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Report No: PAD4199

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED CREDIT

IN THE AMOUNT OF US$102 MILLION,
COMPRISING SDR 53.7 MILLION (US$72 MILLION EQUIVALENT) FROM THE SCALE UP WINDOW-SHORTER MATURITY LOANS (SUW-SML) AND EUR 27.2 MILLION (US$30 MILLION EQUIVALENT) FROM THE REGULAR SCALE UP WINDOW (SUW)

TO THE

PEOPLE'S REPUBLIC OF BANGLADESH

FOR A

JAMUNA RIVER SUSTAINABLE MANAGEMENT PROJECT 1

August 23, 2023

Water Global Practice
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective July 31, 2023)

Currency Unit =	Bangladeshi Taka (BDT)
BDT 108.52 =	US$1
US$1.34294 =	SDR 1
US$1.1036 =	EUR 1

FISCAL YEAR
July 1 – June 30

Regional Vice President:	Martin Raiser
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Regional Directors:	Dina Umali-Deininger
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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
BDP2100	Bangladesh Delta Plan 2100
BIWTA	Bangladesh Inland Water Transport Authority
BoQ	Bill of Quantities
BUET	Bangladesh University of Engineering and Technology
BWDB	Bangladesh Water Development Board
CCDR	Country Climate and Development Report
CPF	Country Partnership Framework
CIA	Cumulative Impact Assessment
DP	Development Partner
DRF	Disaster Risk Financing
DSS	Decision Support Systems
E&S	Environmental and Social
EA	Economic Analysis
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
FM	Financial Management
FRERMIP	Flood and River Erosion Risk Management Investment Program
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoB	Government of Bangladesh
GSFF	Global Shield Financing Facility
GRS	Grievance Redress Service
IA	Implementing Agency
IDA	International Development Association
IDRA	Insurance Development and Regulatory Authority
IMF	International Monetary Fund
IWT	Inland Water Transport
JRNMP	Jamuna River Navigation Master Plan
LCS	Labor Contracting Societies
M&E	Monitoring and Evaluation
MIS	Management Information System
MoF	Ministry of Finance
MoS	Ministry of Shipping
MoWR	Ministry of Water Resources
MTR	Mid-term Review
NAP	National Adaptation Plan
NBS	Nature-Based Solutions
NDC	Nationally Determined Contribution
NRMMP	National River Management Master Plan
O&M	Operation and Maintenance
PDO	Project Development Objective
PIU	Project Implementation Unit

PoE	Panel of Experts
PPSD	Project Procurement Strategy for Development
PSC	Project Steering Committee
RIS	River Information Services
SBC	Sadharan Bima Corporation
SDFP	Sustainable Development Finance Policy
SEA/SH	Sexual Exploitation and Abuse and Sexual Harassment
SoP	Series of Projects
STEP	Systematic Tracking of Exchanges in Procurement
SUW	Scale-Up Window
SUW-SML	Scale Up Window – Shorter Maturity Loans
TA	Technical Assistance
TBPG	Top Blocked Permeable Groyne
ToR	Terms of Reference
VAT	Value Added Tax
WMGs	Water Management Groups

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Bangladesh	Jamuna River Sustainable Management Project 1	
Project ID	**Financing Instrument**	**Environmental and Social Risk Classification**
P172499	Investment Project Financing	High

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[✓] Contingent Emergency Response Component (CERC)
[✓] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	[ ] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
19-Sep-2023	31-Dec-2028

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The Project Development Objective (PDO) is to increase capacity for flood management and navigation along the Jamuna River.

Components

Component Name	Cost (US$, millions)
1. Flood and riverbank erosion management	69.10
2. Navigation channel development	49.00
3. Financial protection of communities	7.80
4. Project management	12.30
5. Contingent emergency response	0.00

Organizations

Borrower:	People's Republic of Bangladesh
Implementing Agency:	Bangladesh Inland Water Transport Authority (BIWTA), Ministry of Shipping (MoS) Bangladesh Water Development Board (BWDB), Ministry of Water Resources (MoWR) Insurance Development and Regulatory Authority (IDRA), Ministry of Finance (MoF)

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	138.20
Total Financing	138.20
of which IBRD/IDA	102.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	102.00
IDA Credit	30.00
IDA Shorter Maturity Loan (SML)	72.00

Non-World Bank Group Financing	
Counterpart Funding	30.20
Borrower/Recipient	30.20
Trust Funds	6.00
Global Shield Financing Facility (GSFF)	6.00

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	SML Amount	Guarantee Amount	Total Amount
Bangladesh	30.00	0.00	72.00	0.00	102.00
Scale-Up Window (SUW)	30.00	0.00	72.00	0.00	102.00
Total	**30.00**	**0.00**	**72.00**	**0.00**	**102.00**

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2024	2025	2026	2027	2028	2029
Annual	4.30	18.30	37.70	29.80	8.00	3.90
Cumulative	4.30	22.60	60.30	90.10	98.10	102.00

INSTITUTIONAL DATA

Practice Area (Lead)

Water

Contributing Practice Areas

Finance, Competitiveness and Innovation, Transport

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	High
8. Stakeholders	High
9. Other	
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Not Currently Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description

Section I.A.1(b) of Schedule 2 to the Financing Agreement:
"The Recipient shall, at all times during the implementation of the Project:
(b) take, or cause to be taken, all actions, including the provision of funding, personnel, and other resources, to enable BWDB, BIWTA, and IDRA (together, "Implementing Agencies", and individually, "Implementing Agency") to perform its respective functions under the Project, including the establishment of a dedicated unit for Project management and implementation in each Implementing Agency ("Project Implementation Unit"), by not later than sixty (60) days after the Effective Date, which shall be headed by a Project director and supported with adequate number of staff and/or consultants, each with terms of reference, qualifications, and experience satisfactory to the Association."

Sections and Description

Section I.A.2(a) of Schedule 2 to the Financing Agreement:

"The Recipient shall maintain, at all times during the implementation of the Project, with a mandate, composition, and resources satisfactory to the Association: (a) a steering committee ("Project Steering Committee" or "PSC") for each Implementing Agency, which shall: (i) be established by not later than sixty (60) days after the Effective Date; (ii) be responsible for providing overall guidance and policy direction at a higher level and ensuring sound coordination between the Implementing Agencies and other government entities involved; (iii) be led by a Senior Secretary/Secretary of the concerned ministry, with the PSC under MOWR acting as the coordinator of all PSCs; and (iv) consist of representatives from concerned ministries, BWDB, BIWTA, IDRA, Economic Relations Division, Finance Division, the Planning Commission, IMED, and the Bangladesh Bridge Authority and other relevant stakeholder agencies;"

Sections and Description

Section I.A.2(b) of Schedule 2 to the Financing Agreement:
"The Recipient shall maintain, at all times during the implementation of the Project, with a mandate, composition, and resources satisfactory to the Association: (b) an panel of experts for BWDB and BIWTA, which shall: (i) be established by not later than six (6) months after the Effective Date; and (ii) to be responsible for addressing Project risks, providing advice on river engineering and morphology, inland navigation, livelihood restoration, and aquatic biodiversity, and ensuring that the Project is implemented in line with global best practices."

Sections and Description

Section I.B.1 of Schedule 2 to the Financing Agreement:
"The Recipient shall prepare and adopt, by not later than forty-five (45) days after the effective date, and thereafter implement the Project in accordance with, a manual ("Project Operations Manual"), in form and substance satisfactory to the Association."

Sections and Description

Section I.E of Schedule 2 to the Financing Agreement:
"The Recipient shall: (a) ensure that all expenditures under Part 1(b) and consulting services under Part 1(d) are financed exclusively out of its own resources and not out of the proceeds of the Financing; and (b) provide, promptly as needed, the resources needed for this purpose:
(i) all costs associated with land and land use rights, compensation and afforestation required for the purposes of the Project; (ii) procurement of vehicles (other than one prototype self-propelled vessel and two prototype floating jetties), recurrent expenditures for the purpose of attending meetings, conferences, seminars, workshops and study tours (sitting allowances / cash per diems / honoraria, notwithstanding eligible expenditures under Operating Costs and Training), and recurrent expenditures for fuel, under the Project; (iii) all Taxes, except value-added taxes under Part 2 of the Project up to 15% of the Credit Amount; (iv) all Incremental Operating Costs associated with the operations of BWDB-PIU and IDRAPIU offices and leasing of vehicles for BIWTA-PIU under Part 4 of the Project; and (v) procurement of equipment and goods under Part 3."

Conditions

Type	Financing source	Description
Disbursement	IBRD/IDA	Withdrawal Conditions - Section III.B.1(b) of Schedule 2 to the Financing Agreement: "no withdrawal shall be made: (a) for payments made prior to the Signature Date; or (b) for Emergency

		Expenditures under Category (4), unless and until all of the following conditions have been met in respect of said expenditures: (i) (A) the Recipient has determined that an Eligible Crisis or Emergency has occurred, and has furnished to the Association a request to withdraw Credit amounts under Category (4); and (B) the Association has agreed with such determination, accepted said request and notified the Recipient thereof; and (ii) the Recipient has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Association."

I. STRATEGIC CONTEXT

A. Country Context

1. **Bangladesh experienced rapid social and economic progress in recent decades, reaching lower middle-income status in 2015.** Stable macroeconomic conditions drove 6.7 percent average annual real Gross Domestic Product (GDP) growth between 2010 and 2019. The national poverty rate fell from 48.9 to 24.5 percent between 2000 and 2016, supported by labor market gains. However, poverty reduction has recently slowed, particularly in urban areas and in the west of the country.[1] Annual consumption growth of the bottom 40 percent (1.2 percent) trailed the overall population (1.6 percent) from 2010 to 2016.

2. **Rising global commodity prices and global monetary policy tightening disrupted the economic recovery from COVID-19.** Government stimulus programs supported a rapid economic recovery in FY21 as movement restrictions ended. However, the current account deficit surged in the second half of FY22 amidst rising commodity and intermediate goods prices, which contributed to accelerating inflation. Import price moderation and rationing narrowed trade deficit in FY23, supported by resilient export growth. However, this was offset by a sharp contraction in trade credit and lower medium- and long-term lending in the financial account. The balance of payments deficit reached US$8.2 billion by end FY23. Authorities requested support to restore external balance, including an International Monetary Fund (IMF) program approved in January 2023.

3. **The fiscal deficit widened to an estimated 4.4 percent of GDP in FY23.** Tax revenues remained among the lowest in the world at an estimated 7.6 percent of GDP in FY23. Expenditure growth accelerated with higher subsidy spending as a result of elevated commodity prices, while revenues declined with lower imports. Capital expenditure was led by infrastructure megaprojects, with rationalization of other projects in FY23 to slow the growth of the budget deficit.

4. **Real GDP growth is expected to reach 6.2 percent in FY24 before accelerating to its long-term trend.** Growth is expected to converge to 6.5 percent over the medium term as inflationary pressure eases, depending on the depth of reforms implemented. The fiscal deficit is expected to gradually narrow with accelerating economic activity, higher incomes, and tax administration reform implementation. The Current Account Deficit will narrow as imports normalize with moderating commodity prices. Remittance inflows are expected to rise, supported by strong external demand for migrant workers. The financial account deficit is projected to moderate in FY24.

5. **Structural reforms are needed to support a faster pace of growth over the medium term.** Priorities to reach upper middle-income status by 2031 include building a competitive business environment, diversifying exports, increasing human capital, building efficient infrastructure, deepening the financial sector, and attracting private investment. These reforms will support international competitiveness as Bangladesh prepares for graduation from the Least Developed Country status in 2026, which will gradually lead to reduced concessional financing and preferential market access for its exports.

