Document of
The World Bank

FOR OFFICIAL USE ONLY

Report No: PAD1652

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 254 MILLION

(US$360 MILLION EQUIVALENT)

TO THE

PEOPLE'S REPUBLIC OF BANGLADESH

FOR

BANGLADESH REGIONAL WATERWAY TRANSPORT PROJECT 1

MAY 20, 2016

Transport and ICT Global Practice
Bangladesh Country Management Unit
South Asia Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective April 30, 2016)

Currency Unit	=	Bangladesh Taka (BDT)
US$1.00	=	BDT 78.62
BDT 1.00	=	US$0.127
US$1.4173	=	SDR 1

FISCAL YEAR
July 1 – June 30

ABBREVIATIONS AND ACRONYMS

ADP	Annual Development Program
AG	Accountant General
BBIN	Bangladesh-Bhutan-India-Nepal
BEC	Bid Evaluation Committee
BE	Budget Estimates
BIWTA	Bangladesh Inland Water Transport Authority
BP	Business Policy
CPTU	Central Procurement Technical Unit
CNG	Compressed Natural Gas
CAS	Country Assistance Strategy
C&AG	Comptroller & Auditor General
CONTASA	Convertible Taka Account
CPF	Country Partnership Framework
CSC	Construction Supervision Consultant
DoE	Department of the Environment
DA	Designated Account
DCC	Dhaka-Chittagong Corridor
DEPTC	Deck & Engine Personnel Training Center
DFID	Department for International Development
DGPS	Differential Global Positioning System
DPP	Development Project Proposal
DWT	Dead Weight Tons
DMDP	Dredged Material Disposal Plan
e-GP	e-Government Procurement
EIRR	Economic Internal Rate of Return
ECC	Environmental Clearance Certificate
EHS	Environmental Health and Safety
EMF	Environmental Management Framework
EMP	Environmental Management Plan
ESCCU	Environmental, Social and Climate Change Unit
ENC	Electronic Nautical Chart

ESA	Environmental & Social Assessment
ESHS	Environmental & Social Health and Safety
ESIA	Environmental & Social Impact Assessment
EU	European Union
FAPAD	Foreign-Aided Project Audit Directorate
GHG	Greenhouse Gas
GoB	Government of Bangladesh
GoI	Government of India
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Services
GTIDR	Global Transport & ICT Development Region (Practice)
HIES	Household Income and Expenditure Survey
HOPE	Head of the Procurement Entity
IA	Implementation/Implementing Agency
ICB	International Competitive Bidding
ICD	Inland Container/Clearance Depot
ICP	Integrated Check Posts
ICR	Implementation Completion Report
IDA	International Development Association
IFC	International Finance Corporation
IFR	Interim Financial Reports
IGSNC	Indian General Steam Navigation Company
IPP	Independent Procurement Panel
IT	Information Technology
IWT	Inland Water Transport
IEE	Initial Environmental Evaluation
KM	Kilometer
LAD	Least Available Depth
LMIC	Lower Middle Income Country
LPI	Logistics Performance Index
M	Meter
M&E	Monitoring & Evaluation
MEAL	Monitoring Evaluation Audit Learning
MoF	Ministry of Finance
MoS	Ministry of Shipping
NCB	National Competitive Bidding
NER	North East Region
NIMTP	National Integrated Multimodal Transport Policy
NLTA	Non-Lending Technical Assistance
ODC	Over-dimensional Cargo
OP	Operational Policy
PBC	Performance-Based Contract
PD	Project Director
PDO	Project Development Objective

PEC	Proposal Evaluation Committee
PFP	Procurement Focal Point
PIC	Project Implementation Committee
PIE	Project Implementing Entity
PIU	Project Implementation Unit
PIWTT	Protocol on Inland Water Transit & Trade
PPA	Public Procurement Act
PPR	Public Procurement Rules
PSC	Project Steering Committee
RAP	Resettlement Action Plan
R&R	Resettlement and Rehabilitation
RETF	Recipient-Executed Trust Fund
RIS	River Information Systems
RFP	Request for Proposals
RGoB	Royal Government of Bhutan
RMG	Ready-Made Garments
RSNC	River Steam Navigation Company
SAR	South Asia Region
SAARC	South Asia Association for Regional Cooperation
SE	Superintending Engineer
SIA	Social Impact Assessment
SMF	Social Management Framework
SPMC	Supervision and Performance Monitoring Consultant
STEP	Systematic Tracking of Procurement Exchanges System
STS	Ship-to-Ship
TBD	To Be Defined
TOR	Terms of Reference
UNDB	United Nations Development Business
WB	World Bank

Regional Vice President:	Annette Dixon
Country Director:	Qimiao Fan
Senior Global Practice Director:	Pierre Guislain
Practice Manager:	Karla Gonzalez Carvajal
Task Team Leader:	Diep Nguyen-van Houtte

SOUTH ASIA
Bangladesh Regional Waterway Transport Project 1
Table of Contents

Page

PAD DATA SHEET

Bangladesh

Bangladesh Regional Waterway Transport Project 1 (P154511)

PROJECT APPRAISAL DOCUMENT

SOUTH ASIA REGION

Transport and ICT Global Practice

Report No.: PAD1652

Basic Information			
Project ID P154511	EA Category A - Full Assessment		Team Leader(s) Diep Nguyen-Van Houtte
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date 17-Jun-2016	Project Implementation End Date 30-Dec-2023		
Expected Effectiveness Date 15-Sep-2016	Expected Closing Date 30-Jun-2024		
Joint IFC No			
Practice Manager/Manager Karla Gonzalez Carvajal	Senior Global Practice Director Pierre Guislain	Country Director Qimiao Fan	Regional Vice President Annette Dixon

Borrower: People's Republic of Bangladesh			
Responsible Agency: Bangladesh Inland Water Transport Authority			
Contact:	Mahmud Hasan Salim	Title:	Director of Planning
Telephone No.:	88-02-9563188	Email:	dpl@biwta.gov.bd

Project Financing Data(in USD Million)					
[ ]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[X]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	400.00	Total Bank Financing:	360.00
Financing Gap:	0.00		

Financing Source	Amount
BORROWER/RECIPIENT	40.00
International Development Association (IDA)	360.00
Total	400.00

Expected Disbursements (in USD Million)

Fiscal Year	2017	2018	2019	2020	2021	2022	2023	2024
Annual	11.20	35.20	81.00	77.50	44.00	44.00	42.00	25.10
Cumulative	11.20	46.40	127.40	204.90	248.90	292.90	334.90	360.00

Institutional Data

Practice Area (Lead)

Transport & ICT

Contributing Practice Areas

Environment & Natural Resources, Trade & Competitiveness, Social, Urban, Rural and Resilience Global Practice, Water

Cross Cutting Topics

[X] Climate Change
[ ] Fragile, Conflict & Violence
[X] Gender
[X] Jobs
[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Transportation	Ports, waterways and shipping	100	4	100
Total		100		

☐ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Trade and integration	Other trade and integration	50
Trade and integration	Trade facilitation and market access	50
Total		100

Proposed Development Objective(s)
The development objective of the Project is to improve Inland Water Transport (IWT) efficiency and safety for passengers and cargo along the Chittagong-Dhaka-Ashuganj Regional Corridor and to enhance sector sustainability.

Components	
Component Name	**Cost (USD Millions)**
Component 1: Improved Inland Waterway Navigation	261.00
Component 2: Improved Services at Priority Inland Waterway Terminals and Landing Stations	83.00
Component 3: Institutional Capacity Development and Sector Sustainability	56.00

Systematic Operations Risk- Rating Tool (SORT)	
Risk Category	**Rating**
1. Political and Governance	Substantial
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	High
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	High
7. Environment and Social	High
8. Stakeholders	Moderate
9. Other	
OVERALL	High

Compliance		
Policy		
Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [X]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	**X**	

Natural Habitats OP/BP 4.04	**X**	
Forests OP/BP 4.36	**X**	
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12	**X**	
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50	**X**	
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**
Subsidiary Agreement		15-Sep-2016	

Description of Covenant

The Recipient shall, by the Project Effectiveness date, make the proceeds of the Financing available to the Project Implementing Entity under a subsidiary agreement between the Recipient and the Project Implementing Entity, under terms and conditions acceptable to the Association.

Name	**Recurrent**	**Due Date**	**Frequency**
Safeguards	**X**		CONTINUOUS

Description of Covenant

The Recipient shall: (a) ensure that the Project is carried out in accordance with the provision of the Safeguard Instruments and the requirements of the Grievance Redress Mechanism; and (b) not amend, abrogate or waive, or permit to be amended, abrogated or waived, any provisions of the Safeguard Instruments, unless the Association has provided its prior approval thereof in writing, and the Recipient has complied, or caused the Project Implementing Entity, as applicable, to comply with the same consultation and disclosure requirements as applicable to the original adoption of the said instruments.

Name	**Recurrent**	**Due Date**	**Frequency**
Safeguards	**X**		CONTINUOUS

Description of Covenant

The Recipient shall take all actions necessary on its part to coordinate with the Project Implementing Entity in the event that the acquisition of land and/or resettlement and/or related activities resulting in Affected Persons is needed for purposes of the Project.

Name	**Recurrent**	**Due Date**	**Frequency**
Project Implementation Committee	**X**		CONTINUOUS

Description of Covenant

The Project Implementing Entity shall establish and thereafter maintain through the Project implementation period, a Project Implementation Committee with a mandate, composition and resources satisfactory to the Association.

Name	**Recurrent**	**Due Date**	**Frequency**

Project Implementation Unit / Financial Management Specialist	**X**		CONTINUOUS
Description of Covenant The Project Implementing Entity shall: (i) establish and thereafter maintain through the Project implementation period, a Project Implementation Unit with a mandate, composition and resources satisfactory to the Association; (ii) hire a financial management specialist with qualifications, experience and terms of reference satisfactory to the Association			
Name	**Recurrent**	**Due Date**	**Frequency**
Proposal Evaluation Committee	**X**		CONTINUOUS
Description of Covenant The Project Implementing Entity shall establish, and therefore maintain throughout the Project implementation period, a proposal evaluation committee with composition, qualifications, experience and terms of reference satisfactory to the Association.			
Name	**Recurrent**	**Due Date**	**Frequency**
Management, Monitoring and Evaluation of Performance-Based Contract	**X**		CONTINUOUS
Description of Covenant The Project Implementing Entity shall ensure that adequate staff in numbers and with qualifications, experience and terms of reference satisfactory to the Association, are in place to be responsible for the management, monitoring and evaluation of the Performance-Based Contract.			
Name	**Recurrent**	**Due Date**	**Frequency**
Supervision and Performance Monitoring/Construction Supervision Consultant	**X**		CONTINUOUS
Description of Covenant The Project Implementing Entity shall appoint a supervision and performance monitoring consultant for Part 1 of the Project and/or Construction Supervision Consultant for Part 2 of the Project, with qualifications, experience and terms of reference satisfactory to the Association.			
Name	**Recurrent**	**Due Date**	**Frequency**
Project Operational Manual	**X**		CONTINUOUS
Description of Covenant The Project Implementing Entity shall adopt and thereafter maintain, throughout the Project implementation period, a Project Operations Manual in form and substance satisfactory to the Association.			
Name	**Recurrent**	**Due Date**	**Frequency**
Safeguards (Frameworks)	**X**		CONTINUOUS
Description of Covenant The Project Implementing Entity shall: (a) prepare in accordance with the provisions of the EMF or the RPF; and (b) in the case of any activity involving Displaced Persons, ensure that no displacement shall			

occur before the necessary measures consistent with the RPF and RAP have been executed, including full payment to Displaced Persons of compensation and other assistance required.

Name	Recurrent	Due Date	Frequency
Safeguards (Performance-Based Contract)	**X**		CONTINUOUS

Description of Covenant

The Project Implementing Entity shall ensure that each contract for civil works, including the Performance-Based Contract, under the Project includes the obligation of the relevant contractor and any sub-contractor(s) to comply with the relevant provisions of the Safeguards Instruments applicable to such civil works commissioned/awarded pursuant to said contract.

Name	Recurrent	Due Date	Frequency
Safeguards (Use and Disposal of Dredged Materials)	**X**		CONTINUOUS

Description of Covenant

The Project Implementing Entity: (a) shall undertake the testing, management and disposal of Dredged Materials in accordance with the Safeguard Instruments; and (b) shall cause all Dredged Materials to be disposed preferentially in-river in accordance with the provisions set forth in the Safeguard Instruments; and (c) under cases where suitable in-river Dredged Materials disposal locations are not available; may dispose Dredged Materials on land provided that: (i) an appropriate site has been identified following the criteria set forth in the Safeguard Instruments; and (ii) additional required Safeguards Instruments have been prepared.

Name	Recurrent	Due Date	Frequency
Safeguards (Grievance Redress Mechanism)	**X**		CONTINUOUS

Description of Covenant

The Project Implementing Entity shall establish, and thereafter maintain until completion of the Project, an independent Grievance Redress Mechanism acceptable to the Association, as per the requirements of the Safeguard Instruments.

Name	Recurrent	Due Date	Frequency
Project Steering Committee	X		CONTINUOUS

The Recipient shall establish and thereafter maintain throughout the Project implementation period, a Project Steering Committee with a mandate, composition and resources satisfactory to the Association.

Name	Recurrent	Due Date	Frequency
Governance and Accountability Action Plan	X		CONTINUOUS

The Recipient shall ensure that the Project is carried out in accordance with the Governance and Accountability Action Plan.

Name	Recurrent	Due Date	Frequency
Expenditures to be Exclusively Financed with Counterpart Funds	X		CONTINUOUS

The Recipient shall (a) ensure that the following expenditures are financed exclusively out of its own resources or the Project Implementing Entity's resources; and (b) provide, promptly as needed, the

resources needed for this purpose: (i) all costs associated with land and land use rights required for the purposes of the Project; (ii) all resettlement and rehabilitation compensation and other assistance to Displaced Persons; (iii) Incremental Operating Costs; and (iv) motor vehicles.

Name	Recurrent	Due Date	Frequency
Audit Reports	X		CONTINUOUS

Description of Covenant

The Project Implementing Entity shall have its Financial Statements for the Project audited by independent auditors acceptable to the Association. The Project Implementing Entity shall ensure that the audited Financial Statements for each fiscal year shall be: (a) furnished to the Associated not later than six months after the end of the fiscal year; and (b) made publicly available in a timely fashion and in a manner acceptable to the Association.

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Diep Nguyen-Van Houtte	Team Leader (ADM Responsible)	Sr Transport. Spec.		GTI06
Asif Ali	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist		GGO06
Arvind Prasad Mantha	Financial Management Specialist	Financial Management Specialist		GGO24
Abedalrazq F. Khalil	Team Member	Sr Water Resources Spec.		GWA06
Ashis Bhadra	Team Member	Sr Transport. Spec.		GTI06
Charles Kunaka	Team Member	Senior Trade Specialist		GTCTC
Comfort Onyeje Olatunji	Team Member	Program Assistant		GTI06
Deepak Man Singh Shrestha	Team Member	Sr Transport. Spec.		GTI06
Iqbal Ahmed	Safeguards Specialist	E T Consultant		GEN06
Jorge Luis Alva-Luperdi	Counsel	Senior Counsel		LEGES
Kirti Nishan Chakma	Safeguards Specialist	Consultant		GSUGL
Leanne Farrell	Safeguards Specialist	Environmental Specialist		GEN06
Luiza A. Nora	Team Member	Social Development Specialist		GSU06
Matias Herrera Dappe	Team Member	Senior Economist		GTI06
Md. Akhtaruzzaman	Safeguards Specialist	Consultant		GSU06
Mridula Singh	Safeguards Specialist	Senior Social Development Specialist		GSU06

Nasreen Begum	Team Member	Program Assistant		SACBD
Syed Ahmed Ali	Team Member	Consultant		GGO06
Zhiyun Jiang	Team Member	Consultant		GEE06

Extended Team

Name	Title	Office Phone	Location
Anthony Hughes	Consultant - Inland Water Operations		
Theodorus Konijn	Consultant, Navigation Channel Maintenance		

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Bangladesh	Chittagong	Sandwip	X		
Bangladesh	Dhaka	Chandpur	X		
Bangladesh	Barisal	Barisal	X		
Bangladesh	Dhaka	Dhaka Division	X		
Bangladesh	Chittagong	Chittagong	X		
Bangladesh	Chittagong	Chittagong	X		

Consultants (Will be disclosed in the Monthly Operational Summary)

Consultants Required? Consultants will be required

I. STRATEGIC CONTEXT

A. Regional Context

1. The East India Company exported Assam tea by steamboat from Guwahati in Assam to Kolkata in West Bengal, India, by inland waterways as early as 1841. Tea and other traded products between Northeast India and the rest of the world traveled through the inland waterways of the Ganges/Padma, Meghna, and Brahmaputra rivers, also referred to as the GMB river system, in territory that is now Bangladesh and India. These waterways provided a more direct route to connect landlocked Northeast India to Bangladesh, the rest of India, and ports for exports to the rest of the world, cutting the trip by about 1000 kilometers (km). Similarly, Chittagong Port in Bangladesh used to be the main port for the Indian state of Tripura, less than 90 km away, as well as for Mizoram and other states of Northeast India. Between 1863 and 1947, the Assam-Bengal inland navigation trade routes were developed for cargo and passenger transport by the Indian General Steam Navigation Company (IGSNC) and the River Steam Navigation Company (RSNC), which when combined with railway development in Northeast India and West Bengal, formed a multimodal system of transport.

2. However, the continent's conflicts disrupted this unique multimodal system. Passenger transport on these waterways discontinued in 1948, and cargo transport was disrupted in 1965. A new protocol between Bangladesh and India was signed in 1972 to permit cargo transport but with significant limitations that up to now have hampered private sector interest and investment.[1] Passenger transport through this regional system has never resumed since the disruption of 1948.

3. The South Asia continent's long history of political tensions and conflict has been reflected in other facets of life, giving South Asia the dubious distinction of being the world's least economically integrated region. Intra-regional trade currently accounts for just five percent of total trade - versus, for example, 25 percent for Association of South East Asian Nations (ASEAN) countries and 60 percent for the European Union (EU). Cross-border investment is also low and there has been little cooperation to date on urgent, shared issues such as river and disaster risk management, which are more amenable to regional rather than national solutions. Removing obstacles to trade - among other things, through improved transport connectivity, logistics facilitation measures and lowering tariffs and other trade barriers - is a high priority for South Asia (especially for its poorest landlocked regions) as a key element of the effort to build shared prosperity and improve people's welfare. The World Bank's 2014 Logistics Performance Index (LPI), a global multidimensional assessment of logistics performance, shows that as in previous years, South Asia lags behind all other regions except Sub-Saharan Africa in overall logistics performance. India's performance is relatively strong overall, but the three landlocked countries (Afghanistan, Bhutan and Nepal) are among the weakest performers. India's landlocked Northeast Region (NER) is also disadvantaged from a transport cost and, consequently, trade cost perspective. Available estimates suggest that annual intra-regional trade in the region could

[1] For example, the Protocol was intended to be renewed every two years, but in practice the renewal process has been done in a piecemeal manner, often only extended for months at a time.

increase from the current US$5 billion to US$20 billion if barriers to trading with neighbors were removed.[2]

4. In the last year, however, dramatic progress has been made on key regional cooperation issues along the 'Eastern Corridor' of South Asia involving the BBIN (Bangladesh-Bhutan-India-Nepal) countries. In June 2015, the four countries signed the BBIN Motor Vehicle Framework Agreement which lifts considerably past restrictions on cross-border road transit for vehicles, passengers and cargo across the territories of the countries. The four countries are also in discussions regarding the Multimodal Transport Agreement which will encompass cross-border transit by road, rail and inland waterways. In addition, also in June 2015, India and Bangladesh signed the Coastal Agreement which allows goods to move by sea from Kolkata in West Bengal to Chittagong Port in Bangladesh, and renewed the Protocol on Inland Water Transit and Trade (PIWTT) for five years with automatic renewal with additional ports of call and routes. They also agreed to seek international financing for development of the entire Bilateral Protocol Routes between the two countries with assured Least Available Depth (LAD) to ensure navigability of the routes year-round and including night-time navigation, as envisaged in the Bilateral Framework Agreement on Trade and Transit. Meanwhile, landlocked Bhutan and Nepal have agreements in place with both India and Bangladesh to use the inland waterways (as well as roads, railways, and ports) in these two coastal countries to transport Bhutanese and Nepalese bilateral, international and transit trade.

