the poor and vulnerable groups; (vi) prepare a strategy for social development and poverty reduction including gender strategy and action plan, following ADB's Handbook on Poverty and Social Analysis; (vii) suggest subproject-specific interventions to implement poverty reduction and social strategy; and (viii) recommend specific arrangements and cost estimates for undertaking beneficiary participation, social development, and livelihood enhancement in the context of the concerned subprojects.

7. **FREM Technical Assessment and Design.** The consultants will (i) support investigations, data collection, and analyses for identifying appropriate combination of FREM options including structural and non-structural measures for the subprojects; (ii) support the design of FREM structures while pursuing cost-effectiveness, efficiency, durability of the adopted designs; (iii) support hydro-meteorological and hydraulic analyses of flood protection works; (iv) assess the need for providing non-structural measures in the selected schemes, and provide basic approach and designs; (v) assess river behavior, instability, and earthquake risks with the collection of morphological data, geo-technical investigation, and analyses; (vi) analyze and develop sediment budgeting with the assessment of sediment intrusion through landslides and soil erosion, deposition or degradation of riverbeds and banks; (vii) assess necessary maintenance and follow-on investment requirements and costs to cope with further morphological changes in the future and recommend appropriate arrangement.

8. **Complementary Program Assessments.** The consultants will review other ongoing programs in the subproject areas with a view to identifying any activities that could stimulate economic growth and sustainable environmental management. Specific programs may include: (i) agriculture and fishery development, (ii) catchment management, (iii) community development and empowerment, and (iv) livelihood support targeting women and the poor.

9. **Safeguards Assessments.** The consultants will prepare a safeguards framework and related plans as required following ADB's policies on involuntary resettlement (1995), indigenous peoples (1999), and environment (2002), and Operations Manual on involuntary resettlement (OM Section F2);² and APSG and Government policies. On resettlement, the consultants will prepare a resettlement framework and sample resettlement plans for MFF subproject/loan 1 by (i) reviewing APSG and the Government policies and guidelines; (ii) assessing APSG operations on the subject; (iii) screening sample subprojects and prepare resettlement plans for subprojects that will require land acquisition, change in land use of restricted access resulting in permanent or temporary socio-economic impacts; (iv) arranging land survey, census, and consultation with the affected people; (v) identifying options for relocation, measures required to assist with transfer to new sites and to restore livelihood; (vi) ensuring safeguards are in place for voluntary land donations; (vii) documenting and quantifying land donations in resettlement plans; (viii) preparing time-bound income restoration measures; (ix) defining mechanisms to redress grievances; (x) specifying responsibilities for approving, implementing, financing, and monitoring resettlement plans, and capacity development programs; (xi) assessing a resettlement budget, annual financing plan, implementation schedule, and monitoring plan; and (xii) assisting the APSG and the Government in ensuring timely disclosure of resettlement information. As for indigenous peoples, the consultants will prepare a framework for their development. If the impacts are found insignificant, a development plan or an action plan will be drafted by (i) collecting baseline data and information on social, economic, and cultural practices of affected tribal populations; (ii) assessing the likely effects of the project on tribal populations; (iii) assessing and recommending culturally-appropriate strategies for engaging affected tribal communities in consultations and their participation in project implementation and monitoring.

10. Regarding environmental impacts, the consultants will (i) review all subprojects and develop an environmental screening format to determine appropriate environmental assessment of subprojects; (ii) prepare environmental impact assessments (EIA) or initial environmental examinations (IEE) of sample subprojects with baseline surveys, in accordance with the Government's EIA Notification³ and ADB's Environmental Assessment Guidelines,⁴ assuming

² Including its footnote 6 in paragraph 5 regarding voluntary donation of land.

³ The Environment (Protection) Act, 1986, amended 1991 and EIA Notification, S.O. 60(E) of 27 January 1994.

⁴ Available: http://www.adb.org/documents/Guidelines/Environmental_Assessment/default.asp.

responsibility for obtaining approval and for submission to ADB; (iii) prepare the environmental assessment and review procedures framework for the project;⁵ and (iv) assess the capacity of WRD to undertake scoping of environmental impacts, supervise environmental studies, and implement measures defined in the IEEs/EIAs, while recommending staffing and training requirements; and (v) provide on-the-job training to designated counterpart staff of WRD.

11. **Feasibility Studies and Subproject Implementation Plan.** The consultants will (i) prepare feasibility-level designs, engineering cost estimates, and implementation schedules; (ii) prepare detailed estimates of the potential flood and erosion damage in the subproject area; (iii) assess subproject risks and identify risk management measures; (iv) conduct analyses by assessing the economic and financial viability of the subprojects; and (v) synthesize the findings of the subproject-level feasibility studies into a subproject implementation plan.