6. **Bangladesh is at low risk of overall and external debt distress in the January 2023 joint IMF-World Bank Debt Sustainability Assessment (DSA).** Bangladesh is not currently subject to Debt Limits Conditionality under the Sustainable Development Finance Policy (SDFP). In its most recent Staff Report,

[1] Bangladesh Systematic Country Diagnostic Update (2021).

the IMF stressed the need for Bangladesh to accelerate its ambitious reform agenda to achieve a more resilient, inclusive, and sustainable growth, requiring substantial investments in human capital and infrastructure.

7. **Bangladesh faces a high level of vulnerability to the effects of climate change.** The Global Climate Risk Index ranks it as the seventh most affected country in 2000-2019,[2] with high susceptibility to extreme weather events such as cyclones, floods, and storm surges. Recurring flooding in Bangladesh affects a greater population than any other natural hazard, impacting more than 1 million people annually. Once every three to five years, up to two-thirds of the country is inundated by floods. Addressing these climate risks will support sustainable economic development and prevent vulnerable populations from being left behind.

B. Sectoral and Institutional Context

8. **Over the last decade, the Government of Bangladesh (GoB) has been spending around 0.6–0.8 percent of GDP on the water sector, which needs to be improved both in quantity and quality.** The overall water sector in Bangladesh still faces many challenges, and the GoB aims to increase the sector spending to 2.5 percent of GDP by 2030 to tackle them. It is important that this increased spending is matched with efforts to enhance quality of spending. For example, while the water resource management (WRM) subsector has received around 70 percent of the total sector spending, most of this is used for capital expenditures with little regard to repairs and maintenance, and there is a need to refocus on the quality of spending to improve sector outcomes.[3]

9. **Bangladesh aspires to attain upper-middle-income status by 2031, and better river management is important for achieving that goal.** Bangladesh is situated among the floodplains of three major international rivers—Padma–Ganges, Jamuna–Brahmaputra, and Meghna—and 230 smaller rivers and has access to the sea (Annex 1 – *figure A*). Given the dominance of rivers in the country's geography, good river management practices would go a long way in maximizing overall productivity of the river system and minimizing climate change exacerbated disaster risks, both of which translate into economic growth.[4]

10. **A policy focus on food security in the past has exacerbated river management challenges.** For decades, strategies for water management were shaped by a series of master plans that focused solely on food security, which meant controlling monsoon floods to avert famines and increasing groundwater use for rice production in dry seasons. While the approach is understandable in the context of Bangladesh's history, its limited focus admittedly led to insufficient and inadequate investments in river management, resulting in poor floodplain management, inadequate protection of vulnerable communities, reduction in inland water transport (IWT), and weak transboundary water collaboration.

11. **Weak and inefficient institutions are at the center of river management challenges.** The Water Act 2013 serves as a robust, comprehensive legal framework for the country's water sector, including river management. However, the institutions face several challenges in implementation, including fragmentation, weak technical capabilities, and limited community participation. Additionally, there is a

[2] German watch (2021) Global Climate Risk Index 2021.
[3] Pricewaterhouse Coopers. 2020. Public Expenditure Reviews of the Water Sector in Select Countries in Asia: Bangladesh.
[4] Biswas, A. K., O. Ünver, and C. Tortajada. 2004. *Water as a Focus for Regional Development.* Oxford University Press.

notable shortfall in incorporating gender perspectives and promoting gender diversity within the context of water and river management.

12. **Adopted in 2018 as part of GoB's key development agenda, the Bangladesh Delta Plan 2100 (BDP2100) is expected to stimulate economic growth through a paradigm shift in river management.** With the vision of achieving a safe, climate-resilient, and prosperous delta, the water-centric, climate-change-focused integrated plan prioritizes US$38 billion worth of physical and institutional investments, which will result in incremental economic growth of 2 percent per year until 2041.[5] To aid the BDP2100 implementation, the GoB created the Delta Wing under the Planning Commission. In addition, the Prime Minister chairs the Delta Governance Council which is an inter-ministerial forum providing which provides strategic directions in the water sector.

13. **The Jamuna River ("the River") features prominently among the BDP2100's priority projects.** The Jamuna River is a section of one of the major rivers in the world. It flows through India as the Brahmaputra River, and then dissects Bangladesh from north to south until it meets the Padma-Ganges River and the Meghna River before discharging into the Bay of Bengal (Annex 1 - *figure A*). About 50 percent of the households living in districts in the Jamuna basin depend on agriculture and fisheries for livelihood, compared to 27 percent nationwide. In the BDP2100, the Jamuna River is featured under the US$3.7 billion Integrated Jamuna-Padma Rivers Stabilization and Land Reclamation Project - the largest in the 'Rivers and Estuaries' hot spot and the fourth largest among the 80 priority projects identified for implementation until 2030. It aims to control riverbank erosion, increase land reclamation, reduce flooding, restore navigation, increase land productivity, and designate environmental protection zones. Investments in economic zones and irrigation near the River, which fall outside the 'Rivers and Estuaries' hot spot, bring above US$6 billion total capital costs to the Jamuna region.

14. **Given its size, location, and undeveloped status, the Jamuna River has enormous economic potential.** Its economic benefits are expected to be among the highest within the BDP2100, especially due to its potential in flood/erosion risk management, IWT, and multiplier effect of a river economic corridor.

15. **The proposed Jamuna River Sustainable Management Project 1 ("the Project") is the first major investment to be implemented under the BDP2100.** The BDP2100 implementation got off to an understandably slow start given its size, complexity, and the need for multisector coordination, compounded by delays associated with COVID-19. The Project responds to the GoB's Preliminary Development Project Proposal, dated June 2020, which consists of 10-year multiphase, multisector investments worth US$2.8 billion in the Jamuna River. The Project aims to not only offer financing and relevant knowledge but also help build overall confidence in the BDP2100 and establish implementation momentum. It will provide critical support to Bangladesh's long-term economic goals.

C. Relevance to Higher Level Objectives

16. **The Project is aligned with the Bangladesh Country Partnership Framework (CPF) FY23–27 discussed by the World Bank Board of Executive Directors on April 27, 2023 (Report No. 181003-BD).** The Project contributes to four objectives in the CPF, which recognizes the BDP2100's central role in bringing about long-term growth and poverty reduction through strengthened delta management: 1) the Project helps achieve Objective 7 by enhancing the Jamuna River's resilience to floods and riverbank erosion and promoting a wider use of IWT, which would lead to reduced Greenhouse Gas (GHG) emissions; 2) the

[5] Annual economic growth is expected at 8 percent with the BDP2100, compared to 6 percent without it.

Project tackles some of the key constraints to Objective 6 by providing foundations for the river economic corridor that could accelerate regional trade and integration; 3) the Project contributes to Objective 5 as it will help protect/enhance the livelihoods of the women and men living along the River, reduce migration to urban slums, and improve women's access to IWT services and opportunities; and 4) the Project helps support Objective 2 through developing and implementing insurance schemes against floods.

17. **The Project supports the GoB's sector strategy, the BDP2100, and its proposed GHG emission reduction and mitigation goals included in Bangladesh's Nationally Determined Contribution (NDC) and National Adaptation Plan (NAP).** The Project will help implement the BDP2100's hot spot-specific strategy on 'River and Estuaries', contributing to achieving four of the six BDP2100 goals: 1, 3, 5, and 6. The Project's contribution to Bangladesh's NDC and NAP implementation through climate change mitigation and adaptation measures embedded in its design.

18. **The Project is aligned with the Bangladesh Country Climate and Development Report (CCDR, P176757)**. The CCDR includes a review of the BDP2100 projects that are potentially most climate adaptation effective, and the review's result confirms that the Project is one of the top priority investment projects within the BDP2100. The CCDR also highlights strengthening post-disaster social protection as a key pathway for climate resilience, which is supported by the Project under the disaster risk financing (DRF) activities. The Project is also aligned with the South Asia Roadmap to implement World Bank's Climate Change Action Plan for 2021–2025.

19. **The Project will reinforce ongoing regional efforts to enhance transboundary water management in South Asia, in line with the World Bank's Approach to South Asia Regional Integration, Cooperation, and Engagement 2020–23.** Recognizing that inland waterways for South Asia could be a driver of economic growth and poverty reduction, [6] some riparian countries are actively exploring and implementing ambitious plans for IWT. Because of the Jamuna–Brahmaputra River's extensive reach, the Project's impact would be truly regional, connecting Bangladesh, Bhutan, India, and Nepal.

20. **In line with the World Bank's Gender Equality Strategy, the Project addresses gender gaps specific to the sector.** The Project will (a) incorporate gender capacity building in the implementing agencies (IAs) by developing and implementing gender strategies to enhance gender equality in their human resources practices; (b) incorporate actions to increase gender equality and sex disaggregated monitoring in the IAs' planning documents to be prepared; (c) ensure women's representation as water management group (WMG) members and leaders, their voices are heard and reflected in river management and community engagement activities; and (d) offer targeted leadership training for current and prospective women executive committee members.

21. **The Project qualifies for the World Bank's corporate definition of 'Maximizing Finance for Development',** because it addresses bottlenecks for realizing this vision on the Jamuna River, through public investments in river structures; a range of river information services (RIS) and navigational prototypes; setting up DRF instruments to transfer part of the climate risk to the insurance market; and building capacity in river institutions.

[6] Trade among Bangladesh, Bhutan, India, and Nepal (BBIN) has increased significantly, from US$3 billion in 2005 to over US$18 billion in 2019. There is still significant potential for further expansion of regional trade opportunities, considering considerably low intra-BBIN trade (4.3 percent) compared to intraregional trade in East Asia (50 percent) and Sub-Saharan Africa (22 percent).

D. Series of Projects

22. **The Project is the first in a Series of Projects (SoP).** There are three principal reasons for choosing the single-borrower SoP modality over a stand-alone investment project financing approach to support the BDP2100 implementation in the Jamuna River: (i) achieving the Jamuna River's full economic potential will require support beyond the short term; (ii) a longer-term plan signals the World Bank's commitment to the BDP2100 implementation; and (iii) the SoP will provide room for technical and institutional learning.

23. **The SoP development objective is to increase climate resilience and economic productivity along the Jamuna River, and the proposed series of three projects are expected to be implemented over 14 years (Annex 1 – *figure C*).** Succeeding projects under the SoP will build on the learning from the preceding ones. For example, the length of the Jamuna River targeted for river structure investments would expand throughout the SoP; the River's navigability will gradually enhance through performance-based, dynamic dredging. The third project in the series may commence investments in economic zones, enabled by activities in the first and second projects that will have made the River safer from flooding and riverbank erosion and more navigable. Each project will include preparatory activities, such as feasibility studies, for the subsequent project. Using its convening power, the World Bank will make its best efforts to bring in other sources of financing, including from Development Partners (DPs) and the private sector, to support the SoP, which may cost up to US$2.8 billion. Leveraging the private sector financing will become critical in the second and third projects, including through levying navigation end-user fees and engaging irrigation service providers. A detailed study examining the SoP's potential for private sector financing will be prepared under the first project.

