

FRAMEWORK FINANCING AGREEMENT

IND: Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program

Parties This Framework Financing Agreement (FFA) dated 08 September 2010 is between India acting by its President, and the Asian Development Bank (ADB).

Background India has requested, on behalf of the State of Assam (the State), ADB to finance the Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program (AIFRERMIP) following the Roadmap and Investment Plan described in Schedule 1 hereto.

The AIFRERMIP aims to enhance sustainable and inclusive economic growth in flood prone areas along the Brahmaputra River in Assam. Priority urban, suburban, and productive rural and other strategic sites will be targeted to contain flood and river erosion damages and to promote increased investments in urban industries, services, and productive agriculture. Its immediate objective is to substantially enhance the State's flood risk management systems (including the risks of river erosion and drainage congestion damages). Provided as the initial model to lead future replication, the AIFRERMIP will renovate and extend various structural works with a focus on three existing deteriorated large flood embankment systems, and a range of nonstructural flood management measures improving pro-active flood prevention. It will also strengthen policy, planning, and institutional basis towards addressing flood, river erosion, and drainage congestion problems in an integrated manner with a long-term, comprehensive, and basin wide perspectives, incorporating modern international best practices.

Investment Program for Multitranche Financing Facility India and the State are committed to and will implement the AIFRERMIP, which is a stand alone project forming the State's essential Investment Plan for the sector and is described in the Schedule 1 hereto.

The total cost of the AIFRERMIP over the period of 2010 to 2017 is expected to be \$150.0 million equivalent.

Multitranche Financing Facility The Multitranche Financing Facility (the Facility) is intended to finance the components including their subprojects of the Investment Plan, which are divided based on procurement packages and/or implementation years and are packaged as individual projects (or tranches). The specific components include:

- A. Development of FRERM planning, Institutional, and Knowledge Bases
- B. Comprehensive FRERM Systems
- C. Multidisciplinary Program Management Systems

This FFA does not constitute a legal obligation on the part of ADB to commit any financing. Exercised reasonably, ADB has the right to deny any financing request made by India, cancel the uncommitted portion of

the Facility, and withdraw India's right to request any financing tranche under the Facility. Financing tranches may be made available by ADB provided matters continue to be in accordance with the general understandings and expectations on which the Facility is based and which are laid out in this FFA.

This FFA does not constitute a legal obligation on the part of India to request any financing. India has the right not to request any financing under the Facility. India also has the right at any time to cancel any uncommitted portion of the Facility.

India and ADB may exercise their respective rights to cancel the Facility or any uncommitted portion thereof, and ADB may exercise its right to refuse a financing request, by giving written notice to such effect to the other party. The written notice will provide an explanation for the cancellation or refusal and, in the case of a cancellation, specify the date on which the cancellation takes effect.

Financing Plan

The Financing Plan for the AIFRERMIP is summarized below. Details are set out in Schedule 1 hereto.

		(\$ million)	
	Source	Total	Share (%)
	ADB	120.0	80
	Government	30.0	20
	Total	150.0	100

Financing Terms

ADB will provide loans to finance components and their subprojects under the Investment Program, as and when they are ready for financing, provided, India is in compliance with the understandings hereunder, the components and their subprojects are in line with those same understandings and a related request is made under a periodic financing request. Each loan will constitute a tranche.

Each tranche may be financed under terms different from the financing terms of previous or subsequent tranches. The choice of financing terms will depend on the project, capital market conditions, and ADB's financing policies, all prevailing on the date of signing the legal agreement for such tranche. Tranches may be provided in sequence or simultaneously, and some may overlap in time with each other.

Commitment charges are not payable on the Facility. They are payable only on financing actually committed by ADB as a loan. ADB rules on commitment charges, which are in effect when the legal agreements are signed for a tranche, will apply with respect to such tranche.

Amount

The maximum financing amount available under the Facility is one hundred twenty million dollars (\$120,000,000). It will be provided in individual loans from ADB's Ordinary Capital Resources.¹

Availability Period

The last date on which any disbursement under any tranche may be made will be 30 September 2017. The last financing tranche is expected to be executed no later than 31 March 2014.

Terms and Conditions

India will cause the proceeds of each tranche to be applied to the financing of expenditures of the Investment Program, in accordance with conditions set forth in this FFA and the legal agreements for each tranche.

Execution

The Executing Agency for the Facility will be the State acting through Assam Integrated Flood and Riverbank Erosion Risk Management Agency (AIFRERMA) (a special purpose vehicle registered under the Societies Act, 1860) anchored to the Water Resources Department (WRD) and in association with Revenue and Disaster Management Department of the State. The Agency will implement the Investment Plan in accordance with the principles set forth in Schedule 1 of this FFA, and as supplemented in the legal agreements for each tranche.

The Facility will be implemented over a 7-year period. Implementation is proposed in two (or more if needed) tranches over the said period. The subprojects and components under tranche one comprise civil works and construction materials purchased for the priority riverbank protection and flood embankment renovation works in the three selected subprojects (Palasbari, Kaziranga, and Dibrugarh subprojects) of the Facility, along with equipment, consulting services, and operational costs of the first three years. The institutional strengthening and project management support will continue over the entire period of implementation, and a strong emphasis is placed on this component to achieve the progressive reform milestones as set forth in Schedule 1 of this FFA.

Periodic Financing Requests (PFRs)

India may request, and ADB may agree, to provide loans under the Facility to finance the Investment Program and its related components and their subprojects upon the submission of a Periodic Financing Request (PFR). Each PFR should be submitted by India. India will make available to the State the proceeds of the loan in accordance with the related PFR, and the legal agreements for the tranche.

Each individual tranche will be for an amount of no less than the equivalent of \$20 million. ADB will review the PFR, and if found

¹ Provisions of the Ordinary Operations Loan Regulations applicable to LIBOR-Based Loans Made from ADB's Ordinary Capital Resources, dated 1 July 2001, would apply to each loan, subject to modifications, if any, that may be included under any Loan Agreement (said Ordinary Operations Loan Regulations as so modified, if any, being hereinafter called the Loan Regulations).

satisfactory will prepare the related legal agreements.

The components for which financing is requested under the PFR will be subject to the criteria set out in Schedule 4 hereto, satisfactory due diligence, preparation of relevant safeguards and fiduciary frameworks and other documents. ADB, India and the State have agreed on a Facility Administration Memorandum and a schedule to initiate these activities.

Until notice is otherwise given by India, the Secretary, Additional Secretary, Joint Secretary, Director, or Deputy Secretary in the Department of Economic Affairs of the Ministry of Finance of the Government of India is designated as authorized representative of India for the purpose of executing PFRs.

**General
Implementation
Framework**

The Facility will be implemented in accordance with the general framework set out in Schedule 3 hereto.

Procedures

Tranches to be provided under the Facility will be subject to the following procedures and undertakings:

- (a) India will have notified ADB of a forthcoming PFR in advance of the submission of the PFR.
- (b) India will have submitted a PFR in the format agreed with ADB.
- (c) ADB may decline to authorize the negotiation and execution of any legal agreement for a tranche.
- (d) If ADB confirms acceptance of the PFR, the legal agreements will be negotiated and executed by the parties.

PFR Information

The PFR will substantially be in the form attached hereto, and will contain the following details:

- (i) Loan amount
- (ii) Description of subproject/components to be financed
- (iii) Cost estimates and financing plan;
- (iv) Implementation arrangements specific to the subprojects or components;
- (v) Confirmation of the continuing validity of and adherence to the understandings in this FFA;
- (vi) Confirmation of compliance with the provisions under previous Loan Agreement(s) as appropriate; and
- (vii) Other information as may be required under the Facility Administration Memorandum, or reasonably requested by ADB.

Safeguards

Attached as Schedule 5 are the references to the Safeguards Frameworks and documents that will be complied with during the implementation of the Facility.

ADB's *Safeguard Policy Statement, 2009* currently include (i) Involuntary Resettlement safeguards (ii) Indigenous Peoples safeguards, and (iii) Environmental safeguards. However, for the first tranche, ADB's

Safeguard Policy in effect prior to the introduction of ADB's Safeguard Policy Statement, 2009 will apply.

Procurement and Consulting Services

All goods and services to be financed under the Facility will be procured in accordance with ADB's Procurement Guidelines (2010, as amended from time to time).

Consulting Services

All consulting services to be financed under the Facility will be procured in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time).

Advance Contracting and Retroactive Financing

Under each tranche, ADB may, subject to its policies and procedures, allow on request (a) advance contracting of civil works, equipment and materials, and consulting services and (b) retroactive financing of eligible expenditures for civil works, equipment and materials, consulting services and project management up to 20% of the proposed individual loan, incurred prior to loan effectiveness but not earlier than 12 months before the date of signing of the related loan agreement. India and the State acknowledge that any approval of advance contracting and/or retroactive financing will not constitute a commitment by ADB to finance the related project.

Disbursement

Disbursement will be in accordance with ADB's Loan Disbursement Handbook (2007, as amended from time to time).

Each loan under the Facility will have its own imprest account in the Reserve Bank of India, established by India as the Borrower. The State through AIFRERMA may establish a second-generation imprest account (SGIA) for each loan in an account in a commercial bank acceptable to ADB. India and the AIFRERMA will be responsible for administering and managing the imprest account and the SGIA, respectively, which will have an initial deposit not exceeding the lower of the estimated expenditure for the first 6 months of project implementation, or 10% of the relevant loan amount. The statement of expenditures (SOE) procedure will be used to reimburse/liquidate eligible expenditures not exceeding \$100,000 equivalent per individual payment.

Monitoring, Evaluation, and Reporting Arrangements

The AIFRERMA will establish a Project Performance Management System (PPMS) for each project and an Investment Program performance monitoring system (IPPMS) for the Facility respectively, acceptable to ADB within 3 months of effectiveness of the respective loan and the first loan, respectively. The IPPMS will select a set of performance monitoring indicators relating to physical implementation, institutional development, and socio-economic and other conditions. Schedule 2 hereto sets as the Design and Monitoring Framework for the Facility, against which the implementation effectiveness will be evaluated.

The AIFRERMA will establish baseline data for each of the selected indicators and will conduct annual surveys with the assistance of the consultants, and update the State and ADB on the progress against each indicator. AIFRERMA will also provide India and ADB with quarterly

progress reports in the format to be attached with the Facility Administration Memorandum, within 45 days of the end of each quarter. Quarterly reviews will be completed by the tripartite review meetings chaired by the State and attended by AIFRERMA and ADB.

The project accounts will be audited annually and submitted for review by India, and the State to ADB. In addition to the regular review missions for each Loan, a midterm review mission for the Facility will be conducted four years from the effectiveness of project 1 under the Facility. The reviews will include a summary of contract awards and disbursement, implementation progress including progress against institutional development and capacity development milestones. The midterm review will also identify problems or weaknesses in implementation arrangements, and agree on changes needed. Within 3 months of physical completion of each project under the Facility, the AIFRERMA will under intimation to the Government of India submit to ADB an individual project completion report. Within 3 months of the completion of the Facility, AIFRERMA will under intimation to Government of India submit to ADB a Facility completion report.

Undertakings

India and the State will undertake the following actions:

Sector Road Map. India will ensure that the Facility funds are utilized effectively and efficiently to implement the Investment Program and achieve its objectives. The State will ensure compliance with the institutional development actions in the Sector Road Map, which are identified in Table 1 of Schedule 1, including organizational reforms and strengthening of AIFRERMA and associated institutions.

Sustainable Infrastructure Maintenance. The State will ensure that the implementation of the measures for the assured maintenance of the facilities constructed with the Facility funds, through:

- (i) Establishment of infrastructure asset management information system for sound monitoring, planning, and implementation of requisite maintenance and adaptation works.
- (ii) Transparent management of maintenance fund utilization, with disclosure of information on fund allocation, procurement, contracts, and work order content.
- (iii) Full allocation of the fund required for annual maintenance for the facilities managed by AIFRERMA, and increase of the all the facilities managed by WRD towards progressively meeting the requirement by 2017.

Fiduciary Oversight. India and the State will ensure that each Project account will be audited by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB and the audit reports will be submitted to ADB within 6 months of the end of the relevant fiscal years. The State will further ensure the compliance with the specific institutional reforms measures set out in Schedule 3 of this FFA.

Counterpart Funds. The State will ensure that sufficient counterpart

funds are available from its budget for each fiscal year, in a timely manner, for the efficient implementation of the Projects under the Facility.

Safeguards. India and the State will ensure that subprojects under the Facility will be carried out in accordance with applicable laws and regulation of India and the State, the safeguard policies of ADB, and the Indigenous Peoples Development Framework, Resettlement Framework, and Environmental Impact Assessment of the three subprojects included in the Facility and referred to in Schedule 5 of this FFA.

INDIA

By

6/9/2010
Anuradha Thakur
Director (ADB)

ASIAN DEVELOPMENT BANK

By

Uta Kim
Hun Kim
Country Director

SCHEDULE 1

ROADMAP, POLICY FRAMEWORK, AND INVESTMENT PLAN FOR INTEGRATED FLOOD AND RIVERBANK EROSION RISK MANAGEMENT IN ASSAM

A. Introduction

1. The Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program (the Program) aims to reduce the economic vulnerability and social disruption in flood prone areas along the Brahmaputra River in Assam state (the State), and thus, enhance sustainable and inclusive economic growth. Priority urban, suburban, productive rural, and other strategic sites will be targeted to reduce flood and river erosion damages and promote increased investments in urban industries, services, and productive agriculture. Its immediate objective is to substantially improve the flood and riverbank erosion risk management (FRERM, including the risks of drainage problems) systems. Provided as the initial model to lead future replication, the Program will renovate and extend various structural works with a focus on three existing deteriorated large flood embankment systems, and a range of nonstructural flood management measures. The Program will also strengthen policy, planning, institutional, and knowledge bases with a long-term and comprehensive perspective, incorporating modern international best practices.

2. The State's 11th Five-year Plan (FYP: 2008–12) envisage accelerating annual growth rate to 6.5% during the period, and sets out key strategic pillars comprising: (i) regaining agriculture dynamism by improving agriculture productivity and market orientation; (ii) increasing manufacture competitiveness; (iii) developing human resources with provision of essential services to the poor; and (iv) reforming fiscal and financial management, improving public sector accountability, and strengthening private investment climate. In this context, reducing the risks of flooding and river erosion remains high on the development agenda, given that 90% of the State's key agriculture and urban areas are located in flood-prone areas. The Program therefore forms an important part of the State's 11th FYP and its Water Resources Department (WRD).

B. Roadmap

1. Current Sector Performance and Impediments

3. **Assam State Economy.** Development of Assam, is important as a gateway for the development of the North East given its relative largest size and its position as a center of interstate trade and regional economic integration. The State is rich in natural resources, including forestry (covering 34% of its geographic area), crude oil (as the country's lead producer), and water resources. However, many development indicators for the northeastern region as a whole are lower than the national level indicators. While the average annual economic growth rate of Assam increased from 2.7% during the 9th FYP period to 5.6% during the 10th FYP period, the latter is still lower than the national average of 7.8%. As a result, per capita income was 45% lower than national average in 2005, with its gap still widening. Incidence of poverty is also high at 36% in 2000, mostly concentrated in rural areas.² Several structural features have constrained the economic performance, including in agriculture sector, poor infrastructure, remoteness, high transportation costs, and vulnerability to natural disasters such as earthquakes and flooding.

² The statistical data were drawn from the State's 11th Five Year Plan (2007-12), Economic Survey Assam (2003-2004), and Assam Development Report (2002).

4. **The Brahmaputra River.** Assam's geographical area is mostly covered by alluvial plains and hilly terrains of the Brahmaputra and the Barak River basins. The rivers serve as a lifeline for the entire northeast, providing a range of key resources and vast development potentials, including fertile floodplain soils, water for domestic use and irrigation, navigation, and sources of hydroelectric power. However, about 3.2 million hectare (ha) or 40% of the State's geographical area is flood prone, covering most of its plain land. Costs of floods are on a rising trend, due to high flood frequency, low level of flood protection, and high population growth in flood-prone areas. In 2004, devastating floods affected 12.3 million people (44% of the State's total population), 2.9 million ha including 1.3 million ha of crop land, causing damage amounting to Rs20.0 billion. On average, floods affect about 5.0 million people, 1.0 million ha of agriculture and nonagricultural land with a damage of about Rs4.0 billion. In addition, about 7% of the land in the State's 17 riverine districts has been lost due to riverbank erosion in the last 50 years.³ About 8,000 ha of land is lost annually, with the appearance of unproductive and low-lying char land or sand bars, equivalent to an annual asset loss of Rs1.0 billion. Poverty incidence is significantly higher in the riverine areas affected by flooding and riverbank erosion.

5. **Floods and Riverbank Erosion—Causes and Management Status.** These chronic flooding and riverbank erosion calamities are caused by runoff from extremely heavy rainfall and high sediment loads from upper watersheds, which are geologically unstable and susceptible to earthquakes and landslides. They are exacerbated by upper watershed degradation, due to deforestation and shifting cultivation. The flood discharge of the Brahmaputra River is the fourth highest in the world. Its annual sediment transport, reaching 500 million tons, is the second highest next to the Yellow River in China. Climate change impacts may further exacerbate the frequency and magnitude of water related disasters in the Northeastern region.

6. The State has taken up a number of flood control, drainage, riverbank erosion mitigation and other structures, covering about 1.6 million ha or 50% of flood prone areas, with 4,500km of embankments, 850km of drainage channels, and over 870 anti-erosion structures for protecting about 50km of riverbank at critical sites. While anti-erosion structures have been generally performing well, their effectiveness and reliability is limited, due to deterioration in maintenance, river erosion, and riverbed rising, leading to occasional flood damage and reduced public confidence. Many embankments overlooked natural water bodies and drainage systems, obstructing optimal water intrusion in the monsoon and smooth drainage in the post-monsoon seasons. The development potentials of the infrastructure is thus largely underutilized. Nonstructural measures are still to be effective, except for emergency response provided through local districts. Basic flood forecasting is informed by the Government of India to SGOA but does not easily reach local population. Overall, the State is in high need of renovating existing embankments in particular those protecting urban and productive rural areas, with assured maintenance and necessary control facilities (such as sluice gates) to facilitate optimal water management. An alternative, more adaptive approach should also be explored and expanded, including sound warning and flood coping systems, and minor infrastructure such as flood shelter platforms and minor dykes to manage local flooding with a community based approach.