5. These historic agreements have paved the way for the development of a regional integrated multimodal transport network with enormous potential to increase trade, people-to-people contact, and development of economic corridors. Goods can now move by sea or coastal route from Kolkata Port in West Bengal, India to Chittagong Port in Bangladesh, where bilateral and transit goods to Northeast India would travel by inland waterways from Chittagong Port to Dhaka and onwards to Ashuganj Port. At Ashuganj, the goods would be trans-shipped by road or rail to the border crossing at Akhaura-Agartala to Tripura State in Northeast India. Alternatively, the goods that arrive at Chittagong Port can take the road route to the Ramgarh-Sabroom border crossing, also on the border with Tripura State, Northeast India. The third route would be from Chittagong Port to Thegamukh-Kawrpucchuah on the border with Mizoram State, Northeast India. The map in annex 3 illustrates the alternative multimodal routes linking West Bengal, India with landlocked Northeast India through the territory of Bangladesh. Goods headed from or for Bhutan can also use these same routes from Chittagong Port through Northeast India.

6. To support these encouraging trends in regional cooperation, the Bank has developed and implemented since 2011 a continually evolving Regional program to support the BBIN countries to improve connectivity and trade potential along the 'Eastern Corridor' of South Asia. The investments in the Regional Program described in annex 3 are complemented by a significant regional technical assistance and analytical program. The investments include projects supporting regional connectivity for the BBIN countries through road, rail, ICT, and inland waterway connectivity and trade facilitation measures that aim to facilitate intra-regional trade as well as

[2] Ahmed, Sadiq and Ghani, Ejaz, 2008. "Making regional cooperation work for South Asia's poor," Policy Research Working Paper Series 4736, The World Bank and Ahmed, Sadiq and Ghani, Ejaz, 2009. "Accelerating Growth and Job Creation in South Asia," OUP Catalogue, Oxford University Press. Raihan (2012) suggests that there would be an increase in South Asian countries' exports to each other in the range of 94 to 1105 percent (India to Sri Lanka, and Pakistan to India, respectively), with most other bilateral export increases in between.

access to the sea and international markets for the landlocked countries and sub-regions namely Bhutan, Nepal, and Northeast India.

B. Country Context

7. Bangladesh is the third largest economy in South Asia. It is among the most densely-populated countries in the world with a population of about 160 million in a land area of 130,168 square kilometers. Bangladesh's economy grew well above the average for developing countries in recent years, averaging 6.2 percent since 2010. With a per capita GDP of US$1,212, Bangladesh reached an important milestone by achieving lower middle income country (LMIC) status in 2015.

8. Bangladesh has made remarkable progress in reducing poverty; however significant challenges remain. The poverty rate in Bangladesh has fallen from 48.9 percent in 2000 to 31.5 percent in 2010 while projections of the 2010 Household Income and Expenditure Survey (HIES) data indicate that the national poverty rate would fall to 24.8 percent in 2015. The creation of more and better jobs is a key challenge for eliminating poverty and boosting shared prosperity. The labor force in the country is growing at 3.1 percent per annum and 21 million people are projected to enter the working age population over the next decade. Therefore, accelerating the employment shift of casual workers and small farmers engaged in agriculture to salaried employment in more dynamic and remunerative sectors of the economy is an important priority. At the same time, growth and employment associated with increased productivity, diversification, and value addition in agriculture and manufacturing supply chains should be strengthened. In that sense, removing hurdles for both domestic and foreign businesses and tapping into regional and global markets is a priority for Bangladesh.

9. Key to the success of Bangladesh's growth and poverty reduction strategy is the improvement of the multimodal transport and logistics system in the country, with its neighbors and the rest of the world. High transport costs, low efficiency and excessive delays in the logistics chain increase trade costs and reduce the competiveness of the country's products. Good quality roads, ports, railways, inland water transport (IWT) services, land ports/border crossings, and efficient clearing, consolidation and forwarding systems (that is, logistics systems) are essential components of the regional multimodal system. The inability of the transport and logistics network to keep up with the pace of demand is hampering trade performance. With fierce international competition, Bangladesh manufacturers have complained that their 'Order to Delivery Cycle' is 35 to 50 percent longer than many of their competitors due to: slow, expensive and unreliable inland transportation; cumbersome banking, clearance and customs processes; inadequate consolidation terminals and inland clearance depots and land ports; and poor seaport and river port terminal productivity. These supply chain bottlenecks translate into higher costs and negatively affect Bangladesh's ability to compete in the world market.

10. The Government's Plan to address the above bottlenecks includes key activities to: (a) enhance the capacity of multiple key modes of transport including expanding the road network, increasing the capacity of Bangladesh Railways to carry freight, and increasing the capacity of the country's inland waterways to carry freight and passengers; (b) improving the capacity and performance of the country's main sea port, Chittagong Port, while developing additional deep sea and higher capacity ports for the longer-term; (c) improving regional connectivity; and, (d) improving banking, customs and clearance systems and procedures to decrease clearance times.

11. In addition, there are plans to expand intra-regional trade by improving connectivity with India, Bhutan and Nepal through road, rail and inland waterways. For inland waterways, the Government has prioritized the development and improved maintenance of 65 priority river routes, including the Bilateral Protocol Routes[3] agreed between Bangladesh and India but also used for trade between Bangladesh, Bhutan and, in the future, Nepal. The protocol routes overlap the Dhaka-Chittagong and Dhaka-Ashuganj corridors, especially for Indian goods in transit to the landlocked Northeastern states. Bhutanese traders have also started using IWT to trade with Bangladesh, especially for the transport of rocks and aggregates used for construction, and the Royal Government of Bhutan (RGoB) is under discussion with Government of Bangladesh (GoB) to improve the waterways for use by Bhutanese trade. Bhutanese traders are already using road and rail networks in India and road network in Bangladesh for trade, but continue to seek a more efficient multimodal transport solution. Bhutan already has permission to use the Bilateral Protocol Routes in both India and Bangladesh.

12. In the meantime, the Government of India (GoI) is making parallel and complementary investments on the Bilateral Protocol Routes within its territory. It has also provided financing to Government of Bangladesh through a Line of Credit to improve the road and railway connections between the inland waterway cargo terminal at Ashuganj to the border with Tripura State in Northeast India. GoI also plans to finance the development of a new container terminal at Ashuganj, and has also invested heavily in its Integrated Check Posts (ICP) Program which has developed key land ports between Bangladesh and India including at Benapole-Petrapole in West Bengal, Akhaura-Agartala and Dawki-Tamabil in Northeast India, with plans to invest in land ports at Kawrpucchuah-Thegamukh, Sabroom-Ramgarh, and Sutarkandi-Shaula in Northeast India. The Government of Bangladesh is making corresponding investments in the same border crossings, partially through the proposed Bank-financed Bangladesh Regional Connectivity Project 1 (Project C in the Regional Program, annex 3). These investments support the BBIN regional multimodal connectivity program.

C. Sectoral and Institutional Context

13. Bangladesh has made great strides in developing an extensive transport system to support the needs of its growing export-oriented economy. It boasts an expanding network of highways and rural roads, inland waterways, two seaports, maritime shipping, and a railway system. Major road corridors connect the two largest cities Dhaka and Chittagong with key economic centers and towns. Bangladesh has also developed a network of village roads connecting communities to market centers and the main roads. However, economic growth over the past decades has been accompanied by even faster growth in transport demand, estimated at 6 - 9 percent per year. Growth is putting strain on the transport network, particularly the road network, which is poorly managed and maintained and with only 40 percent of main roads in good condition.

14. As a riverine country, Bangladesh has a large and vibrant inland water transport sector. It has some 700 rivers, streams and canals with a total length of about 24,000 km. Approximately 6,000 km are navigable during the monsoon (wet) period, shrinking to about 3,900 km in the dry periods. Though not as large as in the more developed countries, it carries approximately 194 million tons of cargo and about one-quarter of all passenger traffic. There are some 22,300

[3] The Protocol made pursuant to Article VIII of the Trade Agreement between Bangladesh and India.

registered vessels, including dry cargo vessels (22 percent), barges (7 percent), tankers and double bottom vessels used predominantly for carriage of petroleum products, sand carriers (16 percent), and passenger vessels (10 percent). In addition to the list of registered vessels, there are some 750,000 country boats of a great variety of shape and size. These play a vital role in the transport of goods and people, especially the poorest, especially on the smaller rivers where transport demand is generated by rural communities, a substantial proportion of which only has access to river transport. Table 1 shows how Bangladesh compares with key global IWT markets.

Table 1. Size and Characteristics of Key IWT Markets

	USA	**EU**	**China**	**India**	**Bangladesh**
Commercially significant waterways (km)	19400	5000	12000	4434	5923
Tons carried (million tons/year)	615	565	1,161	16	194
IWT Cargo Fleet (No. of vessels)	31,700	11,700	183,000	–	14,000*
Main Commodities	coal, coke, grains, mineral ores, chemicals and fertilizer, oil and petroleum products	coal and coke, building materials, mineral ores, chemicals and fertilizer, oil and petroleum products	coal and coke, building materials, mineral ores, chemicals and fertilizer, oil and petroleum products	coal, building materials, market produce (river crossings)	coal, fly-ash, grains, cement, chemicals and fertilizer, building materials, oil and petroleum, market produce

Note: *excludes fishing vessels, small launches, speed boats, sea going vessels, and country boats.

15. With the exception of ferry services,[4] the IWT sector is dominated by the private sector, which has invested heavily in shipping.[5] Most cargoes and passengers are trafficked on the Dhaka-Chittagong Corridor (DCC). The annual IWT trade on the main and immediate adjacent routes accounts for a cargo volume of about 90 million tons and 46 million passengers. External seaborne trade is heavily oriented toward imports and of all volumes handled at Chittagong Port, over 50 percent is carried by IWT, primarily to Narayanganj, Dhaka and Ashuganj. Cargo is mainly: dry bulks (including clinker, fertilizers, food grains, coal, salt, gypsum and fly ash); liquid bulks (petroleum products); and, general dry cargo (bagged cargo, machinery and steel). The main dry and liquid bulks are typically offloaded at private jetties or terminals, most of which are equipped with dedicated bulk handling equipment. Some break bulks and other smaller general cargoes are handled at a limited number of common user facilities or directly over the riverbanks by manual labor. There is also bilateral, regional and transit traffic on the Protocol Routes between Bangladesh, India and Bhutan. Most of this consists of fly ash, grains, Over-dimensional Cargo

[4] Provided by two Government organizations, BIWTC and the Roads and Highways Division (Ferry Planning Circle/Construction Division).

[5] In an estimated amount of US$4 billion in the passenger, dry and liquid bulk trades alone. Various associations represent cargo owners including: the Coastal Ship Owners Association, the Cargo Vessel Owners Association, the Tanker Owners Association and the Launch (Passenger) Vessel Owners Association. Combined they represent some 1,600 owners, the majority of which are single vessel owners. The maximum private fleet size is approximately 20 vessels.

(ODC) for capital projects, mostly collected from India on Bangladesh-registered vessels. Cargo from Bhutan is starting to use the Bilateral Protocol routes, mainly to export boulders and construction materials to Bangladesh.

16. As in other countries, IWT has competitive advantages for dry and liquid bulk cargoes. Added advantages for the IWT sector in Bangladesh are that: (a) Much of this cargo can be transferred in the anchorages outside the seaports through Ship-To-Ship (STS) operations—meaning that an ocean carrier does not have to enter the port and thus avoid the current 17-day dwell time at Chittagong Port; and, (b) Much of Bangladesh's industries requiring bulk imports (that is, the cement and power industries) are located on the riverfront and can be supplied by a mono-modal IWT service directly to the factory gate.

17. This contrasts to the textile and Ready-Made Garments (RMG) industry, the major driver of container imports (of inputs, especially cotton and other fabrics) and exports (Ready-Made Garments accounting for about 85 percent of all exports). Only 3 percent of total current container through-puts (representing about 36 percent of the Chittagong Port volumes) are transported by IWT vessels. While this sector does provide some growth prospects for IWT, there is currently little container penetration to inland markets. Most boxes arriving or departing from Chittagong Port are stripped or stuffed in the port environs and cargo is transported in break-bulk form by small single or double-axle trucks with load limits toward the lower-end of current international practice.[6] Although transport of container cargos on inland waterways has a lower ton-km cost, growth in this sector requires reducing river terminal costs, through economies of scale and fast ship and cargo turn-around times at sea and inland ports.[7] The development of this sector may therefore require a rethink of the total logistics solutions. Foremost among these will be the need for efficiency improvements and investment in trans-shipment capability (between ocean-going and IWT vessels). Additional capacity will also be needed at the inland ports.

18. River navigation also presents certain challenges. While the larger rivers are up to 50m (meters) depth and the lower Meghna (the main trafficked route on the Dhaka-Chittagong Corridor) is generally 10 - 25m depth, navigation is hindered by very shallow depths on bars, especially at the confluences of the major rivers and their tributaries, river bends, and in the wide delta area. Rainy season floodwater combined with very low-lying topography presents major infrastructure development challenges. Flood waters can rise as much as 10 meters. The Bay of Bengal is responsible for the formation of some of the strongest and most destructive tropical cyclones in the world. Heavy rainfall and associated storm surges from these cyclones are a major cause of loss of life and infrastructure damage in the maritime delta area. Cyclones can occur at any time of the year but most often just before or after the Southwest monsoon (which runs from June to September), affecting communities living on the old and young Meghna floodplains. Notwithstanding the challenges and realizing the importance of the trade between Dhaka and Chittagong and onwards to Ashuganj, Northeast India, and Bhutan, and the need to reduce demand on roads and to reduce Greenhouse Gas (GHG) emissions, the Government has prioritized the improvement of navigability of this IWT Corridor.

[6] The single-axle limit in Bangladesh is 10 tons and the maximum combined weight for a truck is only 30 tons. This compares to a weight of 38–42 tons for a tractor-semitrailer unit, normally used for container haulage.

[7] IWT vessels operating on short journeys can spend as much as 70 percent of their time in ports—leading to very poor asset utilization and thus high operational cost.

19. The sector is managed on behalf of the Government by the Bangladesh Inland Water Transport Authority (BIWTA). It was established to develop, maintain and control inland water transport under the East Pakistan Ordinance No. LXXV Of 1958, changing its name at independence. It operates as a fully-owned Government corporation under the Ministry of Shipping (MoS). It currently employs 3,403 personnel and operates some 100 vessels, 24 river ports,[8] 448 riverine stations, 374 landing points, 23 coastal stations, 8 ferry terminals, 24 pilot stations, 25 field offices and 5 Differential Global Positioning System (DGPS) stations. It also has three training centers, one each at Narayanganj and Barisal and a ship personnel training institute at Madaripur. Its main functions include: river conservancy/training works for navigational purposes; provision of aids to navigation and navigational/meteorological information/charts; pilotage and hydrographic survey services; efficient maintenance of existing navigable waterways and development of new ones; development, maintenance and operations of inland river ports, landing ghats and terminal facilities; removal of wrecks and obstructions on inland waterways; and, inspection of ships to ensure compliance with Government shipping ordinances and regulations.

20. Despite its importance, IWT has received little attention in the last few decades with only limited resources allocated to its development. The waterways receive only 4 - 7 percent of total transport sector funding. Realizing the important role that inland waterways play in addressing transport needs in Bangladesh, especially for the poor and to support trade, the Government of Bangladesh developed the 2009 Inland Water Transport Master Plan which laid out a detailed action plan for investment in the sector, including for development and maintenance of river routes, navigational aids, river ports, rural development, and institutional development. Current issues faced by the inland water transport sector include: (a) little funding allocated to maintenance of waterways other than ferry crossing routes and consequently inadequate dredging maintenance which fails to address rapid and continuous processes of sedimentation; (b) outdated hydrographic capability and limited data acquisition for river maintenance and other planning purpose; (c) a poor navigation aid system and very limited night time aids; (d) a poor safety culture, including outdated rules and regulations concerning the design, licensing, construction, operation and maintenance of IWT vessels, insufficient vessel shelters, and the lack of facilities for searching and rescuing people in distress; and, (e) insufficient and dilapidated river port facilities for general cargo trade and passenger transport. Many terminal facilities consist of no more than wooden planks used to embark and disembark passengers which are a challenge for mothers with small children, pregnant women, elderly people and the disabled. In the delta and other areas, passengers often have to wade into the river at low water periods to access a vessel. The lack of toilets in most landing places and vessels adds to the inconvenience. This has discouraged many female passengers from using inland water transport. Although GoB has not been systematically collecting data on safety incidents at river terminals and along IWT routes other than for major catastrophic incidents, interviews with users and observations by safeguards specialists indicate significant safety concerns. The lack of reliable navigation safety infrastructure and equipment and vessel storm shelters exposes vessels during inclement weather and prevents night-time navigation.

[8] Including Dhaka, Narayanganj, Barisal, Chandpur, Khulna, Baghabari, Patuakhali, Narsingdi, Aricha, Nagarbari, Daulatdia, Tongi, Mawa, Char-Janajat, Ashuganj-Bhairab Bazar, Bhola, Bargona, Nowapara, Munshiganj, Chatak, Meghna Ghat, Cox's Bazar, Ghorashal and Faridpur.

D. Higher Level Objectives to which the Project Contributes

21. The proposed Project supports the Bank's Twin Goals of poverty alleviation and shared prosperity by facilitating trade and growth which will benefit all, and by focusing on the poorest which are the predominant users of IWT. The Project also supports the new Sustainable Development goals as described in table 2 below.

Table 2. How Proposed Project Supports Sustainable Development Goals

Sustainable Development Goal	Project Support
Target 7.3. By 2030, double the global rate of improvement in energy efficiency.	The Project supports IWT which is more energy efficient than road transport, and will explore how to improve the energy efficiency for most categories of vessels plying inland waterways.
Target 9.1. Develop quality, reliable, sustainable, and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.	The Project supports improving the quality, reliability and safety of infrastructure and systems linked to inland water transport services including improving navigability of inland waterways, building new river ports and landing ghats, and improving existing river ports for both cargo and passenger transport services. Focus on access issues for vulnerable populations including women, children, and the less-abled are emphasized.
Target 11.2. By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons.	
(2.1) air pollution	IWT is more fuel efficient and releases fewer GHG and other air emissions for most classes of vessels than road transport. The Project aims to increase traffic on inland waterways and increase IWT's share of transport services. In addition, the Bank will provide complementary technical assistance to Ministry of Shipping, its agencies, and other relevant ministries to explore alternative technologies for 'greening' the vessel fleet to emit lower GHG and other emissions.
(3.9) climate change adaptation and mitigation	The Project supports climate change adaption and mitigation. Navigational aids, vessel storm shelters, and design of river ports and landing ghats incorporate climate change adaptation considerations. Improving navigability of inland waterways to reduce traffic on roads will help reduce GHG emissions and contribute to mitigating the impact of climate change.

22. The 2008 SAARC (South Asia Association for Regional Cooperation) Multimodal Transport Development Plan endorses development of regional transport networks for road, rail, air and inland water transport sectors. For IWT, the SAARC Plan calls for the re-establishment of old transport routes on inland waterways which now form the Bangladesh-India Bilateral Protocol Routes as negotiated under the Protocol for Inland Water Transport and Trade and renegotiated in June, 2015. Bangladesh and India also renewed in 2015 the bilateral Trade Agreement with new trade facilitation provisions to further increase bilateral trade, investment and economic cooperation with the goal of opening up opportunities for regional trade.