II. PROJECT DESCRIPTION

A. Project Development Objective

24. **The Project Development Objective (PDO) is to increase capacity for flood management and navigation along the Jamuna River.** Given that the Project is the first in the SoP, capacity refers to both physical and institutional aspects. The physical capacity to be built through the Project is limited in nature and will be expanded, scaled up, or upgraded in the subsequent projects in the SoP based on the evaluation of project outcomes. The institutional capacity building activities in the Project are focused on preparing the IAs for larger, more complicated subsequent projects with higher risks. The PDO will be evaluated against the following PDO-level indicators:

(a) Construction, maintenance, and evaluation of river structures that are climate-adapted (yes/no)
(b) Average travel time of vessels from Sirajganj to Daikhowa (days)
(c) The two Master Plans (NRMMP & JRNMP) be submitted for approval (yes/no)
(d) Government capacity improved for coordinating multisector decisions on river planning (yes/no)

B. Project Components

25. **With NBS and the four elements of disaster risk management —mitigation, preparedness, response, and recovery—as guiding principles, the Project combines activities in the Jamuna River, including investments in innovative river structures, navigation channel development, DRF solutions, and community engagement** (Annex 1 – *figure D*)**.** NBS seeks to integrate 'green infrastructures' (or natural

systems) and 'grey infrastructures' (or traditional built solutions) to provide next generation solutions that enhance system performance and communities protection. The Project will include nature-based solutions (NBS) in riverbank protection, combined with cost-effective, innovative hard engineering structures. NBS are also manifest in the Project's dynamic navigation approach that allows 'room for the river'—letting the River dynamically meander and naturally carve out multiple channels during the monsoon season and then seeking the best navigation routes at the start of the dry season, without coercing permanent navigation channels.[7] Through the Project's multisectoral approach, all four phases of disaster risk management are supported to deal with extreme weather events (Annex 1 – *figure D*).

26. **The Project will invest about US$138.2 million over 5 years across five components, includes US$102.0 million from IDA credit,[8] US$30.2 million from counterpart funding, and US$6.0 million from the GSFF (table 1).** The project will also benefit from support of other DPs, include: 1) the Kingdom of Netherlands, which intended to offer an US$6.0 million grant to support institutional strengthening, and 2) the Asian Infrastructure Investment Bank (AIIB), which has approved an US$5.0 million grant to support subcomponent 1.5 of the project. Major capital works that rehabilitate and modernize the GoB's ongoing river works will be limited to Components 1 and 4, and the rest of the financing would be used for procurement of goods, Operation & Maintenance (O&M),[9] and technical assistance (TA). Each component will be implemented in different sections of the Jamuna River, within the 250 km stretch between Daikhowa and Aricha (Annex 1 - *figure B*). A summary of climate adaptation and mitigation activities embedded in project design is provided in the "Climate Change Technical Note"[10]. Further activity details of each component will be described in the project operations manual.

Table 1. Project Costings and IA by Subcomponent (US$, millions)

Project Component	Project Costs	IDA Financing	DP Grants	Counterpart Funding	IA
1. Flood and riverbank erosion management	**69.1**	**53.1**	**—**	**15.9**	**BWDB**
1.1. Works and O&M	47.0	39.9	—	7.1	
1.2. Land acquisition, compensation, and afforestation	2.5	—	—	2.5	
1.3. Institutional strengthening	1.8	0.4	—	1.4	
1.4. Community engagement	15.1	12.8	—	2.3	
1.5. Preparation for the second project	2.7	—	—	2.7	
2. Navigation channel development	**49.0**	**47.2[a]**	**—**	**1.8**	**BIWTA**
2.1. Hydrography and RIS	26.8	26.8	—	—	
2.2. Prototype structures	9.5	9.1	—	0.4	
2.3. Institutional strengthening	11.5	10.1	—	1.4	
2.4. Preparation for the second project	1.2	1.2	—	0.0	
3. Financial protection of communities	**7.8**	**—**	**5.4[b]**	**2.4**	**IDRA**

[7] Dynamic navigation focuses on keeping navigation routes functional when river channel shifting takes place. It is important to concurrently invest in three aspects: (a) regular hydrographic surveys to update navigation charts, (b) aids to navigation, and (c) river training structures and dynamic dredging. The Project applies all three aspects of dynamic navigation (except for dynamic dredging, to be included in the second project). Experience from Ayeyarwady River supports this approach.

[8] The IDA credit includes US$30 million from the regular SUW and US$72 million from the SUW-SML.

[9] The GoB does not typically provide O&M budget for infrastructure completed under an ongoing project. IDA will support the O&M costs until the project closure, and then the GoB will provide the O&M budget thereafter.

[10] The Climate Change Technical Note is included in the Supplemental Note (section B).

Project Component	Project Costs	IDA Financing	DP Grants	Counterpart Funding	IA
3.1. Design and development of prearranged financial solutions	7.3	—	5.0	2.3	
3.2. Institutional strengthening	0.5	—	0.4	0.1	
4. Project management	**12.3**	**1.7**	**0.6[b]**	**10.1**	
BWDB	2.0	0.5	—	1.6	**BWDB, BIWTA, and IDRA**
BIWTA	9.0	1.2	—	7.8	
IDRA	1.3	—	0.6[b]	0.7	
5. Contingent emergency response	**—**	**—**	**—**	**—**	**BWDB and BIWTA**
Total	**138.2**	**102.0**	**6.0**	**30.2**	

Note: a. SUW-Regular portion would finance part of component 2 expenditures and front-end fee only; b. Recipient-executed trust fund by the GSFF;

27. The project components are summarized below, and details on project location and components can be found in the supporting document. The costs/financiers for each component are found on the Table 1.

28. **Component 1 on flood and riverbank erosion management (US$53.1 million from IDA, of US$69.1 million in total)** will invest in integrated green and grey infrastructure and institutions that oversee and manage it. The component is also linked to a grant of US$5.0 million from the AIIB to support the subcomponent 1.5 activities, including the feasibility studies and Environmental and Social Framework (ESF) preparation for the second project. The Kingdom of Netherlands also intended to offer an US$6.0 million grant, among which around US$3.6 million is tentatively planned to be allocated to support subcomponent 1.3 activities.[11] The component involves five subcomponents: (1.1) Works and O&M, to supports capital and O&M expenditures for both transversal structures designed to deflect the River flow away from the riverbanks, reduce the flow velocity near the riverbanks, and promote sedimentation; and longitudinal structures built between groynes and independently along the riverbanks; (1.2) Land acquisition, compensation, and afforestation, to acquire land and fund the afforestation works; (1.3) Institutional strengthening, to enhance capacity of BWDB on river management. It includes support to developing the National River Management Master Plan (NRMMP); (1.4) Community engagement, to promote participatory planning, decision-making, and monitoring in the river management sector to directly engage and empower people along the Jamuna River; and (1.5) Preparation for the second project.

29. **Component 2 on navigation channel development (US$47.2 million from IDA, of US$49.0 million in total)** invests in fundamental steps toward establishing dynamic navigation channels of adequate depth that can accommodate large cargo vessels year-round. It consists of four subcomponents: (2.1) Hydrography and RIS, to invest in developing and operating an RIS system on the Jamuna River between Daikhowa and Aricha; (2.2) Prototype structures, to test pilot green shipping that could kick-start innovative thinking in the IWT sector. This subcomponent includes environmentally friendly design, commissioning, delivery, and O&M of a prototype cargo vessel and (estimated two) cargo-handling pontoons, both of which cater to the specific conditions of the Jamuna River and require public investment to spur innovation; (2.3) Institutional strengthening, to fulfill BIWTA's role as the IA responsible for Component 2 implementation, including O&M. The key activities include the Jamuna River Navigation

[11] The rest of the amount, around US$2.4 million, would be allocated to support project management for the BWDB PIU under Component 4.

Master Plan (JRNMP), Regional IWT dialogue, and capacity building of the BIWTA staff; and (2.4) Preparation for the second project.

30. **Component 3 on financial protection of communities (US$0 from IDA, of US$7.8 million in total),** offers cash payments to the communities soon after payout-eligible flood events occur. This component includes two subcomponents: (3.1) Design and development of prearranged financial solutions. The two solutions include a macro-level insurance product and a community protection fund. Sites are likely to be a subset of locations of the C1 pilot sites, which will be validated with flood risk modeling activities and household data. Beneficiaries will be pre-identified based on criteria of vulnerability and gender. When the instrument is triggered, digital payments will be made to beneficiaries; (3.2) Institutional strengthening, to identify and address capacity gaps in relevant government agencies to support the design and development of the financial solutions and the scale-up in the second project.

31. **Component 4 on project management (US$1.7 million from IDA, of US$12.3 million in total)** will support the BWDB, BIWTA, IDRA's Project Implementation Units (PIUs) for implementing the Project. Costs to be covered include equipment, furniture, and consultancy services on fiduciary, Environmental and Social (E&S) (including a Cumulative Impact Assessment [CIA], an Environmental and Social Impact Assessment [ESIA] and Environmental and Social Management Plan updated during the implementation of the Project), and Monitoring and Evaluation (M&E).

32. **Component 5 on contingent emergency response** is a provisional zero amount component, which will allow for rapid reallocation of loan proceeds from other project components during an emergency, including climate events, under streamlined procurement and disbursement procedures.

33. **The Project will contribute to and make use of the Decision Support System (DSS) supported by** the ongoing Climate Adaptation and Resilience for South Asia (CARE) Project (P171054), which is developing DSS portals in Bangladesh including for the water sector.

C. Project Beneficiaries

34. **Local communities are expected to significantly benefit from the Project.** People living along the Jamuna River, including vulnerable communities and char dwellers[12], will benefit from lower risk of land erosion and flooding with improved water-related disaster risk mitigation, preparedness, response, and recovery approaches. The Project aims to protect about 2,500 hectares of land from riverbank erosion. This protection is expected to provide significant benefits to climate-vulnerable communities living or have livelihoods nearby. About 100,000 people along the River could benefit from navigation improvement through improved safety, reduction in transportation costs for those switching from buses to passenger ferries, and enhanced spatial mobility. For the DRF solutions, about 1.2 million people are expected to benefit from the insurance scheme and about 120,000 people from the community protection fund. Labor Contracting Societies (LCS) formed through WMGs will give local communities access to income-generating opportunities. Women's access to DRF, income-generating opportunities, and leadership roles in WMGs is expected to improve through the Project.