7. Riverbank erosion is also causing substantial displacements and flood damage when it breaches flood embankments.⁴ Riverbank protection is challenging due to high capital costs. So far, some 50km of bank line (4% of total reaches of the Brahmaputra River in Assam) has been

³ It often causes devastating flood damages when it undercuts flood embankments in high flood season.

⁴ Riverbank erosion is a major cause of embankment failure along the Brahmaputra River. In its extreme form, major avulsion (channel migration) is also observed causing devastating damages and changes in the landscape, settlement, and natural environment. The Brahmaputra River also has an overall widening trend.

protected along vital areas of state interests, primarily adopting spurs. However, resource constraints result in the State taking up works mainly in response to emergency situations in a reactive manner. More strategic and systematic approach is needed to provide protection in response to changes in morphology through regular survey, monitoring, and proactive planning.

8. There are significant opportunities for enhancing cost-effectiveness and sustainability of managing riverbank erosion by adopting alternative approaches and new technologies, which are also advocated by the Ministry of Water Resources (MOWR): First, revetments are increasingly promoted as appropriate structural measures that can stabilize bank lines adaptively along the naturally developed alignments with little flow disruption, as compared to spurs that obstruct river flows and cause erosion erratically in adjacent and opposite reaches. Second, in view of rapidly rising financial and environmental costs of quarrying boulders from forest areas, use of alternative materials such as sand-filled geo-textile containers is increasingly seen as a lower cost and more sustainable option. This technology supported by ADB was recently demonstrated effective in Bangladesh and reflected in their national guidelines. The State with the support of MOWR also applied the technology recently for embankment reconstruction in northern Assam. Third, short-term erosion prediction tool may also be developed, which could reduce the mitigation cost through advance planning of protection works, and advance warning and evacuation of vulnerable people.⁵ Finally, the State is developing a new approach of coping with erosion with flow retarding screens thereby inducing siltation, which have proven effective up to certain flow conditions. This has a potential for application not only for conventional erosion mitigation but also proactive river channel management with affordable costs.

9. **Water Resources.** The Brahmaputra valley in India is endowed with high rainfall, and provides abundant water resources that are generally underutilized. Their effective management and use are critical for economic growth and livelihoods of the indigenous population. Critical challenges include (i) sound management of floods and riverbank erosion risks; (ii) preservation of water bodies and wetlands, and livelihoods of the associated people; (iii) extension of sustainable water delivery in irrigation and domestic use and the promotion of indigenous self-help efforts in public water supply systems, (iv) catchment area management, (v) exploration of hydropower potential with dams incorporating flood cushions subject to environmental and social safeguards, and (v) inland transport. A paramount need is to set up a system of managing water in an integrated, sustainable, participatory, and knowledge-driven approach with due attention to the interests of vulnerable poor and natural ecosystems. Intrinsic linkages of upstream watersheds and downstream water environment also call for basin-wide approach and regional cooperation to progressively address the region's water management issues.

10. **Institutional Setup.** At the national level, Ministry of Water Resources (MOWR) and its Central Water Commission (CWC) provide policy and technical guidance for FRERM operated at the state level, with the latter also providing flood forecasting and warning (FFW) data to the states. A holistic policy framework for FRERM has been set up including the 2002 National Water Policy that promotes a balanced combination of structural and nonstructural measures with a long-term basin-wide approach, although there is a wide gap between the national policy guidelines and actual state operations. Under MOWR, the Brahmaputra Board has prepared master plans for the Brahmaputra and its tributaries and is now undertaking a number of technically challenging anti-erosion works for FRERM. The master plans provide a planning framework, but need regular updating with systematic data collection, analyses, and learning,

⁵ The prediction system—based on satellite image analyses—has also been established in lower reaches of the Brahmaputra and the Ganges Rivers.

including incorporation of state initiatives and stakeholder views, and with stronger integration with watershed programs. Finally, National Disaster Management Authority (NDMA) has been set up following the national Disaster Management Act 2005 (DMA 2005) to guide holistic disaster risk management for which FRERM forms an essential part in Assam.

11. At the State level, key public institutions associated with FRERM include (i) WRD; (ii) Revenue and Disaster Management Department (RDMD) and recently established Assam State Disaster Management Authority (ASDMA); (iii) other development departments including agriculture, fisheries, soil conservation, and forestry and environment; and (iv) local government institutions at district (DDMA), sub-division, and panchayat (cluster of villages) levels. The State has also recently set up State Water Resources Council (SWRC) and State Water Resources Board (SWRB) chaired by Chief Minister and Chief Secretary, respectively, as apex bodies for sector policy guidance, and intersectoral coordination. In general, the concerned State agencies have requisite technical capacities, but are constrained by (i) quality of works not fully meeting the standards due to untimely fund flows and limited supervision; (ii) limited incentives and capacity to deliver programs with stakeholder participation; (iii) insufficient maintenance; and (iv) insufficient coordination among line departments, local governments, and stakeholders.

2. Sector Development Prospects and Partnership Opportunities

12. **National Priority.** The Government of India in its 11th FYP (2008–12) has accorded significantly higher priority for effective FRERM. This is in recognition to the need for addressing persistent poverty particularly in flood prone areas thereby reducing the regional disparity in economic growth, and the possible impacts of climate change such as a higher incidence and increased severity of water-related natural disasters anticipated in the future. It also coincides with the paradigm shift of the country's new disaster management strategy that now focuses on and integrates prevention, mitigation, and preparedness actions with post-disaster response and recovery. Accordingly, the 11th FYP envisages implementing FRERM programs amounting to Rs80 billion across the states. In this context, substantial needs and opportunities exist to revamp the present State FRERM operations towards fully meeting the national policy framework and guidelines, while incorporating modern international best practices and norms.

13. **State Policy Framework.** The State has initiated broad macroeconomic, fiscal, and governance reforms with the support of ADB in the 2000s, providing overall reform environment. In the Government's "Northeast Vision 2020" of the State's 11th FYP, flooding and riverbank erosion have been recognizing as critical impediments affecting the performance of the State economy and investment climate both in urban and rural areas. Accordingly, FRERM has been included as a key element of the draft State Water Policy that is under preparation. Aiming at providing a comprehensive sector management framework, the draft Policy adopted the principles of IWRM on the basis of river basins, and sustainable service delivery with user participation and financing.

14. **Institutional Framework for Disaster Management.** In accordance with the DMA 2005, the State established the Assam State Disaster Management Authority (ASDMA, headed by Chief Minister), along with district disaster management authorities (DDMAs) covering all districts. Within this framework, the State is establishing local disaster management committees (DMCs) at the block and gram panchayat levels with the assistance of the UNDP. So far, DMCs have been established in 12 districts, 109 blocks, and some 1,340 panchayats involving elected representatives and other stakeholders. The institutional setup of DDMA and DMCs provides a basic local framework for FRERM in a participatory manner with enhanced agency

accountability, although continuous awareness and capacity building are required for the effective functioning of local DMCs with the involvement of wider stakeholders.

15. **FRERM Strategic Framework and Priorities.** India's national water policy provides strategic framework for comprehensively addressing the risks of flood and riverbank erosion. In line with the framework, and based on stakeholder consultations at the state and national levels, and lessons and international best practices learned in ADB's sector operations, critical strategic elements in enhancing the reliability and effectiveness of the State's FRERM include the following.⁶

- (i) Operationalizing integrated FRERM, comprising (a) strategic planning; (b) balanced structural and nonstructural measures focusing on proactive prevention; and (c) institutional foundations including agency capacities, and knowledge base;
- (ii) Establishing comprehensive FRERM plan to pursue long-term solutions to the flooding and riverbank erosion problems with a basin perspectives
- (iii) Adopting a systematic, adaptive, and proactive approach to natural processes (as opposed to a piece meal approach) with sound data and knowledge base, recognizing highly dynamic, complex, and erratic nature of natural geomorphology and hydrology;
- (iv) Pursuing FRERM operations with much stronger people orientation and participation, with integration with the disaster management systems run by the local governments;
- (v) Focusing on renovating existing embankments protecting strategic interests of the State and supported by stakeholders with assured safety and maintenance, while extending nonstructural risk management across flood prone areas;
- (vi) Exploring more cost-effective, sustainable and adaptive options for riverbank erosion mitigation including international best practices, with a pro-active approach such as combining riverbank erosion prediction and advance planning and mitigation;
- (vii) Substantially strengthening institutional foundations, comprising (a) enabling policy framework, (b) data and knowledge base, and (c) institutional framework and capacities of WRD, other relevant institutions, and stakeholder organizations.

16. **State Level FRERM Plan.** Given the physical, hydrological, and spatial inter-linkages of flood and river erosion events and management practices with land and water use conditions of upstream watersheds (including reservoir operations) and downstream areas, a comprehensive FRERM plan is needed to provide short- to long-term programs. Towards this, a new National Disaster Management Guidelines for Flood Management (2008) has advocated state level flood management plans, with comprehensive list of activities that should be considered. The State's draft SWP envisages the FRERM master plan. In Assam, this can be based on the existing Brahmaputra Master Plan and reports of the Government including Task Force 2004 report that have included requisite short- to long-term measures. The WRD has also prepared "Vision 2020" with the list of priority structural and non-structural measures. These need updation and

⁶ These elements have been drawn in light of the lessons and good practices of FRERM operations observed in India and other Asian countries, including (i) a conducive policy, planning, and institutional framework with political support is essential for effective FRERM; (ii) the State's and WRD's commitment and capacities to provide holistic programs with stakeholder accountability needs to be ensured; (iii) more knowledge based, systematic, and proactive (as opposed to ad hoc, reactive, and piece meal) approach is needed with effective planning exploring alternatives and with sound monitoring and evaluation; (iv) stringent quality control of structural works is required, with their safety and reliability as the supreme principle of the associated public agencies; (v) nonstructural FRERM measures require serious attention and direction for their effective extension towards proactive flood risk management; (vi) rigorous risk analyses are required to consider the possibility of extreme events and the impacts of climate change; (vii) effective stakeholder participation mechanisms should be in place, possibly with the use of local DMCs; (viii) there are capable local research institutions and NGOs willing to take on knowledge development and participatory agendas, with necessary capacity development; and (ix) effective institutional mechanisms should be in place to ensure due interagency coordination and stable leadership in Program implementation.

increased nonstructural measures, and knowledge and capacity development programs. There is also a need for stronger integration with catchment management programs, as well as stakeholder consultation.

17. **Water Resources Department.** Within WRD, there is willingness for strengthening its FRERM operations in line with the stated strategic framework (as per para. 14 above) and learning from international practices. However, there is a wide gap between the present setup and capacities and the requisite systems. WRD remains a construction agency with high running costs. At the headquarter level, there is a need for strengthening data and knowledge base, state- and project-level planning, nonstructural FRERM operations, monitoring and evaluation, and support systems for stakeholder participation. At the field level, sound relationship among WRD, local stakeholders, and relief agencies needs to be established to support accountable program delivery by WRD staff. Quality of work also needs strengthening with stringent procurement, work supervision, and contract management with timely fund flows. All these require capacity development in modern technical, multidisciplinary and associated managerial skills and leadership.

18. **FRERM Infrastructure Maintenance.** At present, infrastructure maintenance is one of the critical constraints of the State's FRERM operations, suffering from under financing and implementation quality. The State has initiated steps to address the problems, such as a progressive increase of state maintenance funding from Rs14 crore in 2004/05 to Rs23 crore in 2009/10, and implementation of projects for systematic renovation and maintenance under the flood management program of the central Government in the 11th FYP (referred in para. 11) as directed in the 2004 Task Force report. However, the present allocation is far from the requisite amount of Rs93 crore estimated following the guidelines shown in the Government's 11th Finance Commission report in 2000. A multi-pronged approach is called for to address this critical constraint, which needs to be combined with introduction of sound infrastructure asset management information systems (MIS) to systematically monitor, plan, and implement maintenance works.

19. **Social and Environmental Considerations.** FRERM is operated following the Government's and the State's social and environmental safeguards regulations on arrangements for clearance, compensation, and management. Nevertheless, the implementation remains a constraint, in applying the requisite environmental monitoring and management plans, timely compensation for land acquisition and resettlement. Stakeholder consultation in planning and implementation has also been weak. While these remain critical challenges, willingness exists within the State and WRD to address the safeguards requirements and participatory processes in the Program.

20. **Institutional Reforms.** The State recognizes good governance as an essential element for expediting inclusive economic growth, and is pursuing institutional reforms on accountability, transparency, and decentralization.⁷ In WRD, a quality control directorate headed by a separate chief engineer has been established. Its effectiveness needs further strengthening for providing internal quality control, including external and independent audit process. WRD also issues annual reports to disclose departmental activities and budgets, and is also in the process of establishing an external advisory council (including reputed external experts) to review, guide, and advise its annual and mid-term operations. There is a scope for further enhancing

⁷ Key outputs include issuance of a public procurement manual (focusing on principles on economy, efficiency, transparency, accountability, and ethical standards) and recommendations of the public administration commission for anti-corruption vigilance systems.

institutional reforms in the FRERM operations and exploring stringent quality control systems following the international practices.

21. **The Program and Its Rationale.** The Program has been prepared following the investment proposal submitted by the State and WRD. With a primary focus on three appraised subprojects, the Program is needed to initiate the specific steps towards more effectively and reliably managing the risk of flood and river erosion problems, along with strengthening of policy and institutional framework. Wider replication is envisaged upon demonstration of successful implementation of the three subprojects. The strategic aim of the State-ADB partnership and the relevant policy and institutional actions pursued are further synthesized below.

C. State-ADB Partnership

22. ADB's overall strategic direction in India is to assist the country in promoting efficient and sustainable economic growth to increase employment opportunities and reduce poverty. Within this framework, ADB's assistance strategy envisages enhanced role of ADB in water resources including disaster risk management, agriculture and rural infrastructure, along with their sustainable management systems. This is in consideration of the high priorities accorded by the Government on addressing rural poverty and regional disparities particularly in disaster prone areas, and concerns on looming water crises and the possible impacts of climate change that may exacerbate water-related disasters. Opportunities exist for using best practices and lessons learned from ADB's sector operations in other countries. In this context, the assistance strategy for water resources sector envisages extension of ADB operations to selective states willing to pursue critical investments with necessary policy and institutional strengthening, and with a long-term partnership.

23. Within this framework, an integrated FRERM is prioritized, comprising the key elements as shown in para. 14 above. In the context of Assam, however, the need for longer term support and partnership has been recognized, in view of the relatively wide institutional gaps as noted above. Accordingly, while the partnership envisages full operationalization of the stated strategies over the longer term, progressive approach is adopted under the Program. This focuses on the selected flood embankment systems, associated field functional offices, and a central Program management unit (PMU) to implement the key principles of the FRERM strategy. The progressive replication of the improved and successful functions is envisaged under the subsequent phase of the partnership.

D. Policy and Institutional Framework and Actions

24. **Goal and Objective.** The sector road map for the Program, has been prepared with a primary focus on operationalizing integrated FRERM. It is built on the initiatives already taken or proposed to be taken by the State, and is based on consultations held during the Program preparatory stage. The goal of the Program is to contain massive flood and erosion damages in the flood prone areas of the selected subproject sites, thereby improving opportunities for economic growth, livelihood of the potentially affected vulnerable people. Its immediate objective is to enhance the reliability and effectiveness of FRERM operations in the selected sites, with the associated strengthening of the policy, planning, and institutional basis.

25. **State Water Policy and Integrated FRERM Policy Framework.** The draft State Water Policy (SWP) was prepared in 2008 in line with the National Water Policy 2002, and provides a framework for integrated FRERM within the context of integrated water resources management (IWRM) on the basis of river basins. It is pending final stakeholder consultations prior to

finalization. In conformity to the national policy framework, the draft Policy emphasizes on comprehensive planning, extension of nonstructural measures, stakeholder participation, and knowledge-driven approach. To put into operation integrated FRERM and these operational agendas on a priority basis, the State has established a special purpose vehicle (SPV, an agency registered under Societies Registration Act, 1860) titled "Assam Integrated Flood and Riverbank Erosion Risk Management Agency (AIFRERMA)".

26. **State FRERM Plan.** In line with the national Disaster Management Guidelines—Management of Floods, the State will prepare its comprehensive FRERM plan. Aimed as a framework for substantially resolving flood and river erosion problems in Assam, the plan will encompass short- to medium-term structural and nonstructural measures for FRERM along the Brahmaputra River and its tributaries, as well as longer-term catchment wide measures such as flood cushioning reservoirs and watershed management programs. The associated knowledge base and capacity development programs will also form an important part of the plan.

27. **Institutional Strengthening of FRERM Organizations.** The roles and capacities of FRERM organizations are critical for the effective implementation of the Program. In this regard, AIFRERMA has been established as the executing agency of the Program. AIFRERMA aims to demonstrate effective integrated FRERM starting with the selected subproject areas of the Program, and is expected to expand operations upon successful implementation.⁸ Its operation is based on (i) rule of business established with clear strategy statement to operationalize integrated FRERM; (ii) its leadership appointed from qualified administrative expertise and supported by multidisciplinary staff drawn from the State and externally engaged experts; and (iii) human resources management with due guidelines for recruitment, promotion, and personnel management. On the basis of these steps, the roadmap actions further envisage establishing (i) an expert advisory group to advise on sector operations; (ii) stringent work implementation and quality control systems; (iii) comprehensive FRERM guidelines for research and development, planning, design, implementation, quality control, and monitoring and evaluation; (iv) multidisciplinary capacity development plan for the Program implementation; and (v) social and safeguards unit to address all short, medium, and long-term social and environmental risks associated with its activities.

