

SECTOR ASSESSMENT (SUMMARY): FLOOD PROTECTION SUBSECTOR UNDER THE AGRICULTURE AND NATURAL RESOURCES SECTOR¹

Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. The livelihoods of people in Bangladesh are often affected by water-related disasters including floods, riverbank erosion, drought, cyclones, saline intrusion, and tidal surges, some of which are directly related to the location of the country on a vast flat floodplain at the confluence of the three main rivers—the Jamuna (and Padma), the Ganges, and the Meghna—totaling 1.74 million square kilometers (km²) of the catchment area.

2. Riverbank erosion is one of the most prominent disasters in Bangladesh, especially along the Jamuna and Padma rivers, caused by dynamic river channel shifting. An estimated 5,000 to 6,000 hectares (ha) of land was lost annually from the 1960s until about 2000. Around 3,000 ha of land has been lost annually since about 2000. About 2,000 km² of land has been eroded along the Jamuna and Padma rivers over the last 40 years since about 1972. This process affects about 100,000 people annually, including the poor, who face significant social hardships such as loss of homestead, lands, and/or crops, and are displaced to fringe lands or urban slums.

3. Flood inundation also causes losses. Combined with flat topography, unstable riverbank alignments have made flood protections in the country challenging. Active riverbank erosions demolish existing flood embankments; and the lack of reliable and stable riverbank erosion protection structures discourages the construction, rehabilitation, and/or restoration of systematic flood embankments. About 20% of the country is submerged under floodwater during the monsoon season every year, and inundation extends up to about two-thirds of the country during large floods. Inundation causes loss of assets and infrastructure damage, and restricts agriculture productivity. Disaster risks increase with the growth of the population, and the high population density of Bangladesh restricts the scope for moving people away from disaster-prone areas. These disasters would be exacerbated by global climate change.²

4. Poverty and low economic growth in Bangladesh are largely associated with the exposure to flood and riverbank erosion disasters. The poor landless are often shifted to disaster-prone lands, and the poverty incidence tends to be high in riverine districts. The threat of frequent flood and riverbank erosion disasters discourages investment, and leads to lower economic growth of riverine areas. Hence, effective and strategic flood and riverbank erosion risk management of the main rivers is essential for the poverty reduction and economic growth of riverine districts. Benefits of the stabilized main rivers will contribute to nationwide economic growth through the creation of more stable and useful lands.

5. Floodplains are partially protected by flood embankment and riverbank protection structures, constructed by Bangladesh Water Development Board (BWDB) using its own funds or under externally funded projects, including the Asian Development Bank (ADB) funded

¹ This summary is based on Asian Development Bank (ADB). 2011. *Country Partnership Strategy: Bangladesh, 2011–2015*. Manila.

² ADB. 2010. *Final Reports on Impacts of Climate Change on the Morphological Processes of the Main Rivers and Meghna Estuary of Bangladesh*. Consultant's report. Manila (Research fund under the Pilot and Demonstration Activities Program).

Jamuna–Meghna River Erosion Mitigation Project.³ However, the existing riverbank protections are ad hoc piecemeal measures for emergency protection at progressively eroded sites.

6. Coping with these challenging and complex flood and riverbank erosion problems in Bangladesh requires more strategic and holistic flood and riverbank erosion risk management. This includes:

- (i) comprehensive understanding of the river morphology of the main rivers;
- (ii) more strategic planning and intervention for flood and riverbank erosion management, based on comprehensive understanding of the river morphology;
- (iii) more effective integration of structural and non-structural measures;
- (iv) sustainability of measures;
- (v) higher stakeholder participation to explore the above;
- (vi) measures to address uncertainties of unexpected natural disasters, including potential impacts of global climate change; and
- (vii) strengthened institutional capacity, including coordination capacity.

2. Government's Sector Strategy

7. Economic growth with equity and social justice, and poverty reduction, are the main objectives of the government's Sixth Five-Year Development Plan, 2011–2015—in line with the Government's Perspective Plan, 2010–2021.⁴ Sustainable management of rivers and enhancement of climate change resilience, including disaster risk management, are considered essential to accomplish the growth and poverty reduction objectives.