35. **The Project will also serve businesses and industries along the Jamuna River, the GoB's river institutions, and the society as a whole.** Better and safer navigation is expected to benefit businesses and

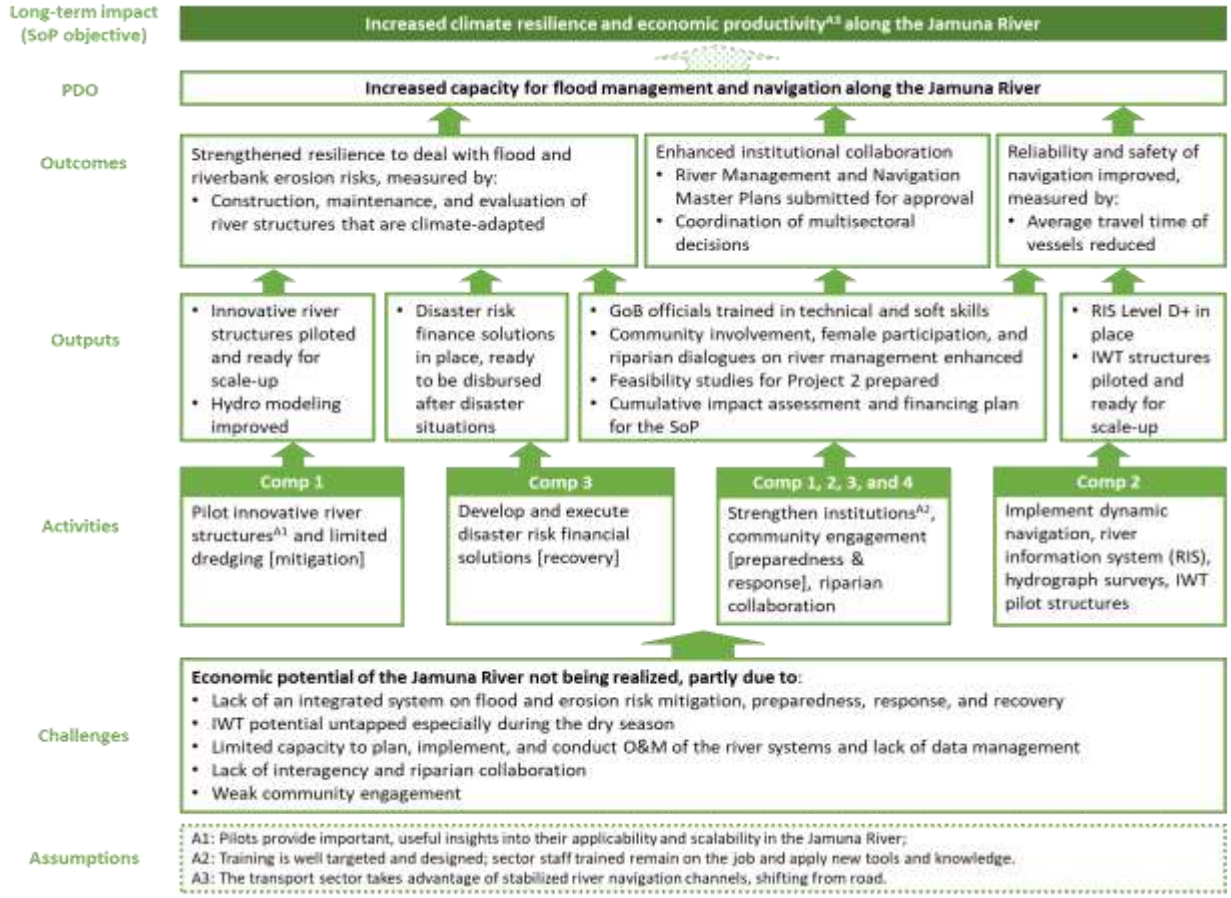
[12] Char dwellers are communities that reside on 'chars,' which are temporary sandbars or islands formed by the sediment deposits in the Jamuna River. These communities face unique vulnerabilities, including frequent flooding, erosion, and limited access to resources.

industries located along the River, given that the unit cost of moving cargo will be reduced, capacity to handle freight will increase, and transportation modal shift from trucks to IWT is expected to occur. This in turn would lead to reduced congestions and road accidents and lesser air pollution, which will benefit the society as a whole because of reduction in physical and mental stress and curbing of GHG emission. Given the SoP's multisectoral nature, strengthening institutional coordination will be emphasized through training and multisectoral decision-making, for example, jointly review design and bid documents.

D. Results Chain

36. **Figure 1 illustrates how the Project activities will contribute to results and the long-term impact.**

Figure 1. Theory of Change



E. Rationale for Bank Involvement and Role of Partners

37. **The World Bank brings global and local expertise in river management. Its convening power enables shoring up DPs' direct and indirect support for the Project.** It has extensive global and local expertise on river management[13] and has supported the BWDB and the BIWTA for several decades. The WB-GoB dialogue and partnership is the foundation for enhancing support for river management in the country.

[13] The WB prepared and supervised many river management projects, policy reforms, and capacity building around the world.

Building on the partnership that the World Bank has nurtured in the past, some DPs have committed to parallel- or co-financing the Project (*table 1*). The World Bank will work with DPs to ensure coherent support for managing the Jamuna River and the overall delta. This support will be fully aligned with the GoB's strategy.

38. **The Project benefits from the experience and knowledge gained through projects and capacity building activities that other DPs have financed in the sector over the years.** Along with the World Bank, numerous multilateral agencies and bilateral partners have offered TA and remain committed to supporting the implementation of BDP2100.[14] Among these, the Flood and River Erosion Risk Management Investment Program (FRERMIP) supported by the Asian Development Bank (ADB) and the Netherlands is very relevant. The FRERMIP invests in improving flood/erosion risk management in the lower Jamuna and Padma River through the construction of revetments and embankments and institutional strengthening at national level for flood and riverbank erosion risk management. The Project will seek alignment with the FRERMIP going forward.[15]

F. Lessons Learned and Reflected in the Project Design

39. **Recognizing its potential to contribute to the country's economic development, a holistic river management approach is applied to the Project.** In line with the GoB's view that riverbank protection alone is insufficient to address multifaceted river management issues, the Project includes interventions in navigation, DRF, and community engagement. In the subsequent SoP projects, a wider range of undertakings are envisioned aligned with the GoB's economic vision for the River, including performance-based dredging, irrigation, recreation, eco conservation, logistics, and green economic zones.

40. **To ensure effectiveness of the river structures, the Project invests in innovation and O&M capacity building.** There is no single river structure that can both protect the riverbank and preserve room for the River. Hence, different types of structures need to be designed, put in place, and evaluated to maximize their impacts. The Project will invest in a combination of longitudinal and transversal river structures, including innovative Top Blocked Permeable Groynes (TBPGs). The Project also supports building O&M capacity in the BWDB to sustain the river structures.

41. **The Project defers dredging to the second project in the SoP.** Despite the importance of dredging in a country brimming with rivers, the industry is neither effective nor efficient. To change the status quo, the SoP promotes 'dynamic performance-based dredging'. The decisions on dredging locations and magnitude are made constantly based on hydrographic surveys and the dredging contractor is paid based on the performance of pre-agreed service indicators, including sustainability. Hence, the Project will (a) lay the foundations for dynamic dredging through activities under Component 2 and (b) take stock of the lessons learned from the performance-based dredging contract pilots executed under the Bangladesh Regional Waterway Transport Project 1 (P154511). In addition, the effectiveness of innovative river structures developed under Component 1, in reducing the need for dredging will be evaluated.

[14] They include the ADB, AIIB, FAO, UNDP, Canada, France, Germany, Japan, the Netherlands, and the United Kingdom.

[15] To maximize learning from the FRERMIP, the Netherlands has agreed to fund institutional strengthening activities under Component 1, including preparing the NRMMP, construction supervision and evaluation of the river structures, and independent PoE, as detailed in the Development Project Proposal (DPP) submitted to the Planning Commission by the BWDB in May 2023.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

42. **The three main Implementing Agencies (IAs) of the Project are the BWDB under the Ministry of Water Resources (MoWR), the BIWTA under the Ministry of Shipping (MoS), and IDRA under the Ministry of Finance (MoF).** The BWDB, the lead IA of the Project, is responsible for surface and groundwater management in Bangladesh, making it relevant for the Project's river works and O&M. The BIWTA, mandated to develop and maintain the IWT system in Bangladesh, will be responsibility for the Project's navigation improvement. IDRA, in charge of regulating and supervising all the insurance companies in Bangladesh, will oversee the component on DRF and coordinate with other stakeholders.[16] The BWDB and the BIWTA have considerable experience in working on projects financed by DPs, including World Bank. However, IDRA has limited experience with World Bank-financed projects and will be staffed with additional GoB staff to ensure IDRA's capacity to manage project activities and comply with M&E requirements. The Project will be implemented in a collaborative manner by three PIUs, headed by project directors from the three respective IAs. Collaboration among the IAs is essential to prepare and implement the larger, more complex second project in a mutually synergizing way, and the Project will help build the capacity.

43. **A Project Steering Committee (PSC) for each IA will be established to provide overall guidance and policy direction at a higher level and ensure sound coordination between the IAs and other government entities involved.** The PSC shall: (1) be led by a Senior Secretary/Secretary of the corresponding ministry, with the PSC under MOWR acting as the coordinator of all PSCs; and (2) consist of representatives from all corresponding ministries. The PSCs will (a) review implementation plans and monitor progress; and (b) make course corrections, as needed. The PSC will function in accordance with the guidelines of the Planning Commission, and under the guidance of the PSC, all IAs will meet regularly to collaborate and make decisions on activities that require joint planning and joint reviews of design and bid documents.

44. **The Project is being supported by an independent Panel of Experts (PoE).** Because of its innovative nature, the Project involves risks. To help address them, the independent PoE will provide advice on river engineering and morphology, inland navigation, livelihood restoration, aquatic biodiversity, and DRF, ensuring that the Project is designed and implemented in line with global best practices.

B. Results Monitoring and Evaluation Arrangements

45. **M&E will be an integral part of the Project and under the responsibility of the PIUs.** The BWDB will be responsible for managing a common web-based M&E platform, which will be developed to track the Project's progress based on the Results Framework. The platform will support a participatory M&E, allowing project stakeholders to collect data on project progress. The M&E of Component 2 may migrate to the RIS system once it is established and fully integrated. Working together with BIWTA and IDRA, BWDB will submit the quarterly progress reports to the World Bank and relevant line ministries. In addition, the World Bank, BWDB, BIWTA, IDRA, and other stakeholders, including DP financiers, will carry

[16] MoF (specifically Financial Institutions Division); government insurance companies like the Sadharan Bima Corporation (SBC); private insurance firms; Ministry of Disaster Management and Relief; Ministry of Agriculture; Ministry of Land; Ministry of Environment, Forest, and Climate Change; Ministry of Fisheries and Livestock; Ministry of Social Welfare; and relevant civil society organizations.

out joint annual progress reviews and the Mid-term Review (MTR). Each PIU will hire an M&E specialist who will be in charge of M&E activities.

C. Sustainability

46. **The GoB's strong commitment to the BDP2100 implementation is confirmed in its most recent Five-Year Plan and provides a solid foundation for sustained implementation of the Project.** In the Eighth Five-Year Plan approved in December 2020, the implementation of the BDP2100 features as one of the top priorities.[17] It is accompanied by 17 indicators with targets to be achieved by 2025, many of which are directly linked to the Project's expected outcomes, such as reducing land erosion along the Jamuna River, reducing the population vulnerable to natural disasters, reclaiming land, and enhancing navigation capacity. Thus, the GoB is strongly committed to the Project's activities and associated results given their clear link to its own mid- and long-term priorities.

47. **The Project addresses the following three factors that are deemed pivotal for sustainability.** The sustainability of institutions will be sought through institutional strengthening activities. For Components 1 and 3, the Project will build capacity in IAs, e.g., for design of innovative solutions, and introduce a new planning and institutional framework with master plans and O&M manuals. The systems developed under Component 3, such as beneficiary selection criteria, a beneficiary registration and management system, and digital payment systems, have the potential for long-term sustainability and can be used for other risk finance instruments that the GoB may choose to introduce beyond the Project scope. Capacity built in the MoF and relative stakeholders would be fundamental for maintaining and using these systems in the design and implementation of any future instruments. The sustainability of financing involves securing adequate O&M budget for the infrastructures after the Project. The O&M costs until the project closure will be supported by IDA, and the government committed to provide funding to cover O&M thereafter, which will be secured through its annual budgeting process. O&M for investments in the second project of the SoP may come from the private sector, for example, in the form of navigation dues collected from the shipping companies. Therefore, a study on O&M financial sustainability will be conducted during the Project as part of preparation for the second project, taking stock of different sources and proposing a viable road map. The sustainability of demand for IWT will be pursued through inviting the relevant private sector[18] to capacity-building activities designed to (i) communicate the upcoming IWT infrastructure upgrades and their benefits; (ii) train them on new technology and information platforms; and (iii) introduce Public-Private Partnership opportunities that could materialize later in the SoP.

