

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

Report No.: PIDA891

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Project Name	Coastal Embankment Improvement Project - Phase 1(CEIP-1) (P128276)
Region	SOUTH ASIA
Country	Bangladesh
Sector(s)	General water, sanitation and flood protection sector (60%), General agriculture, fishing and forestry sector (30%), Other social se rvices (10%)
Lending Instrument	Specific Investment Loan
Project ID	P128276
Borrower(s)	Ministry of Water Resources
Implementing Agency	Bangladesh Water Development Board
Environmental Category	A-Full Assessment
Date PID Prepared/Updated	02-Apr-2013
Date PID Approved/Disclosed	03-Apr-2013
Estimated Date of Appraisal Completion	18-Apr-2013
Estimated Date of Board Approval	20-Jun-2013
Decision	

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I. Project Context

Country Context

Bangladesh is a hydraulic civilization situated at the confluence of three great trans-Himalayan rivers — the Ganges, the Brahmaputra or Jamuna, and the Meghna (GBM). The GBM river system marks both the physiography of the nation, as well as the culture and livelihood of the people of Bangladesh. While over 90 percent of the GBM catchment lies outside of Bangladesh, approximately 200 rivers and tributaries of the GBM drains through the country via a constantly changing network of estuaries, tidal inlets, and tidal creeks, before emptying out into the Bay of Bengal . Thus, the coastal zone of Bangladesh, the lowest landmass of the country, is continually influenced by these Himalayan drainage ecosystems that join to form one of the largest, youngest, and most active deltas in the world.

Bangladesh has made remarkable progress toward achieving the poverty reduction targets set by the Millennium Development Goals for 2015. Sustaining annual growth rates of around 6% in the past decade, the country has witnessed a profound social transformation with an influx of girls into the education system and women into the labor force. Economic growth has pulled 16 million people out of poverty in the last 10 years. Despite these successes Bangladesh faces considerable development challenges posed by its low and flat topography and vulnerability to floods, torrential

rains, erosion, and sever cyclonic storms and tidal surges especially in the coastal zones.

The coastal zone spans over 580 km of coastline and is prone to multiple threats. Sixty-two percent of the coastal land has an elevation of up to 3 meters and eighty-three percent up to 5 meters above mean sea level . The coastal zone constitutes 32 percent of the land area and hosts nearly 28 percent of the population (i.e., nearly 42 million). The coastal population is projected to grow to 61 million by 2050 . Coastal districts are characterized by a high pace of population growth. This trend continues to push millions of people to live in the low lying coastal areas, which are highly vulnerable to natural hazards. Poverty indicators in the coastal area show a higher percentage of population living below the absolute poverty line compared to the rest of the country .

The achievement of food self-sufficiency remains a key development goal for the country. The poor spend a large majority of their income on food (those under the poverty line spend almost 65-70% of their income on food), while many farmers derive much of their income from producing food. The inter-connected nature of the livelihoods of the poor and food production suggests that an increase in the vulnerability of farmers in the coastal areas will have large negative consequences on the welfare of both farmers and poorer consumers across the country.

Women in the coastal areas are the most vulnerable to climatic changes. In the coastal area, women's daily activities are closely related to natural resources and therefore are highly at risk from climate variability. Changes in precipitation and temperature patterns and increased risk of storm surge and tidal flooding disproportionately affect the livelihood of women and their families. Poor people largely depending on subsistence agriculture for their livelihoods are the least able to cope with such changes. These and other pressures force large numbers of people (mostly men) to move out of their rural communities and towards large cities or abroad seeking better income. [In 2012 nearly \$12.8 billion came from remittances ; this represented about 12% of GDP and is projected to reach 16% by 2014-15]. This additional challenge posed by out-migration, leaves women with the extra burden of managing their households, the elderly, the sick, and the young while continuing the farming operations needed to sustain the family.

The years 2007 and 2009 were indicative of the vulnerability of coastal population and the development challenges faced by the government. Severe flooding from July to September 2007 along the Ganges and Brahmaputra rivers affected the lives and livelihoods of over 13 million people and caused extensive damage to agricultural production and physical infrastructure. This catastrophic flood event was shadowed by cyclone Sidr, which made landfall across the southern coast on November 15, 2007, further causing over 3,400 deaths. The cyclone destroyed over a million tons of rice and incurred over US\$1.6 billion in damages and losses. The concurrent increase in international prices of oil and food placed further strains on both government budgets and household livelihoods. In May 2009, cyclone Aila caused 3-6 meters storm surge in western Bangladesh and the Sundarbans, 179 fatalities, flooding that affected 400,000 people, widespread diseases impacting over 10,000 people and over US\$0.5billion in damages.