8. The government has been making progress in establishing a sound policy, planning, institutional, and legal framework for the water sector since the 1990s. The National Water Policy (NWP) was approved in 1999, as one of the outcomes of Flood Action Plan studies conducted from 1990 to 1995 under the coordination of 16 development partners, including ADB, to identify critical needs of the water sector. The NWP established sector goals and guidelines to manage critical resources effectively. It adopted the principles of integrated water resources management, with emphasis on stakeholder participation; strategic planning; decentralization; sound management of social and environmental issues; sustainable operation and maintenance (O&M) through management transfer to users' groups; and autonomy, transparency, and accountability of sector institutions. The NWP's focus includes undertaking surveys and investigation of the problem of riverbank erosion, and developing and implementing master plans for river training and erosion control works for the preservation of scarce land and prevention of landlessness and pauperization.

9. The government prepared in 2001 and approved in 2004 a National Water Management Plan (NWMP), which provides a framework for short- (5 years), medium- (10 years), and long- (25 years) term strategy and priority programs. Building on the NWP, the NWMP established eight focal agenda and identified 84 national-level programs proposed for implementation over

³ ADB. 2002. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of Bangladesh for the Jamuna-Meghna River Erosion Mitigation Project*. Manila (Loan 1941-BAN (SF), approved on 25 November 2002 for \$42.2 million equivalent, and closed on 30 June 2011).

⁴ Government of the People's Republic of Bangladesh, Planning Commission. 2011. *Sixth Five Year Plan FY2011–FY2015: Accelerating Growth and Reducing Poverty*. Dhaka; Government of the People's Republic of Bangladesh, Planning Commission. 2012. *Perspective Plan of Bangladesh 2010–2021: Making Vision 2021 A Reality*. Dhaka.

the next 25 years from 2000.⁵ The “main river” is one of the eight focal agenda, with an allocation of nearly 25% of the overall estimated costs. It covers four main themes: (i) development of the main rivers, (ii) fresh water supply, (iii) a viable and affordable plan to deal with the river erosion problem, and (iv) hydropower. The National Water Act, approved in 2013, aims to govern the utilization and management of water comprehensively.

10. Stabilization of the main rivers is government’s long-term goal, which would boost its overarching goal of national economic development. The recent feasibility study and pilot testing plans for dredging in the main rivers, amounting to about Tk10 billion, indicate the government’s strong interest.

11. The National Plan for Disaster Management, 2010 aims to reduce the risk for people, especially the poor and the disadvantaged, of the effects of natural, environmental, and human induced hazards. As the Disaster Management Act, 2012 supports, risk management has shifted from a reactive recovery and relief approach toward a proactive approach focused on preparedness and prevention. This preventive approach is essential for effective disaster management given the high population density, and the increasing assets on the floodplains.

12. The National Water Resources Council, chaired by the Prime Minister, is the highest authority governing water resources management. The Water Resources Planning Organization under the Ministry of Water Resources (MOWR) is responsible for policy formulation and macro level planning and coordination. BWDB under the MOWR is responsible for water resources projects exceeding 1,000 ha of the command area, including flood and riverbank erosion works along the rivers, and hydrology monitoring. The Department of Disaster Management under the Ministry of Disaster Management and Relief is responsible for specific coordination and information dissemination for local level disaster management, and for emergency support for disaster victims.

13. BWDB is the key agency for the implementation of flood and riverbank erosion risk management. While operationalizing and institutionalizing the existing well-developed policy framework in its activities remains a challenge, BWDB has acquired experience in implementing a range of water management projects. It has initiated self-driven institutional reform (needs-based reform) for filling the human resources deficit, especially at the entry level, and for restructuring, including the creation of the new chief engineer (river management) position.

3. ADB Sector Experience and Assistance Program

14. Contributing to economic growth and poverty reduction—an objective of the government’s five-year plan—is an overarching objective of ADB. The country partnership strategy for Bangladesh, 2011–2015 emphasizes supporting climate-resilient economic growth and poverty reduction by encouraging sustainable management of risks of natural disasters, including risk mitigation. Infrastructure development for flood and erosion disaster management supports one of the core areas of operations in ADB’s Strategy 2020.⁶ Disaster management is one of the other areas of operations in Strategy 2020. In the water management,

⁵ The eight focal agenda are (i) institutional development, (ii) enabling framework, (iii) main river development, (iv) towns and rural areas, (v) major cities, (vi) disaster management, (vii) agriculture and water management, and (viii) natural environment and aquatic resources.

⁶ ADB. 2008. Strategy 2020: *The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

ADB support aims at contributing to the achievement of goals, objectives, and strategies in the NWP and NWRP within the framework of the country partnership strategy.