23. Bangladesh's 2013 National Integrated Multimodal Transport Policy (NIMTP) recognizes that Bangladesh's planning of the last few decades has favored road transport, and investment in inland waterways has been neglected. The policy commits to planning an environmentally sustainable multimodal transport system with attention to safety issues and equitable access. The objectives of the NIMTP include: reducing the cost of transport for goods, so as to make goods and services within Bangladesh less costly, and aid export competitiveness; improving safety; taking advantages of Bangladesh's geographical position to trade in transport services and induce efficiency in the transport sector; reducing the negative environmental effects of transport; ensuring that transport meets social needs with regard to cost accessibility to all sectors of society; improving integration of the overall transport network; and increasing alternative options for passenger and freight transport. The policy also prioritizes improving regional connectivity, greater private sector participation in the sector; and exploring innovative financing mechanisms to fund sustainable transport solutions. Within the framework of the NIMTP, the priorities for IWT are: (a) Increasing funding to improve navigability of rivers; (b) Applying advanced technology and modern management principles, and developing human resources to improve dredging and hydrographic survey techniques to provide updated information on waterways; (c) Investing in existing river ports, new ports, and inland cargo/container depots to improve cargo and passenger handling, improve interchange between water transport and other modes; and to provide door-to-door service for passenger and freight movement through coordination with cargo operators and other transport operators; (d) Improving navigational aids and vessel tracking; (e) Enhancing efficiency and safety of all vessels; (f) Strengthening research into more fuel-efficient vessels; and, (g) Rationalizing regulatory agencies and updating regulations in the sector.

24. Leveraging IWT to support regional multimodal connectivity to facilitate trade and integration is also a key focus of the Bank South Asia Region's Regional Integration Strategy. The World Bank Group's FY16-20 Country Partnership Framework (CPF) program[9] prioritizes investments in inland connectivity and transport corridors, IWT and multimodal connectivity, and regional integration. While the proposed Project is mainly mapped to Focus Area 1 which seeks to promote growth and competitiveness, it also supports objectives in Focus Area 2 which promotes Social Inclusion, and Focus Area 3 which supports Climate and Environmental Management. The Project is also aligned with the Systematic Country Diagnostic which specifies upgrading and integrating key transport corridors, reviving inland water transportation, and better maintenance of existing assets, as 'Priority Areas with Potentially Transformative Impact on the Twin Goals.' Finally, the Bangladesh Diagnostic Trade Integration Study specifies that: dredging sections of the inland waterway network, modernizing the vessel fleet, and investing in handling equipment are key actions for facilitating trade in Bangladesh.

II. PROJECT DEVELOPMENT OBJECTIVES

A. Regional Program

25. The BBIN/Eastern Corridor regional integration program aims to facilitate the movement of passengers and cargo on multimodal transport networks for the benefit of traders, transporters, producers, passengers and communities in Bangladesh, Bhutan, India, and Nepal.

[9] Report No. 103723-BD, discussed at the Board on April 5, 2016.

B. Project PDO

26. The development objective of the Project is to improve Inland Water Transport (IWT) efficiency and safety for passengers and cargo along the Chittagong-Dhaka-Ashuganj Regional Corridor and to enhance sector sustainability.

C. Project Beneficiaries

27. Project beneficiaries include passengers, producers, traders and transport services providers in Bangladesh, India, and Bhutan, as well as communities living around the Project Corridor in Bangladesh. They will benefit from the improved navigability of the river routes year-round, including at night-time, which will cut down transport time and cost, ultimately leading to increased trade and investments, and lower costs for consumers. Traders, including importers and exporters, and transport services providers will benefit from the use of improved and safer cargo terminals, as well as shortened transport time. Economies of scale also reduce transport costs by allowing carriage of greater loads on fewer ships. This can also result in notable environmental benefits by reducing emissions from transport. Users of landing ghats and passenger terminals will benefit from improved safer facilities, and greater access to transport services in the new terminals. Vulnerable groups such as women, children, the elderly, and otherwise less-abled will especially benefit from safer facilities which will improve their access to transport services. More specifically, the Project will focus on women and support development of an action plan on how to make IWT friendlier for women and address barriers that women face in using the facilities including but not limited to issues of safety, lighting, separate toilets and waiting areas.

D. PDO Level Results Indicators

28. The Project Level Results Indicators are:

- Number of days per year that the minimum advertised Least Available Depth (LAD) is available (days)- to increase from the current 150 days/year to 347 days/year;
- Availability of Aids to Navigation (%) – to increase from the current 30 percent to 95 percent;
- Travel time on the Dhaka-Chittagong Corridor for cargo vessels (hours) – to decrease from the current 40 hours to 30 hours;
- Regional trade and transit traffic (million metric tons) – to increase from the current 1.89 million tons to 3.50 million tons;
- Annual Revenue derived from Tariffs associated with Development and Maintenance of Infrastructure (US$ millions) – from the current 14.5 US$ million to US$29.0 million;
- Satisfaction of passengers at project terminals.

29. In addition, the number of beneficiaries will be monitored, and disaggregated by gender.

30. Key intermediate indicators include:

(a) Performance-based contract for navigation improvement signed

(b) Number of Aids to Navigation installed

(c) Number of cargo terminals built or rehabilitated

(d) Number of passenger terminals built or rehabilitated

(e) Number of passenger landing ghats built or rehabilitated

(f) Satisfaction of beneficiaries with consultation process

(g) Number of Class I routes with ENCs produced

(h) Framework for sector sustainability including Tariff Framework developed

III. PROJECT DESCRIPTION

A. Project Components

31. The Project will finance interventions aimed at improving IWT for cargo and passengers along the heavily-trafficked Chittagong-Dhaka-Ashuganj river routes, and in so doing, stimulating traffic growth on the waterways and away from the already heavily congested roads along these routes. These fall under the jurisdiction of the Bangladesh Inland Water Transport Authority, a Government authority mandated to oversee sector development. Main interventions include: navigation channel maintenance and improvement; navigation safety improvements; the construction, rehabilitation, and modernization of select river terminals; development of River Information Systems (RIS); institutional capacity development; and, funding for research and development to enable continuing sector improvement and sustainability. This includes work on sector policies and strategies needed to: improve revenue collection and management; incentivize public and private sector investments especially related to container transport; and, mitigate and improve IWT's impact on the social and physical environment. The Project consists of three components as follows:

Component 1: Improved Inland Waterway Navigation (IDA financing US$235 million)

32. This component shall include work to guarantee advertised depths and widths of navigation channels on select river routes (see table 3.2 in annex 3). The work also includes provision of aids to navigation. The work is to be done on a Performance-based Contracting (PBC) method designed to increase the efficiency and effectiveness of river asset management and maintenance. It is designed to ensure that the physical condition of the rivers under contract are adequate for the need of river users, over the entire period of the contract which is six to seven years. This type of contract significantly expands the role of the private sector, from the simple execution of works to the management and conservation of river assets. This is a departure from the traditional river maintenance contracts used in Bangladesh which have been less-than-optimal. Even where works have been carried out according to plan, the nature of the rivers has meant that advertised depths, aids to navigation and other river infrastructure do not last as long as they should because of

deficiencies in the original design, aggravated by inadequate maintenance. The beneficiaries of the new concept are expected to be the river users. In a wider sense, future generations will be able to benefit from a better maintenance of past investments. River users will be able to know the Service Level they can expect in return for the payments they make for the use of the infrastructure (tolls, tariffs, user fees, taxes, and so on). The River Administration shall also benefit by obtaining better overall river conditions with reduced levels of expenditure.

33. Also included in Component 1 is work to provide six safe harbors or storm shelters whereby users can seek shelter from the stress of inclement weather in the Meghna Delta area during tropical cyclones. The Bay of Bengal is responsible for the formation of some of the strongest and most destructive tropical cyclones in the world. Adverse wave conditions, heavy rainfall and associated storm surges from these cyclones are a major cause of loss of life and infrastructure damage in the maritime delta area. With projected climate change, these effects are likely to intensify in coming decades. It is intended that the storm shelters shall be constructed under the same Performance-based Contract, since the works will primarily consist of dredging close to the bank to create a safe harbor area and breakwater system, and few to no permanent onshore structures. Activities to be financed in this component include: (a) bathymetric and other surveys to determine the extent and types of dredging required, river training, environmental protection or other works; (b) visual aids for day and night navigation such as light buoys, radar beacons, leading lines and other aids; (c) limited and selected performance-based dredging to guarantee advertised Least Available Depth; (d) development of six vessel shelters within cyclone prone areas along Project routes equipped with mooring buoys to ensure safety for the vessels; (e) provision of supervision and performance monitoring consulting services for the works carried out under for this component; (f) carrying out of land assessments to identify suitable land for the activities under this component, including the allocation and acquisition of land and the provision of resettlement and rehabilitation compensations to Displaced Persons; and, (g) carrying out environmental mitigation measures for this component in accordance with the Environmental Management Plan (EMP), including supervision and management of the Dredged Material Disposal Plan (DMDP) and for biodiversity conservation activities.

Component 2: Improved Services at Priority Inland Waterway Terminals and Landing Stations (IDA financing US$75 million)

34. This component supports the development of two cargo terminals, four passenger terminals and 14 landing stations (or ghats). The development of passenger and cargo terminals are within existing inland waterway port areas under the jurisdiction of BIWTA. It includes the modernization and extension of existing facilities to cater for increased demand. Terminals and landing stations are part of the network of about 448 river terminals, 374 landing stations, 23 coastal terminals and 25 pilot stations already provided by BIWTA. The passenger terminals and landing stations will specifically incorporate the needs of women users and less abled users, and all investments will address safety-related issues for all users. Specifically, this component will finance the following:

- The cargo terminals include: (a) extension of the existing Pangaon Container Terminal with new general cargo vessel berths and land access infrastructure on the Buriganga River; and, (b) rehabilitation and modernization of the existing general cargo terminal at Ashuganj including river bank erosion prevention, the replacement of pontoons, gangways and other

dilapidated marine structures, the extension of berthing space.

- The passenger terminals include: (a) construction of a new passenger terminal at Shashanghat downstream of the existing terminal at Sadarghat where landside congestion preclude the development of additional berths; (b) rehabilitation works for the passenger terminal at Narayanganj; (c) construction works for the new passenger terminal at Madrashaghat, Chandpur near the existing terminal; and, (d) extension of the existing passenger terminal at Barisal.

- Rehabilitation works or new construction of 14 landing stations or landing ghats under this Project are designed to provide access for rural communities, some of which in the lower Meghna delta have no alternative means of transport.

- Design, Supervision, Safeguards Services, and Other Activities relating to River Port Terminals and Landing Stations including: (a) Provision of supervision and performance monitoring consulting services; (b) Carrying out of land assessments to identify suitable land including the allocation and acquisition of land and the provision of resettlement and rehabilitation compensations to Displaced Persons; and, (c) Carrying out environmental mitigation measures in accordance with the Environmental Management Framework (EMF), and site-specific EMPs to be developed.

Component 3: Institutional Capacity Development and Sector Sustainability (IDA financing US$50 million)

35. A series of activities are proposed that will support BIWTA's overall enhancement of its management systems and human resources capacity for modern, efficient, and high quality management of the IWT sector in line with international standards, and to help BIWTA achieve long-term operational and financial sustainability, and enhance the climate resilience of the IWT sector. Activities to be supported include: (a) Improving Revenue and Institutional Sustainability through the development of River Information Systems to improve data collection for the planning, maintenance and development of IWT including inter alia: the collection and dissemination of hydrographic data and electronic nautical charts (ENCs); provision of an aid-to-navigation monitoring system; provision of vessel and terminal maintenance plans; provision of a traffic monitoring system for passengers and cargo; conducting a Tariff Review to look into how both infrastructure and service charges are levied - with a view to reducing dependence on Government subsidies; conducting an Organizational Review to look into mechanisms to reduce expenditure; and, conducting an Operations Review to ensure dredging delivers results in solutions that provide best value (rather than lowest cost) including investment in new technology and work processes; (b) improvement of Human Resources capacity for better management of the IWT sector through upgrading and modernizing the IWT Deck and Engine Personnel Training Centre (DEPTC)) into a regional IWT Training Center with open access to all users in the Region and the world; (c) financing of feasibility, surveys, design and safeguards studies for continuous sector development; and, (d) support for the Project Implementation Unit (PIU). A detailed discussion of sustainability challenges is in annex 2.

B. Project Financing

36. The Government seeks regional IDA to finance the proposed Project, in addition to national IDA. The Project meets the requirements for regional IDA because (a) it involves the participation/collaboration of at least three countries - The Project is part of the BBIN/Eastern Corridor Regional Multimodal Connectivity Program which involves the participation of Bangladesh, Bhutan, India and Nepal (annex 3); (b) it supports policy harmonization for connectivity and regional integration as specified in the SAARC Multimodal Transport Development Plan; and, (c) it has spillover benefits, and avoids negative spillover impact at the regional level. Traffic would take more direct routes between landlocked Bhutan, Nepal and Northeast India to-from Bangladesh and the rest of India, and avoid the longer roundabout route around the Chicken's Neck which would add about 1,000 km to the trip causing more GHG emissions, traffic safety issues, and higher transport and trade costs. By component, the Project meets regional IDA criteria as described in table 3. Subcomponent 2b for passenger river terminals will seek only national IDA. However, the remaining components all qualify for regional IDA with Component 3 seeking less than the usual proportion in regional IDA. As such, the Project is seeking US$170 million in national IDA and US$190 million in regional IDA.

Table 3. How Proposed Project Meets Regional IDA Criteria

Component	How Project Meets Criteria
Component 1: Improved Inland Waterway Navigation (IDA US$235 million)	Two-thirds Regional and One-third National IDA - Maintaining the Least Available Depth of the waterways for navigability will benefit regional trade including trade from India, Bhutan, and Bangladesh, and in future, Nepal.
Subcomponent 2a: Improved Services at Priority Cargo River Terminals (IDA US$35 million)	Two-thirds Regional and One-third National IDA - the cargo terminals will be used for Indian and Bhutanese cargo traffic and trade, and in future Nepalese trade, in addition to Bangladeshi traffic.
Subcomponent 2b: Improved Services at Priority Passenger River Terminals (IDA US$40 million)	All National IDA - although in the future it is planned and expected that passengers from Bhutan, India and Nepal will use the passenger terminals, in the near future, the project team expects that most passengers using these terminals will be domestic.
Component 3: Institutional Capacity Development and Sector Sustainability (IDA US$50 million)	Regional and National IDA - The proposed capacity and sector improvements will help maintain the navigability of the waterways in a more economically, financially, technically and environmentally sustainable manner which will benefit regional and national traffic and trade. However, while the component will have clear benefits for regional traffic and trade, the activities are more national in nature and therefore it is proposed that 20 percent of the funds should be funded by regional IDA and 80 percent by national IDA.

Project Cost and Financing

37. The total Project cost is estimated to be US$400 million. The Government will finance ten percent, or US$40 million which will include land acquisition and resettlement and rehabilitation compensation (R&R) costs, part of the taxes associated with contracts, sitting fees, honoraria, civil servant salaries, vehicles, fuel, and office space. IDA will finance 90 percent of total Project cost. The taxes under the Project are presently estimated at SDR 15.22 million which is approximately six percent of total Project cost and will be mainly financed from GoB financing. Under no

circumstances will IDA financing of taxes exceed 15 percent of the total IDA financing. The detailed costing and government contributions vs. IDA financing are included in annex 4.

Table 4. Project Cost and Financing

Project Components	Project Cost	IDA Financing	% Financing
1. Improved Inland Waterway Navigation	261	235	90.0
2. Improved Services at Priority Inland Waterway Terminals and Landing Stations	83	75	90.3
3. Institutional Capacity Development and Sector Sustainability	56	50	89.3
Total Costs	**400**	**360**	**90.0**

C. Lessons Learned and Reflected in the Project Design

38. The proposed Project builds on the Bank's operational experience with IWT projects, with projects under implementation in Bangladesh, and with regional integration projects. The Implementation Completion Report (ICR) for the Third Inland Water Transport Project in Bangladesh which concluded in 1999 concluded that even though Bank and Borrower performance during supervision was satisfactory, and implementation of investments was satisfactory, sustaining institutional capacity is a challenge, and that reforms take time to develop properly and to get ownership. To reflect these lessons, the proposed Project does not propose sector reforms immediately, but builds funds into the Project for consultations and studies to properly design and gain ownership for proposed reforms. Development of systems and staffing capacity are also incorporated into the key aspects of sector management. The multiple aspects of ensuring sector sustainability have also been incorporated into Project design as described in the Sustainability section below. Further, recognizing that improved sector performance will require continuous engagement and significant investments, this Project is the first proposed in a program with foreseeable follow-on projects which will build on the capacity and lessons learned in the implementation of this proposed Project.

39. Lessons learned from the Bank's portfolio in Bangladesh include: (a) most Government agencies require extra procurement capacity and monitoring; (b) intensive project monitoring is key to implementation success; (c) frequent turnovers at senior levels may disrupt project implementation and ownership. To mitigate these impacts, extra resources will be requested for close Bank supervision. To mitigate the impact of senior official changes, capacity development is focused on the PIU and technical staff levels.

40. Lessons from the Bank's extensive experiences in the implementation of regional projects, especially from the Africa Region, include: (a) given the complex and often highly politicized nature of regional projects, national projects or components should be prepared separately when ready, but as key building blocks to an integrated regional program; and (b) knowledge products, technical assistance, and capacity development are key complementary activities that help support

regional dialogue, preparation and implementation readiness. As such, this project is designed to be part of an integrated regional program, with parallel Non-Lending Technical Assistance (NLTA) and investment projects that complement each other's objectives; and, (c) there is significant political risk in regional projects, more so than in national projects, both from the cross-border relationships perspective and from the perspective of managing national stakeholders. As such, it is best to choose projects to implement that are well-embedded in national development plans.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

41. Bangladesh Inland Water Transport Authority is the implementation agency for the Project and is responsible for overall implementation, management and monitoring of the Project. BIWTA is an autonomous body established under the Ministry of Shipping. The authority was set up for development, maintenance and operations of inland water transport in Bangladesh. The institution functions through a formal structure of Board of Directors which is headed by a Chairman at the rank of Additional Secretary and supported by senior officials of Government of Bangladesh. BIWTA has experience in implementing donor-funded programs and managing large value infrastructure projects, but no experience with performance-based contracts. Therefore, the proposed implementation structure builds in needed technical, fiduciary, safeguards and monitoring capacity as needed, especially for monitoring the performance-based contracts, as described in annex 4.

B. Results Monitoring and Evaluation

42. The Project Director (PD) and Project Manager (PM) will be responsible for overall project monitoring and evaluation (M&E). In addition, the Project Steering Committee (PSC) headed by the Secretary, Ministry of Shipping, will monitor overall project performance, make decisions on high-value contracts above defined thresholds, and make key policy decisions. The Project Implementation Committee (PIC), chaired by the Chairman of BIWTA, will monitor performance and decisions required at the transaction/implementation level. The high-value Performance-Based Contract for navigability maintenance will require monitoring support in addition to the capacity within BIWTA. A separate contract for an experienced international Supervision/Performance Monitoring Consultant for the PBC has been planned, and this Consultant will also train staff within BIWTA, in the Planning, Dredging, Hydrography, Civil Engineering and Conservancy and Pilotage departments, to continually monitor and evaluate the performance of the PBC contractor and other navigation improvement contracts.

43. Obtaining reliable historic data has been a challenge for the sector. In response, the Project is financing multiple River Information Systems to help improve sector planning and management, including for data development and maintenance especially for the Hydrographic Department, as well as systems for tracking cargo and passenger traffic, revenues, accidents, passenger and user complaints, contractor performance, and fiduciary systems for improvement of financial management and procurement. Crowd-sourcing will be used to collect data for the River Information Systems and other data systems.

C. Sustainability

44. To ensure sustainability of Project investments and sector improvement, several key principles have been incorporated into the Project design. First, a performance-based maintenance approach has been adopted for the major element of works. This is distinct from the more usual practice for river maintenance (low-bid combined with method specification) and is a departure from customary dredging contracts applied in Bangladesh which have not achieved desired results. The use of PBC maintenance contracting is therefore designed to shift focus to outcomes, specifically a 95 percent availability of advertised depth (and aids to navigation) along the total length of the Project Corridor. Like all PBCs this shall include incentives and and/or disincentives to the contractors to achieve desired outcomes or results - without detailing how, when, or where to do the work. Second, a longer-term contract period has been adopted with the objective of attracting the best international companies. Third, the PBC is designed to allow sub-contracting of local contractors, with the requirement that the lead international contractor must build the capacity of BIWTA and the local contracting industry. This is especially relevant to the use of different technologies which are not used in Bangladesh (such as water injection dredging), and the use of modern surveying and data processing. Fourth, rigorous consultation has been conducted at the design stage to gather stakeholder and community input, and funds have been built into the Project to fund continuous improvement for the sector from the environmental and social safeguards perspective, as well as for market development and improvements to both hard and soft infrastructure to improve the entire logistics system linked to inland water transport. Fifth, noting that institutional development is key to sustainability and profitability of the sector, the Project has focused on institutional development for the multiple and various aspects of IWT. Sixth, the Project sets aside funds to study and engage stakeholders on policy issues, and to develop and continually refine a policy framework to improve the competitiveness and attractiveness of IWT, including attracting private sector investment, maintaining competitive transport costs, incentivizing modal shift, and getting to cost-recovery and eventually profitability for BIWTA.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

45. **The overall risk rating for the proposed Project is rated High**, stemming from risks related to technical design, institutional capacity, fiduciary, and environmental risks. Risks linked to political governance, sector strategies and policies, and stakeholders are rated **Moderate** or **Substantial**, as indicated in the SORT table.