28. **Participatory Mechanisms and Social Development.** The Program will also institutionalize integration of WRD's immediate FRERM operations in the selected subproject areas with the State's disaster management systems at district, block, and gram panchayat (GP) levels with necessary capacity strengthening of the latter with extended stakeholder participation. At the same time, the Program also envisages putting into operation specific social development including gender strategy and actions, developed in line with the 11th FYP of the Government of India and SGOA, and Assam Women Act, 2005. The specific measures include (i) the integration of the local FRERM measures into the district and local level disaster management plans; (ii) implementation of local FRERM works in consultations with the concerned district DMA and the local DMCs; (iii) establishment of DMCs in all the concerned subproject areas at block and GP levels; and (iv) implementation of the Program-specific poverty reduction and social strategy including the gender action plan.

29. **Sustainable FRERM Infrastructure Maintenance.** The institutional actions under the sector roadmap for AIFRERMA provide the short- to medium-term measures to ensure sustainable infrastructure maintenance for the Program, including (i) establishing FRERM

⁸ Over the longer term, however, it is envisaged to merge itself with WRD once effective FRERM operations are transferred to the latter.

infrastructure asset performance MIS for sound monitoring, planning, and implementation of maintenance works; (ii) operating transparent implementation of maintenance works, with disclosure of information on the fund allocation and list of executed works and their amounts; (iii) exploring multi-year maintenance contracts with the private contractors; and (iv) full funding of the necessary maintenance for the subprojects managed by AIFRERMA. By Program completion, envisaged actions include (i) WRD to apply the measures taken by AIFRERMA to its other FRERM schemes; (ii) the State to progressively enhance its non plan maintenance budget allocation to substantially cover the requirement by the end of 12th FYP; and (iii) AIFRERMA to engage local community for routine maintenance works.

30. **Institutional Reforms.** The State will implement the institutional reforms actions including (i) AIFRERMA's operational transparency ensured with organizational website, posting of work information at construction sites, and annual report issuance; (ii) external technical auditing introduced of the Program's civil works; (iii) grievance mechanisms to be put in place by AIFRERMA with awareness campaigns and assignment of chief vigilance officer; (iv) introduction of the above measures by WRD by the time of the Program completion.

31. The specific list of actions and their proposed timeframe are synthesized in Table 1.

Table 1. Sector Roadmap – Institutional Action Matrix

Key Issues and Actions	Actions by	Timeframe	Performance Indicators
A. Policy and Planning Framework			
a-1. State Water Policy drafted with incorporation of key principles for integrated FRERMA, and finalized with stakeholder consultation.	SGOA	Draft by 2009. Policy finalization by 2011.	Policy incorporated with reflection of integrated FRERMA, and then finalized.
a-2. Establish multidisciplinary AIFRERMA as a special purpose vehicle to implement integrated FRERMA under the Program.	SGOA	Cabinet decision in Jan. 2010	AIFRERMA established as a lead organization to implement integrated FRERMA.
b. Prepare integrated FRERMA plan with interagency coordination and stakeholder consultation (as one of the first steps to implement State Water Policy).	AIFRERMA /WRD	Plan drafted by end of tranche-1	State FRERMA plan drafted with stakeholder consultation and finalized
c. Establish ASDMA and district level authorities to provide basic institutional framework for disaster risk management	SGOA	Established in 2009	ASDMA and district level authorities established in all Program districts.
B. Institutional Basis for Reliable and Effective FRERMA			
1. WRD and AIFRERMA			
a. Establish AIFRERMA with governing and executive bodies, multidisciplinary PMU, and 20% female representation among external staff *	SGOA/WRD	December 2010	AIFRERMA established (with FRERMA, DM, and F&A directorates) and staff assigned
b. Set up a common advisory council comprising prominent experts to advise on FRERMA operations	WRD and AIFRERMA	(WRD council established) Starting 2010	Council established and meet on annual and medium-term plans of AIFRERMA and WRD
c. Strengthen infrastructure quality control and management system with (i) FIDIC tender documents and stringent quality control; (ii) supervision consultants, and (iii) third party quality monitoring and auditing arrangements	AIFRERMA	During tranche-1	WRD's FRERMA infrastructure quality attain high level of satisfaction by stakeholders and their organizations
d. Establish holistic guidelines for (i) community participation, (ii) planning and design, (iii) implementation and quality control, (iv) monitoring and evaluation, (v) nonstructural measures, and (vi) gender mainstreaming*, for replication to WRD's state wide operations	AIFRERMA	During tranche-1	FRERMA operations to be provided following the improved guidelines, with progressively higher quality and stakeholder satisfaction
e. Prepare and implement capacity development plan, including 75% staff trained on gender issues*	AIFRERMA /WRD	During tranche-1	Capacities of project offices enhanced, and institutional performance starts to improve
f. Operationalize knowledge-based FRERMA, with mandatory systematic surveys and analysis in planning and design, and monitoring and evaluation of completed works.	AIFRERMA	During tranche-1	Knowledge-based FRERMA planning and M&E made operational
2. Participatory Mechanisms			
a. Issue staff instructions to provide FRERMA operations in close consultation with DMCs with client orientation.	AIFRERMA	During tranche-1	Feedback to AIFRERMA from DMCs
b. Issue staff instructions to ensure that FRERMA operational	AIFRERMA	During tranche-1	FRERMA plans are included in district disaster

Key Issues and Actions		Actions by	Timeframe	Performance Indicators
plans will be included as a part of district and local level disaster management plans				management plans with clear information to beneficiaries
c.	Establish DMCs in all Program subproject areas, to be extended to all districts, with 30% representation of women and vulnerable groups at block and GP levels *	ASDMA	During tranche-1	Local DMCs established and effectively participate in planning and implementation of FRERMA operations
d.	Issue staff instructions to implement poverty reduction and social strategy including gender action plan through PRIs	AIFRERMA	During tranche-1	Poverty and social strategy is reflected in DMC structure and disaster management plans
3. Local Research Organizations				
Effective working relations are established with universities, institutes, and NGOs for undertaking regular investigation and planning, and knowledge management activities		AIFRERMA	By 2011	Network of knowledge institutions mobilized for systematic survey, research and development of FRERMA operations
C. Sustainable FRERMA Infrastructure Development and Maintenance				
a.	Develop structural flood and riverbank erosion protection works to renovate the existing embankment systems in the three subproject areas using innovative technologies.	AIFRERMA	By 2017	Structural infrastructure developed and operational
b.	Develop nonstructural measures including (i) awareness campaigns; (ii) local flood emergency response and related activities; (iii) advanced flood forecasting and warning (FFW) system; (iv) advance erosion prediction.	AIFRERMA	By 2017	Non-structural programs developed and operational
c.	Establish FRERMA infrastructure asset MIS for performance monitoring, planning, and implementation of maintenance	AIFRERMA	Framework prior to approval, MIS during tranche-1	Data collection and entry systems in place and reports produced and distributed to managers.
d.	Institutionalize transparent maintenance work implementation, with disclosure of fund allocation in each field office, and list of works and amounts at district and work sites.	AIFRERMA	During tranche-1	Transparent consultation and implementation system established and made operational
e.	Explore and pilot test multi-year maintenance contracts with private contractors linked with MIS.	AIFRERMA	Develop contracts during tranche-1, and pilot test during tranche-2	Infrastructure maintenance contracts implemented with satisfactory performance
f.	WRD to progressively move towards introducing the measures in c. and d. above in the schemes within the state.	WRD	During tranche-2	Systems for infrastructure performance monitoring and transparent maintenance work management established
g.	Ensure full maintenance funding for AIFRERMA schemes, while progressively enhancing maintenance budget from 25% of requirement at present towards full requirements	WRD, Finance	2017	Annual non plan maintenance budget allocation substantially meets the requirements

Key Issues and Actions		Actions by	Timeframe	Performance Indicators
h.	Pursue FRERM infrastructure rehabilitation and maintenance through centrally assisted schemes	WRD, State, GOI	Initiated in 2008	DPRs prepared, approved, and implemented with improved infrastructure maintenance
i.	Establish and operationalize beneficiary participation systems with (i) mobilization of NREG programs for embankment maintenance where appropriate, and (ii) mobilization of embankment platform beneficiaries and adjacent communities for routine maintenance, with 20% female representation	AIFRERMA	During tranche-1	Beneficiary mobilization systems made operational for embankment maintenance

D. Institutional Reforms and Safeguards				
a.	AIFRERMA to have social and environmental unit to look after safeguards issues	AIFRERMA /WRD	December 2010	Social and environmental unit established and made functional effectively
b.	AIFRERMA and WRD to ensure transparency of its operation by (i) setting up organizational website with annual and mid-term programs, and posting of procurement information there, along with posting of work information at work sites; and (ii) issuing annual reports highlighting the institutional development actions and programs with sufficient details	AIFRERMA and WRD	AIFRERMA starting year-1, WRD during tranche-2	Awareness survey under benefit monitoring and evaluation
c.	AIFRERMA to put into operation external technical auditing for the civil works under the Program (to be institutionalized towards the end of implementation period)	AIFRERMA	During tranche-1	FRERM infrastructure quality attains high level of stakeholder participation, with operationalization of external technical audit
d.	AIFRERMA to put into place, with awareness campaign, grievance mechanisms with assignment of chief vigilance officer	AIFRERMA	During tranche-1	Effective grievance reporting and redressal mechanisms are in place.
e.	WRD will progressively introduce the above measures taken by AIFRERMA to its other FREM schemes	WRD	During tranche-2	

* These actions have been included in the Gender Action Plan (GAP) that has been developed in line with the Government of India's 11th Five-year plan and Assam Women's Act 2005 and its stated commitment to gender mainstreaming in all sectors and will be promoted to the extent feasible.

AIFRERMA = Assam Integrated Flood and Riverbank Erosion Risk Management Agency; ASDMA = Assam State Disaster Management Authority; DDMA = district disaster management authority; DMC = disaster management committee, DPR = detailed project report, FFW = flood forecasting and warning, FRERM = flood and river erosion risk management, MIS = management information system, M&E = monitoring and evaluation, NGO = nongovernment organization, PMU = project management unit, PRI = panchayat raj institution, REG = rural employment guarantee, SGOA = state government of Assam; WRD = Water Resources Department

E. Investment Program – Program Description

1. Impact and Outcome

32. The impact of the Program will be reduced economic vulnerability and social disruption caused by flood and riverbank erosion risks in Assam State. This will also contribute to inclusive economic growth and reduced poverty in the selected flood prone areas along the Brahmaputra River in Assam having priority urban, suburban, and productive rural and other strategic sites benefiting 1 million people. Reduced risks of flood and river erosion damages will support increased investments in urban industries, services, and productive agriculture. Its outcome is enhanced reliability and effectiveness of flood (including drainage congestion) and riverbank erosion risk management systems in the three subproject areas. The design and monitoring framework is shown in Schedule 2.

2. Outputs

33. The outputs of the Program are (i) improved performance of FRERM organizations with sound planning, knowledge, and institutional bases; (ii) comprehensive FRERM structural and nonstructural programs delivered and made operational effectively and reliably to manage flood and erosion risks in the three selected subproject areas (Palasbari, Kaziranga, and Dibrugarh); and (iii) multidisciplinary project management systems to implement FRERM.

Component A: Development of FRERM Planning, Institutional and Knowledge Bases

34. This component will establish sound basis for the State to put into operation reliable and effective FRERM systems, encompassing (i) policy and planning framework, (ii) institutional basis, (iii) knowledge base, and (iv) regional knowledge networks. Experienced international and national consultants will be engaged by AIFRERMA to assist the implementation of the individual subcomponents by the designated counterpart offices of AIFRERMA, WRD, ASDMA, and other Program implementation agencies.

i. Integrated FRERM Planning Framework

35. The Program will support FRERM Plan preparation (i) to set out short- to long-term strategy and programs (be based on existing master plans, task force reports, and WRD's Vision 2020, covers structural and nonstructural measures, associated capacity building programs, and programs for catchment management); (ii) under consultative processes through workshops and seminars, and (iii) for annual coordinated programming of Plan interventions and their implementation review. This will also be one of the essential steps for initiating the implementation of the SWP, as also form a basis for an integrated approach towards addressing the flooding and riverbank erosion problems in Assam on a long-term basis.

ii. Institutional Bases

36. This subcomponent will support the institutional development of the FRERM agencies including AIFRERMA and associated WRD offices in particular, ASDMA, and other relevant departments including local governments and DDMA's. First, support will be provided to the Program staff following the capacity development plan for implementing multidisciplinary FRERM, including modern engineering skills for hydrology, morphology and structure design, FRERM nonstructural measures, multidisciplinary managerial and leadership skills, and social

and environmental safeguards. Program implementation training will also be provided for the concerned staff. Necessary hardware and software will also be provided to support the functional strengthening of AIFRERMA, WRD, and other concerned agencies. The Program will support the implementation of the institutional development actions of the Program in Table 1, including the preparation of sound guidelines and manuals for FRERM following the best practices, including planning, design, construction management with stringent construction supervision, internal and external quality control, and monitoring and evaluation.

iii. Data and Knowledge Base

37. This subcomponent will strengthen data and knowledge base for integrated FRERM operations, with the support for surveys, research, and studies following the research and development plan. Key activities include (i) strengthening data base on hydrology, morphology and geo-morphology, and physical environment of flood plains; (ii) developing nonstructural FRERM tools including (a) short-term river erosion risk mapping through erosion prediction modeling, (b) flood risk mapping through hydrological/ hydraulic modeling as a step towards floodplain zoning, (c) strengthened FFW systems (building on the hydrological data provided from the Government and remote sensing information procured) and improved warning, and (d) accumulating knowledge base for adaptive cropping and indigenous flood preparedness, response, and coping measures; (iii) establishing FRERM infrastructure performance MIS and operationalizing monitoring system of existing FRERM schemes, and (iv) defining and undertaking action researches to strengthen the technological basis of FRERM tools and design alternatives with exploration of national and international good practices in respect of flood proofing and low cost building technology. These activities will be coordinated with the central Government organizations undertaking data collection and analysis, to ensure effective work and responsibility sharing. Partnerships will be forged with local research and development organizations to undertake these activities to build local capacities.

iv. Knowledge Sharing and Networking

38. This subcomponent will support the capacity and knowledge enhancement of the State FRERM organizations through national and international level networking, while contributing to international technology and knowledge development on the subject. Specifically, the Program will support (i) action-oriented research, related papers, and participation in international conferences; (ii) seminars and workshops on specific topics related to the Program; and (iii) participation in and contribution to international networks for knowledge and technology development, such as collaboration with knowledge hubs related to FRERM in the Asian region, networks on water sector apex bodies and on river basin organizations facilitated by ADB.

Component B: Comprehensive FRERM Systems

39. This component will enhance the reliability and effectiveness of FRERM systems with comprehensive structural and nonstructural measures and strengthening of the relevant local organizations such as DDMA and DMCs that provide a framework for community consultation and participation. The programs will primarily be provided in the three selected subproject areas (having existing deteriorated embankment systems protecting urban, suburban, and productive rural areas) in the districts of Dibrugarh, Golaghat, and Kamrup, which covers a total of about 100,000ha of direct benefit area and population of 1 million. The component comprises (i) DMC development and community-based flood risk management (CBFRM) planning; (ii) nonstructural and other CBFRM measures; (iii) structural FRERM measures, and (iv) sustainable infrastructure monitoring, adaptation, and maintenance.

i. Nonstructural and CBFRM Measures with DMCs

40. **DMC Development and CBFRM Planning.** Working closely with ASDMA and DDMA, support will be provided for the establishment and/or strengthening of the disaster management committees (DMCs) at the block and GP levels, building on the State's efforts. The DMCs in the subproject areas will be strengthened with inclusion of members from the most vulnerable groups,⁹ with the facilitation of the local NGOs engaged under the Program.¹⁰ The Program will also provide intensive support to the selected most vulnerable villages (about 75 in Project-1) to form village DMCs and prepare detailed CBFRM plans that include flood preparedness emergency response and identified priority investments to strengthen the resilience to floods.

41. **Nonstructural Measures.** Targeting the DMCs, nonstructural measures will be provided including (i) flood and riverbank erosion awareness campaigns including the residual risks of the structural works; (ii) strengthening of local flood emergency response, relief, and damage assessment systems; (iii) improved FFW system with more advanced and relevant forecasting and intensive information dissemination; (iv) advance warning of riverbank erosion based on erosion prediction modeling;¹¹ (v) provision of flood and erosion hazard maps; and (vi) awareness campaigns for adaptive cropping and fishery practices to local flooding practices.

42. **CBFRM Measures.** The Program will provide support for implementing the identified and eligible CBFRM investments in the most vulnerable villages for preventative, response and recovery measures, including (i) community flood shelters (and/or raised platforms) built on public lands or attached to embankments and other minor structures; (ii) minor infrastructures (such as sluice pipe under rural roads) to improve local drainage; and (iii) other community initiatives to cope with the risk of flooding and river erosion. For implementing these programs, resources of the existing state and other programs will be primarily sought (through DDMA and coordination committees), and the Program funds will be utilized in case of the former's unavailability for the concerned communities and up to the fixed financial ceiling. Communities will also be entrusted to implement the minor works through a participatory modality acceptable to the State and ADB.¹²

iii. Structural Measures

43. This subcomponent will provide structural flood and riverbank erosion protection works to renovate the existing embankment systems in the three subproject areas. The flood embankments will be upgraded to provide protection up to 1 in 100-year-return period flood in principle, based on the hydrological analysis of the available data. Riverbank protection works will be provided at critical locations pursuing an adaptive approach for stabilizing naturally developing bank lines (as opposed to controlling river flows with spurs and other protruding (or more offensive river training) structures, except where existing structures are rehabilitated), with the exploration of alternative options from national and international best practices such as the use of sand-filled geo-textile containers and porcupines, and with stringent quality monitoring and control systems with the involvement of DMCs and third party auditors. The Program will

⁹ Including women, scheduled castes and indigenous people residing outside of the flood embankments and along the embankments as squatters.

¹⁰ Specific priority activities of the district disaster management authority will be supported, such as flood disaster information center and training of volunteers at the circle level.

¹¹ Once developed, the information on riverbank erosion warning will be provided to ASDMA and the concerned DDMA beyond the subproject areas.