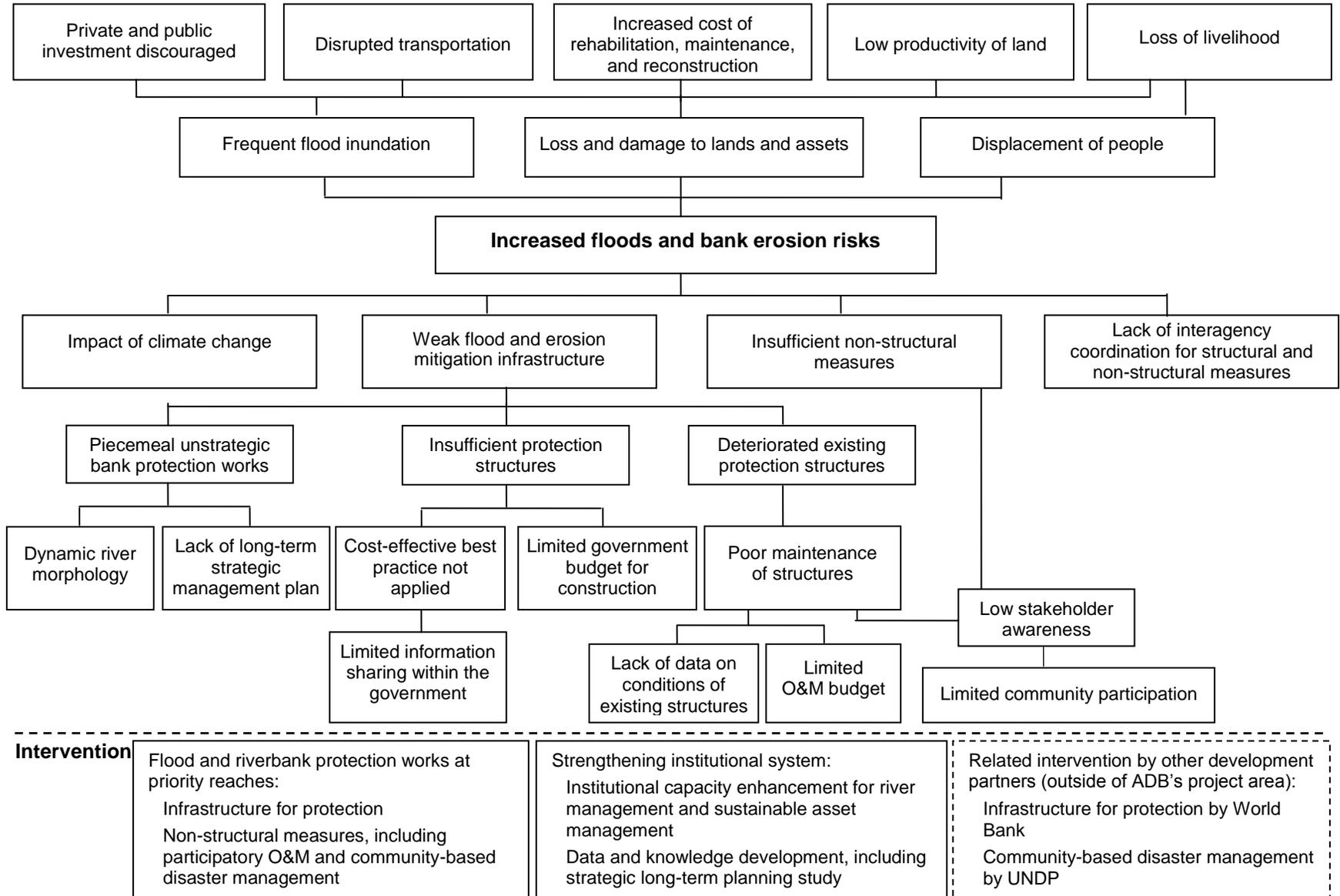
15. ADB has been one of the key development partners for the water management in Bangladesh. Its experience covers a range of projects, including irrigation, water resources management, disaster rehabilitation, and flood and riverbank erosion protection. It has also been playing a key role in promoting the operationalization of sector policies. The World Bank has been another major player in the water management, supporting sector reform and policy issues. It has supported the Water Management Improvement Project, which encompassed both investment and sector reform support. The Government of the Netherlands has been another prominent player covering a range of projects and programs for the sector, such as irrigation, coastal protection, char (river island) livelihood supports, and river channel restoration. The Japan International Cooperation Agency has also assisted the sector, including technical cooperation for institutional capacity strengthening of BWDB. ADB has maintained close coordination with these partners through the water management working group of the Local Consultative Group, cofinancing, and collaboration on various projects and programs.