46. **Political governance risk is rated Substantial.** Frequent Government changes at senior level may affect implementation progress. However, maintaining navigability of the waterways, especially for regional trade, is a top government priority. At the technical level, staffing has remained relatively stable, and capacity development efforts will focus on this level to ensure commitment and continuity.

47. **Risks associated with Sector Strategies and Policies are rated Substantial** as maintaining navigability of priority waterways, and improving the operating environment for IWT has remained a top Government priority since the adoption of the 2009 Inland Water Transport Master Plan, followed by the 2013 National Integrated Multimodal Transport Policy which

commits to planning an environmentally sustainable multimodal transport system with attention to safety issues and equitable access for all. The policy to incentivize private sector investment in IWT needs to be developed, and will be addressed during implementation.

48. **Technical design risks are rated High.** The risks related to technical design mainly arise from (a) the dependence on one contractor for a high-value PBC contract which accounts for about 56 percent of the total Project cost; and, (b) the Government's limited experience with performance-based contracting for navigation fairway improvement and maintenance. To mitigate the first risk, the team has done a market assessment to assure that there are sufficient contractors on the global market who fulfill the financial and technical criteria to implement the PBC. Moreover, an ongoing prequalification process provides assurance that there is sufficient interest from qualified contractors in the PBC. To mitigate the second risk, experiences from other countries that have used PBCs for IWT have and continue to be studied, and international experts with the requisite experience will be procured by the Project for advice and monitoring. A Monitoring/Supervision Consultant will be hired concurrently with the performance-based contractor, and will be available to monitor the contractor from the start of the contract, as well as to train BIWTA staff in the management of PBCs for dredging and navigation improvement contracts. Procurement of the Supervision/Performance Monitoring Consultant has been initiated. Both the PBC contract and the Supervision/Performance Monitoring Consultant contract are expected to be awarded by December, 2016.

49. **Institutional capacity risks are considered High** as BIWTA has insufficient experienced technical staff. Capacity is weak, and BIWTA has not implemented a Bank-financed project since the 1990s. To mitigate this risk, the Project will require the deputation of a full-time Project Director who is a GoB official, plus the deputation and recruitment of an additional 20 technical staff to support project implementation, in addition to consultant support.

50. **Fiduciary risks are rated High and are described in the Appraisal Summary section.** Bangladesh operates in a challenging procurement environment. Procurement risks arise out of many factors like weak capacity, unfavorable market, and weak governance. The last one manifests itself in the form of fraud, corruption, collusion and coercion. BIWTA deals with a limited number of specialized suppliers, which has kept its procurement environment free from fraud, corruption, and collusion. The works contracts involving civil construction could experience some governance issues as bidders for those types of contracts are known to have a tendency for collusion and coercion. The PBC, on the other hand, is large and specialized to the extent that the critical mass required for collusion does not exist within the country. In the backdrop of the unsupportive country governance context, and weak procurement capacity in relation to PBCs and somewhat weak contract management capacity in the implementing agency, overall procurement risk is rated as High. Mitigation measures are described in detail in annex 4 and include: Establishment of a Procurement and Contract Management Cell; ensuring balanced representation in the Bid / Proposal Evaluation Committee; Introducing the Systematic Tracking of Procurement Exchanges system (STEP); development of a Project Procurement Strategy; implementing e-Procurement for NCB contracts; utilizing an Independent Procurement Panel (IPP) to provide oversight and assurance of the procurement of high-risk and complex contracts; and carrying out extra due diligence on the local agents of bidders. For financial management, the assessment indicates that BIWTA over years has developed some financial management capacity to implement government programs and schemes in the area of port development and dredging

operations. However, it lacks institutional capacity and experience to manage PBCs. It requires extensive support and guidance in the area of financial management and Bank disbursement policy/procedures. To support project implementation, essential institutional capacity will be provided by contracting accounting firms and professionals. An accounting system will be procured for the Project to support timely submission of financial reports. The accounting and payment function will be centralized from the PIU and internal control aspects will be documented in the Accounting Manual which will serve as a reference document to Project staff. The oversight arrangements, that is, internal and external audit will provide reasonable assurance on use of Bank funds for Project activities. During the first year of implementation, the Bank will undertake semi-annual implementation support missions, including field visits to ensure that agreed financial management arrangements are understood and appropriately followed by the PIU. As implementation progresses, review of financial and audit reports will be required.

51. **Environmental and Social risks for the Project are considered High.** The Project is classified as Category 'A' under OP 4.01, due to the diversity, overall magnitude, and complexity of potential environmental impacts related to the proposed dredging and river terminal investment activities under the Project. Although the routes selected for channel maintenance are already being dredged without the Project, dredge volumes are nonetheless expected to be significant in some locations, including in some areas of known sensitive natural habitat. Major environmental risks for Component 1 relate to disposal of dredged material, as well as disturbance of aquatic and benthic habitats caused by dredging operations and subsequent traffic on the river channel. Construction and rehabilitation works on river terminals and landing stations will also entail various site-specific impacts, which in some cases may be significant. In addition, the majority of the Project area is highly exposed to natural hazards including cyclones, storm surges, and flooding in cases of extreme weather events. Climate change may further increase rainfall intensities during the monsoon period, decrease rainfall during the dry season, raise future sea levels, increase wind speeds, and increase cyclone-induced storm surge height and wave run-up, all of which may impact river navigability and also directly threaten IWT terminals and other on-shore infrastructure. Land acquisition is minimal as BIWTA already owns most of the land required for terminal construction and upgrading; nonetheless, it is estimated that 2.06 hectares of land may need to be acquired, and existing lands to be allocated to the Project may be under current use by leaseholders and or squatters (those with no title to land). BIWTA's lack of any existing internal capacity on environmental and social management is an element of risk. The Environmental and Social Assessment process has evaluated impacts and identified necessary mitigation, management and monitoring measures, including measures to enhance climate change and natural hazard resilience, as well as necessary institutional arrangements and capacity building to manage these risks.

52. **Stakeholder risks are considered Moderate,** since the main social impacts are positive as beneficiaries will benefit from improved facilities with focus on incorporating gender and physical challenge aspects in the design and will have access to feedback and grievance systems. The Grievance Redressal Mechanism (GRM) using information technology (IT) systems for the Project will be set up to address grievances and to strengthen accountability. Satisfaction surveys will be administered to ensure participation and transparency in all processes.

VI. APPRAISAL SUMMARY

A. Economic Analysis

53. The main objective of improvements to the performance of trade corridors is to increase trade, either by volume or by value. The Project is expected to affect passenger time and safety of users of the corridor, the time and reliability of goods shipments handled on the inland waterway, improve the capacity of the institutions that manage and train personnel and deepen the knowledge of operations on inland waterways in Bangladesh and through shared networks in India and other countries in South Asia. The expected impacts of the Project are summarized in table 5.

54. Where a corridor is already well-developed and economic rigidities are not very strong cost-benefit analysis can be used to assess likely impacts.[10] Cost-benefit analysis in corridor projects involves estimating the cost and time savings of implementing a proposed project rather than not implementing it. The cost savings typically include those of operating and maintaining vessels as well as reductions in the cost of deterioration and loss of goods in transit. The time savings include those related to vessel operations (such as reductions in vessel transit time) and the inventory costs of goods in transit and kept in storage to cover the risk of delays in transit and uncertainty of delivery times. Where feasible, the time savings are converted into equivalent cost savings. These cost and time savings are compared with the infrastructure and investment and maintenance costs needed to achieve them. This comparison is usually through comparing the stream of all cost and time savings and investment costs and either discounting the net annual costs to a net present value or calculating an internal rate of return for the stream of annual net costs.

Table 5. Expected Project Impact

Activity	Expected Impact
Maintenance of fairway and provision of navigational aids	□ Reduced costs from use of larger vessels □ Reduced transit times for domestic and regional traffic □ Improved reliability □ Reduced road congestion from traffic diversion □ Reduced GHG emissions □ Reduced accident costs
Shelters for vessels in adverse weather conditions	□ Reduced vessel and cargo losses during adverse weather events
New common user general cargo terminal Rehabilitation and modernization of the existing general terminal at Ashuganj Development of a new passenger terminal at Shashanghat Rehabilitation of passenger terminals at Narayanganj and Chandpur, extension of existing passenger terminal at Barisal Upgrade of 14 Existing Landing Stations/ Launch Ghats	□ Reduced cargo handling and transport costs □ Improved vessel utilization through reduction in delays at terminals □ Passenger time savings due to increased service frequency □ Improved convenience for passengers □ Improved safety for users (excluded from economic analysis)
Seafarer Training Hydrographic Survey Improvements	□ Improved safety, regulatory compliance and oversight (excluded from economic analysis)

[10] World Bank (2005) TRN-19 Projects With Significant Expected Restructuring Effects, World Bank.

Activity	Expected Impact
Environmental Safeguards Improvement and Sustainability through sector level capacity building	□ Increased climate resilience and reduced GHG emissions (excluded from economic analysis) □ Reduced costs and GHG reductions from use of larger vessels and cleaner engines (excluded from economic analysis) □ Increase in utilization of IWT (excluded from economic analysis) □ Experience gained in enhanced environmental performance of IWT sector (excluded from economic analysis)
Continuing Sector Improvement and Sustainability	□ Increase in utilization of IWT (excluded from economic analysis)

55. The economic evaluation of the Project was carried out in a context where there is generally poor data on transport and logistics. For this Project, the dearth of data was exacerbated by the fact that the Project is on a mode of transport that has generally been neglected. In such a case, recommended practice is to employ as simple an approach as possible and to rely on good practice techniques. As a result, while corridor projects are known to potentially have significant economic and spatial impacts on firms and the space economy in the regions that they serve, the data are just not available to provide robust results. Consequently, the economic evaluation sought to determine whether the reductions in cost of current trade and the generation of new trade are worth the investment cost that is needed to bring them about. Simple cost-benefit analysis was employed.

Summary of Evaluation

56. The economic evaluation of the proposed improvements along the corridor is based on a generalized cost function for passengers and trade flows. The analysis utilizes two distinct but complementary approaches, one for expected project impact on passenger traffic and the other on trade logistics. Both are founded on well-established techniques and apply generalized cost functions to the changes in monetary and time costs to be brought about by the project interventions. As argued above, some of the project interventions, such as safety improvements, are required under international best practice and are therefore not monetized. The project evaluation therefore presents a conservative estimate of the expected impacts.

57. The benefits are estimated as the sum of savings in: (a) logistics costs of shippers; (b) vessel operator costs; (c) reduced losses from weather related events for vessel owners and shippers; (d) reduced passenger waiting costs; (e) reduced accident losses; and (f) reduced carbon footprint. All these costs are monetized as described in annex 8. The benefits would accrue to both Bangladesh's international and domestic trade traffic, and regional transit traffic especially to and from India.

58. Based on the above, and using the cost and time and uncertainty measures related to each project component as defined by the sequence of movements along the corridor, estimates of costs and benefits were derived for the six expected impacts. The net present value of the sum of benefits of the Project were estimated over a period of 20 years at approximately US$365 million (based on a discount rate of 12 percent) and the EIRR of the Project is estimated at 14 percent. The results include maintenance costs of the waterway and were subjected to sensitivity analyses including costs escalations, lower growth rates of traffic, and poor supply response by vessel operators. The

EIRR under these scenarios ranged from 11 percent to 12 percent.[11] The sensitivity analyses suggest that the Project is viable within feasible ranges of the key risks that can be expected. Details of the calculations are provided in annex 8.

B. Technical

59. About half of the funds of the Project are set aside for improvement of navigability of the priority Dhaka-Chittagong-Ashuganj Corridor, as this is key to local, national, and international trade for Bangladesh and the region. Aside from the area between Sandwip and Hatia Islands in the Delta, the Project rivers are characterized by numerous small shoals at multiple different locations which will require small and selective but constant dredging intervention using different dredging techniques. This may include water injection dredging in areas of high flow velocity, the use of cutter suction dredging, use of backhoe or trailing suction hopper dredgers. A Performance-Based Contract maintenance approach is chosen due to the poor performance of traditional dredging contracts in the past and due to the nearly non-existence of navigational aids in the inland waterways network. The PBC work shall include the provision and maintenance of aids to navigation including light buoys, shore beacons and channel markers. Monitoring and Supervision shall be undertaken by BIWTA with the support of an appointed Supervision/Performance Monitoring Consultant. In addition, channel monitoring shall also be undertaken by placing survey sounders on select merchant ships regularly trading on certain routes (crowd-sourcing). Included in the PBC shall be the development of vessel storm shelters in the lower Meghna cyclone area known for frequent and damaging cyclones linked to deaths and vessel damage.

60. Using a performance-based approach is a departure from the traditional dredging approach employed in Bangladesh which is failing to maintain advertised channel depths and widths on a sustained basis. Contractors have historically been paid on the basis of inputs to the works. Even where these works are carried out according to plan and much money is spent, the overall service quality for the river user depends on the quality of the design given to the Contractor who is not accountable for it. In many cases advertised depths, aids to navigation and other river infrastructure do not last as long as they should because of deficiencies in the original design, and rapid and continuous sedimentation processes aggravated by inadequate follow up maintenance. The PBC approach adopted for this project is designed to address these issues. During the bidding process, contractors compete among each other by essentially proposing prices for bringing the river to a certain Service Level and then maintaining it at that level for a relatively long period. Under the output and performance part of the contract, contractors will not be paid directly for "inputs" or physical works (which they have to carry out), but for achieving specified Service Levels, i.e., the maintenance of the river to pre-defined standards (as required by the bidding documents) which is represented by outputs or outcomes. Due to the nature of the river and routes and type of dredging vessels required, the team has determined that having one PBC contractor perform all the work rather than two is more efficient and cost-effective.

61. In addition to BIWTA's function to provide river conservancy works including river training works for navigational purposes and for provision of aids to navigation, BIWTA is also responsible to develop, operate and maintain facilities for the landing of goods and passengers. Currently there are some 24 river ports of varying size, the largest in the Dhaka area which extends

[11] The lower EIRR of 11 percent is obtained for a 5 percent increase in costs which, based on recent trends, is considered highly unlikely. In any event, the use of performance-based contracts is designed to contain costs.

some 40km along the length of the Buriganga River. Within these, BIWTA manage some 448 river terminals/stations. Outside the port limits, BIWTA is also responsible for the provision and operation of an additional 374 landing ghats, 23 coastal stations, 8 ferry terminals and 24 pilot stations. Funds are allocated for the development of some of the highest prioritized facilities, including two common user cargo terminals, four passenger terminals and 14 landing ghats. Works on the general cargo and passenger terminals include upfront feasibility and design studies to inform the best design option/alternative for development and including in cases, rehabilitation and modernization of these terminals to cater for growing through-put trends. This includes provision of a new passenger terminal at Shashanghat to relieve congestion at Dhaka's main passenger terminal, a new common user general cargo terminal adjacent to Pangaon which currently only serves containerized cargo. The 14 landing ghats are mainly located in the lower Meghna River, especially on remote chars or river islands where facilities are either in very poor condition or non-existent. These facilities are often the only means of landing for passengers and goods to communities without other transport alternatives.

62. As mentioned earlier, developing institutional capacity is key to maintaining sustainability for investments and reforms in the sector. As such, significant funds are allocated to the development of systems and staffing capacity in BIWTA to better collect and maintain data, monitor traffic, monitor contractor performance, improve financial management, and lead to overall better management of the sector. Funds are also allocated to studies and activities to improve sector financial and operational sustainability, sector environmental and social impact, and sector market development studies to increase the competitiveness of IWT relative to other, less environmentally-friendly modes of transport, and to promote the job creation potential of IWT.

C. Financial Management

63. BIWTA has implemented a Bank-financed project decades ago (during the 1990s). While carrying out the assessment and designing financial management arrangements for this project, the lessons learned in the earlier project were taken into account. BIWTA over the years has developed some financial management capacity to implement government and donor-funded programs and schemes in the area of port development and dredging operations. However, it lacks institutional capacity and experience to manage performance-based contracts. It requires extensive support and guidance in the area of financial management and Bank disbursement policy/procedures.

64. The Project will be implemented by the PIU formed by BIWTA. The PIU will maintain the financial management system of the Project and will ensure that activities are carried out in accordance with the Project's legal agreements. BIWTA will open two separate bank accounts for receipt of funds under the Project. A Designated Account (DA), Convertible Taka Account (CONTASA) in Nationalized Commercial Bank of Bangladesh will be opened exclusively for receipt of funds from the Bank and for payment for Bank-funded activities**.** An initial deposit/Advance will be transferred by the Bank into the Designated Account after the Project is declared Effective. Another bank account will be opened by BIWTA for counterpart activities. The accounting and payment function will be centralized at the PIU and internal control principles will be guided through the Accounting Manual. The field offices will maintain accounting records for completed works and will submit bills/invoices to the PIU. Supervision consultants will be engaged as independent engineers to monitor the quality and progress of works and it will certify the bills for payment. An off-the-shelf accounting system will be procured for Project accounting

and financial reporting. A financial management specialist will be hired to provide support to the PIU in accounting functions. The Interim Financial Reports (IFRs) will be submitted to the Bank within 45 days from the end of each calendar quarter and will provide detailed financial information on the sources and application of funds according to disbursement categories and project components. The IFR will form the basis of subsequent disbursement into the Designated Account. The Internal Audit will be carried out according to ToRs approved by the Bank and auditors will be selected through Bank procurement guidelines. Additionally, an Integrated Fiduciary Review will be carried out periodically by a consulting firm hired by the Bank with prior notification to the Implementing Agency to assess the governance and oversight arrangements. The annual External Audit for the Project will be carried out by Comptroller and Auditor General of Bangladesh (C&AG) through its Foreign-Aided Project Audit Directorate (FAPAD) and audit reports will be provided to the Bank within 6 months from the end of each financial year, that is, December 31. Overall, the financial management risk of the Project is considered 'Substantial'. The financial management arrangements proposed under the Project will satisfy fiduciary requirements of OP/BP 10.00. Further details are provided in annex 4.

D. Procurement

65. BIWTA has experience in implementing donor-funded and Government-funded development projects. Procurement under these projects are being processed by relevant departments like Dredging, Marine and Mechanical Engineering, Civil Engineering, Conservancy and Pilotage, Hydrography, Deck and Engine Personnel Training Center, and so on. The Project involves one high value performance-based contract to maintain navigability of an inland waterway corridor, and a number of civil works involving construction or upgradation of river ports. BIWTA, however, does not have recent experience implementing Bank-financed projects and no experience processing and managing PBCs.

66. Bangladesh operates in a challenging procurement environment. Procurement risks arise out of many factors like weak capacity, unfavorable market, and weak governance. The last one manifests itself in the form of fraud, corruption, collusion and coercion. BIWTA deals with a limited number of specialized suppliers, which has kept its procurement environment free from fraud, corruption, and collusion. The works contracts involving civil construction could experience some governance issues as bidders for those types of contracts are known to have a tendency for collusion and coercion. The PBC on the other hand is large and specialized to the extent that the critical mass required for collusion does not exist within the country. In the backdrop of the unsupportive country governance context, and weak procurement capacity in relation to PBC and somewhat weak contract management capacity in the implementing agency, overall procurement risk is rated as High. Mitigation measures are described in detail in annex 4 and include: establishment of a Procurement and Contract Management Cell; ensuring balanced representation in the Bid / Proposal Evaluation Committee; introducing the Systematic Tracking of Procurement Exchanges system (STEP); development of a Project Procurement Strategy; implementing e-Procurement for NCB contracts; utilizing an Independent Procurement Panel to provide oversight and assurance of the procurement of high-risk and complex contracts; carrying out extra due diligence on the local agents of bidders; verification of recommended bidders' post-qualification information; making bidders generally aware about fraud and corruption issues; maintaining detailed procurement records and documents; and, publishing contract award information on

Central Procurement Technical Unit's (CPTU) and BIWTA's website (and UNDB online for ICBs and international consultancies).