C. Institutional Development Roadmap and Investment Programs

12. **Integrated FREM and IWRM.** The consultants will: (i) follow up on the action agendas identified, prepare a work plan to assess, and define appropriate actions; (ii) assess and recommend appropriate arrangements for (a) integrated and strategic planning and coordinated implementation of FREM, and (b) sound flood and riverbank erosion damage assessments; (iii) undertake detailed institutional analysis of WRD,⁶ identify gaps covering organizational structure, human resources, business processes and management, monitoring and maintenance, and recommend short- to medium-term action plan; (iv) review and assess data requirements for WRD to effectively manage floods, riverbank erosion, and water resources, and devise and cost a program to strengthen decision support systems; (v) investigate the feasibility, costs, and requirements for the development of integrated river basin-based FREM plans, flood forecasting and warning system, land use zoning, and any other flood risk management measures, based on which specific programs will be prepared; (vi) assess possible steps, schedules, and resource requirements to establish IWRM, including preparation of a draft state water policy, a state water plan, and associated institutional framework; and (vii) facilitate regional dialogues for an effective FREM, and develop possible programs that may be supported under the NEIFREMP such as exchange and development of knowledge base.

13. **Sustainable Maintenance Funding.** The consultants will develop specific actions for sustainable maintenance of FREM structures. Consultants will explore: (i) measures to reduce the maintenance costs and assess the necessary financing gaps that need to be fulfilled by the APSG; (ii) participatory approaches to elicit beneficiary participation in subproject maintenance such as training beneficiary organizations to do routine maintenance tasks, developing locally-based monitoring and evaluation systems, and mobilizing local resources; (iii) linkages with other government and funding agency-financed programs to help defray O&M costs, for example by tapping into the labor available under the Guaranteed Employment Scheme; and (iv) measures to secure a dedicated source for the maintenance of FREM infrastructure (e.g., through establishment of user charges, earmarking a portion of existing property or excise taxes, etc.) and budgetary mechanisms to earmark the funds collected (e.g., establishment of a separate FREM maintenance fund). The consultants will also design a management information system for monitoring subproject planning, prioritization and performance.

⁵ Available: http://www.adb.org/documents/Guidelines/Environmental_Assessment/default.asp.

⁶ As part of the institutional analysis of Water Resource Department, and in accordance with ADB's guidelines for *Financial Management and Analysis of Projects (2005)*, the consultants will (i) assess WRD's financial management capacities to implement the Project and operate project assets, (ii) undertake financial management assessment (FMA) utilizing the ADB's FMA Questionnaire, (iii) review the audited and unaudited financial statements, (iv) assess the adequacy of financial management arrangements and/or identify financial management risks and suggested mitigation measures for institutional strengthening and action plan, and (v) recommend ways to improve corporate governance in light of ADB's Policy on Governance: *Sound Development Management (1995)*.

14. **Investment Programming and Roadmap.** In line with the requirements for adopting MFF modality for the ensuing NEIFREMP, the consultants will develop an investment program for the FREM and associated sectors. The specific activities will include the following: (i) review and synthesize the short- (up to 5 years), medium- (up to 15 years), and long-term (up to 25 years) investment plans of the Government and APSG for FREM and associated sectors; (ii) develop an investment strategy as well as plans for the relevant structural, non-structural, and institutional development works to be supported under the NEIFREMP for AP; and (iii) propose a comprehensive sector investment programs, encompassing and highlighting those supported under NEIFREMP and other interventions, while outlining physical and non-physical interventions, their sequence, and financing arrangements.

D. Project Packaging

15. Based on the above activities, the consultants will prepare a comprehensive MFF project proposal including (i) institutional development roadmap and investment programs for the entire FREM and associated sector at large; (ii) investment and institutional strengthening program for the NEIFREMP of spanning 5-6 years of priority FREM programs; (iii) draft framework financing agreement that synthesizes the above, and the draft periodic financing request corresponding to the first MFF tranche; (iv) project design and monitoring framework with performance indicators, monitoring mechanisms, and assumptions; (v) detailed project component design and implementation arrangements; (vi) capacity development program particularly for WRD; (vii) resettlement framework and plans, IEEs/EIAs, and indigenous peoples' plans, as required; (viii) cost estimates and implementation schedule; (ix) project procurement plan for each of the proposed tranches and support for proceeding with advance actions for recruiting consultants and procurement; and (x) program of pre-construction and initial institutional strengthening activities which could be undertaken prior to project approval.

E. International Advisor for River Engineering

16. The international advisor, to be separately recruited by ADB in consultation with the Government and the APSG for 1 person-month will provide an external advice to assist the WRD and the TA consultant team on (i) drafting sector review, strategy, and action agendas; (ii) designing options for cost-effective FREM infrastructure including lower cost and more durable designs, efficient cost estimates, procurement, work execution, monitoring, and maintenance; and (iii) surveying and data collecting arrangements for sound feasibility studies.

III. REPORTING AND WORKSHOP ARRANGEMENTS

17. **Reporting.** The following reports and documents will be prepared and submitted to APSG, the Government, and ADB for review and advice: (i) inception report (within 3 weeks of fielding); (ii) FREM sector review, strategy, and action agenda report (draft submitted within 1.5 months of fielding and finalized in 2 months of fielding); (iii) interim report (within 2 months of fielding); and (iv) final report (draft submitted within 5 months of fielding and finalized in 6 months of fielding). The international advisor will also prepare and submit a succinct review report.

18. **Workshops and Seminars** To facilitate the effective preparation of the ensuing NEIFREMP covering AP and Assam, the following workshops will be organized, possibly as joint events with the separate TA for Assam: (i) workshop to discuss the inception report in the first month; (ii) joint workshop in month 2 to discuss the draft report on sector review, FREM strategy and action agenda; and (iii) joint workshop in month 6 to present and discuss the draft outputs of the TA.