

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC15207

Project Name	BD RIVER BANK IMPROVEMENT PROJECT - PHASE 1 (P149734)
Region	SOUTH ASIA
Country	Bangladesh
Sector(s)	Flood protection (70%), General water, sanitation and flood protection sector (15%), General agriculture, fishing and forestry sector (15%)
Theme(s)	Water resource management (40%), Rural services and infrastructure (15%), Other environment and natural resources management (15%), Other rural development (20%), Natural disaster management (10%)
Lending Instrument	Investment Project Financing
Project ID	P149734
Borrower(s)	Economic Relations Division, Ministry of Finance
Implementing Agency	Bangladesh Water Development Board (BWDB)
Environmental Category	A-Full Assessment
Date PID Prepared/ Updated	23-Nov-2014
Date PID Approved/ Disclosed	23-Nov-2014
Estimated Date of Appraisal Completion	17-Jul-2015
Estimated Date of Board Approval	15-Sep-2015
Concept Review Decision	Track II - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

Bangladesh has over 160 million inhabitants, 53 million of which are below the poverty line. With a per capita GDP of US\$840 per year, Bangladesh is one of the poorest and most disaster prone countries in the world. Given its topography and climate, it ranks first in the world in terms of disaster vulnerability and sixth in terms of human exposure to floods. Frequent natural disasters severely impact the economy, disproportionately affecting the vulnerable groups, particularly the rural poor.

Despite significant developmental challenges, Bangladesh has sustained a strong annual GDP growth in recent years, averaging 5.8 percent between 2000 and 2010, and has made noteworthy gains in education, literacy, health, life expectancy and per capita food production. Building on

these successes in social and economic performance, Bangladesh aims to become a middle income country by 2021. Achieving this aim will require the Government of Bangladesh (GoB) to make concerted efforts in improving governance, narrowing the infrastructure deficits, reducing vulnerability to natural and external shocks, and capitalizing on low labor costs.

To feed a growing population and ensure future food security Bangladesh has to address the escalating flood risk that adversely impacts the country. Given that 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, achieving sustainable economic growth and reducing poverty will require significant investments in flood control schemes, strengthening associated institutions, and developing risk mitigation policies that are conducive to lasting change.

In order to provide better income opportunities to rural people in line with the Government's 6th Five-year Plan, improving the stability and connectivity along the river banks will be important. Secured river banks, maintained by capable institutions, will also pave the way for development along the riverbank, with the possibility of better transportation infrastructure along the river, improving accessibility in rural areas.

Together these measures will increase resilience in rural areas reducing human displacement due to river erosion and providing a more stable environment for social and economic development.

Sectoral and Institutional Context

The Government has created a highly supportive institutional and policy environment with water resources management as a major agenda in its development strategies. Among the various institutions, the Ministry of Water Resources (MWR) is the apex body responsible for the development and management of the entire water resources of the country, with the BWDB as its implementing arm. MWR, through its strategic and macro-planning arm—Water Resources Planning Organization (WARPO)—formulates policies, plans, strategies, guidelines, instructions, acts, and rules relating to the development and management of water resources, including the National Water Policy (1999), a Coastal Zone Policy (2005), National Water Management Plan (2004), and the more recent Bangladesh Water Act (2013). Through BWDB, MWR also prepares and implements development projects relating to flood control, drainage and irrigation, river bank erosion and control, coastal development and land reclamation. BWDB, which has been in operation since 1959, is responsible for the execution of flood, drainage and irrigation plans and development projects. It is also responsible for the collection and dissemination of hydrologic and hydraulic data and the management of Flood Forecasting and Warning Center. Since its inception, BWDB has been tasked with a number of development projects, some of which are outside the realm of the water sector.