E. Social (including Safeguards)

67. The proposed Project supports dredging activities, installation and maintenance of navigational aids, and construction of storm shelters, river terminals (including improvements or modifications to access roads where required) and landing stations. These interventions will improve facilities for passenger and cargo movement. More specifically, women will benefit from upgraded facilities designed to address their needs and safety at terminals and landing stations. River terminals and landing stations will be developed and improved using existing BIWTA land. Vessel shelters will be developed within the river with some facilities on riverbanks. According to BIWTA estimates, 2.06 hectares of private land is likely to be acquired for improvement of landing stations. However, exact locations of the land to be acquired and specific boundary of sites for Project interventions will be identified only when detailed designs of these facilities will be undertaken during project implementation.

68. The Bank's Operational Policy on Involuntary Resettlement (OP/BP 4.12) is triggered for all the proposed facilities. The adverse impact due to development of terminals both passenger and cargo, storm shelters and landing stations will impact communities dependent on the land required. Disposal of dredged material will be almost entirely in the river. At locations where it is not feasible to deposit in the river, the option to dispose on government land free from encumbrance will be considered. BIWTA has, therefore, prepared a Resettlement Policy Framework (RPF) including community engagement plan and Dredge Material Disposal Plan based on a comprehensive Environmental and Social Impact Assessment (ESIA) of the IWT corridor from Dhaka to Chittagong with links to Barisal and Ashuganj, and an initial screening of proposed terminals and landing stations which are not yet designed. The RPF lays down a clear road map to prepare site-specific Social Impact Assessment (SIA) and Resettlement Action Plan (RAP) when the designs will be available at implementation stage and will use mobile applications to geo-tag the census including inventory of assets affected, and locations of consultations. If it is identified during project implementation that acquisition of private land and/ or, transfer of public land that is being used by individuals or communities, are required at any site, RAPs will be prepared. The ESIA provides the information that no indigenous peoples are living within the influence area of the Project corridor. The RAPs will be shared with the Bank for review and clearance and disclosed locally before the bidding process and implemented before award of civil works contracts.

69. Stakeholder consultations during the ESIA process provided a platform to participants to express their views, concerns and apprehensions that might affect them positively or negatively. In total, over 4,000 stakeholders were consulted as part of project preparation, including institutional actors, NGOs, and local communities. Consultations provided meaningful contributions with regard to reducing adverse impacts, addressing safety issues, and so on. Concerns, views and suggestions expressed by the participants during these consultations were integrated in the Project design and safeguards assessments.

70. The Project has a robust Citizen Engagement strategy with focus on strengthening accountability within the Project, which includes: (a) Consultations as the primary tool to promote stakeholder participation in the process of project design and implementation; (b) Development of a Grievance Redressal Mechanism to respond to the needs of beneficiaries and to address and

resolve their grievances and serve as a conduit for soliciting inquiries, inviting suggestions, and increasing community participation. The GRM will cover social, environmental, financial and procurement issues. The collected information will be used to improve operational performance, enhance the Project's legitimacy among stakeholders; to promote transparency and accountability, deter fraud and corruption and mitigate Project risks; (c) Outreach and information campaigns will include the development of a Project website and Project side boards; and (d) User Satisfaction Surveys to obtain feedback on citizens' perceptions of the adequacy and efficiency of services provided through improved cargo and passenger terminals; to monitor citizens' access to services and the facilities, to guide BIWTA's priorities in policy planning and service delivery; and to assess beneficiaries' satisfaction with the quality and adequacy of services and further needs. The surveys will be administered three times during the life of the Project: (a) in year one to establish the baseline; (b) year 4 to feed into the Mid-Term Review; and, (c) in the last year of the Project to generate endline data and the results will be captured by the Citizen Engagement indicator: Percentage of Beneficiaries satisfied with infrastructure implemented by the Project (disaggregated by gender), as measured by user satisfaction surveys.

F. Environment (including Safeguards)

71. IWT is overall a 'greener' transport mode compared to road and rail, notably with respect to GHG and other emissions per ton-km of goods or passengers transported. The Project will therefore overall contribute to improved environmental sustainability of the transport sector on some of the most-trafficked routes in the country, by enhancing the reliability, speed, safety and attractiveness of IWT transport. Nonetheless, Project activities also carry a range of environmental and social risks and impacts which must be appropriately minimized, mitigated and managed in accordance with safeguards policy requirements.

72. The Project is classified as an Environmental Category A project in accordance with OP 4.01 due to the nature and scale of the planned civil works, the complexity of environmental issues associated with the river dredging, and the ecological sensitivity of the Meghna River and estuary. Of the environmental safeguard policies, the Project will trigger (a) OP/BP 4.01 - Environmental Assessment, (b) OP/BP 4.04 - Natural Habitats (d) OP/BP 4.11 - Physical Cultural Resources, and OP 4.36 Forests (due to presence of some mangroves and social forestry plantations in the Project area). In addition, the Environmental, Health, and Safety (EHS) Guidelines of the Bank Group will be applicable to the Project.

73. For IWT route maintenance (Component 1), the main environmental impacts include disturbance of aquatic and benthic habitats, as well as impacts associated with disposal of dredged material. Based on the ESIA, dredging activities under the Project are not expected to cause significant long-term effects on aquatic or benthic species abundance or community diversity, given the existing highly dynamic nature of river morphology, with high sediment and flow volumes which significantly dwarf disturbances caused by the Project. In the smaller navigation channels within the Project area, dredging activities could lead to a marginal decrease in benthic community abundance and diversity within and near dredge locations. River maintenance activities may also impact downstream riverbank erosion patterns, and can temporarily disrupt other river uses such as navigation routes and fishing activities. Increased river traffic expected from Project investments may also increase the risks of improper discharge of waste, ballast waters, and oil spills from ships, with associated impacts to aquatic species. Vessel shelter

construction and maintenance will also involve dredging close to the bank to create a safe harbor area and breakwater system. Mitigation measures will be applied to minimize and manage these impacts, and ongoing monitoring will evaluate their effectiveness. A biodiversity conservation and enhancement program will be implemented to respond to any observed material negative impacts on species of conservation concern.

74. Disposal of dredged material, meanwhile, will take place within the river wherever technically feasible, at pre-designated locations which meet appropriate environmental criteria. The EMP has pre-identified several such locations. In areas close to heavy industries and urban areas, there is a possibility that dredged sediments may contain contamination, although baseline assessments carried out as part of the ESIA have not identified this as a major issue. If contaminated sediments are identified in dredge locations (for channel and ferry crossing maintenance as well as for vessel shelters) during project implementation, their disposal will be required to consider potential impacts to both aquatic and terrestrial flora and fauna, as well as possible risks to human health, and to comply with mitigation measures as outlined in the EMP.

75. For Component 2, the construction and rehabilitation/upgrading of river terminals and landing stations will meanwhile result in various impacts. In the construction stage, typical construction impacts will include noise, dust, construction-related vehicular traffic, management of solid waste and effluent discharges, and so on. At some of the locations, Chandpur terminal in particular, dredging will be required. At the proposed location of the new Shashanghat passenger terminal, soil remediation and clean-up may also be required, as the site is currently being used as a ship-breaking yard. In the operations phase, terminals will also generate ongoing noise to surrounding communities, and localized air pollution from idling ship engines. Management of ship-related waste (solid waste as well as effluents), as well as on-shore management of port-related vehicle traffic will also be potentially significant challenges.

76. For Component 1 activities, a full Environmental and Social Impact Assessment has been carried out by BIWTA. This study also includes a Cumulative Impact Assessment covering the full project area of influence (full IWT routes plus all launch terminals, landing stations, ferry crossings and vessel shelters), as well as an ESA Executive Summary also spanning the entire project. The ESIA includes an Environmental Management Plan, which specifies (a) the environmental, social, health and safety (ESHS) requirements of the contractor as well as of BIWTA (both during and beyond the life of the performance-based contractor); (b) roles/responsibilities/staffing and budget requirements for ESHS management by both contractor and BIWTA; (c) monitoring and reporting requirements on ESHS aspects; and, (d) capacity assessment and necessary capacity building measures for BIWTA. The EMP includes both site-specific provisions - such as specifications for depositing of dredge materials in environmentally appropriate locations (avoiding areas of critical habitat, and minimizing impacts to areas of natural habitat) - as well as general measures and performance criteria to minimize negative impacts of dredging operations and to manage impacts associated with vessel shelters. Contractors will furthermore be required to demonstrate adequate management systems such as through ISO 14001 certification, to retain appropriate ESHS expertise, and to apply relevant international good practices on environmental management in the dredging sector. To address long term and cumulative impacts associated with dredging and increased use of the waterways, the EMP also includes programs for protection and enhancement of sensitive habitat for biodiversity

conservation, such as by strengthening and/or establishment of hilsa fish and dolphin sanctuaries, mangrove restoration programs, and so on.

77. For river terminals and landing stations, since the exact location and the extent of the activities remain unknown, BIWTA has prepared an Environmental Management Framework covering the potential and likely impacts of these facilities and specifying the requirements for further assessment, planning, and management/mitigation of all such impacts. In accordance with the EMF, full detailed ESIAs for these facilities will be commissioned during year one of the Project, parallel to the feasibility and design studies. The EMF meanwhile includes site screenings of the proposed investment locations, preliminary identification of key issues, and key requirements for the full ESIA and design studies to ensure environmental issues are fully assessed and taken into account. The EMF also lays out institutional arrangements, responsibilities, and systems and preliminary budget estimation for completing the detailed assessments and for implementation, monitoring and oversight of mitigation and management measures.

78. Preparation of the ESIA included extensive consultations with stakeholders, including focus group discussions, informal consultation meetings, and key informant interviews as well as through more formal workshops. In total, over 4,000 individuals have been consulted on the environmental and social assessment package. Initial consultations were held during September November 2015 to share the Project objectives and Terms of Reference (ToR) of the proposed EA work. This included a national stakeholder consultation workshop in Dhaka on October 25, 2015, and workshops in Barisal and Ashuganj on November 18, 2015, to present key design features of the Project and preliminary findings of the ESA reports. The original versions of all safeguards assessments were disclosed both in-country and in the Bank Infoshop on December 2, 2015. Additional consultations at the community level, including in several of the known dredging locations, were subsequently carried out during the month of December, and updated versions were re-disclosed in-country on February 4, 2016 and at the Infoshop on February 8, 2016. The executive summary of the EA package, including the RPF, has been translated into Bengali and disclosed on BIWTA's website, as well as made available locally in the Project area. A final national consultation workshop on the safeguards studies was held in Dhaka on March 31, 2016, attended by over 120 stakeholders from government, the private sector, NGOs and civil society. Feedback provided was reflected in the final updated versions, which were then re-disclosed both in-country and on the Infoshop in May 2016.

79. The PIU will have an Environmental and Social Cell, headed by a Deputy Director, supported by one social specialist and one environmental specialist and additional consultants as required, to ensure effective management of environmental issues across all project components, and to implement additional environmental sustainability and value-added activities under Component 3. In addition, the Project will support BIWTA to establish a permanent Environmental, Social and Climate Change Unit (ESCCU) in its institutional structure, which will ensure the long-term sustainability, climate resilience and climate sensitivity of project investments as well as other activities across the organization. To ensure proper environmental management in the Project, independent environmental auditing will be carried out by a third party monitoring firm. Annexes 4 and 6 provide additional details on the environmental and social impacts and management arrangements for the Project.

80. To further support and promote sector-wide environmental sustainability, the Bank will provide complementary technical assistance on various sustainability aspects to Ministry of Shipping and its affiliate agencies, as well as other relevant ministries, in conjunction with project implementation. Areas of technical assistance will include a study to identify policy and investment measures for 'greening' of the vessel fleet, a comprehensive climate change vulnerability assessment for the IWT sector and recommendations for adaptation and resilience measures, and development of a pilot program on biogas production from water hyacinth (which grows plentifully on Project waterways and currently causes obstacles to navigation). Recommendations from these studies would be considered for financing under a potential follow on investment project.

GHG Emission Calculations

81. IWT is generally considered as a more emissions-efficient transport mode compared to roads. Analysis of the GHG implications of the Project is based on the assumption that Project investments will facilitate a modal shift from road to waterway for container cargo being transported between Dhaka and Chittagong.[12] It is also assumed that the Project will increase vessel size for importing and exporting bulk and general cargos. The Freight Transport Model developed by the Transport and ICT Global Practice[13] was used for estimating emissions. In the without-project scenario, expected increases in container cargo traffic between Dhaka and Chittagong due to economic growth over the Project period would primarily take the Dhaka-Chittagong highway, given existing limitations to the reliable availability of the IWT route. It is assumed that Project investments on the IWT route will induce some of this road-based container cargo traffic to instead take the waterway, and the average vessel size will also increase due to increased reliable navigation depth. Overall, emissions related to vessels plying the Dhaka-Chittagong IWT corridor will therefore increase as a result of the Project. However, since most additional container traffic between Dhaka and Chittagong would otherwise take the road in the absence of the Project, it follows that a relative reduction in road-based traffic emissions from trucks carrying container cargo will also result from the Project. Given that IWT transit is overall more fuel-efficient than road-based transit per ton-km hauled, the result is a net decrease in traffic-related GHG emissions between Dhaka and Chittagong, when compared to the without-project scenario. The increase in vessel size for importing and exporting bulk and general cargos will lead to fewer number of trips on inland waterways. Although larger size of vessels require higher fuel consumption per km for each vessel, the total amount of emission will be reduced. The aggregate net project emissions along the Dhaka-Chittagong Corridor between year 3 to year 8 of the Project (for example, the years when full advertised depth of the waterway is expected to be available) are therefore estimated to be -419,203 ton CO2. Assuming maintenance activities will be continued after the Project, total net emission up to year 20 is -1,998,759 ton CO2. Detailed methodology, assumptions and limitations are described in annex 7.

G. Other Safeguards Policies Triggered

82. The Bank's Operational Policy OP 7.50 Projects on International Waterways is triggered since Project activities will take place mostly on the Meghna River and in the Ganges-

[12] Connecting routes to Ashuganj and Barisal were not modeled, due to insufficient baseline data on IWT traffic along these routes, and to remain consistent with the economic analysis which focuses on the main DCC corridor.
[13] Kopp, A. (2015). GHG Analysis for Low-emission Transport. The World Bank. World Bank. (2015). GHG Analysis for Road Investment Guidance Note.

Brahmaputra-Meghna river system. Riparians of these rivers include India, Bhutan, China and Nepal. However, the Project qualifies for an exception from the requirement to notify other riparians under paragraph 7(a) of the policy. To this end, the Bank has determined that an exception is warranted given that the proposed interventions fit within the ongoing scheme of BIWTA's dredging program (for example, all river channels to be dredged are already existing navigation routes) and existing facilities (for example, investments in terminals and landing stations involve additions/expansions or rehabilitation of existing facilities. The aforementioned activities to be financed by the Bank (a) will not adversely change the quality or quantity of water flows to the other riparians; and (b) will not be adversely affected by the other riparians' possible water use.

83. BIWTA's existing 5-year dredging program constitute an 'ongoing scheme'. The BIWTA's on-going dredging program is implemented in the following three sub-programs: (a) Dredging on 12 Important River Routes; (b) Dredging of 53 River Routes in Inland Waterways (1st Phase: 24 River Routes); and (c) Dredging of 53 River Routes in Inland Waterways (2nd Phase: 29 River Routes). The first sub-program was approved in October 2011; the second one in September 2012; and the third one is proposed with an implementation period from July 2014 to June 2020. The dredging activities to be financed under the Project are minor additions to BIWTA's existing dredging program which covers rivers/routes already listed in such program. The list of selected rivers/routes on which dredging activities will be financed under the Project, which are part of the Government's existing program, is in table 3.2 of annex 3 of this document.

84. In addition, the vessel shelters and other infrastructure are either rehabilitation of existing facilities, or minor additions or alterations to existing facilities since the Project will finance: one new general cargo terminal, one new passenger terminal and the rehabilitation of four other passenger terminals, compared to the 448 already existing river terminals, as well as the construction or rehabilitation of 14 landing ghats compared to the existing 374 landing ghats. The Bank has therefore determined that the activities will not adversely change the quality or quantity of water flows to other riparians, since Bangladesh is the lowest downstream riparian of the Ganges-Brahmaputra-Meghna system. In addition, the Project will not be adversely affected by other upstream riparians' possible water uses, given the huge scale of water flows in the shared river system, and the nature of project investments.

H. World Bank Grievance Redress

85. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or to the WB'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 WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/grs. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

Bangladesh

Bangladesh Regional Waterway Transport Project 1 (P154511)

Results Framework

Project Development Objectives

PDO Statement

The development objective of the Project is to improve Inland Water Transport (IWT) efficiency and safety for passengers and cargo along the Chittagong-Dhaka-Ashuganj Regional Corridor and to enhance sector sustainability.

These results are at	Project Level

Project Development Objective Indicators

Indicator Name	Baseline	YR1 (6/2017)	YR2 (6/2018)	YR3 (6/2019)	YR4 (6/2020)	YR5 (6/2021)	YR6 (6/2022)	YR7 (6/2023)	End Target (6/2024)
Number of beneficiaries Of which female	69,729,100 13,945,820								
Number of days per year that the minimum advertised Least Available Depth (LAD) is available (days)	150	150	150	347	347	347	347	347	347
Availability of Aids to Navigation (%)	30	30	30	95	95	95	95	95	95
Travel time on the Dhaka-Chittagong Corridor for cargo vessels (hours)	40	40	40	30	30	30	30	30	30
Regional trade and transit traffic (million metric tons)	1.89	1.89	1.89	2.10	2.30	2.60	2.90	3.20	3.50
Annual Revenue derived from Tariffs associated with Development and Maintenance of Infrastructure (US$ millions)	14.5	14.5	14.5	14.5	14.5	21.8	21.8	29.0	29.0
Satisfaction of passengers at project terminals	Tbd				Tbd				Tbd

Intermediate Results Indicators			Cumulative Target Values						
Indicator Name	Baseline	YR1 (6/2017)	YR2 (6/2018)	YR3 (6/2019)	YR4 (6/2020)	YR5 (6/2021)	YR6 (6/2022)	YR7 (6/2023)	End Target (YR8, 6/2024)
Performance-based contracts for navigation improvement signed (Yes/No)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Aids to Navigation installed - Light buoys - Shore beacons - Channel markers	 20 15 5	 20 15 5	 60 90 180	 100 150 300	 100 150 300	 100 150 300	 100 150 300	 100 150 300	 100 150 300
Number of cargo terminals built or rehabilitated	0	0	0	0	2	2	2	2	2
Number of passenger terminals built or rehabilitated	0	0	0	0	2	3	4	4	4
Number of passenger landing ghats built or rehabilitated	0	0	0	2	6	10	14	14	14
Satisfaction of beneficiaries with consultation process	Tbd				Tbd			Tbd	
Number of Class I routes with ENCs produced	0	0	0	1	3	5	5	5	5
Framework for sector sustainability including Tariff Framework Developed (Yes/No)	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition and so on)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Number of beneficiaries Of which female	Count of number of Project beneficiaries, disaggregated by gender	3 Times (year 1, mid-term, last year)	Consultant surveys	BIWTA
Number of days per year that advertised Least Available Depth (LAD) is maintained on Project Corridors	BIWTA commits and advertises Least Available Depth (LAD) of 3.96m on Class I routes and 2.43m for Class II Routes. The increase in the number of days that the LAD is maintained corresponds to better maintenance and increased confidence in the navigability of the routes for users.	Annual	Weekly contractor surveys, and data submitted by crowd sourcing vessels on hotspots	BIWTA
Availability of Aids to Navigation along Project Corridors	An increase in the percentage of availability of Aids to Navigation as a percentage of total availability indicates improved reliability	Monthly	Aids to Navigation Electronic Monitoring System	BIWTA
Travel time on the Dhaka-Chittagong Corridor for cargo vessels (Hours)	Travel time on the main corridor is measured by vessels plying the route daily.	Yearly	Surveys of vessels normally plying the route	BIWTA
Regional trade and transit traffic (million metric tons)	Regional trade and transit traffic is currently tracked by Customs and BIWTA	Yearly	Customs and BIWTA clearance and permitting data	BIWTA
Increase in Tariffs associated with Development and Maintenance of Infrastructure (US$ millions)	BIWTA currently collects tariffs and tracks manually	Yearly	BIWTA tariff collection data	BIWTA

Intermediate Results Indicators

Indicator Name	Description (indicator definition and so on)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Performance-based contract for navigation improvement signed	Signing of the Performance based contract	Yearly	BIWTA	BIWTA
Number of Aids to Navigation installed	Count of the number of Aids to Navigation installed	Yearly	BIWTA	BIWTA
Number of cargo terminals built or rehabilitated	Count of the number of cargo terminals built or rehabilitated (completion of works)	Yearly	BIWTA	BIWTA
Number of passenger terminals built or rehabilitated	Count of the number of passenger terminals built or rehabilitated (completion of works)	Yearly	BIWTA	BIWTA
Number of landing ghats built or rehabilitated	Count of the number of landing ghats built or rehabilitated (completion of works)	Yearly	BIWTA	BIWTA
Percentage of beneficiaries satisfied with infrastructure implemented by the Project (disaggregated by gender), as measured by user satisfaction surveys	Required citizen engagement indicator measured by three satisfaction surveys—year 1, mid-term and last year)	3 Times (year 1, mid-term, last year)	Consultant surveys	BIWTA
Number of Class I routes with ENCs produced	Count of number of Class I routes where ENCs have been produced	Yearly	BIWTA	BIWTA
Framework for sector sustainability including Tariff Framework developed	There is currently no framework for sector sustainability. The framework needs to be defined and the Tariff Framework developed	Yearly	BIWTA	BIWTA

Annex 2: Sector and Fiscal Analysis

BANGLADESH: Bangladesh Regional Waterway Transport Project 1

1. Since maintaining operational and financial sustainability of the sector continues to be a challenge for the government and BIWTA, this annex provides a summary of the challenges, and how BIWTA plans to approach the issues during the implementation of the Project.

