

**PROJECT INFORMATION DOCUMENT (PID)**  
**APPRAISAL STAGE**

Report No.: PIDA24644

<b>Project Name</b>	BD River Management Improvement Program - Phase I (P149734)
<b>Region</b>	SOUTH ASIA
<b>Country</b>	Bangladesh
<b>Sector(s)</b>	Flood protection (80%), General water, sanitation and flood protection sector (5%), General agriculture, fishing and forestry sector (15%)
<b>Theme(s)</b>	Water resource management (40%), Rural services and infrastructure (15%), Other environment and natural resources management (15%), Other rural development (20%), Natural disaster management (10%)
<b>Lending Instrument</b>	Investment Project Financing
<b>Project ID</b>	P149734
<b>Borrower(s)</b>	PEOPLE'S REPUBLIC OF BANGLADESH
<b>Implementing Agency</b>	Bangladesh Water Development Board (BWDB)
<b>Environmental Category</b>	A-Full Assessment
<b>Date PID Prepared/Updated</b>	02-Jun-2015
<b>Date PID Approved/Disclosed</b>	18-Jun-2015
<b>Estimated Date of Appraisal Completion</b>	10-Jul-2015
<b>Estimated Date of Board Approval</b>	19-Nov-2015
<b>Appraisal Review Decision (from Decision Note)</b>	

## I. Project Context

### Country Context

With a population of over 160 million, 53 million of which are below the poverty line, Bangladesh is one of the poorest and most disaster-prone countries in the world. The country is vulnerable to destructive floods, which typically inundate around 20 percent of the country annually. Moreover, 90 percent of the combined river catchment areas are located outside of Bangladesh, making it very difficult to regulate these flood flows. Such frequent, and often destructive floods, have had a severe impact on the economy, disproportionately affecting vulnerable groups, particularly the rural poor.

Despite frequent natural disasters, Bangladesh has sustained a good track record for growth and development. The country has an annual gross domestic product (GDP) of US\$840, which has grown by around 6 percent in the past decade. However, in order to build on past successes and

become a middle-income country by 2021, the government should continue making efforts to improve governance, capitalize on low labor costs, narrow infrastructure deficits, and reduce vulnerability to natural and external shocks, particularly flood hazards, which have remained a challenging and pressing development issue.

Feeding the rapidly growing population of Bangladesh calls for systematic reduction of flood risks to agricultural land. Around 70 percent of the population lives in flood-prone, rural areas, and over 43 percent of the labor force is engaged in agricultural activities. Therefore, the escalating flood risk must be addressed as it threatens the food security of the country.

Riverbank erosion causes displacement, further contributing to impoverishment in areas adjacent to the river. The northwestern part of Bangladesh, in particular, experiences frequent episodes of floods and riverbank erosion, followed by subsequent displacement of the people. Regular shifting and displacement depletes the resources of the people, as is evident from development indicators. The incidence of poverty is around 7 to 10 percent higher in such areas compared to the national average.

Existing challenges are exacerbated by inadequate institutional capacity, limited tools and resources to manage floods and riverbank erosion, and insufficient attention to operation and maintenance (O&M) of infrastructure. Climate change compounds the challenges further, posing additional future threats.

To address these challenges, investments must be made in improving infrastructure and strengthening institutions, which will not only support economic growth and poverty reduction but also address systemic challenges. This is particularly the case in the water sector where investments in flood infrastructure and institutions is instrumental in reducing poverty, especially given that high flood risk discourages investments in productive economic activities and contributes to persistent poverty.

### **Sectoral and institutional Context**

#### **Flood Control and Brahmaputra Right Bank Embankment Context**

Flood and erosion management have remained a continuing challenge in Bangladesh. Disastrous floods in the 1950s and 1960s heralded an era of large-scale flood control projects, out of which the Brahmaputra Right Bank Embankment (BRE) was born. Brahmaputra is referred to as Jamuna in Bangladesh and BRE is also called JRE and these names are used interchangeably. The BRE began as a 220-km embankment from Kaunia in Rangpur District to Bera in Padma District, constructed to protect Bangladesh's grain-growing northwestern zone from flooding. Before its construction, overbank spills would regularly cause flooding to a 240,000 ha area, adversely impacting economic output.