¹² Enhancing the livelihoods of the most vulnerable people in the DMCs and affected people of the land acquisition and resettlement under the Program, and delivery of livelihood enhancement programs for the poorest is needed.

also include associated facilities such as provision of sluice gates and regulators, and improvement of local drainage channels. The Program envisages renovating and constructing about 43km of flood embankments, build about 37km of riverbank protection works (revetments and pro-siltation) while rehabilitating 10 spurs, and provide at least 9 sluice gates. Its Project-1 includes immediately required investments in the first 3 years of implementation, including construction and renovation of 19km of flood embankments, 17 km of riverbank protection works, and provision of 5 sluice gates. The detailed scope of Project-2 will be further verified during the Project-1 involving stakeholders.

44. In relation to FRERM infrastructure works, the Program will support the requisite social and environmental safeguards actions following the relevant policies and regulations of the Government, the State, and ADB. The specific activities to be financed by ADB include (i) preparation and implementation of resettlement plans and indigenous peoples development plans/actions, (ii) updating of environmental impact assessment (EIA) for the subproject sites as necessary, and (iii) implementation of environmental monitoring and management plans following the EIA.

iv. Sustainable Infrastructure Maintenance and Adaptation

45. The Program will institutionalize sustainable maintenance systems within the three subproject areas, with operationalization of FRERM infrastructure MIS for performance monitoring, planning, and implementation of maintenance and adaptation works with community participation. Flood season maintenance will be executed by the Subproject implementation office (SIO) of the AIFRERMA (or locally engaged and trained manager), who will regularly monitor the performance and mobilize local labor or the contractor to do emergency maintenance using the stockpiles procured prior to the monsoon. During post-monsoon, maintenance works will be undertaken by the contractor with the management of the SIO staff. The Program will explore the establishment of a system of multi-year maintenance contracts to provide stockpiling materials for flood season maintenance and materials for post monsoon routine maintenance, and to undertake periodic maintenance works, with a clear work plan specified in the contracts and confirmed with the local DMCs.

Component C: Multidisciplinary Project Management Systems

46. This component will operate the Program management system through multi-disciplinary program management unit (PMU) and the SIOs, established with the State and outsourced staff and experts. Necessary infrastructure (civil works for office refurbishment and extension, vehicles and equipment, consultants, and incremental operational costs) will be provided in support. This component will also include preparation and processing of the Project-2 of the Program, including the preparation for its updated appraisal report and associated DPRs, along with the implementation review of the Project-1 including due diligence assessment of the safeguards and other requirements.

47. The Program will operationalize participatory processes in subproject planning and implementation and to assist SIO interface with relevant stakeholders including DDMAAs, local DMCs, and community representatives as relevant. This will be supported by the Program implementation MIS and quality control systems that ensures due recording and reporting at SIO on institutional, financial, and other progress against the specified targets and schedules specified in the subproject implementation plans. Necessary awareness and training for the Program staff, local agents, and stakeholder organizations will be provided to operationalize the processes.

3. Cost Estimates, Financing, and Implementation

48. The total cost of the Program is estimated at \$150.0 million. It is proposed that ADB will finance up to \$120.0 million. The Government will finance up to \$30.0 million including taxes and duties amounting to \$15.8 million and financing charges of \$12.1 million. The Program will be implemented over a period of seven years through two tranches (or more if required) of loans under a multi-tranche financing facility (MFF). The total investment cost and financing plan is summarized in Tables 2 and 3, respectively, and detailed in Table 4. Indicative implementation schedule is shown in Table 5.

Table 2. Draft Investment Program Cost Estimates (\$ million)

Item	Amount
A. Base Cost^a	
Component A. Development of FRERM Planning, Institutional and Knowledge Bases	11.2
Component B. Comprehensive FRERM Systems	
(a) Nonstructural and CBFRM Measures with DMCs	2.2
(b) Structural Measures	91.1
(c) Sustainable Infrastructure Maintenance and Adaptation	5.9
Component C. Multidisciplinary Program Management Systems	10.3
Subtotal (A)	120.7
B. Contingencies^b	17.2
C. Financing Charges During Implementation^c	12.1
Total (A+B+C)	150.0

^a In mid 2009 prices.

^b Physical contingencies are computed at 12.5%. Price contingencies computed at 0.8% of foreign exchange costs and 5.0% for local currency cost per annum, including provisions for exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^c Includes interest and commitment charges. Interest during construction has been computed at the five-year forward London interbank offered rate plus a spread of 0.30%.

Table 3. Draft Financing Plan (Total Investment Plan: \$ million)

Source	Total	%
Asian Development Bank	120.0	80
Government	30.0	20
Total	150.0	100

Table 4. Cost Estimates (Total Investment Program by Components) ^a

Item	IN Rs Million	US \$ Million	% Base Costs
Component A: FRERM Planning, Institutional and Knowledge Base			
1. Integrated FRERM Planning Framework	22	0.5	0.4
2. Data and Knowledge Base	164	3.7	3.1
3. Institutions Bases	142	3.2	2.7
4. Knowledge Sharing and Networking	13	0.3	0.2
5. Consultants (Institutional Strengthening)	159	3.6	3.0
Subtotal Component A	500	11.2	9.3
Component B: Comprehensive FRERM Systems			
1. Non-Structural and CBFRM Measures with DMCs	100	2.2	1.8
2. Structural Measures	4,083	91.1	75.5
3. Sustainable Infrastructure Maintenance and Adaptation	265	5.9	4.9
Subtotal Component B	4,448	99.3	82.3
Component C: Multidisciplinary Project Management Systems			
1. Project Management	288	6.4	5.3
2. Consultants (Project Implementation)	173	3.9	3.2
Subtotal Component C	460	10.3	8.5
Total BASELINE COSTS	5,409	120.7	100.0
Physical Contingencies ^b	610	13.6	11.3
Price Contingencies ^b	910	3.6	3.0
Total PROJECT COSTS	6,929	137.9	114.3
Interest During Construction ^c	583	11.7	9.7
Commitment Charges	18	0.4	0.3
Total Costs to be Financed	7,530	150.0	124.3

CBFRM = community based flood risk management, DMC = disaster management committee, FRERM = flood and riverbank erosion risk management

^a In mid-2009 prices. Taxes and duties will be financed by the borrower.

^b Physical contingencies computed at 12.5%. Price contingencies are computed at 0.8% per annum for foreign exchange costs and 5.0% per annum for local currency costs.

^c Includes interest and commitment charges. Interest during construction has been computed at the five-year forward London interbank-offered rate plus 0.3% spread.

Table 5. Cost Estimates (Total Investment Program by Expenditure Categories) ^a

Item	IN Rs Million	US \$ Million	% Base Costs
I. Investment Costs			
A. Civil Works	2,166	48.3	40
B. Civil Works (Maintenance)	265	5.9	4.9
C. Civil Works (Govt)	17	0.4	0.3
D. Construction Materials	1,778	39.7	32.9
E. Restlement	46	1.0	0.8
F. Land Acquisition	130	2.9	2.4
G. Equipment	81	1.8	1.5
H. Vehicles	15	0.3	0.2
I. Capacity Development			
Training/Workshops	78	1.8	1.5
Study Tours	8	0.2	0.2
Subtotal Capacity Development	87	1.9	1.6
J. Survey, Research, and Investigation	159	3.6	3.0
K. Consultants			
International Consultants	167	3.7	3.1
Domestic Consultants	116	2.6	2.2
Consultant Studies and Training	11	0.2	0.2
Consultant Operational Costs	40	0.9	0.7
M&E Consultants	8	0.2	0.2
Subtotal Consultants	342	7.6	6.3
L. NGOs and Local Institutes	35	0.8	0.7
M. Project Management	171	3.8	3.1
Total Investment Costs	5,292	118.1	97.8
II. Recurrent Costs			
O&M Project Institutions	117	2.6	2.2
Total Recurrent Costs	117	2.6	2.2
Total BASE COSTS	5,409	120.7	100.0
Physical Contingencies	610	13.6	11.3
Price Contingencies	910	3.6	3.0
Total PROJECT COSTS	6,929	137.9	114.3
Interest During Construction	583	11.7	9.7
Commitment Charges	18	0.4	0.3
TOTAL	7,530	150.0	124.3

M&E = monitoring and evaluation, NGO = nongovernment organization, O&M = operation and maintenance

^a In mid-2009 prices. Taxes and duties will be financed by the borrower and ADB.

Table 6. Cost Estimates (Expenditure Cost by Financiers – Total Investment Program) ^a

Item	INRs Million			US\$ Million			% Govt		% ADB	Taxes & Duties	
	Govt	ADB	Total	Govt	ADB	Total	Govt	Duties			
I. Investment Costs											
A. Civil Works	225	2,611	2,836	4.4	51.5	56.0	7.9		92.1		6.3
B. Civil Works (Maintenance)	33	299	333	0.6	5.5	6.2	10.0		90.0		0.7
C. Civil Works (Govt)	20	0	20	0.4	0.0	0.4	100.0		0.0		0.1
D. Construction Materials	178	2,066	2,244	3.6	42.0	45.6	7.9		92.1		4.7
E. Resttlement	0	56	56	0.0	1.2	1.2	0.0		100.0		0.1
F. Land Acquisition	155	0	155	3.2	0.0	3.2	100.0		0.0		0.0
G. Equipment	5	93	98	0.1	1.9	2.0	5.0		95.0		0.3
H. Vehicles	1	17	18	0.0	0.4	0.4	5.0		95.0		0.0
I. Capacity Development											
Training/Workshops	0	101	101	0.0	2.0	2.0	0.0		100.0		0.2
Study Tours	0	10	10	0.0	0.2	0.2	0.0		100.0		0.0
Subtotal Capacity Development											
J. Survey, Research, and Investigation	43	169	212	0.8	3.2	4.1	20.3		79.7		0.8
K. Consultants											
International Consultants	35	171	205	0.7	3.5	4.2	16.9		83.1		0.7
Domestic Consultants	30	116	146	0.6	2.3	2.9	20.3		79.7		0.6
Consultants Studies and Surveys	3	10	13	0.1	0.2	0.3	20.3		79.7		0.1
Consultant Operational Costs	10	40	50	0.2	0.8	1.0	20.3		79.7		0.2
M&E Consultants	2	9	11	0.0	0.2	0.2	20.3		79.7		0.0
Subtotal Consultants											
L. NGOs and Local Institutes	79	345	425	1.6	7.0	8.6	18.6		81.4		1.6
M. Project Management	4	40	44	0.1	0.8	0.9	10.0		90.0		0.1
Total Investment Costs											
	744	6,032	6,776	15.0	120.0	135.0	11.1		88.9		15.5
II. Recurrent Costs											
O&M Project Institutions	153	0	153	3.0	0.0	3.0	100.0		0.0		0.4
Total Recurrent Costs											
	153	0	153	3.0	0.0	3.0	100.0		0.0		0.4
Total BASE COSTS											
	897	6,032	6,929	17.9	120.0	137.9	13.0		87.0		15.8
Interest During Construction	583	0	583	11.7	0.0	11.7	100.0		0.0		0.0
Commitment Charges	18	0	18	0.4	0.0	0.4	100.0		0.0		0.0
Total PROJECT COSTS											
	1,499	6,032	7,530	30.0	120.0	150.0	20.0		80.0		15.8

ADB = Asian Development Bank; M&E = monitoring and evaluation, NGO = nongovernment organization, O&M = operation and maintenance

^a In mid-2009 prices. Taxes and duties will be financed by the borrower and ADB.

SCHEDULE 2

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
Impact Reduced economic vulnerability and social disruption caused by flood and riverbank erosion risks in Assam state.	<i>From 2020:</i> <ul style="list-style-type: none"> Higher economic growth in Assam project areas compared with flood prone areas Reduced poverty incidence by 5-10%, Sustained agricultural growth in subproject areas arising from (i) reduced crop production losses due to floods and riverbank erosion; (ii) 20% increase in monsoon crop yields; and (iii) increased on-farm employment by 900,000 person-days/yr Better land value in the benefit areas 	<ul style="list-style-type: none"> SGOA annual economic development reports State and department statistics on agriculture, fisheries, incomes, revenue and HDIs 	Assumptions <ul style="list-style-type: none"> Stable political and local security conditions SGOA replicates similar projects in other flood prone areas Sustainable maintenance of FRERM infrastructure by SGOA Risks <ul style="list-style-type: none"> Natural calamities beyond the design return period International terms of trade for agriculture products turn adverse
Outcome FRERM systems in Assam provide enhanced resilience to flood and riverbank erosion risks in selected subproject areas along the Brahmaputra River, benefiting about 1 million people.	<i>By 2020:</i> <ul style="list-style-type: none"> Sustained reduction of annual flood damage and rehabilitation cost from the current average of Rs350 million/yr (1988-2008) No flood damages due to embankment breach caused by flood or riverbank erosion Reduced land lost by riverbank erosion within protected areas of the project from current average loss of 230ha/yr Urban, agricultural and other flood prone lands in 90km critical reaches of the Brahmaputra River totaling 53,000ha protected from floods and riverbank erosion 	<ul style="list-style-type: none"> Annual reports of CWC, AIFRERMA, WRD, MOWR, ASDMA and their websites State statistics on agriculture and lands (e.g., Public Works Dept.: roads and public buildings; district office: residential properties; Dept. of Fisheries) 	Assumptions <ul style="list-style-type: none"> Stable political and local security conditions Sustainable maintenance of FRERM infrastructure by SGOA Risks <ul style="list-style-type: none"> Natural calamities beyond the design return period
Outputs 1. Integrated FRERM planning, institutional and knowledge bases developed and effectively implemented in Assam	<i>By 2017:</i> <ul style="list-style-type: none"> Assam State Water Policy adopted, and integrated FRERM aspects progressively implemented Comprehensive State FRERM Plan (prepared and implemented with stakeholder consultation) is adopted and its implementation started Performance of FRERM agencies improved and aligned with above, and supported by CDP Sound data and knowledge base developed and strengthened Knowledge sharing and networking established and contributing to knowledge transfer and sharing at national and international levels 	<ul style="list-style-type: none"> SGOA economic devt. reports and district statistics SGOA relevant depts. reports AIFRERMA and WRD annual reports AIFRERMA project progress and completion reports AIFRERMA MIS WRD MIS for monitoring and planning scheme maintenance 	Assumptions <ul style="list-style-type: none"> State support to sustain and proceed with reforms FRERM institutions including AIFRERMA and DMOs sustain their performance targets Beneficiary willingness to participate in DRM activities Risks <ul style="list-style-type: none"> High turnover of trained staff in FRERM institutions

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
2. Comprehensive FRERM non-structural and structural measures developed, implemented and sustainably maintained in selected subproject areas, protecting flood prone areas along 90km critical reach of the Brahmaputra River having 53,000 ha of urban and productive agriculture land	<ul style="list-style-type: none"> DMOs established and strengthened at district, block and GP and highly vulnerable villages, with women participation (30%) Nonstructural and other CBFRM measures, including CBFRM investments in place (2017) Cost-effective FRERM structural measures completed in subproject areas with requisite social and environmental safeguards: <ul style="list-style-type: none"> > 43km flood embankments renovated or newly constructed > 37km riverbank protection works > 10 spurs and 9 sluice gates Short- to medium-term measures for sustainable maintenance and adaptation, as set out under the sector roadmap, in place within agreed timeframe 	Same as above	<p>Assumptions</p> <ul style="list-style-type: none"> Timely consultant and NGO engagement, procurement, and land acquisition Quality of construction and nonstructural works maintained with due quality control Staff capacities strengthened and retained with training and consultant support Stakeholder willingness to participate in DMOs <p>Risks</p> <ul style="list-style-type: none"> Extreme floods and earthquakes
3. Institutional and financial capacities of FRERM institutions in Assam developed and strengthened	<ul style="list-style-type: none"> Specific measures on participatory mechanisms and social devt., including gender actions, as provided in the sector roadmap, incorporated into FRERM operations within agreed timeframe Actions to support institutional reforms fully in place by time of Program completion Integrated FRERM programs introduced and replicated in other affected districts from 2017 onwards 	Same as above	<p>Assumptions</p> <ul style="list-style-type: none"> Timely consultant engagement Staff capacities strengthened and retained with training and consultant support Stakeholder willingness to participate in DMOs
Activities with Milestones		Inputs	
Activity 1: Tranche 1 1.1 Specific policy and institutional actions, as set out in roadmap, completed (by December 2010) 1.2 ADB approves Tranche-1 by Oct 2010 1.3 Contract award of consultants and 1 st year civil works by Dec 2010 1.4 Tranche- 1 implementation completed in 4 years (by 2014) 1.5 Proposal for Tranche 2 completed and submitted by AIFRERMA by Dec 2012 Activity 2: Tranche 2 2.1 ADB approves Tranche-2 by Apr-2013 2.2 Tranche-2 implementation completed by 2017		ADB: \$120 million <ul style="list-style-type: none"> Civil works and related materials: \$99.0 million Resettlement: \$1.2 million Training: \$2.2 million Research: \$3.2 million Consultants, NGOs, and local institutes: \$7.8 million Project Management and Others: \$6.6 million Government: \$30 million <ul style="list-style-type: none"> Counterpart fund for implementation: \$17.9 million (including project personnel) Financial charges: \$12.1 million 	

ADB = Asian Development Bank, AIFRERMA = Assam Integrated Flood and Riverbank Erosion Risk Management Agency; CBFRM = community based flood risk management, CDP = capacity development plan, DMO = disaster management organization, DRM = Disaster Risk Management, FRERM = flood and river erosion risk management, NGO = nongovernment organization, PMU = project management unit, SGOA = state government of Assam; SIO = subproject implementation office, WRD = Water Resources Department

SCHEDULE 3 IMPLEMENTATION FRAMEWORK

1. Unless modified and amended in loan or project agreements under the Multitranche Financing Facility (the Facility), the projects under the Facility will be implemented as follows.

A. Implementation Arrangements

Execution and implementation

2. The State acting through the Assam Integrated Flood and Riverbank Erosion Risk Management Agency (AIFRERMA), a special purpose vehicle (registered under the Societies Registration Act, 1860) will be the Executing Agency (EA) for the individual projects under the Facility. The proposed staff composition and institutional structure of the AIFRERMA is shown in the chart as attached to this Schedule, with functions outlined as follows:

(a) AIFRERMA will be headed by a Chief Executive Officer at a rank of no less than an additional secretary. The AIFRERMA will be responsible for establishing and making operational the integrated flood and riverbank erosion risk management (FRERM) addressing multi-disciplinary agendas to manage the flooding and riverbank erosion. The AIFRERMA will be anchored to the State Water Resources Department (WRD) and associated with the Assam State Disaster Management Authority (ASDMA).