2. BIWTA operates as a fully-owned Government corporation under the Ministry of Shipping. Its primary purpose is the development and control of Inland Water Transport. Among other things, it performs a regulatory function, including fixing minimum prices and tariffs for both passenger and cargo transport.

3. While Authority is meant to operate as a not a profit making organization, its revenues fall far short of expenditure, despite Government subsidy. In the financial year 2013/2014 total earnings were just US$16.25 million, while total expenditure was some US$43.53 million. Though government subsidies (grants) accounted for close to US$20 million (1.2 times total earnings and close to 1.5 times operational earnings), the Authority still posted a net deficit of some US$7.37 million.

4. Operational income, which accounts for 83 percent of all income is derived mainly from port revenues (especially cargo and passenger fees), which accounted for US$10.5 million (close to 65 percent of all income in year 2013/14/). Other operational income included a meager US$1.58 million from river conservancy, pilotage and salvage charges (though levies based on the number and size of ships using the rivers amounted to less than half of all conservancy charges), an even smaller US$0.3 million from canal revenue and some US$1.23 million from dredging revenue (hire of plant and equipment for other government agency or private use). Non-Operational income amounted to 17 percent of all income is derived mainly from interests on bank deposits, land and property rents and sale proceeds (of redundant equipment).

5. By comparison, the cost of maintaining and running the dredging fleet for river conservancy works in the same year amounted to US$12.6 million, about 29 percent of all expenditure (and about 16 times the amount levied to users for river conservancy—excluding pilotage). However, the amount spent on maintenance dredging falls well short of the estimated US$200 million annually required to maintain the existing list of 24 approved routes (at current Bangladeshi prices of US$2/$m^3$) and, an additional US$480 million annually to dredge the routes awaiting government approval (at similar low rates).

6. Indeed, not only is current spending insufficient to guarantee advertised depths (and provision of aids to navigation) on existing routes, but a lack of modern surveying technology and, the short ‘capital’ nature of the dredging contracts (in rivers requiring continuous maintenance to keep pace with re-sedimentation loads) often means that spending (even over and above what may be required) fails to deliver the expected results. The exception to this is on the main ferry crossing routes, especially on the Padma River, where dredging has been very successful.

7. This problem is compounded by the sheer size and nature of some of the rivers, which prevent economic investment in short-term river training works (to reduce dredging need) and, high seasonal variations of river height, discharge and flow rates often leading to river channels

that can shift entirely from season to season. Bangladesh's low lying topography and long tidal reaches often compound sediment patterns, especially in the delta area.

8. Over and above these challenges, expenditures have also been growing at an average of 7 percent year on year since 2010/11, while revenues have been decreasing by about 1.5 percent (meaning that the level of Government subsidy needs to increase to keep pace with spending (Government subsidy in 2010/11 was approximately US$18 million). Table 2.1 lists BIWTA's revenue and expenditure over the 2010/11-2013/14 period.

Table 2.1. Revenue and Expenditure 2010/11–2013/14 (US$)

Description	Year			
	2010/11	**2011/12**	**2012/13**	**2013/14**
Operating Income	9,546,764	13,983,634	13,794,433	13,566,532
Other Income	1,634,794	4,322,749	7,148,023	2,690,099
Total Income	**11,181,557**	**18,306,382**	**20,942,457**	**16,256,631**
Operating Expenditure	22,614,327	24,246,681	28,559,238	33,693,712
Other Expenditure (Charges)	6,772,488	7,152,793	7,834,880	9,836,548
Total Expenditure	**29,386,815**	**31,399,474**	**36,394,118**	**43,530,259**
Net Profit/Loss	(18,205,257)	(13,093,091)	(15,451,661)	(27,273,628)
GOB Grants	17,888,407	15,380,544	17,972,480	19,904,256
Surplus/Deficit	**(316,851)**	**2,287,453**	**2,520,819**	**(7,369,372)**

9. Accordingly and as part of a program (with other interventions) to ensure long-term, cost-effective sustainability, BIWTA wishes to review its revenue and expenditure policy for IWT as described in table 2.2. This entails:

- Conducting a Tariff Review to look into how both infrastructure and service charges are levied—with a view to reducing dependence on Government subsidies;
- Conducting an Organizational Review to look into mechanisms to reduce expenditure; and,
- Conducting an Operations Review to ensure dredging delivers results in solutions that provide best value (rather than lowest cost)—including investment in new technology and work processes.

10. On the main priority routes, the aim should be to make IWT competitive through operation of well-loaded vessels on a regularly used network by an organization with a lean and market-oriented corporate management. Vessel size and payload should provide operating economies, traffic density and heavy network use provide infrastructure economies and corporate structure yields overhead savings.

11. The Tariff Review element of the program shall be designed with the aim to:

(a) Ensure that the Authority does not make a loss in any financial year;

(b) Maintain a level of financial strength that will support an investment grade credit rating;

(c) Generate an Internal Rate of Return on assets from its predicted net cash flows approaching its Weighted Average Cost of Capital (measured over a period of 20 years) and considering the timing of major capital programs and the necessity to smooth prices in any given year;

(d) Generate sufficient revenue for user services that are no lower than the forward-looking avoidable cost of providing that service; and no higher than that required to support the provision of that service on a stand-alone basis;

(e) Provide an explanation and rationale for any changes in the tariff structure to the GoB and river users.

12. Specifically, BIWTA wishes to establish a mechanism by which they will be able to set prices for the different services that are sufficient to meet their long-run costs. This will mean undertaking:

(a) An analysis of the existing tariffs and different tariff categories, their function, the type of charges and the charging units;

(b) An analysis of revenue derived on a year on year basis between 2010 to 2015 from port dues and/or other conservancy charges levied to recover the cost incurred in providing facilities necessary to ensure safe ports (defined as one in which ships can reach, enter, remain at and depart without being exposed to dangers which cannot be avoided by good navigation and seamanship—that is, the cost of channel dredging, widening, and so on);

(c) An analysis of revenue from any charges levied to recover costs associated with provision of basic infrastructure to facilitate the movement of cargo, differentiated into the container, dry bulk, liquid bulks, general and other cargo trades;

(d) An analysis of revenue derived from ship-related user charges, (navigation dues, pilotage, and so on) differentiated by ship size and type in the various trades;

(e) An analysis of revenue derived from both passenger and cargo-related user charges (stevedoring, shore handling, and so on);

(f) An analysis of revenue derived from storage charges, warehousing and other charges for the different trades;

(g) An analysis of revenue derived from all other tariffs;

(h) An analysis of the asset register, and in particular an analysis of the description and value of all listed assets and their remaining economic useful life.

13. The analysis should result in a Tariff Framework that:

(a) Is structured to align with services provided by BIWTA;

(b) Takes into account best practice, current tariff trends and local conditions;

(c) Allows calculation of rates of return;

(d) Takes into consideration different cost-based pricing methodologies, including:

    (i) Average cost pricing (determined by adding the total fixed and variable costs and dividing this sum by the projected demand for IWT services);

(ii) Marginal and Variable cost pricing (determined by dividing the total variable costs by the projected demand for the services and the facilities);

(iii) Performance-based pricing (regarding the use of facilities and optimal usage);

(iv) Market or Value-based pricing;

(e) Aims at increasing the economic efficiency while maintaining value;

(f) Is based on user forecasts and takes into account expected changes to usage resulting from the completion of projects;

(g) Includes all hidden operating and overhead costs;

(h) Allows for estimated taxation expenses;

(i) Includes existing borrowings, proposed repayments and proposed new borrowings;

(j) Includes allowances for profit and/or an allowance to retain earnings for future equity investment; and,

(k) Includes an allowance for cash-flows;

(l) Takes into consideration the need for reduction, abolition, merging and even introduction of new tariff clauses and rates;

14. The analysis should also result in a new reference tariff that ensures:

(a) That all users are charged for all uses of BIWTA facilities and infrastructure;

(b) Takes into account the necessity (if any) for smoothing price increases to minimize large step changes when planned investments are scheduled to take place;

(c) Maintains BIWTA's reputation for being an honest, fair and efficient manager of IWT

(d) Sets out the charges for each regulated service; and,

(e) Provides a description of all regulated services together with any applicable service standards.

Table 2.2. Sector Sustainability Action Plan

Project Component	Subcomponent	Action	Timeline
Component 1: Improved Inland Waterway Navigation		Maintenance Dredging, Navigational Aids	Years 2–8
Component 2: Improved Services at Priority Inland Waterway Terminals and Landing Stations		River Terminals and Landing Stations	Years 2–5
Component 3: Institutional Capacity Development and Sector Sustainability	Revenue and Institutional Sustainability	Tariff Review Organizational Review Operational Review Development of River Information Systems (Hydrographic Data System and Electronic Nautical Charts, Aids-to-Navigation Monitoring System, Traffic Monitoring System)	Year 3 Year 4 Year 5
	Operations Strengthening	Enhanced Human Resources Capacity	Years 2–8

Annex 3: Detailed Program and Project Description

BANGLADESH: Bangladesh Regional Waterway Transport Project 1

A. Regional Program

1. The BBIN/Eastern Corridor regional program aims to facilitate the movement of passengers and cargo on multimodal transport networks for the benefit of traders, transporters, producers, passengers and communities in Bangladesh, Bhutan, India, and Nepal.

2. To support the recent remarkable trends in regional cooperation, the Bank has developed and implemented since 2011 a continually evolving Regional program to support the BBIN countries improve connectivity and trade potential along the 'Eastern Corridor' of South Asia. The investments in the Regional Program are described below and mapped in Figure 3.1, and are complemented by a significant regional technical assistance and analytical program. The investments include projects supporting regional connectivity for the BBIN countries through road, rail, ICT, and inland waterway connectivity and trade facilitation measures that aim to facilitate intra-regional trade as well as access to the sea and international markets for the landlocked countries and sub-regions namely Bhutan, Nepal, and Northeast India.

Project A: FY14 Nepal-India Regional Trade and Transport Project (P144335). US$99 million in national and regional IDA financing plus IFC Advisory Services support for investments that decrease transport time and logistics costs for bilateral trade between Nepal and India and transit trade along the Kathmandu-Kolkata corridor including: (a) Modernizing transport and transit arrangements between Nepal and India; (b) Strengthening Trade-Related Institutional Capacity in Nepal (Trade Portal and Single Window System Development, Improvement of Trade-Related Laboratories, Institutional strengthening for Interagency Coordination); and, (c) Improving Select Trade-Related Infrastructure (Narayanghat-Mugling road section and improvement of the entire Birgunj-Kathmandu Corridor, new ICD (Inland Container/Clearance Depot) in Kathmandu, and improvement of existing ICDs at Birgunj and Bhairahawa).

Project B: FY15 Mizoram State Roads II - Regional Transport Connectivity Project (P145778). US$107 in national and regional IDA to Government of India to support increasing transport connectivity along regional trade corridors in Mizoram. Improvements to the transport network would enhance the environment for development and growth by reducing freight and passenger transport costs, and by providing quicker and safer access to all parts of the state and to neighboring states and countries including Bangladesh and Myanmar.

Project C: proposed FY17 Bangladesh Regional Connectivity Project 1 (P154580). US$120 million in national and regional IDA financing to Government of Bangladesh to support investments that complement and connect directly to the BBIN Regional IWT Program to provide multimodal connectivity by road and inland waterways between the BBIN countries. The proposed investments support trade facilitation measures and facilitate road connectivity with the regional inland waterway routes through Ashuganj, allowing vehicles, passengers and cargo to take more direct routes between Bhutan, Nepal, and Northeast India to Dhaka and Chittagong Port in Bangladesh and to Kolkata Port in West Bengal.

Project D: proposed FY17 Bhutan Regional Connectivity Project (P157726). US$45 million in national and regional IDA financing to Government of Bhutan to support investments in a dry port/ICD that reduces transport costs and facilitates trade with India, Bangladesh and third countries; and improves telecommunications connectivity/redundancy through India and Bangladesh.

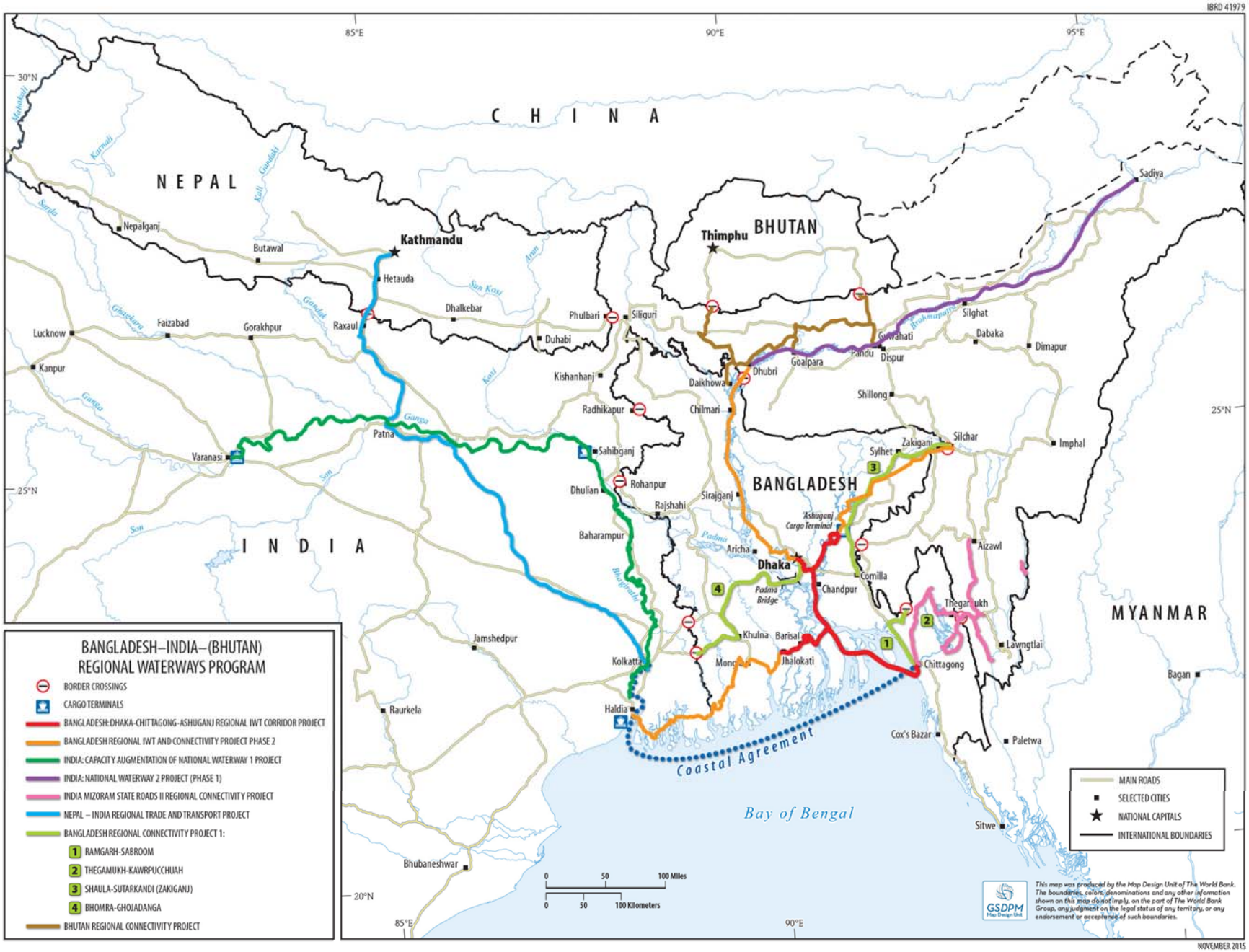
Project E: proposed FY16 Bangladesh Regional Waterway Transport Project 1 (P154511). US$360 million in national and regional IDA financing to Government of Bangladesh to support improving navigability along the highest priority regional waterways including Chittagong-Dhaka-Ashuganj Corridor used by Indian, Bhutanese, and Bangladeshi trade, and in future Nepalese trade.

Project F: proposed FY17 India: Capacity Augmentation of National Waterway 1 Project (P148775). US$200 million in Bank financing to Government of India to support enhancing the transport capacity and reliability of National Waterway 1 (the Ganga/Padma, a Bilateral Protocol Route) and augmenting institutional capacity for the development and management of India's inland waterway transport system.

Project G: proposed FY17 India: Assam Inland Water Transport Project (P157929). US$150 million in Bank financing for Phase 1 to facilitate passenger transport in Assam (the Brahmaputra, a Bilateral Protocol Route), and to facilitate bilateral, international and transit trade and cargo transport along NW2 and Bilateral Protocol Routes to and through Bangladesh.

Project H: proposed FY17–18 Bangladesh Regional Waterway Transport Project 2. US$400–US$500 million in regional and national IDA financing to Government of Bangladesh to support investments based on the outcome of the 53-route study (financed by the Bangladesh Trade and Transport Studies RETF Project, P148881) to prioritize regional inland waterways in Bangladesh for investment, including all remaining feasible Bilateral Protocol Routes that are not part of investments in Project 1 (for example, Jamuna, Padma). Foreseeable investments include improvements in river navigability to additional routes; investment in modal change infrastructure, last mile connectivity; sector reform; PPP and continuing institutional and capacity development leading to expansion of cargo and passenger transport on inland waterways, including along the Bilateral Protocol Routes.