In the 1960s BWDB constructed the 220-kilometer Brahmaputra Right Bank Embankment (BRE), from Kaunia in Rangpur District to Bera in Padma District, to protect the surrounding area from flooding and to improve agricultural production. Prior to the BRE construction overbank spills regularly caused flooding to a 240,000 hectares (ha) area affecting the livelihoods of hundreds of thousands of people. The BRE had a setback distance of about 1.5 kilometers from the Brahmaputra/Jamuna's river bank-line initially but over the years, due to bank erosion, the embankment has breached at several locations, retiring as many as seven times at some locations. Between 1973 and 2014, nearly half of the arable land in these bankline upazilas has been lost to the river and nearly 2,800 ha of homestead land have been eroded displacing an estimated population of

168,000 people. Furthermore, while the original Brahmaputra Right Embankment provided a transport link through a country side road, today's embankment only provides limited connectivity, due to this embankment erosion. Currently there is limited access to these areas, including access for emergency response and maintenance works.

Over the years, several major repair and upgrading projects were carried out to rebuild and strengthen the existing embankment structures but these have been ad hoc and piecemeal. The retired embankments were typically constructed with around a 200 meter setback distance to prevent flooding. In many places the embankment has been retired several times. Presently, nearly 60 kilometers of the original BRE remains intact, and many long reaches are close to the river bank-line, making closing of breaches increasingly costly. Consequently the integrity of the current embankment is being threatened and large areas of rural and urban areas, such as Sirajganj, are being increasingly exposed to flooding. Currently BWDB is following an approach based on erosion response. This means riverbank protection is built where and when needed. However, as the current embankment is regularly sustaining multiple breaches and setbacks, an erosion response approach is becoming increasingly difficult and expensive to maintain.

As a result of this cycle of flood and erosion the water resource sector in Bangladesh is facing major developmental challenges. These challenges are exacerbated by institutions with inadequate capacity, tools and resources to manage floods and erosion. Extensive erosion and insufficient attention to operation and maintenance of the embankments has heightened the vulnerability of the adjacent population causing widespread displacement whilst undermining the interlinked opportunities to safeguard economic development, improve livelihoods, and save lives and assets. This has had significant impoverishing impacts upon the displaced population along the river and contributed to poverty in Bangladesh. The incidence of poverty is around 7 to 10 % higher on the right bank upazilas compared to the national average, which is symptomatic of the impoverishing impacts of the floods. This finding is supported by significant empirical evidence at the macroeconomic level of a positive correlation between the development of infrastructure for flood and erosion protection, and GDP per capita or growth rates.

Climate variability will further accentuate the intrinsic risks facing the population. It is reported that under climate change there will be increased propensity for extreme monsoon outbreaks. Upgrading the flood and erosion control system is recognized as a key investment in reducing exposure of the population to climate risk and strengthening their resilience.

Given the recurring adverse impacts associated with floods and erosion, there is an increasing realization that a preemptive and pro-active approach to flood management; more efficient and cost effective engineering technologies; embankment protection, monitoring, and preventative maintenance; resilience planning and management; and finally a revenue-generating strategy as well as an institutional shift from purely asset creation to asset management are all essential parts of any environmentally, socially and fiscally sustainable strategy. This realization is increasingly reflected in GoB's sector policy.

The Proposed River Bank Improvement Program is composed of a successive and relatively focused individual projects with regular monitoring to address the aforementioned challenges – with each project learning from its predecessor towards a manageable Brahmaputra/ Jamuna River. In such a program, successes can be scaled up, accelerated and replicated. The overall program would improve flood and erosion control embankment infrastructure and build capacity within institutions.

The program area spans approximately 180 km of the river bank, affecting seven districts of approximately 4,650 sq. km. and a population of up to 7 million. The program is divided into three-phases. The first two phases will aim to address the flood and erosion control scheme and improve BWDB capacity to sustainably manage the scheme. The third phase will explore the development of an access controlled road on the rehabilitated embankment. The program total cost will be approximately US\$1500 million. Early feasibility assessment indicates that both embankment rehabilitation and road connectivity are economically justifiable on their own merits.