IV. PROJECT APPRAISAL SUMMARY

A. Technical Analysis

48. **The types and locations of innovative river structures were chosen based on advanced knowledge and data collected in the field, and a solid monitoring plan has been devised to evaluate their impact.**

[17] Relevant specific objectives include (a) establishment of a Delta Fund, (b) establishment of a Delta Portal, and (c) formulation of a high-level riparian committee.
[18] They include shipping and logistics companies, vessel and cargo owners, crews and skippers, operator associations, and freight forwarding agents.

To further validate recent experience[19] and consolidate knowledge, it was critical to select the ideal sites that could generate meaningful data on the impact of TBPGs. The two sites were chosen based on site visits, multicriteria analysis, and consultation with the MoWR and the BWDB. Further, to assess the scalability of the structures, monitoring will take place during and after construction, involving gathering data, carrying out relevant simulations and remediation measures as necessary, and evaluating the structures' performance using a multicriteria analysis, including their resilience under extreme climate events.

49. **Level D+ in RIS classification issued by the World Association for Waterborne Transport Infrastructure (former Permanent International Association of Navigation Congresses) is an ambitious but achievable goal for the BIWTA to aim for by the end of the Project.** Currently, the River's RIS maturity ranking is assessed as Level X, denoting that no service is available. Level D+ is considered cost effective for the River as it is a new-generation technology that offers five services in easy interfaces.

50. **The Project is aligned[20] with the goals of the Paris Agreement on both mitigation and adaptation.** The Project will help Bangladesh meet its goals included in the NDC and the NAP in the following ways:

(a) **Assessment and reduction of adaptation risks.** The Project adequately reduces the physical climate risks through a combination of hard and soft measures, and the Project's climate-resilient infrastructure design limits the climate exposure to an acceptable level of risk. The main climate and disaster risks that the Project address are flooding and erosion. Components 1 and 3[21] are designed using the four pillars of disaster risk management.[22] Component 2 will improve the reliability of navigation in the face of high precipitation variability and a wider, shallower river resulting from excessive flooding, land erosion, and sedimentation, and during extreme climate events. Thereby, the Project will enhance the ability of targeted communities and relevant institutions to deal with the flood and erosion risks along the Jamuna River, likely to be exacerbated by climate change.

(b) **Assessment and reduction of mitigation risks.** The potential for mitigation derives from (a) carbon sequestration, where nature-based riverbank solutions implemented on a larger scale would reduce GHG emissions compared to existing cement riverbank structures; (b) carbon sinks maintained and enhanced through measures aimed at reducing erosion; and (c) fuel efficiency improvement and reduced road congestion resulting from the transportation modal shift from roads to waterways.[23] These measures would be the least-emissive options to meet the PDO, and the Project is not expected

[19] Key inputs are from field testing of permeable groynes in the Gorai Bridge project, Kamarkhali, Faridpur in 1989–90; field testing of bandals and permeable groynes in the Jamuna River under the Flood Action Plan's Study 21 in 1993–96; laboratory experiments on permeable groynes and TBPG at Kyoto University in 2002–04 and Heroshima University in 2000–03; and field testing of bandals in the River through a joint project of BUET and Kyoto University in 2018.

[20] Flood management and protection, coastal protection, urban drainage is on the PA Universally Aligned list.

[21] Component 3 supports cash payment to communities soon after payout-eligible flood occurs, which may count as "activities associated with emergency preparedness and immediate response in the aftermath of a crisis or disaster". As per the Universally Aligned List, this activity would be temporary and time-bound to be enlisted as universally aligned.

[22] This includes innovative river structure pilots and excavation (risk reduction); development and implementation of solutions that cover financial risks (recovery); and community engagement, institutional strengthening, and riparian collaboration (preparedness and response).

[23] As per the Universally Aligned List, for IWT improvements aimed at enhancing IWT capacity and/or reliability, an assessment of the operation is required if: (i) coal, peat or other fossil fuels will be transported as part of overall service, (ii) it finances Internal Combustion Vehicles (e.g. conventional heavy bunker fossil fuel vessels), or (iii) if there is a material risk of contributing to deforestation that is likely to significantly reduce carbon stocks.

to slow down the country's low-carbon transition given that no major emissive infrastructure or activities are envisioned, but rather, reducing net emissions as shown in the GHG accounting analyses.

B. Economic Analysis

51. **The economic analysis (EA) shows that the Project is economically viable.** The EA examined benefits/costs arising from the prevention of future flooding and ensuring protection of assets and livelihoods; utilization of dredged materials; transport cost savings from safer navigation on inland waterways, including at night; transport cost savings as a result of the modal shift from roads to IWT; and reducing GHG emissions. The economic net present value and internal rate of return for 30 years using a 12 percent discount rate are significant at US$261.2 million and 28.8 percent, respectively.

52. **The Project's net GHG emissions over its economic lifetime are estimated to be −1,018,640 tCO_2eq, with average net emissions of −33,955 tCO_2eq per year.** The GHG emissions were computed independently for Components 1 and 2. For Component 1, the gross emissions are estimated at 45,701 tCO_2eq, and net emissions at −1,002,676 tCO_2eq. This is contributed by using integrated green and grey infrastructure, compared to an alternative scenario where traditional bank protection structures, such as concrete groins, are used to provide the same level of services. For Component 2, the navigation channel development is expected to see net emissions of −15,964 tCO_2eq by shifting toward the IWT mode.

C. Fiduciary

53. **The Project satisfies the SUW - eligibility Criteria.** The Project includes US$72.0 million from the SUW-SML and US$30.0 million IDA credit from the regular SUW. Bangladesh is eligible to receive Regular SUW and SUW-SML financing resources in FY24. The regular SUW financing is fully consistent with the Bank's SDFP or IMF borrowing limitations. The country's "low" debt risk rating would not change with the regular SUW financing. In addition, the country has successfully implemented the Policy and Performance Actions in FY23, and no eventual non-concessional borrowing ceiling is breached. The Project directly supports the IDA20 Special Theme on Climate Change and the cross-cutting themes of 'Crisis Preparedness' and 'Governance and Institutions'. The project is aligned with the regular SUW objective.[24]

54. **The Financial Management (FM) risk assessments were conducted on each IA.** Despite the IAs' experience in working with the World Bank, the assessments noted FM risks (section VI). A set of mitigation measures will be applied during implementation (Annex 1), to reduce the residual FM risk to Substantial.

55. **Procurement under the Project shall be carried out in accordance with the World Bank Procurement Regulations and provisions of the Procurement Plan approved by the World Bank.** The Project will use the Systematic Tracking of Exchanges in Procurement (STEP) tool to plan, record, and track procurement transactions. A variety of goods, works, and consulting and non-consulting services are expected to be procured under the Project. Despite the IAs' experience in handling procurement under World Bank-

[24] The IDA20 non-concessional Regular Scale-up Window (SUW) is designed to scale up IDA financing for transformational, country-specific and/or regional operations with a strong development impact and high economic returns. The project aligned with the regular SUW objectives as it lays the foundation to enhance climate resilience and economic productivity along the Jamuna River and support transforming the Jamuna River into a river economic corridor that merges disaster resilience, transport, logistics infrastructure, and industrial development.

financed projects, a number of procurement risks are identified (section VI), and a set of mitigation measures will be applied accordingly to reduce the procurement risk to Substantial (Annex 1).

D. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No

56. **OP 7.50 'Projects on International Waterways' is triggered for the Project.** OP 7.50 applies as Jamuna is a transboundary river, but the exceptions under the policy's paragraphs 7(a) and 7(b) apply. The civil works under Project 1 are of limited scale, focused on modernizing the techniques that the GoB uses on the existing and ongoing river protection schemes, without changing the nature of these schemes. Preparatory activities for SoP2 are limited to feasibility and E&S studies and master plans, without detailed design. The terms of reference (ToR) will include an assessment of any potential riparian issues according to paragraph 7(b) of the policy. The requirement of the World Bank Policy OP 7.50 to exempt the Project from notifying riparian states was approved by the Regional Vice President on March 23, 2023.

E. Environmental and Social

57. **The Project's interventions are small-scale, so the E&S risks can be mitigated with relevant measures applying the principle of mitigation hierarchy.** The major E&S risks and impacts include (a) localized changes in river hydrology and morphology, including unexpected flood risk and erosion; (b) localized air and water pollution during construction; (c) localized noise and vibration from civil works and excavation, which could affect aquatic biodiversity, including the Ganges river dolphins; (d) land acquisition and resettlement, including impacts associated with use of *char* lands (such as riverbank erosion, flood, displacement, access of alternative land, limited livelihood resources); (e) impacts on rural livelihood from the Project's civil works; and (f) community and occupational health and safety, including labor influx, risks of Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH), and exposure to COVID-19-related risks. SEA/SH risk is substantial, as per World Bank's tools on 'major civil works' and 'social protection and jobs'. The risks associated with land acquisition, remoteness of project sites, proximity of educational establishment around project sites, exposure of female beneficiaries and community members under Components 3 and 4, semi-skilled labor recruited from outside, and low capacity of IAs are further contributing factors to the SEA/SH risk. The critical habitat assessment performed as part of the ESIA found some species that qualify as critical habitat features, including the Ganges River dolphins[25], fishing cats, and two fish species that are potentially affected. The Project's impact on these species was assessed as minor and temporary, and effective mitigation aligned with the ESF requirements will be applied. Engagement with international and local dolphin specialists and fisheries authorities have

[25] www.riverdolphins.org

commenced pioneering conservation approaches for future projects in the SoP when larger impacts are expected.

58. **The anticipated land acquisition of the Project includes about 68 ha for the two TPBG pilot sites and community-driven development works.** Based on initial estimates, a total of 928 individuals at Kalihati and Fulchari are anticipated to be displaced while no displacement is expected at Kawakhola char (river island). The related potential risks and impacts include displacement of homesteads, households, businesses, shops, trees, standing structures, and crops. Those affected by the land acquisition include legal owners, informal occupants, businesses, and small traders or shop owners, many of whom are likely to be from the vulnerable and marginalized groups. The char dwellers live a vulnerable livelihood, exposed to perennial river erosion with insecure land tenure. The participants in the consultations, including communities at Kawakhola *char*, during the E&S preparation agreed with the BWDB to make the required land available in their collective interest, provided that they receive compensation and support for livelihoods development that is equal or greater to the replacement value of their land. The lands at Kawakhola *char* for the community-driven development activities under Subcomponent 1.4, required for the construction of embankment and other civil works, are affected by the river erosion, so their ownership will have to be verified by the district administration along with community consultations to determine the eligibility for compensation under the Project. The activities at Kawakhola involves canal digging and excavation, and the spoils will be deposited on riverbanks or on the existing rural roads to raise their ground level.