(b) The Governing Body (GB) of the AIFRERMA will provide policy guidance on matters related to the Facility and individual projects therein.

(c) The Executive Body (EB) of the AIFRERMA will provide program implementation and coordination guidance including the staff assignments in the AIFRERMA.

(d) The Project Management Unit (PMU) in AIFRERMA will be responsible for managing, guiding, and coordinating the Facility and projects' implementation at State level. The PMU staff will be deputed on a full time basis from WRD, State Revenue Department, the ASDMA, and other line departments, or recruited from the market in case of unavailability of deputed staff. Functions of the PMU will be as follows: (i) coordinate with other agencies concerned, (ii) prepare overall implementation plan and annual project budget; (iii) guide the preparation of the detailed project reports (DPRs) and coordinate their clearance by the concerned government and subsequent adaptation, if necessary, (iv) prepare the documents required for the individual project approval including bidding and safeguards documents, (v) monitor and guide the activities of the subproject implementation office (SIOs) on subproject planning, implementation, maintenance and adaptation, (vi) ensure that the SIOs meet all social and environmental safeguards aspects and facilitate the implementation of the resettlement plans and environmental management plans; (vii) establish and maintain a management information system (MIS) for project implementation and asset inventory, (viii) monitor overall project progress and evaluate benefits and social and environmental impacts, (ix) arrange staff training programs including for environment and social effects of subprojects; safeguards plan preparation and appraisal; and implementation monitoring; and reporting; (x) manage procurement, consulting and NGO services, and loan disbursement; (xi) maintain financial accounts; and (xii) prepare periodic implementation progress reports.

(e) At field level, for each subproject, a subproject implementation office (SIO) will be established, comprising (i) technical team, and (ii) non-technical team. For each SIO, an

Additional Deputy Commissioner of the respective district will be assigned as subproject coordinator. Functions of the SIO will be as follows:

(i) Under the support and guidance of PMU and ISPM consultants, the SIO will (1) coordinate with the nodal officers of concerned line departments and district administration; (2) prepare annual work plans for approval by PMU; (3) implement the work plan; and (4) establish reporting systems to provide information on physical and institutional progress and impacts;

(ii) For the purposes of interdepartmental coordination the SIO will work closely with Disaster Management Committees (DMCs) to establish a participatory decision making system through regular meetings at block, and panchayat levels. Within this framework, the SIO will (1) undertake subproject planning including DPR preparation and detailed design process; (2) undertake DMC institutional strengthening and preparation of DMC level community disaster risk management plans in coordination with DDMA; (3) implement safeguards actions following the relevant plans; (4) execute civil works; (5) coordinate for and/or implement nonstructural FRERM measures including those related to adaptive agriculture and community livelihoods; (6) undertake maintenance of FRERM infrastructure, with the mobilization of local labor and resources for routine maintenance works; and (7) arrange training programs for the staff including NGOs, and DMCs.

3. Assistance will be provided to the PMU by

(a) multidisciplinary teams of consultants for institutional strengthening and project management (ISPM consultants), for monitoring, capacity development, quality control, and project management; and

(b) an expert advisory group to allow interchange of ideas and information from renowned experts of FRERM, heads of State departments, community focused and user group stakeholders.

4. At the State level WRD will, on a need basis, provide staff support to the PMU (at the level of superintending engineers, executive engineers and assistant (executive) engineers) for undertaking (i) planning and design, (ii) nonstructural FRERM measures, (iii) research and development, (iv) survey, monitoring and evaluation, (v) data management, GIS and drafting, and (vi) quality control, and provide inputs to implement the activities of the designated subjects.

Funds

5. (a) For each individual Project, the Government will make available on a timely basis the loan proceeds to the State.

(b) The Project funds will be budgeted by the State as a single budget line item of the AIFRERMA under the externally aided projects. Annual budget requirements will be provided to PMU in conformity with the State's budget cycle and will reflect the annual work plans for the Project. The State will make available the loan proceeds and other funds as required, to the AIFRERMA on a timely basis to meet the Project requirements.

(c) The State will provide adequate funds towards O&M of the subproject facilities through budgetary allocations or other means, to be provided to AIFRERMA during and after subproject completions.

(d) By no later than 2 months of loan effectiveness of Project 1, AIFRERMA will prepare and adopt a Financial Management Manual that will provide the financial management rules and regulations including internal control framework for all financial transactions. The manual will include the delegation of financial and administrative powers and responsibilities.

Accounts

6. The external audit of the Project will be carried out by independent firm of chartered accountants appointed by the EB of the AIFRERMA and acceptable to ADB. The firm will be appointed under a competitive process and meet minimum criteria to be specified in the FMM. The annual audit reports will be submitted to ADB within six months of the close of each financial year.

7. Accounting at the state and district/subproject levels will follow double entry accounting systems and all books of accounts (including work related registers and asset records) will be maintained. The information on Project related expenditures by project components/subcomponents will be obtained by the PMU from monthly financial reports submitted by the concerned SIOs. Based on these, PMU will prepare consolidated financial statements and use the same for the purpose of preparation of monthly project financial reports.

8. In order to ensure timely release of funds for subproject implementation as also ensure transparent and proper accounts, at all levels (i.e., the PMU and SIO) adequate and senior accounting staff will be appointed on an immediate basis. The PMU with the support of the ISPM consultants will provide initial and ongoing training on the accounting requirements for the Project at the state and the district levels.

Institutional Reforms

9. During implementation of the Program, the State will ensure following specific institutional reforms:

(a) The State will implement all policy and institutional actions as specified in Table 1 to Schedule 1 and stipulated as the sector roadmap in the FFA, including (i) finalization and implementation of the State Water Policy, (ii) preparing and implementing the integrated FRERM, (iii) organizational reforms and strengthening of AIFRERMA.

(b) The AIFRERMA:

(i) will operationalize consultative decision making systems with its counterpart DMCs at block and panchayat levels regarding all planning and implementation matters, FRERM infrastructure maintenance, through regular SIO-DMC meetings on progress review, annual and periodic work plans and schedules;

(ii) will post the physical and financial details and project progress in the department website, along with the tenders and contracts awarded. For individual subproject, the SIOs will post the abstract of all contracts executed, including the quantity of works and their associated costs;

(iii) will ensure that the grievance reporting and redressal mechanisms are in place to assist stakeholders in resolving their complaints in a timely manner. To this end, the PMU and SIOs will organize awareness campaigns for DMCs and other stakeholders; and

(iv) through the mobilization of independent chartered accounting firm, will undertake annual financial audit for WRD, RDMD, and other departments, and all SIOs and associated offices, which will include investigation of all financial records and transactions.

(b) The WRD will strengthen its construction supervision, recording, and reporting system with the use of modern technologies, and operationalize external third party technical audit mechanism. Accordingly, all work contracts will include provisions for third party inspection for quality control. External monitoring, supervision, and technical audit consultants will also be mobilized under the ISPM consultant team.

(c) All contracts financed by ADB for the project will include provisions stipulating ADB's right to audit and examine the records and accounts of the contractor.

Gender and Social Strategy

10. The AIFRERM and its implementing agencies will carry out the subprojects in a manner consistent with the Poverty Reduction and Social Strategy (PRSS), and the Gender Action Plan (GAP), dated 13 February 2009 for PRSS and 24 July 2009 for GAP, prepared in relation to the Program.

Subproject approval and Implementation

11. AIFRERMA will ensure that all subprojects are selected, processed for approval, and implemented in accordance with the criteria and procedures included under Schedule 4 to the FFA.

Social

12. The State through AIFRERMA will ensure that civil works contracts under the Project follow all applicable labor laws of India and the State and that these further include provisions to the effect that contractors; (i) carry out HIV/AIDS awareness programs for labor and disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction; (ii) do not use children as labor, and (iii) follow legally mandated provisions of labor (including equal pay for equal work), health, safety, sanitation, welfare and working conditions. The contracts will also include clauses for termination in case of any breach of these provisions by contractors.

Performance Monitoring; Reports and Review

13. The AIFRERMA will ensure that an Investment Program performance management system (IPPMS) as well as project performance management system (PPMS) satisfactory to ADB is established within three months of loan effectiveness. The PPMS and IPPMS will monitor and evaluate the performance of the projects, and the Facility respectively. For the IPPMS, the AIFRERMA will select a set of clearly measurable performance monitoring indicators relating to physical implementation, institutional development, socioeconomic and other conditions, and social and environmental safeguards.

14. The AIFRERMA will prepare progress reports for respective projects under the Facility and submit these to ADB on a quarterly basis within 30 days from the end of each quarter. Each report will provide a narrative description of progress made during the period in respect the project, changes in the implementation schedule, problems or difficulties encountered, and the work to be carried out in the next period. The progress report will also include a summary financial account for the components, consisting of project expenditures for the year to date and total expenditure to date. AIFRERMA will undertake periodic project performance review under each individual loan, and also for the Facility to evaluate the scope, implementation arrangements, progress and achievements of objectives of the related project and the overall Facility. Performance shall be evaluated based on indicators and targets stipulated in the Design and Monitoring Framework for the Facility and the projects.

15. Based on a review of quarterly progress reports provided ADB, India, and State representatives through AIFRERMA will meet as required to discuss the progress of the projects and the Facility on any changes to implementation arrangements, or remedial measures required to be undertaken to achieve the overall objectives of specific subprojects and components and of the overall Facility. In addition to regular reviews, including a midterm review for the Project, a detailed midterm review of the Facility will be undertaken within no later than four years of the effective date of Project 1. The midterm review will include a detailed evaluation of the scope of the Facility, implementation arrangements, any outstanding issues, environment, resettlement and other safeguard issues, achievement of scheduled targets, contract management progress, and other issues, as appropriate.

16. The AIFRERMA will provide ADB with a facility completion report within six months of the completion of the Facility.

Component Implementation Procedures and Arrangements

17. Component A: Development of FRERM Planning, Institutional and Knowledge Bases, will be carried out under following procedures, with the advisory support provided by the ISPM consultants.

- (i) State IFRERM Plan: Main responsibility of its preparation will be with the PMU's planning division, in close association with the WRD planning division, and ASDMA. The AIFRERMA will seek formation of interdepartmental working group to prepare the Plan with the assistance of the consultants, and advice of its Expert Advisory Group.
- (ii) FRERM Institutional Basis: Capacity development plan will be managed by CEO of AIFRERMA through the executive officers of technical and non-technical directorate in PMU. The plan will be updated and implemented in coordination with the personnel staff of WRD and other implementing agencies. For pursuing institutional development actions in Table 1 of Schedule 1 to this FFA, the CEO will form an institutional working group comprising PMU, WRD, and ASDMA, and implement the actions with the assistance of the consultants and in coordination with Secretary WRD and/or CEO of ASDMA.
- (iii) FRERM Data and Knowledge Base: Its implementation including the development of nonstructural FRERM tools will be managed by PMU's planning division and implemented by the WRD's designated offices such as river research, planning and design, and monitoring and evaluation. The PMU will also be responsible for capacity development of the concerned offices with the support of the consultants. Some critical research activities will be outsourced to local research institutions.

- (iv) Regional Networking: CEO of AIFRERMA through the executive officer of technical directorate of PMU will be primarily responsible for the implementation and associated agency coordination of this subcomponent.

18. Component B: Comprehensive FRERM Systems, will be carried out under the following procedures.

- (i) Feasibility Study Update and Detailed Project Reports: The concerned SIOs under the support and guidance of the PMU planning division will prepare the DPRs for the Project-2 under the Facility, and update as necessary the subproject feasibility studies at the time of its processing, along with the Project-2 appraisal reports as called for in Schedule 4.
- (ii) Local Organizational Framework: The Program will establish and/or strengthen disaster management committees (DMCs) at block, panchayat and the selected village levels to assist the preparation of community-based flood risk management (CBFRM) plans. For this purpose, PMU will mobilize local NGOs.
- (iii) Nonstructural FRERM Measures: The nonstructural FRERM measures will be provided by the SIO's non-technical team under guidance of the concerned executive officer of the PMU. The specific programs will be delivered by the designated agents arranged through the SIO, including the district disaster management authority (DDMA), line departments, and private delivery agents such as NGOs and locally identified and trained experts/trainers.
- (iv) CBFRM Investments in Selected Villages: Implementation of the nonstructural programs under this component will follow the same arrangements as (iii) above. Small works such as flood shelter platforms and sluices will be implemented under participatory modality acceptable to the State and ADB and guided by SIO's technical team.
- (v) Detailed Design and Cost Estimates of FRERM infrastructure: Detailed design and cost estimates will be undertaken by the SIO technical team under the guidance and support of the PMU procurement division and ISPM consultants, and may be approved by the executive officer of its technical directorate. PMU may form and seek the views of a technical advisory group in the case where innovative designs are adopted.
- (vi) Procurement of FRERM Infrastructure: For FRERM infrastructure, tendering of civil works will be initiated by the SIOs, whereas bulk procurement of construction materials will be initiated by the PMU procurement division, and overall managed by PMU. The evaluation will ensure sufficient technical scrutinization, for which a technical evaluation committee may be formed with the involvement of designated senior WRD staff and external experts as advisors, which will recommend the administrative decisions for endorsement by ADB and the AIFRERMA's Procurement Committee.
- (vii) Subproject FRERM Infrastructure Maintenance: The specific arrangements to be followed under the Program are synthesized in para. 44 of Schedule 1 of the FFA. The Program will establish FRERM infrastructure asset MIS under the programming division of AIFRERMA. Consultants will assist the development of the capacities of the local communities and their DMCs to monitor and regulate the nonformal and unplanned occupation and destruction of embankments by the squatters, while undertaking routine maintenance activities in collaboration with the SIO.

Figure 1. Organizational Arrangements for Program Implementation

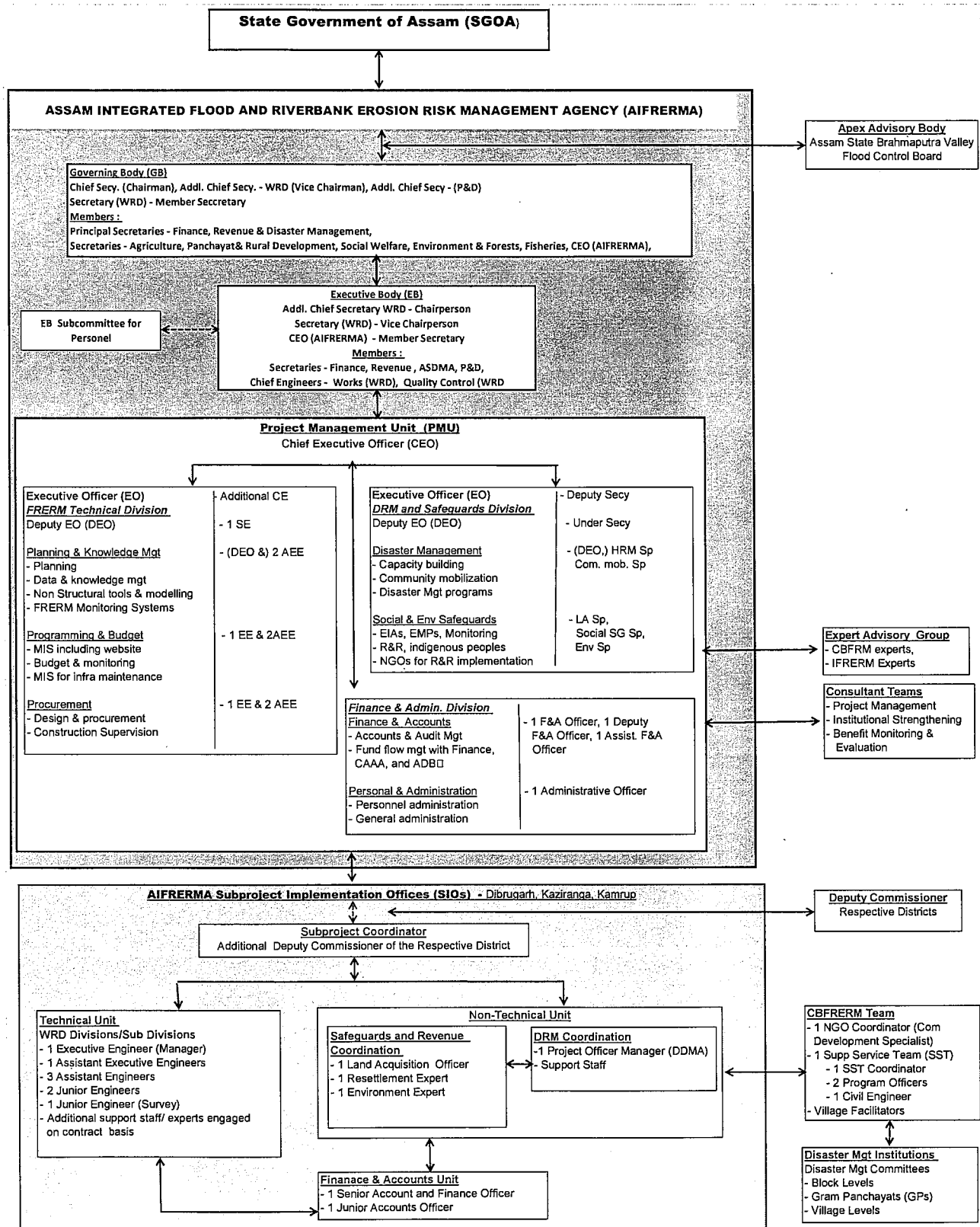
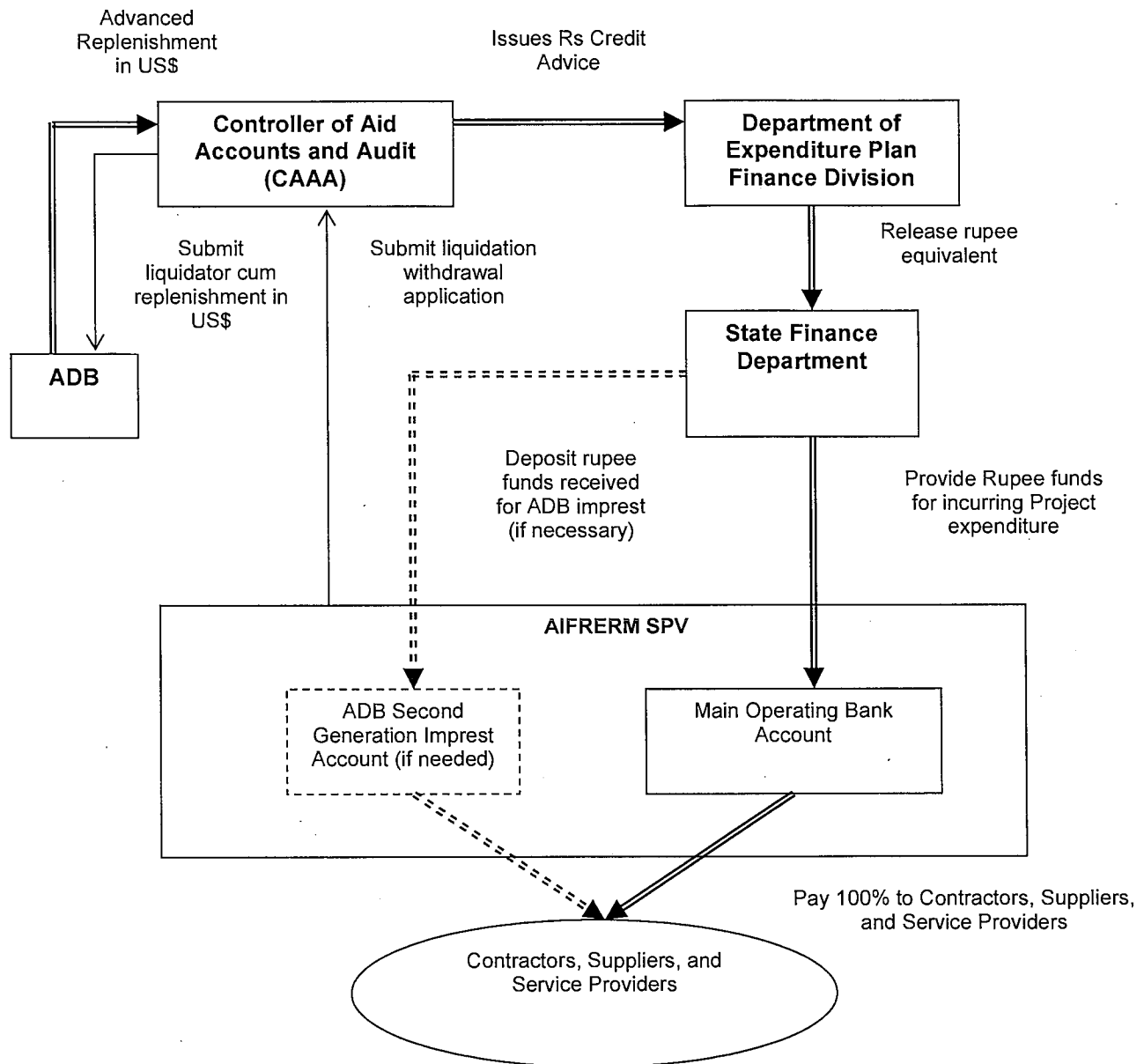