II. Sectoral and Institutional Context

Sectoral Context

The government has always sought to buffer the socioeconomic activities and assets of the coastal population from natural hazard risks. Their commitment to develop a safe and inhabitable coastal zone dates back to the 1960s. Compelled by the call for intensive rice cultivation during the green

revolution, the government constructed a series of embankments and polders in order to provide tidal flood protection for coastal population. This enabled intense crop production and agricultural growth. The Bank became involved in coastal area protection through the Coastal Area Rehabilitation Project (Cr 339-BD) following the devastating cyclone of November 1970. The government requested further Bank assistance that resulted in the Coastal Embankment Rehabilitation Project in 1995. Coastal embankment projects put in place regulators and other structures to control water intake and drainage of polder areas with the primary principle of improving agriculture productivity. Overall, the government invested about US\$10 billion towards the development of structural (i.e. cyclone shelters, cyclone-resistant housing) and non-structural (i.e. early warning and awareness raising systems) disaster mitigation and preparedness systems.

Continuous investment since 1960s has resulted in the establishment of 2,130 cyclone shelters, 139 polders, 2,900 water control structures for drainage, and improved early warning systems. These investments have mitigated the exposure to natural catastrophes and significantly saved lives and property during extreme events. In addition, rural households have adapted their farming systems to the occurrence of floods by switching from low-yielding, deep-water rice to high-yielding rice crops. As a result, the scale of the agricultural production in Bangladesh has seen an increase of up to 200 to 300 percent in certain areas. The construction of polders along the entire coastal belt provided protection to the people and their agricultural land. Today, 1.2 million hectares of land is utilized for agricultural purposes within the coastal embankment system. This represents almost 15% percent of Bangladesh's total arable land. Overall, polderization has altered the landscape of the Bangladesh coastal zone in ways that contributed to enhanced livelihood and food security for the growing population (see Annex 7 for Polder Map).

Notwithstanding the security and enhanced resilience brought by polders, the vulnerability of the coastal population is on the rise due to climate change. Climate variability will accentuate the intrinsic risks facing coastal Bangladesh. These risks span: (i) cyclones and storm surges (ii) river bank erosion and vulnerability of islands and chars, (iii) sea level rise, (iv) saline intrusion, and (v) coastal erosion. A lack of investment to retrofit and upgrade the polders scheme will weaken their capacity to mitigate against natural hazards and protect livelihoods and assets. A recent study on the cost of adapting to extreme weather events in a changing climate indicated that if a 10 year return period cyclone hit the coastal area today, about 8 million people will be affected by inundation depths greater than 3 meters. With population growth, that figure is projected to increase to 13.5 million by 2050. However, given the potential impact of climate change, an additional 9 million coastal inhabitants will be exposed to inundation depths greater than 3 meters. The study identifies which polders will likely be overtopped by intensified storm surges under the climate change scenarios. The study further makes the case that investing in adaptation measures today will provide huge savings in the future by minimizing the damages associated with extreme weather events.

Primarily, the coastal embankment system brought immense benefits to the people living along low lying areas. The system was designed originally to protect against the highest tides, without much attention to storm surges. Recent cyclones brought substantial damage to the embankments and further threatened the integrity of the coastal polders. In addition embankment breaches due to cyclones, siltation of peripheral rivers surrounding the embankment caused the coastal polders to suffer from water logging, leading large scale environmental, social and economic degradation. Poor maintenance and inadequate management of the polders have also contributed to internal drainage congestion and heavy external siltation. As a result, in some areas, soil fertility and good agriculture production are declining due to water logging and salinity increases inside the polders.

All the above reasons have led the Government to re-focus its strategy on the coastal area from one that only protects against high tides to one that provide protection against frequent storm surges. The government has recognized the need for a systematic approach to upgrade the coastal embankment system to protect against an appropriate return period and be based on robust local risk and vulnerability assessments. Moreover, the embankment program needs to be integrated with an afforestation program, particularly on the foreshore, as greenbelts of mangrove and other species have proven to significantly reduce storm surge damage . Restoration of the embankment system is a much needed catalyst to provide resilience to vulnerable communities and to revitalize the coastal zone's ailing socio-economic engine .

Institutional Context

The Government has created a highly supportive policy environment for mainstreaming coastal development, water resources management, disaster risk management, and climate change adaptation agendas in its major development strategies.