16. The recent most major intervention for flood and riverbank erosion management was the ADB-funded Jamuna–Meghna River Erosion Mitigation Project, which introduced an innovative construction material that is more cost-effective and can cope flexibly with the highly dynamic morphological changes of the main rivers in Bangladesh (footnote 3). The Jamuna–Meghna project also developed systematic construction and quality control methodologies of riverbank protection structures, a regular flood and river survey monitoring system, erosion prediction modeling, and design guidelines. After three monsoon seasons, the riverbank protection structures constructed under the Jamuna–Meghna project demonstrated stability and technical efficiency. Project completion reports of the government and ADB noted the efficiency of the new riverbank protection method, and the government’s project completion report recommended applying the Jamuna–Meghna project protection method to other riverbanks in Bangladesh.

17. Further improvement of flood and riverbank erosion risk management could be achieved through (i) more strategic selection and planning of riverbank protection locations, with due consideration of the long-term morphological trend of the entire river reaches, toward long-term stabilization of the entire river course, in contrast to existing ad hoc piecemeal protections; (ii) more effective integration of structural and non-structural measures; (iii) higher stakeholder participation; (iv) measures for ensuring the sustainability of measures provided; (v) addressing uncertainty caused by climate change; and (vi) strategic institutional capacity strengthening to address these issues. Development partner support is essential for such holistic and strategic intervention, and for improvement of the government’s capacity to fully operationalize and institutionalize the existing policy and planning framework.

18. The investment program applies the multitranche financing facility modality, which enable the abovementioned anticipated improvements through a strategic intervention. Under the investment program, flood and erosion management measures will be implemented at priority erosion reaches over successive tranches. The first tranche will provide urgently needed structural and non-structural measures in three high priority subproject areas. Subsequent tranches will extend the protection structures and associated non-structural measures to adjacent stretches, with the design adjusted to the latest riverbank erosion conditions. Future tranches may cover other high priority subproject areas, depending on actual river channel changes. Phased strategic support will also be applied to institutional capacity strengthening, which will be continued throughout the duration of the investment program.

Problem Tree for Flood Protection



ADB = Asian Development Bank, O&M = operation and maintenance, UNDP = United Nations Development Programme.

Sector Results Framework (Agriculture and Natural Resources: Flood Management Subsector, 2011–2015)

Country Sector Outcomes		Country Sector Outputs		ADB Sector Opportunities	
Outcomes with ADB Contribution	Indicators with Targets and Baselines	Outputs with ADB Contribution	Indicators with Incremental Targets	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Interventions
Sustained high growth in agriculture	Agricultural growth remaining at 4.5% on average from 2011 to 2015	Agricultural infrastructure and systems expanded and improved	<p>2,000 km of rural roads upgraded by 2015</p> <p>Additional 158 km of riverbank protected and 142 km of existing riverbank protection upgraded, by 2015</p>	<p>Planned Key Activity Areas Rural infrastructure development and integrated water resources management, including flood control, and protection of irrigation systems and riverbanks</p> <p>Pipeline Projects Chittagong Hill Tracts Rural Development (\$55 million) Climate Resilient Rural Infrastructure Improvement (\$50 million) Irrigation Management Improvement Investment Project (\$150 million) Main River Flood and Bank Erosion Risk Management Program (Total \$410 million, ADB \$250 million)^a Southwest Integrated Water Resource Management (Supplementary, \$20 million) Second Sustainable Rural Infrastructure Improvement (\$75 million)</p> <p>Ongoing Projects Agribusiness Development (\$42.5 million) Participatory Small-Scale Water Resources Sector (\$55 million) Second Rural Infrastructure Improvement (\$96.1 million) South West Integrated Water Resources Management (\$20 million) Sustainable Rural Infrastructure Improvement (\$60 million)</p>	<p>8,000 m of bridges and culverts constructed</p> <p>300 rural markets improved, with 134 women's market sections</p> <p>100 km of riverbanks vulnerable to erosion protected and rehabilitated to protect farmland, adopting low-cost riverbank protection technology using geotextiles</p> <p>57,000 ha of land under improved flood control, drainage, and irrigation</p> <p>50,000 ha converted to high-value crop production and 10,000 demonstration plots for high-value crops established</p>

ADB = Asian Development Bank, ha = hectare, km = kilometer, m = meter.

^a Renamed the Flood and Riverbank Erosion Risk Management Investment Program.

Source: Asian Development Bank.