The original BRE was set back approximately 1.5 km from the river bankline. Shortly after its construction, the embankment came under river attack and breached at many locations. These breaches were typically closed by local BRE retirements at about 200 m setbacks to prevent flooding. As a result of this minimal setback distance, the BRE has been retired several times in many places. Presently, only 61 km of the original BRE remains intact, and many long reaches are close to the riverbank, making it increasingly vulnerable to breaches.

Between 1973 and 2014, nearly half of the arable land in these bankline upazilas was lost to the

river, and nearly 2,800 ha of homestead land eroded, displacing an estimated population of 168,000 people. This displacement has had negative effects on the riparian residents, who generally have high poverty levels, low health, and crowded low-quality dwellings with restricted access to civic amenities and roads.

Regular episodes of flooding and riverbank erosion continue to threaten the integrity of the BRE, causing subsequent displacement and exposing large rural and urban areas, such as Sirajganj, to destructive flooding and inhibiting economic growth.

#### Current Management Paradigm

The history of Bangladesh illustrates the high frequency with which water-related hazards occur. While Bangladesh has significantly reduced the impact of these hazards, efforts focus on emergency relief rather than systematically and proactively reducing vulnerability to flood and erosion hazards.

The Bangladesh Water Development Board (BWDB) continues to follow a response-based approach, providing riverbank protection where and when needed rather than seeking a long-term, sustainable solution to floods and erosion. The effectiveness of their efforts has been limited due to poor designs, insufficient maintenance, failure due to river erosion, and limited long-term planning. Current management practices are also inflexible in dealing with the dynamic nature of the river system and adapting to climate change. This has increased the vulnerability to flood disasters and undermined opportunities to safeguard economic development.

Given these unsuccessful attempts in managing floods and riverbank erosion, high priority needs to be accorded to improving the reliability of existing embankment systems with assured maintenance. Where feasible, riverbank protection needs to be provided in a systematic manner and should be adaptive enough to respond to the river's dynamic morphology. Cost-effective and sustainable innovations such as the use of geo-textile material should also be explored. Nonstructural measures need to be introduced, such as risk reduction, risk mapping and warning, and flood proofing. These should be pursued with sound knowledge development to understand complex morphology and floodplain hydrology and inform decisions based on this knowledge.

Since much of the existing water resources infrastructure has already exceeded its design life and requires rehabilitation, such a river management scheme on the Brahmaputra-Jamuna River will provide an opportunity to plan and design for climate change in a proactive manner.

#### Institutional and Water Sector Context

Since water management is a vital issue in Bangladesh, many government agencies are involved in the sector. Among the various institutions, the BWDB established in 1959 and mandated for managing of more than 400 rivers of total approximate length of 24,000 km, under the Ministry of Water Resources (MoWR), is the most significant organization, handling much of the expenditure in the water sector.

The BWDB has been in operation since 1959 and is responsible for preparing and implementing development projects related to flood control, drainage and irrigation, riverbank erosion, coastal development, and land reclamation. It is also responsible for the collection and dissemination of hydrologic and hydraulic data and the management of the Flood Forecasting and Warning Center.

While the BWDB is the implementing arm of MoWR, the Water Resources Planning Organization (WARPO) is the strategic and macro-planning arm. WARPO formulates policies, plans, strategies, guidelines, instructions, acts, and rules relating to the development and management of water resources. It has been involved in formulating the National Water Policy (1999), a Coastal Zone Policy (2005), the National Water Management Plan (2004), and the more recent Bangladesh Water Act (2013).

Within the water sector, it is recognized that flood and riverbank erosion is a critical challenge and development issue in Bangladesh. However, only short-term solutions have been provided to this lingering challenge and it is economically more sensible to provide a long-term, preventive solution that builds on lessons learned from previous efforts.