The first phase (RBIP-I) of the proposed program (this project) will improve flood and erosion control scheme in the priority reach. The priority reach is approximately 60-70 km, stretching from Sirajgang to Hasnapara, and is exposed to high rates of erosion as estimated by satellite imagery analysis. The priority reach experienced the highest loss of land during the last 40 years (i.e. 279 ha/km against an average of 198 ha/km along the entire BRE). The area directly protected by the priority reach is approximately 2,000 sq. km. with a population of nearly 2.5 million. Flood protection will be achieved through embankment development and river bank protection, along with capacity building of BWDB. Experiential learning has led to significant recent innovations, particularly the use of cost-effective sand-filled geo-textile bags for river bank stabilization. Phase I will build on the existing knowledge base and mobilize these new technologies in efforts to improve BWDB's capacity to effectively maintain the proposed scheme. Phase I will also support the development of detailed studies for the successive phases, including embankment rehabilitation and river bank protection work to be pursued on the remaining reaches, and road development. This Phase will also take into account resettlement and livelihood support for affected people of the priority reach.

During the second phase (Phase II), the focus will be on rehabilitating the flood and erosion control scheme on the remaining reaches (i.e. from Hasnapara to Dudkumar River in Kurigram district) of the Brahmaputra right embankment. This phase will also pursue other strategic studies for land reclamation and improved river navigability.

The third phase (Phase III) will focus on development of road along the crest of the embankment. Embankment schemes are traditionally used as roads in Bangladesh. The design of the embankment scheme to withstand a 1-in-100 years flood and to provide geotechnical stability is found to be associated with a crest width that lends itself to a 4-lane road. Therefore, this phase will seek to develop a road on top of the already rehabilitated embankment. Early traffic surveys suggest that a two-lane road is sufficient until 2025. After 2025, the road could be expanded to a 4-lane road. The development of roads over the rehabilitated embankment is not expected to be associated with substantial resettlement and land acquisition as the majority of this cost will be absorbed under Phase I and II. The potential to develop a road with toll collection plazas at strategic places makes such investment amenable to innovative financing modalities (e.g. combination of private capital and IDA guarantees).

The proposed program focuses on the areas of the river north of Jamuna Bridge and complements the ADB led investment program that addresses the aforementioned challenges through the development of 50 km of riverbank protection structures and 89 km of flood embankments South of Jamuna Bridge.

Phasing Timeline. Three overlapping 7-year phases are envisaged in the program. The phased

approach would help identify best practices within phases systematically and through feedback, help in refining and refocusing components as necessary to achieve objectives.

Relationship to CAS

The proposed program is in line with the Bank's twin goals of 1) Poverty Reduction and 2) Shared Prosperity that are brought about not only through the short-term immediate benefits from the project, such as avoided flood-associated damages but also the long-term, ancillary benefits, and future opportunities created from the project. These are presented below:

- (a) **Strengthened institutions:** The project will support capacity building of existing institutions, particularly the BWDB, providing them with the tools and capabilities to efficiently and effectively control floods and avoid flood and erosion related damages.
- (b) **Increased connectivity and accessibility:** Secured river banks will open the way for better transportation infrastructure along the river, thereby improving accessibility to the rural areas. This is also important step towards effective land reclamation and improved river navigability along the Brahmaputra/Jamuna River.
- (c) **Rural poverty reduction:** Investments and accessibility will create better job opportunities in the rural areas, catalyze economic development, and open new horizons of income opportunities for the poor. Strengthened flood embankments will create a predictable and less vulnerable environment that does not hinder investments.
- (d) **Reduced displacement:** Job opportunities and a more secure environment for the rural poor will reduce human displacement due to river erosion and provide a healthy and stable environment for social economic development in the project area.
- (e) **Long-term revenue-generation:** Developing controlled access roads with the possibility of including toll collection plazas will create a revenue-generating scheme that can contribute towards operation and maintenance costs, thus improving financial sustainability over the long-term.