Coastal Zone Development. The government of Bangladesh, like in many other countries, is highly departmentalized, with innumerable agencies under different Ministries having their own focused mandate. However, development problems do not occur departmentally; they appear in a complex web of interrelationships that can only be addressed through concerted efforts by more than one agency. This complexity is very apparent in the management of the coastal zone area. As such, since 1999 the Government has developed the concept of an Integrated Coastal Zone Management (ICZM) as a response to the administrative fragmentation. The concept is to create a common vision for the development of the coastal area and to translate this vision into actions and operations. As part of the effort under ICZM, the Government has promulgated the Land Use Policy (2001), Tsunami Vulnerability Map (2005), the Coastal Zone Policy (2005) and the Coastal Development Strategy (2006) . The Coastal Zone Policy was the first sectoral policy to explicitly include climate change impacts and actions.

Water Resources Management. The Ministry of Water Resources (MWR) is the apex body of the government responsible for the development and management of all of Bangladesh's water resources. It prepares and implements development projects relating to flood control drainage and irrigation, river bank erosion and control, delta development and land reclamation. It is also responsible for constructing barrages, regulators, sluices, canals, embankments and sea-dykes along the banks of the rivers and coasts. The Bangladesh Water Development Board (BWDB), in operation since 1959, is the implementing arm of the MWR in the execution of flood, drainage and irrigation plans. BWDB is also responsible for the collection and dissemination of hydrologic and hydraulic data and the management of the Flood Forecasting and Warning Center. The Water Resources Planning Organization (WARPO) is the strategic and macro planning arm of MWR. In collaboration with other government sectors, BWDB and WARPO coordinated and prepared the National Water Policy (1999), the Coastal Zone Policy (2005), and the National Water Management Plan (2004).

Food security and poverty levels are highly sensitivity to climate change induced risks. With its particularly sensitive and extensive coastline, the country faces the urgent challenge of building the resilience of coastal communities to cope with climate impacts. These communities are often also

the poorest. The expected rise in the sea level is likely to worsen the situation. Climate change is anticipated to lead to more intense and frequent cyclones, floods, and sea level rise and associated salinity intrusion in the coastal areas leading to growing pressure on ensuring adequate food security and nutrition. This pressure on nutrition and health will be particularly acute for women and children, who face difficulties in the aftermath of a natural disaster event. Not only cyclones cause significant crop damage in coastal areas but they also severely hamper agriculture activities in the following years because saline sea water from storm surges is often deposited on agricultural lands, resulting in food stock shortages for at least two years. The recurrence period for a major cyclone and widespread flooding in Bangladesh is approximately three years, necessitating improved protection of the assets that provide livelihoods for the population of the coastal areas.

Disaster Risk Management. After the 1991 cyclones that claimed nearly 140,000 lives, Bangladesh's ability to manage disaster risks, in particular floods and cyclones, has substantially improved. This has been the result of a gradual shift from a response-based approach to a strategy that incorporates elements of greater emergency preparedness, early warning, and risk mitigation. Bangladesh's Second Poverty Reduction Strategy Paper provides for strengthening disaster management and risk reduction, mainstreaming disaster management into national policies and enhancing community capacity for disaster preparedness and risk reduction. The National Plan for Disaster Management (NPDM) (2010-2015) is centered on the following strategic pillars: (i) risk identification and assessment; (ii) strengthening and enhancing emergency preparedness; (iii) institutional capacity building; (iv) risk mitigation investments; and (v) introducing catastrophe risk financing in the longer term. The underlying principles of the NPDM are that both the loss of life and the economic impact of disasters can be reduced through advance planning and investment. Further, these actions should be both affordable and efficient in their delivery mechanisms. The proposed upgrading of the embankment system is recognized as a key pro-active investment to build the resilience of coastal populations. The Ministry of Disaster Management and Relief is the apex institution responsible for coordinating national disaster management interventions across all agencies.

Coastal embankments are an integral part of the disaster risk reduction program for Bangladesh. There is clear evidence that embankments provided an effective buffer during the tidal surge resulting from Cyclone Sidr. Damages and losses are much lower and lives were saved in areas where effective embankments were present. After Cyclone Sidr, extensive consultations occurred between government agencies, development partners and the World Bank to prepare a Long Term Disaster Risk Reduction Program. The five strategic pillars of this program, estimated to cost about US\$4 billion, are: (i) risk identification and assessment; (ii) strengthening and enhancing emergency preparedness; (iii) institutional capacity building; (iv) risk mitigation investment (mostly multi-purpose cyclone shelters and rehabilitation and upgrading of the embankment system), and (v) introducing catastrophe risk financing in the long term.