#### River Management Improvement Program

Successful river management for improved protection against flood and erosion requires long-term sustained efforts, not piecemeal attempts. The River Management Improvement Program (RMIP) is a comprehensive program that has been proposed to provide long-term solutions to floods and riverbank erosion, while also calling for better integrated river management. The program will be phased into three projects and will include structural and nonstructural interventions.

The RMIP will also support the BWDB in achieving the required flexibility in dealing with large-scale river stabilization and flood control projects and also, provide a ‘learning-by-doing’ approach in river management which would ultimately help in identifying a range of efficient and cost-effective engineering technologies to be implemented in phases as part of a larger program.

This programmatic approach will not only provide protection against riverbank erosion and flooding but also create the opportunity for developing an embankment road. The road is envisaged to become a major corridor linking various parts of the country. The development of such a corridor would reduce transport costs, improve accessibility, and finally promote private sector participation in the management and operation of road infrastructure in Bangladesh.

Along with the development of a corridor, the overall program will be the first step toward improving navigability of the river. The river training works under this program will serve as the first step toward improving navigation and inland water transport.

Phase I of the overall program is RMIP-I (that is, the proposed project), which will strengthen embankments and riverbank protection in a highly vulnerable reach of BRE—hereinafter called a priority reach (i.e. extends from Smila to Hasnapara). It will also heavily focus on nonstructural interventions, including O&M of civil works, resilience planning and management, institutional strengthening, and creating an Embankment Asset Management System (EAMS).

## II. Proposed Development Objectives

The overall program (RMIP) development objective is to reduce the adverse impacts of flooding and erosion along the Brahmaputra right embankment, enhance its sustainable management, and improve transport connectivity of the subregion.

The project-specific (RMIP-I) development objective is to increase protection against river flooding and erosion and improve flood and erosion management capacity along selected sections of the Brahmaputra River.

## III. Project Description

**Component Name**

Component A: Rehabilitation and Improvement of Brahmaputra River Embankment Scheme

**Comments (optional)**

This component will consist of the civil works required for embankment rehabilitation and associated riverbank protection works

Subcomponent A1: Embankment Rehabilitation and Improvement (US\$200 million).

Subcomponent A2: Bank Protection and Revetment (US\$265 million).

**Component Name**

Component B: : Implementation of Social and Environmental Management Plans

**Comments (optional)**

This component will implement planned social and environmental programs to mitigate the social and environmental risks in the project, including resettlement, and provide development assistance to local communities in the project area.

Subcomponent B1: Social and Resettlement Management Plan (US\$85 million).

Subcomponent B2: Environmental Management Plan (US\$15 million).

**Component Name**

Component C: : Institutional Strengthening, Capacity Building of the BWDB, Technical Assistance and Training, and Future Project Preparation and Strategic Studies

**Comments (optional)**

This component will finance consulting services and technical assessments to strengthen the strategic management and ongoing O&M of the flood and erosion protection schemes as well as the preparation of subsequent phases of the RMIP Program. This includes the following subcomponents:

Subcomponent C1: Strengthening of the BWDB, Independent Panel of Experts, and Technical Assistance (US\$20 million).

Subcomponent C2: Future Project Preparation and Strategic Studies (US\$20 million).

**Component Name**

Component D: Project Management Support, Construction Supervision, Monitoring and Evaluation of the Project Impacts, and Social and Environmental Management Plan

**Comments (optional)**

This component will cover consulting services for project implementation. This includes the following subcomponents:

Subcomponent D1: Construction Supervision and Implementation Support (US\$30 million).

Subcomponent D2: Third-party Monitoring and Evaluation of Project and Supervision of EMP, SAP, RAP (US\$5 million).

Subcomponent D3: Project Management Support and Audit (US\$10 million).