The project would strongly support the 2011-14 CAS, as well as the revised November 20, 2013 CASPR. Specifically, the project would directly support Pillar 3: Vulnerability, Adaptation and Inclusion, Output 3.2: Disaster and Climate Change. It would make a focused and significant contribution to this output by improving embankment schemes and the associated river bank protection to reduce the incidence and impacts of flooding and erosion.

The project would also make a significant direct contribution to Pillar 3.1 (agriculture and food security) by reducing damage to crops and interruption to agricultural activity—particularly in the North West region that represents the country's bread-basket. The agricultural significance of the North West region comes from its favorable land topography, soil and climate for growing multiple essential crops. Any interruptions in agricultural production, whether from river erosion or flood in the region, would not only hurt the farmer but it would adversely affect food security in the country.

Further, the project would contribute directly and indirectly to Pillar 3.3 (women's empowerment) by providing improved job opportunities and livelihood restoration. The program would ultimately support the Pillar 2.2 by road infrastructure improvements that would contribute to increased accessibility and hence facilitate broad rural development.

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The objective of this program is to reduce the adverse impacts of flooding and erosion along the

Brahmaputra right embankment, enhance its sustainable management and improve accessibility along the BRE corridor.

The project specific PDO is to improve flood and erosion management capacity, and increase protection against river flooding and erosion along selected sections of the Brahmaputra River.

Key Results (From PCN)

The following key results are expected from the project:

- (i) Reduction in the number of people subject to adverse impacts of flooding and erosion.
- (ii) Reduction of the land area subject to adverse impacts of flooding and erosion.
- (iii) Asset management system established and used for decision making.
- (iv) Flood warning system established and operational.
- (v) Number of resettled households that have improved access to basic services (water and sanitation services as a minimum)

III. Preliminary Description

Concept Description

The proposed project RBIP-I (i.e. Phase I of the RBIP program) consists of the following components:

Component A: Rehabilitation and Improvement of Brahmaputra River Embankment Scheme (US \$375 million). This component would primarily consist of the civil works required for rehabilitation of embankment schemes and associated river bank protection works.

Component A1: Flood Embankment Rehabilitation and Improvement (US\$ 105 million). This component aims to increase community resilience to flooding. It will finance systematic strengthening of the existing degraded embankments and repairing and upgrading the associated drainage for improved flood management of project area. It is expected that 60-70km of embankment will be rehabilitated under this component.

Component A2: River Bank Protection and Revetment (US\$ 270 million). This component aims to increase community resilience to bank erosion and to provide increased protection against river attacks and embankment breaches. It is expected that 60-70 km of riverbank protection will be strengthened to cover priority areas that endanger the stability of the embankment.

Component B: Implementation of Social and Environmental Management Plans (US\$135 million). This component will implement the planned social and environmental programs to address the negative social environmental issues under the project, including resettlement, and provide development assistance to local communities in the project area.

Component B1: Resettlement and Social Development (US\$ 120 million). The aim of the Social and Resettlement Management Plan (SRMP) is to mitigate the adverse impacts of the project, improve the living standard of those affected and provide assistance to promote local area development along the embankments, by addressing the social dimensions of the project, and finance implementation of such plans. The proposed civil works will require land acquisition (i.e., approximately 330 ha) and relocation of many people (i.e. in average 70 households per km of the priority reach with average family size is of four per household, a total of some 20,000 people). The

SRMP plans: (i) compensation for lost assets, resettlement and livelihood restoration for the population affected by the project; (ii) gender and public health action plans; (iii) a communication strategy, grievance mechanism and a plan for ongoing stakeholder engagement; and (iv) local development assistance to communities along the embankment.

Component B2: Environmental Management (US\$ 15 million). All construction-related environmental issues would be addressed in the construction contracts; thus the cost of such measures is included in Components A. This component would include those aspects which are not or cannot be covered under construction contracts, including measures addressing indirect and cumulative impacts, development and implementation of programs for ecological conservation, and costs associated with monitoring and supervision of Environmental Management Plan (EMP) implementation. This will also support the development of EIAs for all remaining embankment and river bank protection works and road development to be carried out in subsequent phases of the proposed program.