Climate Change Policies and Pilot Program for Climate Resilience (PPCR). The government launched the National Adaptation Program of Action (NAPA) back in 2005. The NAPA highlights the main adverse effects of climate change and variability on various economic sectors and identifies a list of adaptation needs. In 2009, Bangladesh was one of the first countries to prepare a Bangladesh Climate Change Strategy and Action Plan (BCCSAP). The BCCSAP is a 10 year program to build the capacity and resilience of the country to meet the challenges associated with climate change. The rehabilitation and upgrading of coastal embankments is a prime objective of the strategy. Bangladesh is also one of nine countries selected to participate in the Pilot Program for

Climate Resilience (PPCR) established under the multi donor Climate Investment Fund (CIF). Bangladesh uses PPCR resources to implement a broad strategy for achieving climate resilience at the national level. The development of a Strategic Program for Climate Resilience (SPCR) provides a medium and long-term vision for enhancing the country's resilience to climate challenges. The SPCR, approved in November 2010, identifies 5 priority activities -for a total envelop of US\$ 110 million- designed to support the implementation of the SPCR . The proposed CEIP-I, is one of these 5 priority activities and is intended to increase the resilience of coastal infrastructure. In order to ensure proper coordination of all PPCR financed activities in Bangladesh, a Quarterly Status Report is prepared with input from the World Bank, the IFC and the ADB. The most recent quarterly report includes a section on emerging lessons designed to capture and exchange lessons and knowledge between activities. In addition, the two PPCR focal points in Bangladesh (from ERD and MOEF) hold regular review meetings with all implementing agencies to ensure proper coordination and knowledge exchange.

III. Project Development Objectives

The project development objectives are to (a) increase the area protected, in selected polder, from tidal flooding and frequent storm surges, which are expected to worsen due to climate change; (b) improve agricultural production by reducing saline water intrusion; and (c) improve the Government of Bangladesh's capacity to respond promptly and effectively to an eligible crisis or emergency.

IV. Project Description

Component Name

Rehabilitation and Improvement of Polders
 Implementation of Social Action and Environment Management Plans;
 Construction Supervision, Monitoring & Evaluation of Project Impact, Supervision of Social and Environment Plans, and Coastal Zone Monitoring
 Project Management, Technical Assistance, Training and Strategic Studies
 Contingent Emergency Response

V. Financing (*in USD Million*)

For Loans/Credits/Others	Amount
BORROWER/RECIPIENT	0.00
International Development Association (IDA)	375.00
Climate Investment Funds	25.00
Total	400.00

VI. Implementation

Institutional and Implementation Arrangements (Annex 3)

The Government would have overall responsibility for project management and coordination through its Ministry of Water Resources. A Project Steering Committee would provide the forum for overall guidance, policy advice and coordination of the project activities and addressing the inter-agency issues. The proposed project is to be implemented by BWDB, which will act as the Project Implementing Agency. BWDB will be responsible for the implementation of the Project through a PMU.

Project Steering Committee (PSC). The PSC would be chaired by the Secretary of Water Resources and will include the Secretaries of Finance, Agriculture, Environment, Public Health Engineering, Forestry and Wildlife, the Chief Executive officer of selected NGO, and representatives of the local/district administration as its members. The PSC will oversee the project; provide policy-level guidance and inter-agency coordination for the project. The Project Director of the PMU will act as the secretary of the PSC.

Project Management Unit (PMU). BWDB will set up a PMU to oversee the development and management of the project. The PMU, will be led by a project director appointed by BWDB. It will have a central project office located at the headquarters of BWDB in Dhaka. The PD will have the rank of Chief Engineer, and will report directly to the Director General (DG). The PMU will have 3 subordinate units: (i) Engineering Unit; (ii) Procurement and Finance Unit; and (iii) Social, Environment and Communication Unit (SECU). The SECU will be established to supervise, among other things, the environmental screening, the EA, the EMPs, SAP, RAP and social mobilization and afforestation activities. The PMU will have one senior environment specialist, one senior social specialist, one senior forestry specialist, one senior revenue staff and a communication officer (see Figure 1) at headquarters and one environment specialist, two social specialist and two revenue staff at the field level. In addition to the central unit in Dhaka, 3 Field Level Offices (FO) will be set up, each headed by an Executive Engineer, recruited by the project. The FOs will be located in each of the three main project districts, namely Khulna, Patuakhali/Barguna, and Bagerhat. The role of the PMU is, therefore, largely to contract competent organizations, to carefully supervise their performance, to enable them to perform efficiently, and to ensure transparent and regular reporting to MoWR and BWDB.

Collaboration with Bangladesh Forestry Department. The implementation of the afforestation activities (Component A2) will be undertaken by the BWDB in close collaboration with the Bangladesh Forestry Department (BFD) and social and environmental NGOs. To ensure the integration of afforestation activities into the project, a Senior Forester will be part of the PMU. The Forester will either be deputed from BFD or externally recruited.

VII. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
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

VIII. Contact point

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