59. **Risk management instruments have been prepared based on the World Bank's ESF.** The final E&S package[26], including the ESIA, Stakeholder Engagement Plan (SEP), Labor Management Procedures (LMP), Rapid CIA, and the E&S Commitment Plan (ESCP), have been disclosed on May 9, 2023 by the BWDB; May 8, 2022 by the BIWTA; May 9, 2023 by IDRA; and May 9, 2023 by the World Bank. A project-specific Resettlement Policy Framework (RPF) along with the SEA/SH Action Plan have been disclosed on May 22 by the BWDB, the BIWTA, and IDRA; and May 23 by the World Bank. The site-specific Resettlement Action Plans (RAPs) will also include a Livelihood Restoration Plan (LRP) based on in-depth assessment of the impacts. No indigenous people have been found in the Project's area of influence. For the activities that will be parallel financed, the World Bank's ESF will apply.

60. **A Rapid Cumulative Impact Assessment (RCIA) following IFC guidelines on RCIA has been carried out during project preparation that meets the requirement of SOP1.** For subsequent projects, the CIA will be updated comprehensively, based on the nature of interventions and changing river ecological considerations. The CIA findings on SOP1 cumulative impacts are: (i) pre-mitigation risk is "Substantial"; and (ii) post-mitigation is "Low". Specifically on Dolphins, the ESIA and the RCIA concluded that SOP1 does not require "Net Gain" for this species since there will be no significant nor residual impacts to the species given the small scale and pilot nature of investments. Engagement with the Ganges River Dolphin Advisory Group is planned for the management of the Jamuna River Dolphin Sanctuaries and for putting measures for protection of dolphins along the River. This will be done with the support of a specialized NGO, as described in the Biodiversity Management Plan and ESCP for SOP 1. The Dolphin conservation will also

[26] Links to the disclosed ESF at the 3 IAs:
MoShip/BIWTA: *http://www.biwta.gov.bd/site/page/2ab485cf-1e1c-4b2e-b88f-23d0ddf5928b*
MoWR/BWDB: *https://www.bwdb.gov.bd/project-report*
MoF/IDRA: *http://idra.portal.gov.bd/site/notices/5d2d12a1-6c3d-4f80-b628-780b731a0a72/Environmental-and-Social-Assessment-Documents-of-Jamuna-River-Sustainable-Management-*

involve pro-active stakeholder engagement including the communities. In addition, the long-term SOP approach ("room for the river") that will allow the River to dynamically meander and naturally carve out multiple channels during the monsoon season, and then seek the best navigation routes at the start of the dry season, will help to minimize disruption to dolphins and aquatic biodiversity. These approaches are consistent with World Wildlife Fund recommendations, following an in-depth study on global best practices for managing impacts and protection of Ganges River Dolphins in the Ganges-Brahmaputra-Meghna River Basin, which also aligns and supports the Bangladesh Dolphin Action Plan 2020-2030.

61. **The IAs will require substantial capacity building on E&S risk management.** The E&S risk management capacity of the IAs is institutionally limited by inadequate workforce and human resource policy and practice. Currently, only the BWDB has an official E&S Unit consisting of multidisciplinary staff, who have little experience with the World Bank's ESF. Thus, in view of the World Bank's potential engagement over the upcoming 14 years or so, the Project will include measures for systemic institutional strengthening on E&S risk management for the IAs, especially for the BIWTA. The existing E&S Unit of the BWDB will be strengthened with qualified E&S specialists. The BIWTA has agreed to create an E&S Wing by revising its organizational structure, to become functional during the third year of the Project. Until then, the BIWTA PIU will include qualified E&S specialists to manage the related risks. Moreover, the BWDB, the BIWTA, and IDRA will be linked with the World Bank's ongoing support to the Center of Excellence at Bangladesh University of Engineering and Technology (BUET) to build in-country capacity on E&S risk management, including E&S training of their staff, consultants, and contractors.

62. **Citizen engagement is an integral part of the Project.** The IAs have carried out extensive consultations with stakeholders at the local, regional, and national levels during preparation and will continue doing so during implementation. Further, establishing and working with WMGs to implement participatory planning, decision-making, and monitoring is a key pillar of the Project to actively empower the communities in river management. The IAs will also set up a project-specific grievance mechanism, the citizens' feedback from which will be regularly monitored, reported, and acted upon. Further, an indicator on citizen satisfaction will be measured at least three times during the Project.

V. GRIEVANCE REDRESS SERVICES

63. **Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the World Bank's Grievance Redress Service (GRS).** The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's GRS, please visit

http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank's AM, please visit https://accountability.worldbank.org.

VI. KEY RISKS

64. **The overall risk rating for the Project is Substantial.** The risks described below call for utilizing global best practices and maximizing outreach to local, national, and regional stakeholders in the Project design and implementation.

65. **Institutional capacity for implementation and sustainability risk is Substantial.** River management has been under a fragmented, weak institutional framework for a long time. Shortcomings are found throughout the water infrastructure investment cycle.[27] Unclear division of labor often leads to unnecessary, counterproductive friction among institutions, and there is a lack of skilled staff and incentives for institutional collaboration. While the institutional capacity risk may be moderate for this Project's implementation,[28] it becomes substantial considering whether GoB institutions can adequately manage more complex, larger subsequent projects necessitating seamless multisectoral collaboration. Hence, strengthening river institutions through capacity building sits at the center of the Project. The PSC will help addressing the risks related to institutional fragmentation, and implementation status reports for the Project will track institutional readiness for the second project in the SoP.

66. **Fiduciary risk is Substantial.** FM risks include a weak internal audit environment, delays in resolving audit observations,[29] absence of a national Integrated Financial Management Information System to generate project financial reports using the standard Budget and Accounting Classification Manual code, and shortage of professionally qualified FM human resources to carry out day-to-day FM responsibilities. Mitigation measures, as illustrated in Annex 1, will be implemented to reduce the FM risk. Procurement risk is substantial, including delays in procurement due to inadequate technical preparation of, for example, ToR, technical specifications, and cost estimates, before the start of procurement; delays in bid evaluation and contract award; slow approval processes within the GoB; possible conflicts between the World Bank Procurement Regulations and the GoB's rules and decision-making; lack of deployment of government procurement staff at the core PIU team; and IDRA's limited experience in World Bank-financed projects. These risks will be mitigated through a range of measures as outlined in Annex 1, including employing specialized staffing, meticulous planning and budgeting, robust internal controls, comprehensive financial manuals, a mix of fund disbursement methods with a focus on the 'advance' method, advanced FM systems, and internal and external audits.

67. **E&S risk is High.** The Project includes the preparation of the SoP's second project, which is anticipated to have 'high' E&S risks, stemming from anticipated accumulated impacts associated with large-scale dredging, river training, land acquisition, involuntary resettlement, and loss of livelihoods. The E&S risks

[27] These include master planning, preparation, implementation, O&M, and monitoring.
[28] As the project is relatively small and simpler in size and design.
[29] IAs do not have any overdue audit report or ineligible expenditure pending with the World Bank. However, the BWDB has outstanding audit observations that require resolution. The World Bank will take appropriate measures if the observations are not settled within the agreed time frame.

and impacts specific to the Project are described in section IV, and mitigation measures associated with the second project will be designed during the Project's implementation.

68. **Stakeholders risk is High.** Global experience shows that river management investments attract international scrutiny and are often opposed by local groups whose livelihoods may be affected. Since 2021, a series of consultations were held in all the Project sites with relevant stakeholders at all levels. Key concerns that were raised include (a) protection from further erosion; (b) receipt of proper market price for their lands; (c) proper compensation for structures and assets, as affected; (d) new livelihood opportunities and trainings, as required; (e) appropriate response to vulnerable groups (such as persons with disability and women); (f) protection of *chars*; (g) ownership of lands in *chars*; and (h) relief/assistance. In response, the Project will develop a clear strategy to establish and implement compensatory and other necessary measures and create better, more sustainable livelihood opportunities and transportation services, which will be measured by an indicator on beneficiary/user satisfaction. Qualified communications specialists with ample stakeholder consultation experience in Bangladesh will be engaged in the awareness raising campaigns and other outreach activities.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY: Bangladesh
Jamuna River Sustainable Management Project 1

Project Development Objectives(s)

The Project Development Objective (PDO) is to increase capacity for flood management and navigation along the Jamuna River.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	End Target
(a) Increased physical capacity for flood management			
Construction, maintenance, and evaluation of river structures that are climate-adapted (Yes/No)		No	Yes
(b) Increased physcial capacity for navigation			
Average travel time of vessels from Sirajganj to Daikhowa (Days)		5.00	4.00
(c) Increased institutional capacity			
The two master plans (NRMMP & JRNMP) be submitted for approval (Yes/No)		No	Yes
Government capacity improved for coordinating multisector decisions on river planning (Yes/No)		No	Yes

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
1. Flood and riverbank erosion management				
Climate-adapted river structures constructed, maintained, and being monitored at Fulchari & Kalihati (Number)		0.00		11.00
Riverbank protective work, including embankments, re-excavation, geo-bags (Kilometers)		0.00		29.50
2. Navigation channel development				
Physical aids to navigation that are installed and remain functional (Number)		0.00		260.00
Installation and operation of the D+ level RIS across the Jamuna River (Yes/No)		No		Yes
People with enhanced access to transportation services (CRI, Number)		0.00		100,000.00
3. Financial protection of communities				
Pre-arranged financial solutions designed and developed (Number)		0.00		2.00
Beneficiaries protected by risk finance solutions developed (Number)		0.00		1,200,000.00
Of whom are women (Number)		0.00		360,000.00
Community engagement				
WMGs with women comprising at least 30 percent of executive committee members (Percentage)		0.00		100.00
Institutional strengthening				
Public officials and private sector personnel trained (Number)		0.00		3,535.00
Beneficiary (BWDB/IDRA) and user (BIWTA) satisfaction level (Percentage)		0.00	20.00	50.00

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
Gender strategies developed and adopted by IAs in preparation for the 2nd project in the SoP (Yes/No)		No		Yes
Survey, design, and O&M capacity in the BWDB and BIWTA enhanced (Yes/No)		No		Yes

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Construction, maintenance, and evaluation of river structures that are climate-adapted	Measures if climate adapted river structures are built & maintained following the flood design standards throughout the project.	Yearly	BWDB Management Information System (MIS)	Monitoring Report of BWDB and Progress Report of the O&M Division	BWDB PIU
Average travel time of vessels from Sirajganj to Daikhowa	Measures the average travel time of vessels sailing from Sirajganj to Daikhowa using the navigation channel.	Yearly	BIWTA and association of operators	Collecting data from Department of Shipping, association of operators, and BIWTA.	BIWTA PIU
The two master plans (NRMMP & JRNMP) be submitted for approval	Measures if the NRMMP & JRNMP are finalized and submitted for approval.	Baseline & endline	BWDB and BIWTA MIS	Collation of the government record on submission for approval	BWDB PIU and BIWTA PIU
Government capacity improved for coordinating multisector decisions on river planning	Measures if the IAs regularly meet and coordinate on multisector decisions and	Yearly	PIUs	M&E	Consultants for 3 PIUs and PSC.

	joint planning & joint reviews of design and bid documents under PSC's guidance.				