Figure 3.1. Map—BBIN Regional Multimodal Connectivity Program



Detailed Description of Project Components

3. The Project will finance interventions aimed at improving IWT for cargo and passengers along the heavily-trafficked Chittagong-Dhaka-Ashuganj river routes, and in so doing, stimulating traffic growth on the waterways and away from the already heavily congested roads along these routes. These fall under the jurisdiction of the Bangladesh Inland Water Transport Authority (BIWTA), a Government authority mandated to oversee sector development. Main interventions include: navigation channel maintenance and improvement; navigation safety improvements; the construction, rehabilitation, and modernization of select river terminals; development of River Information Systems; institutional capacity development; and, funding for research and development to enable continuing sector improvement and sustainability. This includes work on sector policies and strategies needed to: improve revenue collection and management; incentivize public and private sector investments especially related to container transport; and, mitigate and improve IWT's impact on the social and physical environment. The Project consists of three components as follows:

Component 1: Improved Inland Waterway Navigation (IDA financing: US$235 million)

4. This component shall include work to guarantee advertised depths and widths of navigation channels on select river routes (see table 3.2). The work also includes provision of aids to navigation. The work is to be done on a Performance-based Contracting method designed to increase the efficiency and effectiveness of river asset management and maintenance. It is designed to ensure that the physical condition of the rivers under contract are adequate for the need of river users, over the entire period of the contract which is six to seven years. This type of contract significantly expands the role of the private sector, from the simple execution of works to the management and conservation of river assets. This is a departure from the traditional river maintenance contracts used in Bangladesh which have been less-than-optimal. Even where works have been carried out according to plan, the nature of the rivers has meant that advertised depths, aids to navigation and other river infrastructure do not last as long as they should because of deficiencies in the original design, aggravated by inadequate maintenance. The beneficiaries of the new concept are expected to be the river users. In a wider sense, future generations will be able to benefit from a better maintenance of past investments. River users will be able to know the Service Level they can expect in return for the payments they make for the use of the infrastructure (tolls, tariffs, user fees, taxes, and so on). The River Administration shall also benefit by obtaining better overall river conditions with reduced levels of expenditure.

5. Also included in Component 1 is work to provide safe harbors (storm shelters) whereby users can seek shelter from stress of weather in the Meghna Delta area during tropical cyclones. The Bay of Bengal is responsible for the formation of some of the strongest and most destructive tropical cyclones in the world. Adverse wave conditions, heavy rainfall and associated storm surges from these cyclones are a major cause of loss of life and infrastructure damage in the maritime delta area. It is intended that the storm shelters shall be constructed and maintained under the same Performance-based Contract, since the works will primarily consist of dredging close to the bank to create a safe harbor area and breakwater system, and few to no permanent onshore structures.

6. Activities to be financed under this component include: (a) bathymetric and other surveys to determine the extent and types of dredging required, river training, environmental protection or

other works; (b) visual aids for day and night navigation such as light buoys, radar beacons, leading lines and other aids; (c) limited and selected performance-based dredging to achieve guaranteed advertised Least Available Depth; (d) development of six vessel shelters within remote cyclone areas equipped with mooring buoys to ensure safety for the vessels. In addition, Design, Supervision, Safeguards Services, and Other Activities relating to Navigation Improvement will also be financed including: (e) provision of supervision and performance monitoring consulting services for the works carried out under for this component; (f) carrying out of land assessments to identify suitable land for the activities under this component, including the allocation and acquisition of land and the provision of resettlement and rehabilitation compensations to Displaced Persons; and, (g) carrying out environmental mitigation measures for this component in accordance with the EMP, including supervision and management of the Dredged Material Disposal Plan and for biodiversity conservation activities.

Component 2: Improved Services at Priority Inland Waterway Terminals and Landing Stations (IDA financing: US$75 million)

7. In addition to BIWTA's function to provide river conservancy works including river training works for navigational purposes and for provision of aids to navigation, BIWTA is also responsible to develop, operate and maintain facilities for the landing of goods and passengers. Currently there are some 24 river ports of varying size, the largest in the Dhaka area which extends some 40km along the length of the Buriganga River. Within these BIWTA manage some 448 river terminals/stations. Outside the port limits, BIWTA is also responsible for the provision of 448 riverine stations, 374 landing ghats, 23 coastal stations, 8 ferry terminals, 24 pilot stations. This component is focused on assisting BIWTA to develop and grow some of these facilities, including 2 common user cargo terminals, 4 passenger terminals and 14 landing ghats. The design of the river terminals and landing stations will improve intermodal connectivity by improving landward river access and improved facilities for ships. For passengers, the works will include improvement of the security, safety and the waiting environment in remote rural locations, with suitable passenger and luggage handling, sanitation and other facilities. The facilities shall specifically incorporate the needs of women users and small traders (such as toilet facilities for women, women-only waiting rooms) and address safety-related issues for women users. BIWTA will also make suggested changes to operational guidelines to improve women's safety and experiences using inland water transport services. All investments under this component will also aim to enhance the climate change resiliency of terminals and landing stations, such as through design adaptations to account for the expected increased variation in river flows, more intense or frequent extreme storm events, and so on.

Subcomponent 2A: Improvement and Development of Selected Cargo Terminals.

8. This subcomponent supports the (a) development of a new common user (public) general cargo terminal with access infrastructure at on the Buriganga River adjacent to the existing Pangaon container terminal; and (b) Rehabilitation and modernization of the existing general cargo terminal at Ashuganj. Included are all upfront design and other studies to ensure efficient transfer of forecast cargo from various design vessels to the in-country land transport networks. Rehabilitation at Ashuganj shall include work to prevent river bank erosion, the replacement of pontoons, gangways and other dilapidated marine structures, the extension of berthing space, yard paving and access improvement.

Subcomponent 2B: Improvement and Development Selected Priority Passenger Terminals.

9. This subcomponent supports: (a) construction of a new passenger terminal at Shashanghat downstream of the existing terminal at Sadarghat where landside congestion preclude the development of additional berths; (b) rehabilitation works for the passenger terminal at Narayanganj; (c) construction works for the new passenger terminal at Madrashaghat, Chandpur near the existing terminal; and, (d) extension of the existing passenger terminal at Barisal. The passenger terminal at Sadarghat is heavily congested. On a daily basis over 60 thousand people use the facility, which has run out of space for expansion. The new passenger terminal is located on land owned by BIWTA, downstream on the Buriganga River. The new facility shall be on the landward side. Studies have already been commissioned to determine various design options which include the development of multi-level passenger terminal (of approximately 20,000m2), access roads, car and bus parking and waiting areas. On the riverside, it shall include works to improve the berth basin, bank and provision of floating pontoons together with link-span and other arrangements. Rehabilitation works at the other terminals will focus on structural repair and modernization/expansion of existing terminal facilities, including car/bus and passenger access and waiting areas.

Subcomponent 2C: Rehabilitation works or new construction of up to 14 Existing Landing Stations/Ghats.

10. The 14 landing stations/ghats are mainly located in the lower Meghna River, especially on remote chars or river islands where facilities are either in very poor condition or non-existent. These facilities are often the only means of landing passengers and goods to communities without other transport alternative.

Subcomponent 2D. Design, Supervision, Safeguards Services, and Other Activities relating to River Port Terminals and Landing Stations.

11. Activities include: (a) Provision of supervision and performance monitoring consulting services for the works carried out under Components 2A, 2B and 2C of the Project; (b) Carrying out of land assessments to identify suitable land for the activities to be carried out under Part 2.A, 2.B and 2.C of the Project, including the allocation and acquisition of land and the provision of resettlement and rehabilitation compensations to Displaced Persons; and, (c) Carrying out environmental mitigation measures under Component 2 of the Project in accordance with the EMF, and site-specific EMPs to be developed.

Component 3: Institutional Capacity Development and Sector Sustainability (IDA financing US$50 million).

12. A series of activities are proposed that will support BIWTA's overall enhancement of its management systems and human resources capacity for modern, efficient, and high quality management of the IWT sector in line with international standards, and to help BIWTA achieve long-term operational and financial sustainability, and enhance the climate resilience of the IWT sector. Activities to be supported include: (a) Supporting the development of River Information Systems to improve data collection for the planning, maintenance and development of inland water transport and which help improve revenue and institutional sustainability, including the collection and dissemination of hydrographic data and electronic nautical charts; provision of an aid-to-navigation monitoring system; provision of vessel and terminal maintenance plans; provision of a

traffic monitoring system for passengers and cargo; conducting a Tariff Review to look into how both infrastructure and service charges are levied—with a view to reducing dependence on Government subsidies; conducting an Organizational Review to look into mechanisms to reduce expenditure; and, conducting an Operations Review to ensure dredging delivers results in solutions that provide best value (rather than lowest cost) including investment in new technology and work processes. . b) improvement of Human Resources capacity for better management of the IWT sector through upgrading and modernizing the IWT Deck and Engine Personnel Training Centre into a regional IWT Training Center with open access to all users in the Region and the world; (c) financing of feasibility, surveys, design and safeguards studies for continuous sector development; and, (d) support for the Project Implementation Unit, including the provision of equipment, systems and consulting services..

Subcomponent 3A: Revenue & Institutional Sustainability.

13. Organizational Review, Operational Review, Development of River Information Systems (Hydrographic Data System and Electronic Nautical Charts, Aids-to-Navigation Monitoring System, Traffic Monitoring System). This subcomponent will help BIWTA improve data collection for the planning, maintenance and development of IWT, as well as enhance climate resiliency of the IWT sector in Bangladesh by creating a more systematized baseline understanding of river hydrology and navigational implications (which is necessary to underpin modeling and prediction of future effects with climate change, for long-term planning). It consists of:

- Hydrographic Data System and Electronic Nautical Charts - the most fundamental of all aids to navigation. This part includes the supply of new survey vessels (for operation in coastal and inland water areas), modern survey and charting technologies (including multi-beam echo-sounders and LIDAR technology), new Differential Global Positioning System (DGPS) capacity, river gauge stations, and a system to produce and disseminate Electronic Nautical Charts for the main priority routes along the Chittagong-Dhaka-Ashuganj IWT Corridor, as well as paper charts and river navigation notices on other important routes. This subcomponent also includes possible development of crowd source technologies to obtain important (and changing) bathymetric information through procurement and installation of equipment on select commercial vessels regularly operating on various river routes; procurement of coastal survey vessels (with multi-beam survey capacity), procurement of inland survey vessels (with multiple single beam survey capacity), procurement of small speed boats (with single beam survey capacity for cross lining and bank survey works) and procurement of new topographic survey technologies for survey of banks, chars and other important navigation features. Remaining work to complete surveys for all remaining Bilateral Protocol and High Priority routes (from 53- route study currently financed under the Bangladesh Trade and Transport Studies RETF Project) will also be financed.

- Provision of an Aid-to-Navigation Monitoring System - allowing BIWTA to maintain the availability of the same in accordance with International standards. This part shall include the use of remote Supply an AtN Monitoring System for BIWTA, which will use electronic signals to monitor Aids to Navigation. BIWTA staff will be trained to monitor this system, and the PBC contractor and Monitoring/Supervision Consultant can access this system to monitor the installed Aids to Navigation.

- Provision of traffic monitoring system for passengers and cargo - allowing BIWTA to establish mechanisms to control and manage revenue and cost, which is an essential tool in the development of sustainable user pay principal and cost-recovery framework.

Subcomponent 3B: Improved Human Resources Capacity for Management of IWT sector.

14. A Regional IWT Training Institute will be supported in this component. The Deck and Engine Personnel Training Centre, located at Sonakanda, Narayanganj will be upgraded and modernized into a Regional IWT Training Institute. The DEPTC was established in 1971 and currently provides various courses for both deck and engine personnel, with on cadet (pre-sea) training for the merchant fleet, as well as some in-service training for inland matters (Class 1, 2 and 3). In total it trains some 100 cadets annually and some 1,200 in-service personnel on up to 20 different short courses. Most of the facilities are very dated and the center lacks modern teaching aids, including essential equipment such as computers, bridge and other simulators, modern workshops, equipment for life saving and other drills, a modern library and other essential training aids. This subcomponent shall modernize the training facility into a comprehensive training facility on all IWT-related subjects, with open access to all. It shall include a review of all existing legislation that affects the way the institute functions, with the aim of aligning the institute to the general principals contained in the International Convention on Standards of Training, Certification and Watchkeeping for seafarers as amended by the Manila Protocol in 2010 (STCW-2010) - that are appropriate for the operation of inland waterway vessels (and vessels making short coastal voyages). Based on a training needs assessment, the work shall also include upgrading the institute to academy standard, possibly overseen by a board of governors and managed by an executive committee with an academic and development council (drawn from Government and industry). A program to recruit and train the trainers shall be undertaken and the facility shall be equipped with modern training aids. This shall include: facilities for instruction in survival at sea; fire-fighting; first aid; and other short courses. Included in this subcomponent shall be provision of a life boat station, fire-fighting facilities, bridge and navigation simulators, radar stations, marine radio and equipment for the instruction of deck officers and personnel, facilities for the instruction of engine room personnel, upgrade of workshops, libraries, classrooms and computer stations. A sediment and water quality analysis laboratory is also proposed. A Train the Trainers Program for selected staff. Support the capacity development of selected staff who will become trainers in their departments on international standards in different aspects of sustainable management of the IWT sector. About 100 senior staff (or 20 per year over 5 years) including senior staff from Dredging, Hydrography, Piloting, Planning, and Finance Management departments will be trained in Europe on 2–4 week programs. When the trained staff return they will be required to set up a training program and train staff in their departments on the relevant skills that they have learned.

Subcomponent 3C: Continuous Sector Development - Feasibility, Surveys, Design and Safeguards Studies for Continuous Sector Development.

15. This subcomponent will support preparation and design activities as needed to support future investments and continuous sector improvement, including preparation studies for prioritized investments as determined by the current ongoing 53-route study financed by the Bangladesh Trade and Transport Studies RETF Project, and Origin-Destination studies. These prioritized investments include routes that support regional trade with India and Bhutan. Foreseeable studies include: (a) a feasibility and design study to examine options for Ship-to-Ship

trans-shipment at or near Chittagong to avoid dwell time at Chittagong Port for containerized and bulk cargo; (b) Feasibility, design, surveys and safeguards studies for improvement of Dhaikawa/Chilmari River Terminal and Customs Station (on Jamuna/Brahmaputra) for transport of goods to/from Bhutan and Northeast India; and, (c) Feasibility, design, surveys and safeguards studies for improvement of navigability and river terminals along other Bilateral Protocol routes and high priority routes.

Subcomponent 3D: Project Implementation Unit Capacity Support.

16. This component will support the hiring of a project manager, procurement, financial management, technical, and environmental and social safeguards specialists needed for implementation of the Project. The costs relating to internal audit, selected IT and monitoring systems and equipment will also be procured to support the work of the PIU. The Government will finance office space, meeting sitting fees, honoraria, deputized civil servant salaries, vehicles, fuel and other transport costs.

Table 3.2. Project River Routes

Route No.	River Name	From/To	Route Class	Channel width m (no slope)	Dredging depth m
1 and 2	Buriganga, Dhaleshwari and Meghna	Dhaka (Zinzira River Ghat)/Munshigang	1	76	-4.3
2 (South of Chandpur)	Meghna	Munshigang/Chittagong	1	76	-4.3
3 and 4	Shitalakshya and Meghna	Munshiganj/Gorashal	1	76	-4.3
5	Meghna	Munshiganj/Ashuganj	1	76	-4.3
6	Meghna	Nabinagar Loop	1	76	-4.3
14	Meghna and distributaries	Approach via Hijlai upto Barisal	1	76	-4.3
18	Bishkhali	Barisal Jhalokati	2	76	-2.8
19	Meghna	Chandpur/Shariatpur	2	76	-2.8
20	Meghna	Lakshmipur/Bhola	2	76	-2.8
21	Tentulia	Beduria/Laharhat	2	76	-2.8
22	Meghna	Boddarhat/Daulatka	2	76	-2.8
7 and 8	Meghna	Nasingindi Northen and Southern Approachws	2	76	-2.8
12	Chandpur	Chandpur/R-140 Bridge	2	76	-2.8
13	Meghna and Arial Khan	Approach from Alubazar North of Batamara up-to At Hazar	2	76	-2.8
13a	Meghna	Looping Route Inside Char Hijla	2	76	-2.8
9	Meghna	Bancharampur Homa Loop	3	30	-2.1
10	Meghna	Homna/Daukandi	3	30	-2.1
15 and 16	Mehhna, Tentulia	Mehendiganj/Beduria	3	30	-2.1
17	Tentulia	Beduria/Route 14 (North of At Haza)	3	30	-2.1

Annex 4: Implementation Arrangements

BANGLADESH: Bangladesh Regional Waterway Transport Project 1

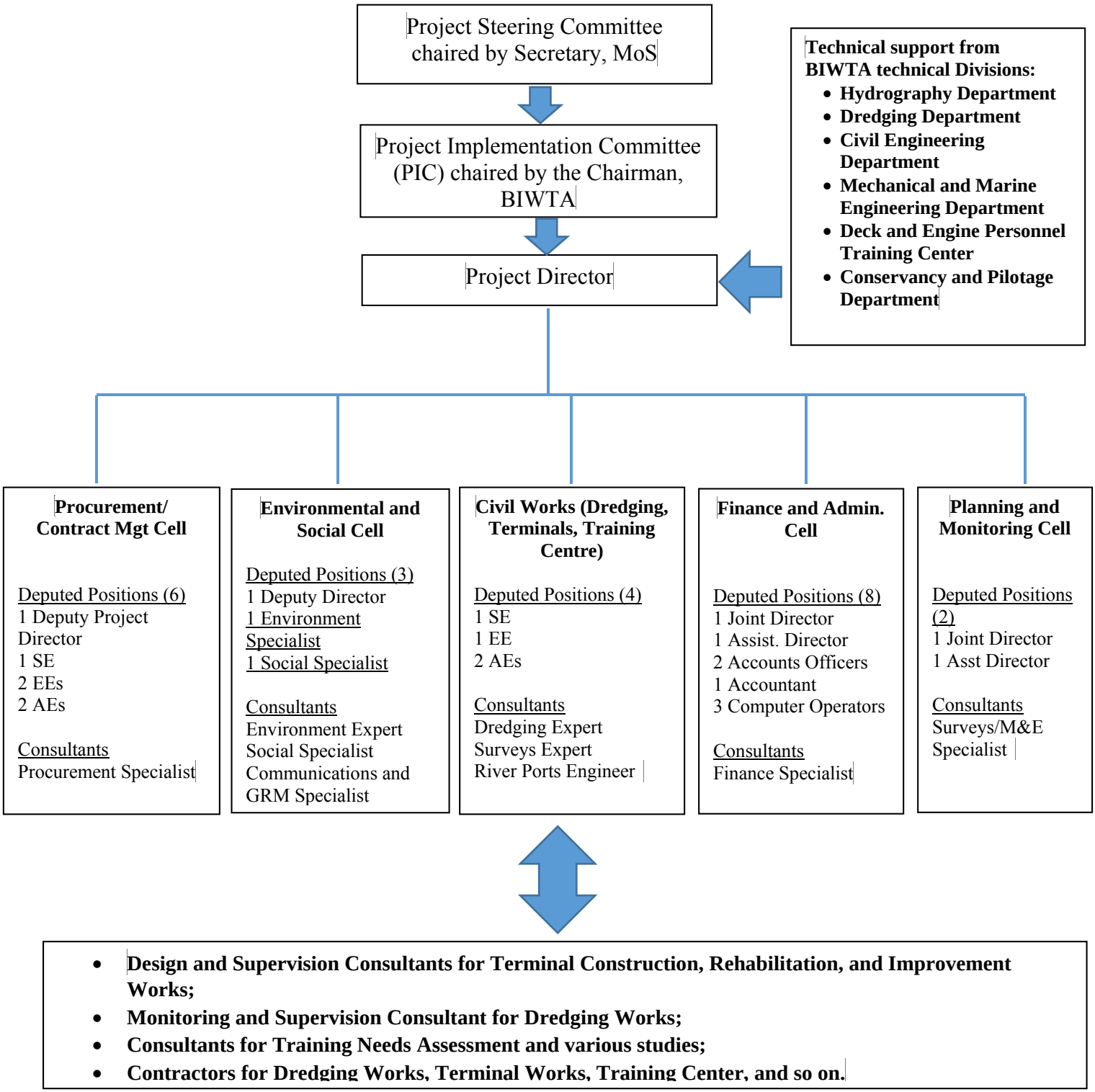
Project Implementation Arrangements

Project Administration Mechanisms

17. BIWTA will be the Implementing Agency for the Project. It plans to set up a separate Project Implementation Unit (PIU) at the main office building headed by the Project Director reporting to the Chairman, BIWTA who is also Chair of the Project Implementation Committee (PIC) of BIWTA. The PIC, consisting of members from MoS and other agencies, will be supporting project implementation, monitoring implementation progress, and guide decisions at the implementation level. A Project Steering Committee (PSC) chaired by the Secretary, MoS with members from ERD, Ministry of Finance (MoF), Planning Commission, and BIWTA will be providing high-level guidance and monitoring especially at the policy level, and make decisions on high-value contracts above defined thresholds. The PSC will meet every six months or more often on an as-needed basis. The PIU shall be fully responsible for planning, procurement, implementation, monitoring, reporting, and coordination with the Bank. The Project Director of the PIU will be supported by an Additional Chief Engineer as Deputy Project Director. The PIU includes a Procurement and Contract Management Cell, Safeguards Cell, Civil Works Cell, Finance and Administration Cell, and a Planning and Monitoring Cell (see figure 4.1. Project Implementation Institutional Arrangements). Twenty-four (24) positions will be hired or deputed by the Government. In addition, consultants will supplement the capacity of the PIU as needed.