FIGURE 2. FUND FLOW MECHANISM



Note: In addition to the above, direct payment from ADB may also be requested from ADB by the AIFRERMA by submitting withdrawal applications.

SCHEDULE 4

APPROVAL PROCESS OF TRANCHES AND PROJECTS

3. **Components.** The Facility will support the substantial enhancement of the reliability and effectiveness of flood and riverbank erosion risk management (FRERM) operations of the State with a focus on three existing deteriorated flood embankment systems along the Brahmaputra River requiring upgrading and immediate protection from riverbank erosion, in combination with requisite nonstructural measures to address the requisite risks. The Facility will also support the strengthening of necessary policy, planning, and institutional basis including data and knowledge base to put into operation effective FRERM at the state level. These programs together with institutional strengthening and project management have been amalgamated into the following parts and components.

Component A: Development of FRERM Planning, Institutional, and Knowledge Bases

Component A: Integrated FRERM Planning Framework

Component B: Institutional Basis

Component C: Data and Knowledge Base

Component D: Knowledge Sharing and Networking

Component B: Comprehensive FRERM Systems

Component A: Nonstructural and CBFRM Measures

Component B: Structural Measures

Component C: Sustainable Infrastructure Maintenance and Adaptation

Component C: Multidisciplinary Project Management Systems

4. **Selection Criteria.** The following criteria are applied in the selected subprojects for financing under the Facility.

- (i) The subprojects involve renovation and strengthening of the existing flood embankment systems with provision of requisite riverbank protection and associated infrastructure as appropriate, including sluice gates and drainage channels, and rural infrastructure.
- (ii) For each subproject, a feasibility study and support due diligence have been prepared and will be updated as required, including the following aspects: (i) technical design; (ii) economic and financial viability; (iii) institutional arrangements; (iv) social assessments including social safeguards plans as applicable; (v) environmental assessments; (vi) implementation plan including monitoring and reporting; and (vii) procurement plan. These have followed a proper consultative process.
- (iii) All necessary central and state government approvals are in place.
- (iv) Each subproject has met with the safeguard requirements referred to in Schedule 5.
- (v) For subproject feasibility assessments, the following criteria are applied.
 - a. The subproject is technically feasible, and does not pose technical risks in terms of its development or operation that would undermine efficacy, economic return, safety, or sustainability.
 - b. The subproject is socially feasible, and there is significant general consensus and support from the local communities to plan, implement, and operate the proposed structural and nonstructural measures.

- c. The subproject is financially and economically viable with an economic internal rate of return of over 12% based on the detailed economic and financial analysis. The subproject is robust under sensitivity and risk analysis.
- d. The subproject planning and design minimizes involuntary resettlement or land acquisition if any, or has minimal impacts on any affected persons of land acquisition or their livelihoods.
- e. The subproject is socially and environmentally sound, and does not have significant adverse impacts. The subproject also includes measures to mitigate social and environmental adverse impacts, if any.
- f. Each subproject will meet the safeguards requirements of the Governments of India and Assam State and of ADB as referred to in Schedule 5.
- g. Planning, design, and implementation of subprojects will be based on inputs from the concerned communities formed as local disaster management committees (DMCs). DMCs will have also supported the basic design of the subprojects, and concurred on their responsibilities in association with the subproject implementation and maintenance of the minor facilities.

5. Procedures

(a) **Tranche 1** – Three subproject proposals have been prepared under the ADB's project preparatory technical assistance, including Dibrugarh (Dibrugarh district), Kaziranga (Golaghat district), and Palasbari-Gumi (Kamrup district), with the preparation of the implementation plan that is divided into two tranches on the basis of the priorities and implementation readiness. Their approval process stands completed.

(b) **Subsequent tranches** – The subsequent tranches if required, will be processed in accordance with the following procedures:

- (i) Feasibility study will be updated by the executing agency (EA) including its cost estimates. The EA will also update and/or prepare (i) poverty and social assessment including gender actions, and the checklists for (ii) involuntary resettlement; (iii) indigenous peoples; and (iv) environmental screening; and submit the same for ADB's review and categorization.
- (ii) Based on the above, the EA will prepare the updated appraisal reports for all the subprojects together with required attachments, i.e., draft (updated) resettlement plan (RP), draft (updated) indigenous peoples development plan (IPDP) and draft (updated) environmental assessment, as applicable, and submit the same with the periodic financing request to ADB for approval.
- (iii) The EA will translate the RP in the local language and disclose it to the affected people and incorporate the results of the consultation, before seeking ADB's approval. The final RP will also be disclosed on the ADB website and the website of EA.
- (iv) ADB will review the updated appraisal report together with the required attachments. If ADB finds that a proposed subproject is not likely to satisfy the eligibility criteria and/or the agreed procedures, ADB will advise the EA either (a) to modify the subproject proposal in a manner that will make it eligible for approval or (b) that the subproject is rejected.
- (v) All necessary approvals of the Governments of India and of Assam State will have been obtained prior to ADB approval of a subproject. The EA will be responsible for

SCHEDULE 5
SAFEGUARD REQUIREMENTS AND SOCIAL DEVELOPMENT ACTIONS

1.. India will cause the State to ensure that all the requirements prescribed in this Schedule, and the following frameworks that have been prepared with respect to the Facility and of which ADB has been provided full copies, and which are deemed incorporated herein by reference, are complied with during the processing and implementation of the subprojects under the Facility.

- (i) Resettlement Framework attached to loan fact-finding (LFF) mission aide memoire (AM) dated 13 February 2009, and posted at the following website after State confirmation: <http://www.adb.org/projects/project.asp?id=38412>
- (ii) Indigenous Peoples Development Framework attached to LFF mission AM dated 13 February 2009, and posted at the above website after State confirmation.
- (iii) Environmental Impact Assessment (EIA) of the three subprojects and Summary EIA (SEIA) including the environmental management plan, prepared by the State and dated December 2008, and
- (iv) Environmental Assessment and Review Procedure, dated December 2008 and forwarded to the State, under ADB communication letter dated 1 February 2009.

2. The frameworks and the EIAs above cover the Facility specific information and requirements in accordance with applicable laws and regulations of India and the State, and ADB's safeguard policies, as set out in the related frameworks and plans: (i) the general anticipated impacts of the subprojects likely to be financed under the MFF and its first Project on the environment, involuntary resettlement, and indigenous peoples; (ii) the safeguard criteria that are to be used in selecting subprojects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure (including the 120-day disclosure rule, if required), and monitoring and reporting; (iv) the institutional arrangements (including budget and capacity requirements) and India's, the State's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents.

3. Prior to the preparation of each PFR, the applicability and relevance of each safeguard framework for environmental assessment, involuntary resettlement, and indigenous people will be reviewed and updated to ensure relevance and consistency with applicable country legal frameworks and ADB's safeguard policies, as amended from time to time.

4. In all cases, for each new PFR preparation, India will cause the State to review on-going subprojects and relevant works undertaken to check on the status of compliance with the safeguard plans and frameworks, and submit the review reports to ADB, together with other required safeguard documents relevant to the subprojects included in the tranche being processed. In any case if major noncompliance is discovered in the course of the review of ongoing subprojects, a corrective action plan will be prepared and submitted to ADB.

5. In addition, all ADB safeguard policies in effect as of the date the financing of subprojects is approved under the Facility will apply to such subprojects.

PERIODIC FINANCING REQUEST

Date: 08 September 2010

To:

Asian Development Bank
6 ADB Avenue
Mandaluyong City, Metro Manila
Philippines

ATTENTION: Director General, South Asia Department.

Sir:

RE: **Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program – Periodic Financing Request # 1**

Please refer to the Framework Financing Agreement (FFA) for the Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program dated 08 September 2010 between Asian Development Bank (ADB) and INDIA. Capitalized terms not defined herein shall have their respective meanings in the FFA.

Pursuant to the provisions of the FFA, INDIA requests ADB to process this Periodic Financing Request (PFR) for a tranche, in the form of a loan from its ordinary capital resources. The proposed financing amounts, terms, conditions and financing plan are specified in Attachment A hereto. Descriptions of the subprojects/components for which financing is hereby requested are also set out in the Attachment hereto.

By: INDIA

b. Thakur 8/9/2010.

Anuradha Thakur
Director (ADB)

ATTACHMENT A

Project Description The components proposed for financing under the requested PFR (details are in Annex 1) are:

1. Component A: Development of Flood and Riverbank Erosion Risk Management (FRERM) Planning, Institutional, and Knowledge Bases

- (a) Integrated FRERM Planning Framework
- (b) Institutional Basis
- (c) Data and Knowledge Base
- (d) Knowledge Sharing and Networking

Component A will support the state level policy, planning, institutional, and knowledge base development for FRERM, as set out in the Roadmap shown in the Framework Financing Agreement Schedule 1 during the period covered under the PFR.

2. Component B: Comprehensive FRERM Systems

- (a) Nonstructural and Community-based Flood Risk Management (CBFRM) Measures with Disaster Management Committees (DMCs)
- (b) Structural Measures
- (c) Sustainable Infrastructure Maintenance and Adaptation

Component B will support the priority interventions to strengthen the FRERM systems of the three subproject areas, viz., Dibrugarh (Dibrugarh district), Kaziranga (Golaghat district), and Palasbari-Gumi (Kamrup district) during the period covered under the PFR.

3. Component C: Multidisciplinary Project Management Systems

Component C will support the project management and its associated training activities, including the preparation of the materials to process the subsequent PFRs.

Cost Estimates and Financing Plan

The total cost of the Project is estimated at \$71.1 million, inclusive of taxes, duties, and financing charges on the loan during construction. The detailed cost estimates and financing plan are in Annex 2.

Cost Estimates and Financing Plan			
Item	ADB	India	Total
Base Cost			
Component A	5.1	0.7	5.8
Component B	47.8	6.2	54.0
Component C	4.0	1.8	5.8
Tax and Duties	(3.1)*	(4.6)*	(7.7)*
Financing Charges	-	5.5	5.5
Total	56.9	14.2	71.1
Percentage	80%	20%	100%

* Included in the financing share of other items.

Loan Amount and Terms

This request is for a loan of \$56.9 million from the ordinary capital resources of the Asian Development Bank (ADB) provided under ADB's London Interbank offered rate (LIBOR)-based lending facility, with a 25

year term including a grace period of 7 years, an interest rate determined in accordance with ADB's LIBOR-based lending facility, a commitment charge of 0.15%, and such other terms and conditions as agreed in the FFA, and further supplemented under the Loan and Project Agreements.

**Period of Loan
Utilization**

The Project is expected to be completed by March 2014. No disbursement from the loan amount will be requested or made later than September 2014.

**Implementation
Arrangements**

The Executing Agency for the Facility will be the Assam Integrated Flood and Riverbank Erosion Risk Management Agency (a special purpose vehicle registered under the Societies Act) anchored to the Water Resources Department (WRD) in association with Assam State Disaster Management Authority (ASDMA) of the State Government of Assam (the State). A Project Management Unit (PMU) will be established with the assignment of a full-time Project Director cum Chief Executive Officer, and assisted by multi-disciplinary staffs. Assistance is also provided by a multidisciplinary team of consultants for institutional strengthening and project management. The PMU will be responsible for overall coordination and guidance for the project implementation, including conformance with the State, National and ADB social and environmental safeguards policies. The implementation will be carried out by deputed dedicated WRD and RDMD staffs and/or externally engaged experts with the support of the line departments that will form multidisciplinary subproject implementation offices (SIOs) at the level to implement individual subprojects. Specific implementation arrangements are as described in Schedule 3 to the FFA.

**Procurement and
Consulting
Services**

All goods and services to be financed under the Facility will be procured in accordance with ADB's Procurement Guidelines (2010, as amended from time to time). All consulting services to be financed under the Facility will be procured in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). The Procurement Plan for the loan is attached as Annex 3.

**Advance
Contracting and
Retroactive
Financing**

Advance contracting of eligible civil works, equipment and materials, and requirement of consulting services are requested in accordance with agreed procedures and guidelines as above.

The expenditures incurred for Project management, civil works, equipment and materials and consulting services eligible for advance action are also requested under retroactive financing under this PFR, not exceeding the amount of 20 percent of the Loan, incurred before Loan effectiveness, but not earlier than 12 months before the signing of the Loan Agreement

Disbursement

Disbursement of the loan proceeds under this loan will be in accordance with ADB's Loan Disbursement Handbook (January 2007, as amended from time to time). India as the Borrower will establish an imprest account in the Reserve Bank of India. The State through the AIFRERMA

may establish a second-generation imprest account (SGIA) in an account in a commercial bank acceptable to ADB. The AIFRERMA will be responsible for administration of the SGIA. The amount at any given time in the imprest account and the SGIA shall be equivalent to 6 months of estimated expenditures or 10% of the relevant loan amount, whichever is lower. The statement of expenditures (SOE) procedure will be used to reimburse/liquidate eligible expenditures not exceeding \$100,000 equivalent per individual payment.

Confirmation of Continued Validity of and Adherence to Provisions of FFA and the Design and Monitoring Framework

India confirms that the provisions of the FFA are adhered to in submission of this PFR and in the implementation of this loan.

Readiness of the Investment Program for Implementation

The three subprojects included in the FFA have been appraised by the WRD have been cleared by the State Government of Assam and the Government of India. The AIFRERMA has been established, and WRD has prepared the detailed designs and tender documents for the infrastructure works, and in advanced stage of tendering (expected to be completed by December 2010) the relevant civil works and materials procurement packages. Relevant consulting services packages have been advertised, with the finalization of the detailed terms of reference, and completion of advertisement, short listing, issuance of request for proposals, and technical evaluation (expected to be completed by February 2011).

Safeguards

The Project was classified by ADB as environmental category A. The environmental impact assessments (EIAs) have been prepared for the concerned subprojects under this PFR. An environmental management plan (EMP) has been prepared for each subproject, and the specific mitigation actions will be incorporated in the related works contracts. The EIAs as discussed and agreed with ADB were submitted from the State to ADB on 13 March 2009.

Strip land acquisition is required for the implementation of civil works associated with some of the riverbank protection and embankment improvement works. Resettlement plans (RPs) for the immediate works were prepared for the embankment construction of Kaziranga, Palasbari, and Dibrugarh subprojects, and was cleared by the State and ADB. The RPs as cleared were submitted by the State to ADB on 27 May 2009 for Kaziranga, 19 September 2009 for Palasbari, and 12 October 2009 for Dibrugarh. If any further subproject works require land acquisition and/or resettlement, the State will prepare and implement an RP following the Resettlement Framework (RF) referred to in Schedule 5 to the FFA.