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Climate-adapted river structures constructed, maintained, and being monitored at Fulchari & Kalihati	Measures the No. of river structures that have been built, kept functional, and are being monitored through the Project.	Quarterly	BWDB MIS	BWDB's Monitoring Report, O&M Divisions' Progress Report, and Circles that oversee Bhuapur and Kalihati	BWDB PIU
Riverbank protective work, including embankments, re-excavation, geo-bags	Measures the length of riverbank protective works done through the Project.	Quarterly	BWDB MIS	Monitoring Report, O&M Division's Progress Report, and Circles that oversee Buhapur and Kalihati	BWDB PIU
Physical aids to navigation that are installed and remain functional	Measures the No. of physical aids to navigation that are installed, maintained, and frequently repositioned to remain functional for day and nighttime operation.	Quarterly	BIWTA MIS	Monitoring Report of BIWTA	BIWTA PIU
Installation and operation of the D+ level RIS across the Jamuna River	Measures the installation and operation of the D+ level RIS across the Jamuna River.	Baseline & endline	BIWTA MIS	Data from BIWTA and monitoring stations for RIS upon installation	BIWTA PIU

People with enhanced access to transportation services	The indicator measures the number of direct beneficiaries that experience improved access to transport infrastructure and services that have been built or rehabilitated through a WBG-financed project (including highways, rural roads, urban and interurban roads, mass transit systems, ports/waterways, railways, and airports). Beneficiaries typically experience reductions in cost and time to travel and/or improvements in safety, as well as increased access to markets, job opportunities, and health and education services. In urban areas, beneficiaries include the increase in the number of users of improved services. In rural areas, beneficiaries include the increase in the number of people who live in proximity to improved services.	Yearly	BIWTA, , BIWTC and local administration such as DC Office, MoLGRD	Primary data from BIWTA and BIWTA and secondary data from the Project 1 DPP, the feasibility study, and other sources	BIWTA PIU

Pre-arranged financial solutions designed and developed	Measures the No. of DRF instruments designed and developed under the Project for smallholder farmers along Jamuna	Number	IDRA reporting	Monitoring report of IDRA	IDRA PIU
Beneficiaries protected by risk finance solutions developed	Measures the No. of beneficiaries to be protected by the DRF solutions to be developed under the Project	Yearly	IDRA MIS	Design and coverage documentation	IDRA
Of whom are women	Measures the No. of female beneficiaries to be protected by the DRF solutions to be developed under the Project	yearly	IDRA MIS	Design and coverage documentation	IDRA
WMGs with women comprising at least 30 percent of executive committee members	Measures the presence of women in the executive committees of WMGs and if they hold any role in decision-making/leadership	Yearly	Primary data to be collected	Data gathering and update in the field on WMGs to be set up	BWDB and BIWTA PIUs
Public officials and private sector personnel trained	Measures the cumulative No. of public and private sector personnel trained on skills required in river and IWT mgmt.	Quarterly	BWDB and BIWTA MIS	Record of training attendees	BWDB and BIWTA PIUs
Beneficiary (BWDB/IDRA) and user (BIWTA) satisfaction level	Measures the satisfaction levels increase of the river training beneficiaries and navigation channel users.	Baseline, mid-term, & endline	BWDB,IDRA, and BIWTA MIS	Results from the three surveys conducted	BWDB,IDRA, and BIWTA PIUs
Gender strategies developed and adopted by IAs in preparation for the 2nd project in the SoP	Measures if the gender strategy aimed at supporting full-scale implementation in the 2nd	End of Project 1	BWDB, BIWTA, and IDRA MIS	Monitoring reports of BWDB, BIWTA, and IDRA	BWDB, BIWTA, and IDRA PIUs

	project prepared.				
Survey, design, and O&M capacity in the BWDB and BIWTA enhanced	Measures if the conditions below met in BWDB & BIWTA: (a) regular river surveys carried out; (b) time required for in-house design reduced (BWDB only); (c) O&M carried out properly and on time, O&M manuals in place, and budget allocation defined and results in sufficient amount.	Yearly	BWDB and BIWTA MIS, qualitative observation	A qualitative assessment will be made on three conditions, backed up by solid data. Progress achieved be outlined in progress reports.	BWDB and BIWTA PIUs

ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: Bangladesh
Jamuna River Sustainable Management Project 1

I. Implementation Arrangements, Support Plan

PIU Composition

1. **Full-time staff at the PIUs.** There will be five staff at the BWDB PIU (including a project director, a procurement specialist, an FM specialist, an environmental safeguards specialist, and a social safeguards specialist); four staff for the BIWTA PIU (including a director, a procurement specialist, an FM specialist, and an E&S specialist); and two staff for the IDRA PIU (including a project director and a fiduciary specialist).

2. **Coordination mechanism.** To facilitate coordination among the three PIUs, there will be one part-time staff from each PIU for a total of six staff months each throughout the project period. Their efforts will be further supported by a subteam of the project implementation consultants, who will dedicate around 12 staff months for the inter-IA coordination.

FM

3. **Risk mitigation measures.** The following set of mitigation measures will be applied during implementation, which will reduce the residual FM risk to Substantial:

(a) **Institutional arrangements and staffing.** The three PIUs' responsibilities will include compliance with fiduciary requirements at each agency level. At least one project accountant will be hired in each PIU to perform day-to-day FM tasks and fulfill the reporting requirements of both the GoB and IDA.

(b) **Planning and budgeting.** The annual budget will be prepared by each PIU based on the Procurement Plan and other relevant annual work plans. The budgets will be monitored periodically to ensure alignment with expenditures and provide input for necessary revisions.

(c) **Internal control.** The PIUs will preserve all accounting, procurement, and other transaction processing records and documents in accordance with the provisions of the Public Procurement Act 2006 and General Financial Rules. These records must be made readily available on request for audit, investigation, or review by the GoB or the World Bank. To facilitate the process, all project-related documents must be filed separately.

(d) **FM manual.** An FM manual will be prepared by the implementing entities within 45 days after project effectiveness. It will contain references to the GoB's financial rules and regulations and other FM requirements that the Project must follow. The FM manual will become part of the project operations manual, and fund flows and reporting mechanisms for each IA will be separately and adequately articulated to reflect all the requirements of the GoB and the World Bank.

(e) **Funds flow.** Three Designated Accounts, one each for the BWDB, the BIWTA, and IDRA, will be opened in a commercial bank acceptable to IDA. Funds from the designated IDRA account will be paid to insurance companies based on applicable contracts. In the event of an eligible disaster, insurance companies will disburse funds to beneficiaries via a digital service provider. While all four

disbursement methods will be available under the Project, the IAs will mainly use the 'advance' method of disbursement from the World Bank, and the direct payment option may be exercised for high-value contracts. The Project will follow Statement of Expenditure based disbursement, and a ceiling will be applied in the Disbursement and Financial Information Letter (DFIL), up to which can be advanced to the Designated Accounts. For Category 2 of the withdrawal table in the Financing Agreement, disbursement would first be made under the IDA SUW-SML credit, before IDA SUW-Regular Credit. The World Bank will not finance salaries and allowances of civil servants, purchase of vehicles[30], land acquisition, and fuel. IDA could finance value added tax (VAT) up to 15 percent of total credit.[31] Parallel financing from the AIIB will cover activities under Subcomponent 1.5; parallel co-financing from the Netherlands will cover activities under Subcomponents 1.3 and 4.2; and the GSFF grant will parallel co-finance Component 3 and Subcomponent 4.4. The counterpart funding, in the form of parallel co-financing, is around US$29.3 million or 20 percent of the project total cost (including all taxes; land acquisition, afforestation, consultancy costs under Component 1; grant-matching funds and equipment under Component 3; and incremental operating costs for running BWDB and IDRA PIU offices, and hiring vehicles for BIWTA under Component 4).

(f) **FM system.** The PIUs will use iBAS++ for accounting and financial reporting in the future as soon as the IBAS Project Management Accounting Portal becomes available for use in all the development projects. Until then, the Project will purchase and use an off-the-shelf accounting software, which would directly generate project financial reports, including interim unaudited financial reports, to provide reasonable assurance on the accuracy and completeness of the financial statements. Each of the three PIUs will submit separate sets of interim unaudited financial reports within 45 days after the end of each calendar quarter.

(g) **Internal audit.** An internal audit consulting firm will be hired to build capacity of the BWDB and carry out internal audit of Component 1. The internal audit firm will transfer skills and knowledge with the expectation that by the third year of the Project, responsibility of internal audit will be gradually transferred to the BWDB's internal audit unit. This capacity building is in line with the strategic objective set by the MoF to establish internal audit units in all high-spending agencies across the country. The ToR of the consultancy will include the following: (i) assessing the existing capacity of the BWDB's internal audit, to be completed within the first year of the implementation; (ii) providing necessary support in the form of audit manuals, audit charters, systems, and software; drafting the required organigram and job descriptions; and providing relevant training to the audit department; and (iii) carrying out three internal audits, using international internal audit standards—the first due within 6 months after the end of the first year, the second 6 months before the MTR, and the third in the fourth year of implementation, to be carried out by the BWDB's own internal audit unit with the consulting firm's support. The BIWTA and IDRA parts of the Project will be audited separately by an internal audit firm twice in the lifetime of the Project, six months before the MTR, and one year before the closure of the Project.

(h) **External audit.** At this point, there is no overdue audit report under any of the IAs and their line ministries. External audits of the Project will be carried out by the Foreign Aided Project Audit Directorate of the Comptroller and Auditor General. The annual audit reports will be submitted within six months after the end of the fiscal year. The audited financial statements will be made available for public disclosure. The project directors at each PIU will be responsible for any follow-up and remedial

[30] Subcomponent 2.2 is approved to be exempted.

[31] VAT is estimated to be less than 15 percent of financing. As of pre-negotiations, all taxes, including VAT, are funded by the GoB according to the DPPs for Components 1 and 3, but for the Component 2 DPP, some taxes are to be financed by IDA.

actions, with assistance from the project accountants and the implementing sections relevant to the audit objections. The PIUs, with the help of the respective ministries, will arrange tripartite meetings to resolve outstanding audit objections within three months from the receipt of audit reports and improve the internal control arrangements to prevent the recurrence of issues that triggered the audit objections.

4. **Implementation support.** All the FM-related procurements will follow 'prior review' and 'post review' procurement method irrespective of the threshold (see paragraph 10 for more details). The World Bank will undertake regular semiannual implementation review missions, the agendas of which will be based on IAs' reports to monitor project performance and resolve areas of concern. Alternate arrangements may be made in the event of a pandemic, like COVID-19, to use desk reviews and information and communication technology tools that allow supervision of fiduciary aspects.

Procurement

5. **Applicable procurement procedures.** Procurement under the Project shall follow the World Bank Procurement Regulations and the provisions of the Procurement Plan approved by the World Bank. The Project shall also be subject to the World Bank's Anticorruption Guidelines.[32] The project will use STEP to plan, record, and track procurement transactions.

6. **Types of procurement.** Civil works are expected to include construction of transversal and longitudinal river structures, re-excavation, and rehabilitation of existing training centers. Goods will include hydrographic survey vessels, buoy handling vessels, prototype structures (vessel and pontoon), fast transit boat, physical aids to navigation, monitoring stations, surveillance equipment, survey equipment, and office and IT equipment. Consulting services will include construction supervision and monitoring, feasibility studies, TA on training, technical studies, planning documents, and hydrographic surveys, design and delivery of financial protection solutions, and calculation agent (third-party service), as well as individual consultants such as project coordinator, dredging specialist, M&E specialist, disaster risk finance advisor, E&S specialists, FM specialist, and procurement specialist, if needed, to supplement the assigned government procurement staff. There may also be some non-consulting services to outsource some of the administrative services. Under Component 3, IDRA will engage co-insurers for channeling the compensation, and the disaster insurance protection services will be procured under two contracts—one with the Government-owned insurance company, the Sadharan Bima Corporation (SBC), and the other with a pool of domestic private insurance companies. The contract with SBC will be procured through Direct Selection method based on the SBC's experience of exceptional worth for the required services and the second contract for selection of domestic private insurance companies will be procured through Open Competition National Market approach. Both the SBC and the domestic private insurance companies will be required to meet predefined qualification criteria and will also be reinsured by international reinsurers.