**IV. Financing (in USD Million)**

Total Project Cost:	650.00	Total Bank Financing:	600.00
Financing Gap:	0.00		
<b>For Loans/Credits/Others</b>			<b>Amount</b>
BORROWER/RECIPIENT			50.00
International Development Association (IDA)			600.00
Total			650.00

## V. Implementation

### Institutional and Implementation Arrangements

The government will have overall responsibility for project management and coordination through its MoWR. The proposed project is to be implemented by the BWDB, which will act as the Project Implementing Agency. The BWDB will be responsible for the implementation of the project through a PMU. A Project Steering Committee (PSC) will provide the forum for overall guidance, policy advice, coordination of the project activities, and addressing of interagency issues.

**Project Steering Committee.** The PSC will be chaired by the secretary of Ministry of Water Resources and will include as its members the secretaries of Departments of Environment, Fisheries, Forestry, Ministry of Land, Planning, Finance, Shipping, Communication, and Local Government. The PSC will oversee the project and provide policy-level guidance and inter-agency coordination for the project. The project director (PD) of the PMU will act as the secretary of the PSC.

**Project Management Unit.** The BWDB will set up a PMU to oversee the development and management of the project. The PMU will play a central role in carrying out procurement and FM functions. The PMU will also ensure compliance with all Bank rules, including FM and disbursement of funds and compliance with safeguards standards. The PMU will be led by a PD appointed by the BWDB. It will have a central project office located at the headquarters of the BWDB in Dhaka. The PD will preferably have the power of Chief or Additional Chief Engineer, and will report directly to the Director General (DG). The PMU will have three subordinate units: (a) Engineering Unit; (b) Procurement and Finance Unit; and (c) Social, Environment, and Communication Unit (SECU). The SECU will be established to supervise, among other things, the environmental screening, the environmental assessment (EA), the EMPs, RAP, and social mobilization and afforestation activities. The PMU will have one senior environment specialist, one senior social specialist, one senior forestry specialist, two senior revenue staff, and a communication officer at headquarters and two environment specialist, two social specialists, and two revenue staff at the field-level office. In addition to the central unit in Dhaka, two field-level offices will be set up, each headed by an executive engineer, recruited by the project. The field-level offices will be located in the Sirajganj and Bogra districts. The role of the PMU is, therefore, largely to contract competent organizations, carefully supervise their performance, enable them to perform efficiently, and ensure transparent and regular reporting to the MoWR and BWDB.

A PD for the project has already been named from the BWDB and given appropriate authority to begin project management. Given the size of the contracting packages, as well as the scope of overall management, designated staff will be recruited under the project to fill key positions. Positions can be filled either from BWDB's existing personnel, through external recruitment procedures, or through deputation from other government agencies. The project will have designated procurement and FM staff, as well as staff for the technical/engineering unit and the social, and environment that will report directly to the PD. All staff will be expected to serve for the duration of the project to ensure consistent implementation of the project. Externally recruited staff will be remunerated according to the GoB market rates.

**Funding flow.** The GoB contributions would be channeled through the BWDB according to the Development Project Performa. The BWDB will ensure that the cost of the approved programs is included in their respective ministries' budgets. For utilization of eligible project expenditure, the PMU will maintain one designated account (DA) where grant funds will flow under agreed terms and conditions.

## Results Monitoring and Evaluation

Monitoring the results and impacts of the project will consist of the following activities: Quarterly report. The PD will submit quarterly reports in an appropriate format to the PSC and the Bank no later than 45 days after the end of each quarter. The quarterly report will cover (a) progress toward achieving the results framework and all project key indicators; (b) the progress for each component and expected completion dates for civil works, equipment supply contracts, and consultancy contracts; (c) progress on implementation of SAP and EMP; and (d) progress in institutional strengthening, capacity building, training and studies.

Semiannual PSC meetings. The PSC will be called once a year to hold a review of the project progress and to raise or resolve any pending issues. Ad hoc meetings can also be called to discuss urgent issues.