The subprojects included in the tranche will provide overall benefits to the ethnic minorities of the population, although they may also be

affected by the requisite land acquisition. In case of the immediate works for Kaziranga subproject, indigenous peoples specific actions have been incorporated in the RP referred above and will be implemented, in accordance with the Indigenous Peoples Development Framework (IPDF) referred to in Schedule 5 to the FFA. In case of any other negative impacts for the indigenous peoples, the State will prepare and implement indigenous peoples development plan or specific actions in accordance with the IPDF.

PROJECT DESCRIPTION

1. Impact and Outcome

1. The impact of the first tranche (the Project) for the Assam Integrated Flood and Riverbank Erosion Risk Mitigation Investment Program (AIFRERMIP) will be the enhanced resilience to flood and erosion risks and increased public confidence to the risk management systems in the three flood prone subproject areas, viz., Dibrugarh (Dibrugarh district), Kaziranga (Golaghat district), and Palasbari (Kamrup district) subprojects. The outcome will be the progress in enhancing the reliability and effectiveness of flood and riverbank erosion risk management (FRERM) systems in these subproject areas, and improved institutional performance of FRERM in the associated agencies. The following specific scopes of works are included in the Project. The design and monitoring framework will be shown at the end of this Annex.

Table 1. Project Scheme Profile

Scheme	Objective and Main Scope
Dibrugarh (Dibrugarh district) Area: 14,800 ha 29,000 households (HHs)	<p><u>Objective:</u> Securing Dibrugarh Town and adjacent areas from Brahmaputra floods while enhancing effectiveness and reliability of local FRERM system</p> <p><u>Main scope:</u></p> <p>Structural: Embankment renovation (9.5km) and provision of 4.7 km of riverbank protection.</p> <p>Non-structural: support for community based flood risk management including flood mapping, improved regular information about erosion and flood risk, and community based FRERM management</p>
Kaziranga (Golaghat district) Area: 7,300 ha 14,000 HHs	<p><u>Objective:</u> Securing the productive agriculture area from Brahmaputra floods, and preventing river avulsion and sudden flood water intrusion into Kaziranga National Park, while enhancing effectiveness and reliability of FRERM system</p> <p><u>Main scope:</u></p> <p>Structural: Embankment construction along existing rural road (4.7km), provision of 5 sluice gates to improve local drainage, and provision of systematic riverbank protection (3.1 km)</p> <p>Non-structural: support for community based flood risk management including flood mapping, improved regular information about erosion and flood risk, and community management with support for platforms</p>
Palasbari-Gumi (Kamrup district) Area: 34,300 ha 50,000 HHs	<p><u>Objective:</u> Securing the suburban and productive agriculture area in Palasbari – Gumi reach from Brahmaputra floods, and preventing major river avulsion, while enhancing effectiveness and reliability of local FRERM system</p> <p><u>Main scope:</u></p> <p>Structural: Renovation including retirement of embankments (4.9 km) with systematic provision of new riverbank protection (9.4 km).</p> <p>Non-structural: support for community based flood risk management including flood mapping, improved regular information about erosion and flood risk, and community management with support for platforms</p>

2. Outputs

2. The outputs of the Project are initial implementation progress achieved towards (i) improved policy, planning, institutional, and knowledge bases, (ii) improved reliability and effectiveness of FRERM systems operated in the selected subproject areas, and (iii) effective project management with strengthened capacities of the Project personnel.

Component A: Development of FRERM Planning, Institutional and Knowledge Bases

3. This component/output will establish sound basis for the State to put into operation reliable and effective FRERM systems, encompassing (i) policy and planning framework, (ii) institutional basis, (iii) knowledge base, and (iv) regional knowledge networks.

i. Integrated FRERM Planning Framework

4. This subcomponent will support the preparation of a comprehensive State FRERM Plan and strengthening of the capacities to this end, following the relevant principles of integrated FRERM that is included in the draft State Water Policy (SWP), National Water Policy, and other relevant national guidelines. The Project-1 will support (i) FRERM Plan preparation to set out short- to long-term strategy and programs, building on the existing mater plans, task force reports, and WRD's Vision 2020, and covering structural and nonstructural measures, associated capacity building programs, and programs for catchment management; and (ii) its consultative processes through workshops and seminars. Draft Plan will be prepared by the end of Project-1.

ii. Institutional Bases

5. This subcomponent will support the institutional development of the FRERM agencies including WRD in particular, RDMD, and other relevant departments. Key accomplishments under the Project will include (i) effective functioning of multidisciplinary PMU in Assam Integrated Flood and Riverbank Erosion Risk Management Agency (AIFRERMA), (ii) AIFRERMA's capacity development plan, (iii) draft guidelines for stakeholder participation, planning, implementation, and knowledge management, and (iv) progress in other institutional development actions specified in Table 1, Schedule 1 to FFA.

iii. Data and Knowledge Base

6. This subcomponent will set up sound data and knowledge base for integrated FRERM operations. The Project will support initial progress for the first three years on (i) data base on hydrology, (geo-)morphology, and physical environment of flood plains and watersheds; (ii) tools for FRERM including short-term river erosion risk mapping with relevant models establishment in the lower Brahmaputra River, flood risk mapping in Kaziranga subproject, strengthened FFW systems with improved warning; and (iv) action researches to strengthen the technological basis of FRERM tools and design alternatives.

iv. Knowledge Sharing and Networking

7. This subcomponent will support the capacity development of the State FRERM agencies through national and international networking, while contributing to international technology and knowledge development on the subject. The Project accomplishment will include (i) preparation and contribution of technical papers in international conferences and the participation of the concerned staff; and (ii) seminars and workshops to discuss the initial findings of the Project.

Component B: Comprehensive FRERM Systems

8. This component will enhance the reliability and effectiveness of FRERM systems with comprehensive structural and nonstructural measures and strengthening of the relevant local

organizations that provides a framework for community consultation and participation, in the three subproject areas referred in para. 1 above.

i. Nonstructural Measures and Community Based Flood Risk Management with Disaster Management Committees

9. Working closely with Assam State Disaster Management Authority (ASDMA) and district disaster management authorities (DDMAs), the subcomponent will first support the establishment and/or strengthening of the disaster management committees (DMCs) at the sub-divisional and the panchayat levels. The concerned DMCs in the subproject benefit areas will be strengthened with extension of members such as the most vulnerable groups,¹ with the facilitation of the local NGOs engaged under the Program. The Project-1 will also provide intensive support to the selected most vulnerable villages (about 75 in Project-1) to form village DMCs and prepare community based flood risk management (CBFRM) plans, which will include programs for flood preparedness, emergency response and relief actions and arrangements, and priority investments to strengthen the resilience to floods.

10. On the basis of the above, Project-1 will provide the specific nonstructural programs, including (i) flood and riverbank erosion awareness campaigns; (ii) strengthening of local flood emergency response, relief, and damage assessment systems; and (iii) improved FFW system with more advanced and relevant forecasting and intensive information dissemination. During Project-1, these will be prioritized in the subdistricts having structural works under Project-1, and the selected highly flood prone villages. In addition, support is provided for implementing the identified eligible CBFRM investments for preventative, response and recovery measures, including (i) community flood shelters (and/or raised platforms); (ii) minor infrastructures (such as sluice pipe under rural roads) to improve local drainage; and (iii) other community initiatives to cope with the risk of flooding and river erosion.

iii. Structural Measures

11. This subcomponent will provide structural flood and riverbank erosion protection works to renovate the existing embankment systems in the three subproject areas. The specific provisions included in the Project are: construction and renovation of about 19 km of flood embankments, about 18 km of riverbank protection works, and provision of 5 sluice gates. In relation to FRERM infrastructure works, the Project will plan and implement the requisite social and environmental safeguards actions following the relevant policies and regulations of the Government, the State, and ADB, including (i) preparation and implementation of resettlement plans and indigenous peoples development plans/actions, and (ii) implementation of environmental monitoring and management plans following the EIA.

iv. Sustainable Infrastructure Maintenance and Adaptation

12. The Project will support the initial steps to institutionalize sustainable infrastructure maintenance systems. Specifically, the Project will (i) prepare FRERM infrastructure asset MIS, and (ii) initiate the system of performance monitoring, planning, and implementation of flood embankment maintenance within the three subproject areas.

¹ Including women, scheduled castes and indigenous people residing outside of the flood embankments and along the embankments as squatters.

Component C: Multidisciplinary Project Management Systems

13. This component will operate the Project management system through multi-disciplinary PMU and SIOs, with the provision of necessary training for the Project personnel including NGOs and other private providers. The Project will attain full operationalization of PMU and SIOs during the initial implementation period, with the participatory decision making systems with district disaster management authorities and local disaster management committees.
14. This component with the assistance of the consultants will also prepare the appraisal report for the tranche-2, including the detailed project reports (DPRs) for consideration and approval by the State and the Government of India.

DESIGN AND MONITORING FRAMEWORK (PROJECT 1)

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
Impact FRERM systems in Assam provide enhanced resilience to flood and riverbank erosion risks in selected subproject areas along the Brahmaputra River, benefiting about 1 million people.	By 2020: <ul style="list-style-type: none"> Sustained reduction of annual flood damage and rehabilitation cost from the current average of. Rs350 million/yr (1988-2008) No flood damages due to embankment breach caused by flood or riverbank erosion Reduced land lost by riverbank erosion within protected areas from the current average loss of 230 ha/yr in the subprojects area 53,000 ha of agricultural and nonagricultural lands protected from floods and riverbank erosion 	<ul style="list-style-type: none"> Annual reports of CWC, AIFRERMA, WRD, MOWR, ASDMA and their websites State statistics on agriculture and lands (e.g., Public Works Dept.: roads and public buildings; district office: residential properties; Dept. of Fisheries) 	Assumptions <ul style="list-style-type: none"> Stable political and local security conditions Sustainable maintenance of FRERM infrastructure by SGOA Risks <ul style="list-style-type: none"> Natural calamities beyond the design return period
Outcome SGOA provides reliable, effective and sustainable FRERM systems in selected subproject areas in Assam along the Brahmaputra River	By 2013-2014: <ul style="list-style-type: none"> FRERM systems in 3 subproject areas fully operational and supported by riverbank erosion prediction, advance warning and other state wide programs with: <ul style="list-style-type: none"> Reduced flood damages due to embankment breach Reduced land lost by riverbank erosion along the protected reaches Critical flood warnings must be issued to communities at least 24-hr lead time equally benefiting women All erosion vulnerable families receive advance warning 	<ul style="list-style-type: none"> AIFRERMA progress and completion reports AIFRERMA MIS Annual reports of AIFRERMA, WRD, ASDMA/DDMAs and their websites 	Assumptions <ul style="list-style-type: none"> Sustainable maintenance of infrastructure FRERM institutions including DMOs sustain their performance targets Risks <ul style="list-style-type: none"> Natural calamities beyond the design return period
	<ul style="list-style-type: none"> Institutional performance of relevant FRERM institutions improved: <ul style="list-style-type: none"> Appropriate institutional setup and functions for integrated FRERM in place by 2011 AIFRERMA delivering satisfactory FRERM programs DMCs functioning effectively to the satisfaction of local stakeholders & 30% women representation by 2017 FRERM infrastructure maintained satisfactorily in coordination with DMOs with increased fund allocation by SGOA and central financing by 2017 SGOA starts to replicate similar programs in other areas by 2017 	<ul style="list-style-type: none"> Baseline data and BME reports by AIFRERMA AIFRERMA MIS WRD MIS for monitoring and planning scheme maintenance Annual reports of AIFRERMA, WRD, Dept. of Rural Devt. and ASDMA annual reports and websites 	Assumptions <ul style="list-style-type: none"> State support to sustain and continue institutional and financial reforms Project institutions incl. DMCs sustain their performance targets Beneficiary willingness to participate in DMCs Risks <ul style="list-style-type: none"> Local or internal conflicts threatening DMOs performance
Outputs A. FRERM planning, institutional and knowledge basis established 1. FRERM Policy and Plan Framework fully established	<ul style="list-style-type: none"> Comprehensive FRERM strategy and planning framework established Work plans of all FRERM institutions are aligned with the FRERM strategy 	<ul style="list-style-type: none"> SGOA policy document and policy review reports State FRERM Plan AIFRERMA, WRD and ASDMA annual reports 	Assumptions <ul style="list-style-type: none"> Political support to sustain and continue with reforms Active stakeholder support and participation in FRERM activities

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
2. Respective roles and key results areas of FRERM institutions clarified and their respective capacities for participatory DRM developed	<ul style="list-style-type: none"> • Multidisciplinary AIFRERMA set up with 20% female representation among external staff • CDP for AIFRERMA, WRD, associated organizations and stakeholders in place by 2012, with robust training needs assessment • As part of CDP, 75% staff fully aware of gender issues • Staff use guidelines and manuals on structural and non-structural measures prepared in accordance with international best practices • Other relevant actions for establishing institutional basis for FRERM, as stipulated in AIFRERMIP sector roadmap, are in place within agreed timeframe 	<ul style="list-style-type: none"> • AIFRERMA, WRD and ASDMA annual reports and websites • CDP and Trainee documentation 	Risks <ul style="list-style-type: none"> • High staff turnover • Willing and dedicated staff to support the institutional development process
3. Improved data and knowledge base for integrated FRERM	<ul style="list-style-type: none"> • AIFRERMA and DMOs are using expanded data base to inform their planning and decision making processes on hydrology, geomorphology and physical environment of flood plains • Nonstructural FRERM model tools in place by 2011 for river erosion risk mapping through erosion prediction model, etc. • Research and knowledge development plans and programs are incorporated into State FRERM strategy 	<ul style="list-style-type: none"> • AIFRERMA project progress and completion reports • FRIS comprising river, flood, and infrastructure • Special activity reports and outputs • AIFRERMA and WRD annual reports and websites 	Risks <ul style="list-style-type: none"> • Concerns about data sensitivity with limited or delayed development • Dedicated staff availability
4. Knowledge sharing and regional networking mobilized and effective working relationships established for undertaking regular investigation and planning, and knowledge management activities	<ul style="list-style-type: none"> • AIFRERMA and DMOs adopt international best practice accumulated from knowledge institutions • AIFRERMA knowledge and experience shared, cited and well documented in Indian and international conferences and knowledge hubs 	<ul style="list-style-type: none"> • AIFRERMA and WRD annual reports and websites • Knowledge hubs related to FRERM in Asia Pacific region and networks on water sector apex bodies or river basin organizations • Conference proceedings 	Risks <ul style="list-style-type: none"> • Concerns about information sensitivity with delayed or restricted participation
B. Comprehensive FRERM program implemented with DMC participation			
1. Empowered communities play a role in FRERM Programs	<ul style="list-style-type: none"> • In full coordination with ASDMA/DDMAs, DMCs are established at district, block, GP and 75 highly vulnerable villages by 2013, with local NGO facilitation; and are made functional by 2016 • DMCs have 30% female representation and involved in decision making process 	<ul style="list-style-type: none"> • AIFRERMA project progress and completion reports based on its MIS • ASDMA disaster risk management publications 	Assumptions <ul style="list-style-type: none"> • Effective participation at district and community levels • Support at State and local levels • Timely NGO

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
	<ul style="list-style-type: none"> CBFRM plans are comprehensive and inclusive of programs for flood preparedness, emergency response and relief actions and arrangements and priority investments 		engagement and their capacities
<p>2. Nonstructural measures are provided to DMCs up to GP; and CBFRM provided to highly vulnerable villages</p> <p>3. Cost effective FRERM structural measures provided in the 3 subproject areas</p> <p>4. Sustainable FRERM infrastructure monitoring, maintenance and adaptation institutionalized in the 3 subproject areas</p>	<p><i>By 2012:</i></p> <ul style="list-style-type: none"> Appropriate nonstructural measures in place: (i) flood and riverbank awareness campaigns, (ii) strengthened flood emergency response, relief & damage assessment systems, (iii) advance flood and erosion warning In 75 highly vulnerable villages, eligible CBFRM investments supported, including minor infra, hazard maps, and adaptive cropping awareness campaigns. At least 30% programs are provided for women and vulnerable groups FRERM infrastructure, conforming with international standards, provided with stakeholder satisfaction: <ul style="list-style-type: none"> 19km of flood embankments 18km of riverbank protection 5 sluice gates Other minor CBFRM infrastructure (e.g. flood shelter platforms, minor dykes operational in 75 villages MIS in place for project implementation and complete asset inventory for all subprojects by 2013 Improved and transparent management of fund for maintenance in place at AIFRERMA by 2013 FRERM infrastructure sufficiently maintained with mobilization of local labor and resources for routine works Regular participatory system with DMCs are operational from 2012 Full participation (20% women) of communities adjacent to dykes in earth works with WRD from 2013 Funds from centrally-sponsored schemes supporting adaptation works (2014) 	<ul style="list-style-type: none"> AIFRERMA project progress and completion reports based on its MIS ASDMA disaster risk management publications AIFRERMA website Construction completion reports collected by AIFRERMA from contractors and consultants Project progress and completion reports AIFRERMA and WRD websites AIFRERMA project progress and completion reports AIFRERMA and WRD MIS, annual reports and websites State Finance 	<p>Assumptions</p> <ul style="list-style-type: none"> Participatory process is duly followed by all. Capacity strengthening and quality control are effective with qualified consultants engaged. Beneficiaries support collective action <p>Assumptions</p> <ul style="list-style-type: none"> Effective participation at community level Land acquisition undertaken well in advance <p>Risks</p> <ul style="list-style-type: none"> Price of construction materials soar <p>Assumptions</p> <ul style="list-style-type: none"> (Same as above) Damages from excessive natural calamities duly rehabilitated WRD staff pay due attention to maintenance performance <p>Risks</p> <ul style="list-style-type: none"> Trained and experienced staff are transferred to unrelated assignments
<p>C. AIFRERMA Program Management developed</p> <p>1. Appropriate project management system established incl. results monitoring with indicators agreed and baseline data determined</p>	<p><i>By 2010:</i></p> <ul style="list-style-type: none"> Multi-disciplinary PMU, SIOs established, staffed, and trained, with 20% female representation at PMU and SIOs, and 40% for NGOs support service teams All staff abide by Project and financial management manuals MIS and accountability measures for 	<ul style="list-style-type: none"> Detailed operational guidelines AIFRERMA progress reports Special study reports including the third party AIFRERMA and WRD annual report and websites 	<p>Assumptions</p> <ul style="list-style-type: none"> Sufficient counterpart funding Engagement of qualified consultants and NGOs Retention of the human resource and