7. **Procurement methods and approaches.** The Procurement Plan will specify the procurement method and approach that each procurement activity will take. Goods, works, and nonconsultant services are expected to be procured mostly through the open bidding international or national approach, subject to the provisions required for ensuring consistency with the World Bank's Procurement Regulations, whereas small-value, simple procurement may follow the Request for Quotations method. Consulting

[32] Dated October 15, 2006, revised in January 2011, and as of July 1, 2016.

services requiring firms are expected to be selected mostly through the Quality- and Cost-Based Selection method and individual consultants through competitive selection.

8. **Project Procurement Strategy for Development (PPSD) and Procurement Plan.** A single PPSD is being jointly prepared by the IAs, which are responsible for carrying out respective procurement activities. The PPSD, a living document that may be updated from time to time with the World Bank's approval, will spell out the detailed procurement arrangements and contract management plan, including the related risks and mitigation measures. The initial Procurement Plan, an output of the PPSD, will specify each contract to be financed under the Project, including the procurement method, market approach, estimated cost, timelines for completing key milestones, and the World Bank's review requirements. The Procurement Plan will be uploaded and maintained in STEP and updated at least annually or when necessary, during implementation. A General Procurement Notice would be published on the World Bank's website and United Nations Development Business online.

9. **Risk mitigation measures.** To mitigate the procurement risks and reduce the residual procurement risk to Substantial (section VI), the following set of measures will be applicable to all IAs during implementation:

(a) Completing the technical prerequisites, such as budget approval, design, bill of quantities (BoQ), technical specifications, ToR, land acquisition, and E&S requirements, on time before bids are invited.

(b) Completing procurement processes, particularly bid/proposal evaluation and contract award, in accordance with the activity schedule and time standards specified in the approved Procurement Plan to avoid noncompliance with the 'efficiency' principle of the World Bank's Procurement Regulations.

(c) Preparing and submitting quarterly procurement progress monitoring reports to the Head of the Project IA, with copy to the World Bank, providing the status of the technical preparation and procurement process of each procurement activity against the approved procurement plan, identifying the bottlenecks, and recommending corrective measures.

(d) Applying the World Bank Procurement Regulations, which shall govern all procurement under the Project and shall take precedence if any conflict arises with the GoB's procurement rules and decision-making.

(e) Using the GoB's electronic procurement system where acceptable to the World Bank (currently only for procurement of goods and works under open bidding national market approach).

(f) Assigning at least two full-time government procurement staff (who received training in government procurement) in each PIU no later than project effectiveness. If the need for additional support is justified by the PIU and acceptable to the World Bank, two procurement consultants may be hired under the Project (one for supporting both the BWDB and IDRA for a maximum of the first three years and the other for supporting the BIWTA for a maximum of two years) to assist the government procurement staff and also conduct training to build procurement capacity of IAs.

(g) Completing the World Bank's procurement and STEP training by relevant project officials.

(h) Monitoring implementation of the PPSD during the World Bank's implementation support missions, including the procurement and contract management risk mitigation measures.

10. **Implementation support.** The World Bank's procurement implementation support will include prior reviews and post reviews and provision of training and guidance as needed to the IAs. The prior review

contracts will be those that are relatively complex or of high value and will be agreed in the Procurement Plan following a risk-based approach. Post reviews will be conducted by the World Bank on a sample of contracts selected based on associated risks, at least on an annual basis or more frequently as needed. For some of the post review contracts, the ToR of the consulting services, technical specifications, and BoQs of some of the goods/works packages may require technical review by the World Bank.

M&E

11. **Participatory M&E**. The project allows project stakeholders—such as the local BWDB and BIWTA officials, consultants, WMGs, and LCS—to collect data on project progress, including geospatial data with photographs of the outputs and any key features that require regular monitoring. To further analyze the Project's impact, data will be collected on (a) assets and livelihood activities near the project location and (b) households near the project location. The M&E of Component 2 may migrate to the RIS system once it is established and fully integrated. Working together with the BIWTA and IDRA, the BWDB will submit the quarterly progress reports to the World Bank and relevant line ministries. The contents will include (a) updated implementation schedules by component; (b) commitment and disbursement by component; (c) the status of indicators against targets; and (d) facts, recommendations, and agreements to be reached on key implementation issues.

12. **Component 1.** Since the Project's interventions are intended to be expanded at a larger scale in the second project, it is critical to gather data and perform relevant simulations, so that their performance can be evaluated thoroughly.

(a) **Data collection.** Through water monitoring; meteorological measurements; and topographic, bathymetric, and drone survey, the following data will be collected during the detailed design phase, during construction, and after construction: (i) natural conditions such as water levels, waves, velocities, vortexes, and induced local scouring; (ii) sediment load; (iii) horizontal and vertical impacts such as sedimentation, scouring, velocity propagations, and flow diversion; (iv) deterioration of the materials and two protection works; (v) change in subsoil conditions; (vi) variation on the surrounding flow pattern and bank line; (vii) impact on navigation channel formation/deepening and gradual river width stabilizing potential; and (viii) unexpected changes induced by humans or animals.

(b) **Model simulation and rectification.** Using the data above, 2D hydrodynamic and sediment transport models will simulate bed conditions, structural deterioration, scouring conditions beneath the structures, and others on a regular basis for the future. Simulation outputs will be used to make decisions on any rectification measures to be undertaken immediately or in the future. If model output or visual inspection implies that the structure is under immediate threat, emergency response will be provided, which may include immediate placing of geo-bags or concrete cement blocks to prevent sudden failure. If the needed response is not of an emergency nature, a convenient period for rectification may be chosen.

(c) **Evaluation.** Toward the end of the Project, all the collected and simulated data will be used by an independent evaluator to carry out a multicriteria analysis of the performance of river structures. An interim evaluation by the IA may be conducted around the MTR. The criteria to be assessed will include (i) effectiveness in protecting riverbanks from erosion, (ii) sedimentation at riverbank side and riverbank building, (iii) flow diversions and potential for gradual stabilization of the River, (iv) positive impact on navigation channel formation, (v) implications for different river stretches, (vi) adaptability to soil conditions and channel geometry, (vii) use of local materials and construction expertise, (viii) potential for early repair in case of damage and low maintenance requirement, and (ix) E&S impact.

II. Project Location

13. The project location is illustrated on the maps (figure A and figure B) below.

Figure A. Main Rivers and River Basins in Bangladesh

Source: Bangladesh Water Development Board (BWDB), Ministry of Water Resources (MoWR).

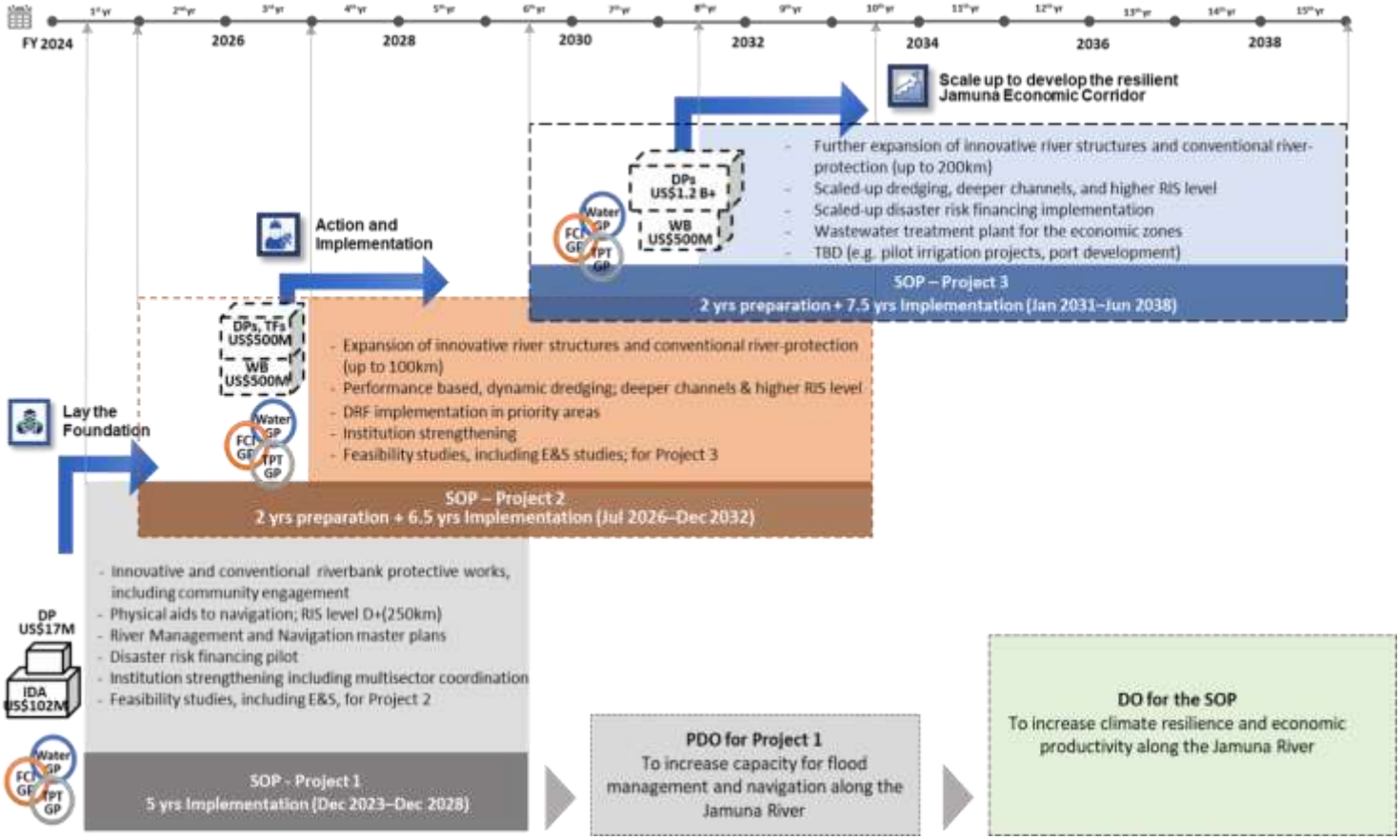
Figure B. Project Location in the Context of the Bangladesh-India Protocol Routes

Source: Bangladesh Inland Water Transport Authority (BIWTA) and the BWD

III. SoP Sequencing and Design

14. The SoP framework is illustrated on figure C as below.

Figure C. SoP Sequencing and Design



Note: DO = Development objective.

15. As illustrated on Figure D below, the project supports all the four elements of disaster risk management[33] for the first time in Bangladesh through investing in innovative river structures, dynamic navigation, DRF solutions, and community engagement. A detailed description of each component is found in a separate Annex ("Supplemental Note").

[33] Emergency managers think of disasters as recurring events with four phases. Mitigation includes actions taken to prevent or reduce the cause, impact, and consequences of disasters. Preparedness refers to planning, training, and educational activities for events that cannot be mitigated. The response phase occurs in the immediate aftermath of a disaster, where personal safety and well-being depend on the level of preparedness. Recovery means restoration efforts that occur toward returning to a normal state. https://training.fema.gov/emiweb/downloads/is111_unit%204.pdf

Figure D. Project's Support for the Four Elements of Disaster Risk Management