The PD and PMU will be supported by a specialized M&E firm recruited under Component D2 of the project that will be responsible for monitoring project impacts. The M&E studies will evaluate the success in project implementation in terms of meeting the project's objectives and assess its physical, hydrological, environmental, social, and economic impacts. The M&E activities will provide continuous feedback to the GoB and the PSC on the project's performance and on mitigation of negative impact under various components so that corrective actions can be undertaken in a timely manner if necessary.

### Sustainability

The project sustainability hinges on strong project ownership of different stakeholders, client commitment, robust technical design, capacity building for improved O&M, strong environmental and social safeguards, as well as the long-term benefits from the sustained programmatic engagement in river management improvement.

The project physical interventions have been carefully designed to ensure its long-term sustainability. The embankment is accompanied by riverbank protection work to increase its protection against river erosion. The riverbank protection works increases the reliability of the embankment to be used as a road. The embankment crest and width are designed to account for climate change and uncertainty by adding extra freeboard to protect against higher floodwater levels. The strong design will reduce incidences of breaches and thereby reduce the cost for O&M.

The project's strong emphasis on institutional capacity building will further enhance its sustainability. Significant support for training will be provided to the BWDB O&M divisions along the BRE. This will include the deployment of advanced monitoring and river surveying instruments and tools to allow numerical manipulation and visualization of surveyed data for early detection and real-time O&M. In addition, a scalable asset management system will be developed for the BWDB to monitor the performance of the proposed water infrastructure over time. The system will be used to guide corrective measures to be implemented to avoid damage and failure and will allow for public inputs to detect the onset of distress or failure mode before expensive consequences occur.

Environmental and social aspects were an integral part of the proposed project design to avoid the potential of the project to imperil future economic and social development. Detailed environmental and social assessments have been undertaken and plans have been developed to mitigate adverse impacts. In terms of environmental sustainability, four fish passes and two regulators were

incorporated in the embankment for fish migration and to concurrently ensure connectivity of the river to the floodplain. Additional fisheries programs have been designed as mitigation against any adverse impacts. On the social side, the project will support the development of 15 resettlement villages, promote local area development, and carry out social programs through local NGOs to improve livelihoods of those living near the banks.

The programmatic engagement intends to scale up capacity building and ultimately develop a highway on top of the embankment that can create a revenue stream through toll collection. This will further ensure the long-term financial viability of the proposed project.

## VI. Safeguard Policies (including public consultation)

<b>Safeguard Policies Triggered by the Project</b>	<b>Yes</b>	<b>No</b>
Environmental Assessment OP/BP 4.01	x	
Natural Habitats OP/BP 4.04	x	
Forests OP/BP 4.36		x
Pest Management OP 4.09	x	
Physical Cultural Resources OP/BP 4.11	x	
Indigenous Peoples OP/BP 4.10		x
Involuntary Resettlement OP/BP 4.12	x	
Safety of Dams OP/BP 4.37		x
Projects on International Waterways OP/BP 7.50	x	
Projects in Disputed Areas OP/BP 7.60		x

### Comments (optional)

## VII. Contact point

### World Bank

Contact: Abedalrazq F. Khalil  
 Title: Sr Water Resources Spec.  
 Tel: 473-5456  
 Email: akhalil@worldbank.org

### Borrower/Client/Recipient

Name: PEOPLE'S REPUBLIC OF BANGLADESH  
 Contact:  
 Title: Additional Secretary, Ministry of Finance  
 Tel: 9180675  
 Email: addl-secy2@erd.gov.bd

### Implementing Agencies

Name: Bangladesh Water Development Board (BWDB)  
 Contact: Sarder Sirazul Hoque  
 Title: Additional Chief Engineer  
 Tel: -  
 Email: pdecrrp.bwdb@gmail.com



**VIII. For more information contact:**

The InfoShop  
The World Bank  
1818 H Street, NW  
Washington, D.C. 20433  
Telephone: (202) 458-4500  
Fax: (202) 522-1500  
Web: <http://www.worldbank.org/infoshop>