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
2. Capacities of FRERM institutions strengthened 3. Efficient program management	<ul style="list-style-type: none"> project organizations are in place CDPs are well targeted and with increased gender awareness FRERM institutions are provided with full project management support (2010) Training programs timely arranged well targeted and participated Implementation follows approved annual workplan Procurement, consulting and NGO services and loan disbursement managed in timely manner 	<ul style="list-style-type: none"> CDP implementation report (by consultants) Periodic surveys, as required 	<ul style="list-style-type: none"> developed capacities Risks <ul style="list-style-type: none"> Trained and experienced staff are transferred to unrelated assignments
Activities with Milestones			Inputs
1. Investment Program Preparation (within 2010) <ul style="list-style-type: none"> (a) Establishment of AIFRERMA, PMU and SIOs and staff assignments (b) Preparation and finalization of DPRs for phase 1 works (c) All statutory clearances obtained (d) Preparation of all project-related guidelines and manuals incl. implementation plan and CDP (e) Preparation and Finalization of RPs for the tranche-1 works (f) Advance selection of consultants and NGOs (g) Advance procurement of civil works and goods 2. Investment Program Implementation 2.1 Policy, Planning, Institutional and Knowledge Base <ul style="list-style-type: none"> (a) Institutional roadmap actions implemented as per the stipulated schedule by 2017 (b) CDP implemented substantially by 2013, including gender sensitive training provided to at least 75% of the staff working on the project by 2017 (c) Data and knowledge system established by 2013 and made fully operational by 2017 (d) Establish links with regional knowledge networks by 2013 2.2 Institutionalizing Comprehensive FRERM <ul style="list-style-type: none"> (a) Nonstructural instruments fully developed by 2013 (b) Local DMCs for tranche-1 and tranche-2 works established by 2012 and 2015, respectively, and CBFRML plans prepared and implemented by 2013 and 2016, respectively. (c) Structural works for tranche-1 implemented as follows <ul style="list-style-type: none"> - RPs implemented by mid 2011 for applicable works - All tenders for 1st year works completed and awarded between June 2010 to November 2010 - All civil works and goods procurement completed by March 2013 (d) Tranche-2 implementation preparation as follows <ul style="list-style-type: none"> - DPRs for tranche-2 works and updated project concept paper cleared by December 2012 - RPs prepared by June 2012 and implemented by June 2013 - All tenders completed and awarded between January 2013 to Sept 2014 (e) Establishing maintenance mechanisms for 70km, 35km, and 21km of existing embankments in Palasbari, Kaziranga, and Dibrugarh subprojects by 2014 2.3 Project Management and Associated Capacity Building <ul style="list-style-type: none"> (a) Immediate training provided to PMU and SIO staffs, and NGOs and other providers by 2010 and project management system fully operationalized by 2011 (b) Consultants for institutional strengthening and project management mobilized, and provide effective support from 2010–2017 (c) Investment Program management information system (MIS) established by September 2010 (d) Prepare and process tranche-2 following the requisite procedures by 2013 (e) ADB inception mission by beginning 2011, mid-term review in 2013, and regular review missions undertaken at least twice a year throughout 2016 			Total: \$71.1 million ADB: \$56.9 million <ul style="list-style-type: none"> Civil works and related materials: \$46.9 million Resettlement: \$0.7 million Equipment and vehicles: \$1.1 million Training: \$0.9 million Research: \$ 0.6 million Consultants: \$4.5 million Project management and others: \$2.1 million Government: \$ 14.2 million <ul style="list-style-type: none"> Counterpart fund for implementation: \$8.7 million (including project personnel) Financial charges: \$5.5 million

ADB = Asian Development Bank, AIFRERMA = Assam Integrated Flood and Riverbank Erosion Risk Management Agency; AIFRERMIP = Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program; CBFRML = community based flood risk management and livelihoods, CDP = capacity development plan, CO = community organizer, DMC = disaster management committees, DMO = disaster management organization, DPR = detailed project reports, DRM = Disaster Risk Management, GP = gram panchayat (cluster villages); FRERM = flood and river erosion risk management, FRIS = Flood and River Information System, HDI = human development index,

IWRM = integrated water resources management, MIS = management information system, MOWR = Ministry of Water Resources, NGO = nongovernment organization, PMU = project management unit, RP = resettlement plan; SGQA = state government of Assam; SIO = subproject implementation office, WRD = Water Resources Department

COST ESTIMATES **Component Cost (Tranche-1)**

Component Cost (Millions of US\$)										
Item	INRs Million			US\$ Million			% ADB			Taxes & Duties
	Govt	ADB	Total	Govt	ADB	Total	Govt	ADB	%	
Component A: FRERM Planning, Institutional and Knowledge Base										
1. Integrated FRERM Planning Framework	0	1	2	0.0	0.0	0.0	19.0	81.0	0.0	0.0
2. Data and Knowledge Base	8	58	65	0.2	1.2	1.4	11.5	88.5	0.2	0.2
3. Institutions Bases	4	70	74	0.1	1.5	1.6	5.7	94.3	0.2	0.2
4. Knowledge Sharing and Networking	0	7	7	0.0	0.1	0.1	4.0	96.0	0.0	0.0
5. Consultants (Institutional Strengthening)	22	101	124	0.5	2.1	2.6	18.0	82.0	0.5	0.5
Subtotal Component A	35	237	272	0.7	5.1	5.8	12.7	87.3	0.9	0.9
Component B: Comprehensive FRERM Systems										
1. Non-Structural and CBFRM Measures with DMCs	3	54	57	0.1	1.1	1.2	5.7	94.3	0.1	0.1
2. Structural Measures	280	2,111	2,391	6.0	45.4	51.4	11.8	88.2	5.7	5.7
3. Sustainable Infrastructure Maintenance and Adaptation	7	63	70	0.1	1.3	1.4	10.0	90.0	0.2	0.2
Subtotal Component B	290	2,228	2,518	6.3	47.8	54.0	11.6	88.4	6.0	6.0
Component C: Multidisciplinary Project Management Systems										
1. Project Management	59	87	146	1.3	1.8	3.1	40.7	59.3	0.3	0.3
2. Consultants (Project Implementation)	24	103	127	0.5	2.2	2.7	18.9	81.1	0.5	0.5
Subtotal Component C	83	190	273	1.8	4.0	5.8	30.5	69.5	0.8	0.8
Total BASELINE COSTS										
Interest During Implementation	408	2,655	3,063	8.7	56.9	65.6	13.3	86.7	7.7	7.7
Commitment Charges	246	0	246	5.3	0.0	5.3	100.0	0.0	0.0	0.0
	7	0	7	0.2	0.0	0.2	100.0	0.0	0.0	0.0
Total Costs to be Financed	662	2,655	3,317	14.2	56.9	71.1	20.0	80.0	7.7	7.7

ADB = Asian Development Bank, CBFRM = community based flood risk management, DMC = disaster management committee, FRERM = flood and riverbank erosion risk management.

^a In mid-2009 prices. Taxes and duties will be financed by the borrower and ADB.

^b Physical contingencies computed at 12.5%. Price contingencies are computed at 0.8% per annum for foreign exchange costs and 4.0-5.0% per annum for local currency costs.

^c Includes interest and commitment charges. Interest during construction has been computed at the five-year forward London interbank-offered rate plus 0.3% spread.

Expenditure Cost by Financiers (Tranche-1)

Item	INRs Million			US\$ Million			% Govt		% ADB	Taxes & Duties	
	Govt	ADB	Total	Govt	ADB	Total	Govt	%			
I. Investment Costs											
A. Civil Works	64	1,012	1,076	1.4	21.4	22.7	6.0		94.0		2.7
B. Civil Works (Maintenance)	7	63	70	0.1	1.3	1.4	10.0		90.0		0.2
C. Civil Works (Govt)	16	0	16	0.4	0.0	0.4	100.0		0.0		0.0
D. Construction Materials	83	1,108	1,192	1.8	24.2	26.0	7.0		93.0		2.9
E. Resttlement	0	33	33	0.0	0.7	0.7	0.0		100.0		0.1
F. Land Acquisition	118	0	118	2.5	0.0	2.5	100.0		0.0		0.0
G. Equipment	2	37	39	0.0	0.8	0.8	5.0		95.0		0.1
H. Vehicles	1	13	13	0.0	0.3	0.3	5.0		95.0		0.0
I. Capacity Development											
Training/Workshops	0	40	40	0.0	0.8	0.8	0.0		100.0		0.1
Study Tours	0	4	4	0.0	0.1	0.1	0.0		100.0		0.0
Subtotal Capacity Development											
J. Survey, Research, and Investigation	0	44	44	0.0	0.9	0.9	0.0		100.0		0.1
	7	27	34	0.1	0.6	0.7	20.3		79.7		0.1
K. Consultants											
International Consultants	23	114	137	0.5	2.4	2.9	16.9		83.1		0.5
Domestic Consultants	16	64	80	0.3	1.3	1.7	20.3		79.7		0.3
Consultants Studies and Surveys	2	8	11	0.0	0.2	0.2	20.3		79.7		0.0
Consultant Operational Costs	6	22	28	0.1	0.5	0.6	20.3		79.7		0.1
M&E Consultants	1	4	5	0.0	0.1	0.1	20.3		79.7		0.0
Subtotal Consultants											
L. NGOs and Local Institutes	48	213	261	1.0	4.5	5.5	18.5		81.5		1.0
	2	18	21	0.0	0.4	0.4	10.0		90.0		0.0
M. Project Management	0	87	87	0.0	1.8	1.8	0.0		100.0		0.2
Total Investment Costs	349	2,655	3,004	7.5	56.9	64.4	11.6		88.4		7.6
II. Recurrent Costs											
O&M Project Institutions	59	0	59	1.3	0.0	1.3	100.0		0.0		0.2
Total Recurrent Costs	59	0	59	1.3	0.0	1.3	100.0		0.0		0.2
Total BASE COSTS											
Interest During Implementation	408	2,655	3,063	8.7	56.9	65.6	13.3		86.7		7.7
Commitment Charges	246	0	246	5.3	0.0	5.3	100.0		0.0		0.0
	7	0	7	0.2	0.0	0.2	100.0		0.0		0.0
Total PROJECT COSTS	662	2,655	3,317	14.2	56.9	71.1	20.0		80.0		7.7

ADB = Asian Development Bank; O&M = operation and maintenance

^a In mid-2009 prices. Taxes and duties will be financed by the borrower and ADB.

PROCUREMENT PLAN

Project Information	Effective and reliable flood and riverbank erosion risk management (FRERM) systems in three existing large-scale flood embankment systems in Assam
Country	India
Borrower	India
Project	Assam Integrated Flood and Riverbank Erosion risk Management Investment Program
Loan No.:	To be determined (t.b.d.)
Date of Effectiveness	t.b.d.
Amount :	\$120 million (MFF)
Of which Committed, US\$	\$56.9 million (Tranche 1)
Executing Agency	Water Resources Department, Government of Assam
Approval Date of Original Procurement Plan	15 May 2010
Approval of Most Recent Procurement Plan	08 September 2010
Publication for Local Advertisement ¹	20 August 2010. (for consulting and NGO services) t.b.d. (for works contracts)
Period Covered by this Plan	48 months

Procurement Methods: Works and Goods	To be used above/below (\$)
NCB works ²	All works contracts less than \$ 10,000,000 Other than community works contracts ³
ICB goods	All goods greater than \$1,000,000
NCB goods	All goods greater than \$ 100,000 and less than \$1,000,000
Shopping Goods	Less than \$100,000
Exceptional Methods	See footnote 3.

Consulting Services	To be used above below (\$)
Quality Cost Based Selection (QCBS)	Greater than \$200,000 ⁴
Consultants Qualifications Selection (CQS)	Only for specific specialist services (less than \$200,000) with prior agreement of Project Director and ADB
Least Cost Selection (LCS)	Less than \$100,000

Procurement Packages under the First Periodic Financing Request

1. Civil Works

Contract Package No.	Contract Description	Value (million)	Date / Expected date of Advertisement	Mode of Procurement	Prior Review Y/N
1. Dibrugarh Subproject					
D-NCB-T1/E1	Raising and Strengthening of Dibrugarh Town Protection Embankment, 9.5 km	Rs. 130 \$2.9	1 July 2011	NCB	Y
D-NCB-T1/RBP1	Provision of revetments and pro-siltation measures in the reach Oakland to Bogibeel, total 2.4 km	Rs200 \$4.4	15 Oct 2010	NCB	Y

¹ General procurement notice, invitations to pre-qualify and to bid, calls for expressions of interest.

² For NCB procurement of works and goods). ADB in consultation with the SGOA and AIFRERMA will review and arrive at agreed procedures and documents to be applied under the National Competitive Bidding mode of procurement under the projects. The general conditions of contract follow the Fédération Internationale des Ingénieurs-Conseils (FIDIC) in its most recent version.

³ Small community works costing less than \$10,000 may be implemented through direct contract with the labor contracting groups formed under the concerned disaster management committees (DMCs), which has participated in the planning and design, and agreed to provide support for maintaining the facilities.

⁴ Full technical proposal required for services greater than \$1,000,000.

Contract Package No.	Contract Description	Value (million)	Date / Expected date of Advertisement	Mode of Procurement	Prior Review Y/N
2. Kaziranga Subproject					
K-NCB-T1/E1	Construction of 4.7 km of embankment	Rs 140 \$ 3.1	1 July 2011	NCB	Y
K-NCB-T1/DS1	Construction of 5 gated drainage sluices	Rs 140 \$ 3.1	1 Jan 2011	NCB	Y
3. Palasbari Subproject					
P-NCB-T1/E1	Construction of 4.9 km of embankment	Rs 66 \$ 1.5	1 July 2011	NCB	Y
P-NCB-T1/RBP1	Provision of revetments in the Palasbari Dhakala Hill area, total 4.9 km	Rs 103 \$ 2.3	15 Oct 2010	NCB	Y
P-NCB-T1/RBP2	Provision of revetments in the Gumi Zakirpur area, total 4.5 km	Rs 100 \$ 2.2	15 Oct 2010	NCB	Y
Total		Rs. 879 \$ 19.5			

2. Goods – Revetment Materials

Contract Package No.	Contract Description	Value (million)	Expected date of Advertisement	Mode of Procurement	Prior Review Y/N
D-G-T1/GC1	Procurement of geotextile container (110 x 80 cm), 720,000 Nos and geotextile sheet	Rs240 \$5.4	20 Sept 2010	ICB	Y
P-G-T1/GC1	Procurement of geotextile container (110 x 80 cm), 770,000 Nos and geotextile sheet	Rs260 \$ 5.8	20 Sept 2010	ICB	Y
P-G-T1/GC2	Procurement of geotextile container (110 x 00 cm), 700,000 Nos and geotextile sheet	Rs 230 \$ 5.1	20 Sept 2010	ICB	Y
P-G-T1/B1-10	Procurement of boulders for revetments and wave protection 67,000 m ³	Rs172 \$3.8	15 Dec 2010	NCB	Y
P-G-G1/GW1-3	Procurement of wire netting sheets for boulder crates 97,000 Nos	Rs70 \$1.6	15 Dec 2010	NCB	Y
Total		Rs.972 \$ 21.7			

3. Goods - Equipment and Supplies

Contract Package No.	Contract Description	Value ('000)	Expected date of Advertisement	Mode of Procurement	Prior Review Y/N
EQ-G-T1/GPS 1	Procurement of handheld GPS, 15 nos and distance measurement devices 5 nos	\$ 12.5	15 Oct 2010	Shopping	Y
EQ-G-T1/Computer	Procurement of 15 computers including licensed software, and ACAD, GIS	\$ 40.0	1 Nov 2010	Shopping	Y
EQ-G-T1/M&E 1	Procurement of 4 engine boats	\$ 100.0	1 Nov 2010	Shopping	Y
EQ-G-T1/M&E 2	Procurement of 4 double frequency echosounders	\$ 100.0	1 Nov 2010	Shopping	Y
EQ-G-T1/M&E 3.1	Procurement of 5 RTK – GPS	\$ 100.0	1 Nov 2010	Shopping	Y
EQ-G-T1/M&E 3.2	Procurement of 5 RTK – GPS	\$ 100.0	1 Nov 2010	Shopping	Y
EQ-G-T1/M&E 4	Procurement of 2 ADCP	\$ 60.0	1 Nov 2010	Shopping	Y
EQ-G-T1/M&E 5	Procurement of 12 floats	\$ 6.0	1 Nov 2010	Shopping	Y

Contract Package No.	Contract Description	Value ('000)	Expected date of Advertisement	Mode of Procurement	Prior Review Y/N
EQ-G-T1/M&E 6	Procurement of 8 ruggedized survey laptops	\$ 24.0	1 Nov 2010	Shopping	Y
EQ-G-T1/M&E 7	Procurement of 5 survey computer stations including printer	\$ 12.5	1 Dec 2010	Shopping	Y
EQ-G-T1/DB 1	Procurement of hydrometric database	\$ 50	1 Dec 2010	Shopping	Y
Total		\$605.0			

3. Consulting Services

Contract Package No.	Contract Description	Value ('000)	Expected date of Advertisement	Mode of Procurement	Prior Review Y/N
S-T1/CS 1	Institutional strengthening consultant	\$ 3,600	20 Aug 2010	QCBS (90:10)	Y
S-T1/CS 2	Project management consultant	\$4,200	20 Aug 2010	QCBS (80:20)	Y
S-T1/CS 3	Monitoring and Evaluation	\$200	15 Sept 2010	QCBS (80:20)	Y
S-T1/NGO 1-2	Resettlement, Implementing NGO	\$200	15 Oct 2010	CQS	Y
S-T1/NGO 3-5	NGO Social mobilization: disaster management committees	\$300	15 Oct 2010	CQS	Y
S-T1/morph	Morphological analysis of Brahmaputra reaches	\$100	1 Jan 2011	Individual	Y
S-T1/g-xsec	Gauging and cross sectional surveys	\$340	1 Jan 2011	QCBS (80:20)	Y
Total		\$8,940			