Component C: Institutional Strengthening, Capacity Building of BWDB, Technical Assistance and Training and Future Project Preparation and Strategic Studies (US\$ 20 million). This includes:

Component C1: Strengthening of BWDB, Independent Panel of Experts and Technical Assistance (US\$ 15 million). This sub-component will provide strategic support for enhancing central-level institutional capacity and increase the use of non-structural measures in flood and erosion management. It will also strengthen BWDB capacity to carry out effective operation and maintenance (O&M) programs of the embankment scheme and the associated river bank revetment and road. This will also aim to improve O&M divisions and monitoring cells through office upgrading, capacity building, and modern survey equipment to support timely embankment O&M. This subcomponent will also develop BWDB capacity for community mobilization for sustainable O&M. This will also support the development of embankment asset management system and improve the flood early warning systems. It will also support the recruitment of independent panel of experts to provide expert technical advice necessary for efficiently and effectively addressing the flooding, river control, economic, environmental and social impacts, and other project related issues as well as provide BWDB with long term strategic planning regarding Jamuna River management.

Component C2: Future Project Preparation and Strategic Studies (US\$ 5 million). This sub-component would support strategic studies to address technical, financial, or management issues, mitigation measures, pilot nonstructural interventions and plans and preparation of future projects that may be identified during Project implementation and agreed upon with the Bank. For examples, this subcomponent would finance: (i) strategic studies including the continuous updating of the strategic assessment /master plan to look into river training, flood control schemes, and river navigation and other preparatory studies for following phases of the RBIP; (ii) a feasibility study to assess different toll options; and (iii) establish framework of collaboration among allied institutions to improve integration of structural and nonstructural measures in flood and erosion management and overall water resources planning.

Component D: Project Management Support, Construction Supervision, Monitoring and Evaluation of the Project Impacts and Social and Environmental Management Plan (US\$ 50 million). This includes:

Component D1: Construction Supervision and Implementation Support (US\$ 25 million). This sub-

component would cover the cost of consulting and other services for the Project implementation. It will finance consulting services for (i) surveys, designs of remaining embankment improvement and (ii) construction supervision of civil works. It would also cover implementation of all activities under the Project, including: procurement, contract administration, quality control, certification of payments, financial management, preparation of any additional designs, and bidding documents.

Component D2: Third Party Monitoring and Evaluation of Project, and Supervision of GAPP, EMP, SRAP (US\$5 million). This sub-component aims at ensuring effective Project monitoring and evaluation. It will finance consulting services for continuously monitoring project activities and providing feedback to the government and the implementing agency on the Project's performance. This includes supervising the implementation of the Governance and Accountability Action Plan (GAAP), EMP and Social Resettlement Action Plan (SRAP). This will be provided through third party assessment and monitoring of key aspects of project/program implementation.

Component D3: Project Management Support and Audit (US\$ 20 million). This sub-component would support BWDB in implementing Project-related activities, including support for operation of the Project Management Unit (PMU), capacity building, and incremental allowances for Project's staff, operational cost, and audits, etc.

Project Cost

The total project cost is US\$ 580.00 million. RBIP-I will be financed by jointly by IDA and GOB. The financing composition is as follows : (i) IDA is expected to contribute a total financing of about US\$500 million; and (ii) GOB is expected to contribute the remaining costs.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
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	

V. Financing (in USD Million)

Total Project Cost:	580.00	Total Bank Financing:	500.00
Financing Gap:	0.00		
Financing Source			Amount
BORROWER/RECIPIENT			80.00

International Development Association (IDA)	500.00
Total	580.00

VI. Contact point

World Bank

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

Borrower/Client/Recipient

Name: Economic Relations Division, Ministry of Finance
 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

VII. 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>