18. Considering the multi-disciplinary project components requiring special skills and knowledge on Hydrology and Hydrography, Dredging, Terminals, Landing Stations, Navigation, Rescue and Safety, and Capacity Development, the PIU will also be supported by the Technical Divisions of BIWTA. Technical support will be provided from the Hydrography Department, Dredging Department, Civil Engineering Department, Mechanical and Marine Engineering Department, Deck and Engine Personnel Training Center, and Conservancy and Pilotage Department of BIWTA when required by the PIU.

Figure 4.1. Project Implementation Institutional Arrangements



Financial Management, Disbursements, and Procurement

Financial Management

19. **Financial management assessment summary.** BIWTA is an autonomous body established under the Ministry of Shipping that came into existence after independence as successor of the erstwhile East Pakistan Inland Water Transport Authority accredited under E.P. Ordinance of 1958. The East Pakistan Inland Water Transport Authority Ordinance 1958 has been amended several times including under the Act of 1997. The authority is functioning for the development, maintenance and operations of inland water transport and waterways in Bangladesh. The institution functions through a formal structure of Board of Directors which is headed by Chairman at the rank of Additional Secretary and supported by senior officials of Government of Bangladesh mostly at the rank of Joint Secretary. To oversee core functions of financial management, BIWTA has three separate departments, that is, Finance (planning and budgeting), Central Accounts (for the Head Office and nine field offices), and Audit. The institution earns substantial revenue through port and dredging operations and proceeds are utilized to fund expenditures. The budget estimates for Development Project Proposals (DPPs) are prepared annually by the Planning Department of BIWTA in close coordination with Ministry of Shipping after which approval from the Planning Commission and endorsement from Ministry of Finance are required. Budget funds are released/ transferred quarterly into the bank account of BIWTA. Physical and financial progress of project implementation are monitored by MoS and revisions to the budgets (RE) are made at the middle of the financial year. The accounting and payment function for development projects is centralized at the Head Office. Revenue expenditures are decentralized and operated through regional (field) offices (which have their own bank accounts), which maintain manual books to record accounting and financial transactions following double-entry bookkeeping principles. The Treasury and General Financial Rules issued by Ministry of Finance are used for transaction/financial controls. Internal audits are conducted by the Audit wing of BIWTA. The annual External Entity Audit is carried out by a firm of chartered accountants appointed by the Board. Audits are completed through the financial year ending June 30, 2014. Audit reports reviewed by the Bank team are unqualified with no serious accountability and internal control issues identified by the auditor.

20. **Risk analysis and mitigation.** BIWTA has implemented Bank-financed project decades ago (during the 1990s). The financial management performance was affected due to frequent changes of key professional staff at BIWTA and MoS. There were delays in the implementation of action plans and submission of audit reports, including timely resolution of audit issues which resulted in suspension of disbursements. There were also problems associated with GoB budget allocations with regard to adequacy and timeliness which led to delayed payments to contractors affecting overall project implementation. While carrying out the assessment and designing financial management arrangements for this project, the lessons learnt in the earlier project were taken into account. BIWTA over many years has developed some financial management capacity to implement government programs and schemes in the area of port development and dredging operations. However, it lacks institutional capacity and experience to manage large contracts of infrastructure projects. The risk assessment and mitigation measures are tabulated in table 4.2 below:

Table 4.2. Financial Management Risk Matrix

Potential Area of Concern	Risk	Risk Rating	Risk Mitigation
Accounting	The present system of manual accounting both at Head Office and regional offices pose significant risk in carrying out appropriate accounting and financial reporting functions (for example, possibility of posting incorrect accounting entries and mis-classification of expenditures in accounts, possible delay/non-reconciliation of inter unit and bank reconciliations, advances reported as expenditures and delay in settlement of advances, and so on). The inefficiency may result in delay in submission of Interim Financial Reports, and incorrect disbursement claims to the Bank.	**Substantial**	The accounting function will be centralized at PIU and there will be no funds that will be advanced by PIU to field divisions and training centers. For the Project, a computerized accounting system will be procured by BIWTA. The chart of accounts shall be appropriately configured and training shall be provided to finance staff. The agency will also hire a competent and qualified accountant to support the Project in carrying out accounting and financial reporting functions.
Internal Control	BIWTA has an age old accounting manual for transaction and financial controls and to guide staff on internal control principles. The manual require significant update.	**Substantial**	The Bank is in the process of finalizing a Financial Management Guidebook which comprises of GFRs, latest circulars issued by MoF, gazette notifications of GoB and so on. The guidebook was prepared so that it can be used as an effective tool to implement development programs in Bangladesh. BIWTA will customize its accounting manual using this guidebook.
Internal Audit	The internal audit is done by the Audit Wing of BIWTA and is mainly focused on traditional methods of transactional auditing. It lacks institutional capacity, professional skills and exposure to conduct risk-based performance audits.	**Substantial**	To satisfy Bank's fiduciary requirements, a firm of internal auditors will be hired to conduct internal audits of the Project. The ToR of the firm will also include providing technical assistance to BIWTA's internal audit department by exposing the audit staff to the new audit tools and techniques. Additionally, an Integrated Fiduciary Review will be carried out periodically by a consulting firm appointed by the Bank to identify issues.
External Audit	At present, statutory audits of BIWTA are conducted by a private firm of chartered accountants. The firm is selected using least-cost method. There are significant delays noted in the appointment of statutory auditors by BIWTA and issuance of Entity audit reports and financial statements.	**Substantial**	To improve governance and oversight arrangements and enhance objectivity and independence in the audit function, the external audit of the Project shall be conducted by FAPAD in CAG according to the Terms of Reference agreed with the Bank and the report will be issued within 6 months from the end of the fiscal year.

21. **Project financial management arrangements.** The PIU formed under BIWTA will have the overall accountability of planning, implementation, management and monitoring of the Project. The PIU will maintain the financial management system for the Project and will ensure that these

are carried out in accordance with the Project's legal agreements. These activities would include: (a) adequate annual budget provision, effective utilization and periodic monitoring; (b) cash management and timely payment for eligible Project activities; (c) maintenance of adequate and competent financial management staff; (d) appropriate accounting of Project expenditures, (e) preparation and timely submission of Interim Financial Reports (IFRs); and (f) timely submission of audit reports and project financial statements to the Bank. The following arrangements will govern the Project's financial management:

22. **Budget.** BIWTA has prepared a Development Project Proposal for the Project detailing out nature of activities and associated costs that will be financed from IDA and GoB. The budget has been submitted by Ministry of Shipping to the Planning Commission for concurrence and inclusion in Annual Development Program (ADP). The utilization of the budget will be closely monitored by GoB and any deviation from original budget will be met through supplementary approval by revision in the Annual Development Program.

23. **Accounting, payment and internal control.** BIWTA does not have a computerized accounting system. It maintains manual books to record accounting and financial transactions following double entry book keeping principles. For the Project, an off the shelf accounting system will be purchased and chart of accounts will be appropriately configured to the accounting system. The accounting and payment function will be centralized at the PIU and there will be no funds that will be advanced by PIU to field divisions and training centers. The financial transactions will be supported by approved vouchers and all the payments (except for petty cash expenditures) will be made through electronic bank transfers using the country banking systems. The assets procured under the Project will be appropriately recorded in the accounting systems and will be subject to annual physical verification by the auditors and Bank staff. The ledger accounts and expenditure statements generated from the accounting system will be used for the preparation of Interim Financial Reports. The field offices will maintain adequate subsidiary records (that is, measurement books, and so on) for the ongoing works and will submit bills periodically to the PIU. A technical supervision consultant shall be engaged for regular monitoring and certification of the payments. BIWTA has an age old accounting manual to guide staff on internal control principles that require significant update. The Bank is in the process of finalizing a Financial Management Guidebook which comprises of GFRs, latest circulars issued by MoF, gazette notifications of GoB and so on. The guidebook was prepared so that it can be used as an effective tool to implement development programs in Bangladesh. BIWTA will customize its accounting manual using this guidebook.

24. **Quarterly financial reporting.** The Interim Financial Reports will provide financial information on the sources and uses of funds according to disbursement categories and project components. They will report actual expenditures incurred by the Project and will be prepared by the PIU from underlying accounting records and expenditure statements generated from the accounting system. The IFR will be submitted to the Bank within 45 days from the end of each calendar quarter. The IFR will form the basis of subsequent disbursement into the Designated Account.

25. **Finance staffing.** In the previous project with BIWTA, the financial management performance was largely affected due to frequent changes of key professional staff. The availability of professionally qualified finance and accounting staff is essential for successful implementation of this project. It is therefore agreed with BIWTA that one Deputy Director (accounts), accounts

officer and cashier having rich experience in government transactions will be fully committed for the Project. The Deputy Director will provide overall financial management oversight for the Project. A Financial Management Specialist with extensive experience on donor funded projects will be additionally recruited from the market and will be retained throughout the Project duration to provide support to the PIU on financial management matters. It has been agreed with BIWTA that the person will be hired along with other PIU staff and will join project office within 30 days from signing of Financing Agreement. The job description and requisite qualification of the person will be specified in the Terms of Reference. The Finance Wing of the PIU will be provided adequate training in financial management and disbursement-related aspects to meet the Bank's requirements.

26. **Internal audit.** There is an internal audit department in BIWTA headed by Director (Audit) to conduct internal audit of BIWTA's financial transactions. The financial management assessment indicates that the department lacks professional skills, capacity and exposure to conduct audits of large infrastructure projects. To satisfy Bank's fiduciary requirements and to enhance objectivity and independence in the internal audit function, an accounting firm will be externally engaged for doing internal audits of the Project. The firm will be selected through a competitive process following Bank procurement procedures. The internal audit will be conducted according to Terms of Reference agreed with the Bank and audit will focus on review of the Project's financial management arrangements, internal control processes adopted by the PIU and field offices in processing project payments, assess functioning of accounting system, and procurement and contract management functions. The internal audit will be conducted annually and will provide feedback to management on control weaknesses and issues that require management attention. The internal audit reports along with the corrective actions taken by the Project to address the control weaknesses (if any) will be shared with the Bank. The ToR of the internal audit firm will also include providing technical assistance to BIWTA's internal audit department. The professional expertise of internal auditor will be used to strengthen the knowledge and capacity of internal audit department by exposing the audit staff to the new audit tools and techniques. The training and capacity building of the staff shall be organized through a series of workshops. During the first few years of project implementation, internal audit will be conducted by the audit firm and audit reports will be shared with the Bank. Once the capacity is developed within BIWTA, the Bank will rely on the internal audit reports issued by internal audit department.

27. **Integrated fiduciary review.** The Bank will carry out an Integrated Fiduciary Review to assess the governance and oversight arrangements which the Project will undergo at least three times during the implementation phase that is, year 2, 5 and 7. An external firm will be engaged by the Bank and the scope will include a comprehensive review of procurement and financial transactions. A formal report will be issued to the Project and any ineligible expenditures that arise of this review will be refunded to the Bank by GoB.

28. **External audit.** The statutory audit of BIWTA is carried out by a firm of chartered accountants appointed by the Board of BIWTA. Audits are conducted according to the accounting standards prescribed by Institute of Chartered Accountants of Bangladesh. There are significant delays noted in the appointment of statutory auditors by BIWTA and issuance of Entity audit reports and financial statements. The audit report for the Financial Year 2014–15 has not been issued yet. The Bank therefore cannot not rely on the Entity audit reports for its fiduciary assurance purposes.

The Comptroller and Auditor General of Bangladesh (C&AG)[14] has a separate mandate to conduct external audits for all donor-financed projects in Bangladesh. The audit reports issued by C&AG for other Bank-financed programs were mostly timely and it conducts and issues audit reports according to the agreed Statement of Audit Needs (SAN).Therefore for the Project, the annual external audit will be carried out by C&AG through its Foreign-Aided Project Audit Directorate (FAPAD). A Statement of Audit Needs (SAN) will be agreed with CAG during the first year of implementation. It will require auditors to provide a professional opinion on the true and fair view of project financial statements and additionally provide an opinion on (a) adequacy of project accounting and internal control systems; (b) adequacy of documentation maintained for the Project transactions to support disbursement claims to the Bank; (c) eligibility of expenditures incurred for Bank financing; and, (d) whether procurement under the Project has been undertaken according to agreed norms/Bank guidelines. The annual project audit report would consist of: (a) audit opinion; (b) project financial statements; and, (c) management letter highlighting significant weaknesses. The PIU will be responsible for providing the Project Audit Report to the Bank within six months from the end of each fiscal year (July 01 to June 30). The expenditures that were considered as ineligible by C&AG and reported in the audit report will be refunded to the Bank by GoB. The Bank would require BIWTA to share its entity audit reports reflecting Project transactions for information purposes. Table 4.3 shows the audit reports that will be monitored in the PRIMA (Public Risk Management) system by the Bank.

Table 4.3. Audit Reports Monitored in PRIMA

Agency	Audit Report	Auditor	Year	Due Date
BIWTA	Project Audit Report	FAPAD, C&AG	July 01–June 30	December 31 of each year

29. **Oversight by Project Audit Committee.** A Project Audit Committee will be constituted to ensure that Project audit issues and recommendations raised by Internal Audit, Entity Audit and Project Audit are periodically reviewed, addressed and closed satisfactorily. The Audit Committee will meet at least twice a year and will function as a sub-committee of the Implementation Support Committee. It has been agreed that Member Finance of BIWTA will act as Chairman with support from two additional members that is, Director (Audit) and Deputy Secretary nominated by Ministry of Shipping. The Financial Management consultant appointed by PIU will provide administrative support for the committee meetings.

30. **Retroactive financing.** There is no retroactive financing provided to the Project.

31. **Public disclosure.** The IDA funds received and spent by BIWTA, ledger balances and assets created under the Project will be reflected in the forming schedules and entity financial statements and will be available on the external website of BIWTA. Additionally, the Project Audit Report issued by C&AG will be posted on the external website of BIWTA.

32. **Risk and supervision plan.** The financial management risk of the Project is **Substantial.** To support project implementation, essential institutional capacity will be provided by contracting accounting firms and professionals. An accounting system will be procured to support project in timely submission of financial reports. The accounting and payment function will be centralized from the PIU and internal control aspects will be documented in the Accounting Manual which will

[14] Supreme Audit Institution of Bangladesh.

serve as a reference document to Project staff. The oversight arrangements, that is, for internal and external audits, will provide reasonable assurance on use of Bank funds for Project activities. During the first year of project implementation, the Bank will undertake semi-annual implementation support missions, including field visits to ensure that agreed financial management arrangements are understood and appropriately followed by the PIU. As implementation progresses; financial and audit reports will be reviewed. The financial management arrangements proposed under this Project are considered to be adequate to account for and report on project expenditures, and satisfy the fiduciary requirements of OP/BP 10.00.

Disbursements

33. **Disbursement and fund flow.** BIWTA will open two separate bank accounts for this Project. One Designated Account, Convertible Taka Account (CONTASA) in Nationalized Commercial Bank of Bangladesh will be opened exclusively for receipt of funds from the Bank and for payment of Bank-funded activities. The Advance will be transferred by the Bank into the Designated Account after the Project is declared Effective based on receipt of the Interim Financial Report providing expenditure forecast of the next two quarters. The Designated Account will be jointly operated by the Project Director and head of Finance Cell deputed to PIU (that is, Deputy Director). The subsequent disbursement into the Designated Account will be made by the Bank on submission of withdrawal applications (Interim Financial Reports) by the PIU. The Project will be given flexibility to use the Direct Payment, Reimbursement, and Special Commitment methods to withdraw funds from the Credit. BIWTA will open another bank account for receipt of counterpart funds from GoB. This funding arrangement will avoid comingling of Project funds and will ensure that Bank funds are not used to finance counterpart activities. BIWTA has prepared a Development Project Proposal for the Project detailing out nature of activities and associated costs that will be financed from IDA and GoB. The taxes under the Project are presently estimated at SDR 15.22 million which is approximately six percent of total Project cost. The taxes will be initially financed from the GoB allocation for taxes of SDR 13.12 million equivalent, and subsequently IDA funds of SDR 2.10 million. During Project implementation, if the actual expenditure on taxes exceeds SDR 15.22 million equivalent, IDA funds available under the Unallocated category may be used to finance the additional taxes. However, under no circumstances will IDA financing of taxes exceed 15 percent of the total IDA financing. Table 4.4 lists the IDA financing by disbursement categories.

Table 4.4. IDA Financing by Disbursement Categories

Disbursement Category	Amount of IDA Financing Allocated (expressed in SDR)	Percentage of Expenditures to be Financed
(1) Works	201,100,0000	100% exclusive of taxes
(2) Goods (excluding motor vehicles) and non-consulting services	15,250,000	100% exclusive of taxes
(3) Consultant's services	15,500,000	100% exclusive of taxes
(4) Training	500,000	100% exclusive of taxes
(5) Taxes	2,100,000	100%
(6) Unallocated for contingency	19,550,000	100%

TOTAL AMOUNT	**254,000,000**	

Environmental and Social (including safeguards)

34. For the purpose of managing the necessary Environmental and Social safeguards compliance issues associated with Project activities, the PIU shall have an Environmental and Social Cell headed by a Deputy Director, an Environment Specialist and a Social Specialist, and individual consultants employed under the Project for environmental, social and communications support. The Environmental and Social Cell shall be fully responsible to coordinate with Project activities and ensure the compliance of inclusion, safeguards and communications requirements in planning and implementation of Project interventions following the legal and policy framework of the GoB and the Bank. The Environmental and Social Cell shall also coordinate the launching of the grievance management system for the project, and will also oversee implementation of value-added sustainability activities under Component 3 of the Project which go beyond risk management. In addition, to ensure the long term sustainability of project investments and to mainstream climate resilience and climate sensitivity across the organization, the Project will support the establishment and initial capacity building of a permanent Environmental, Social, and Climate Change Unit (ESCCU) within BIWTA's permanent organigram. The Environmental and Social Cell within the PIU will provide training to the permanent unit, and will integrate permanent unit staff once appointed into the ongoing management of the Project. In particular, preparatory studies for a potential follow on investment project, as well as diagnostic, modeling and planning studies on climate change in the IWT sector, will be closely overseen by the new permanent Unit, with in coordination with the PIU's Environmental and Social Cell.

Monitoring & Evaluation

19. The Project Director and Project Manager will be responsible for overall project monitoring and evaluation (M&E) including data for monitoring achievement of Project results. The Project Implementation Committee will review and discuss the M&E reports on a monthly basis. In addition, the Project Steering Committee will monitor project performance and make decisions on high-value contracts above defined thresholds and make key policy decisions. The high-value performance-based contract for navigability maintenance will require independent monitoring in addition to the capacity within BIWTA. A separate contract for a Monitoring/Supervision Consultant for the PBC has been planned, and this Consultant will also train staff within BIWTA, in the Dredging, Hydrography and Conservancy and Pilotage departments, to continually monitor and evaluate the performance of the PBC contractor and other navigation improvement contracts.

20. Obtaining reliable historic data has been a challenge for the sector. In response, the Project is financing multiple River Information Systems including for data development and maintenance, especially for the Hydrographic Department, as well as systems for tracking cargo and passenger traffic, revenues, accidents, passenger and user complaints, contractor performance, and fiduciary systems for improvement of financial management and procurement.

Role of Partners

21. The U.K. Department for International Development (DFID) has financed many of the analytic and preparatory studies and technical assistance that informed the preparation of the proposed Project and proposed follow on projects.

Procurement

22. A Procurement/ Contract Management Cell headed by the Deputy Project Director and supported by one Superintending Engineers (SE), two Executive Engineers, and two Assistant Engineers (AEs). The Cell will coordinate and be responsible for planning and managing the entire procurement process and oversee the contract management issues of Project works. To enhance the capacity of the Cell, procurement experts/ consultants will be hired for the Project. Staff of this Cell and persons involved in procurement evaluation and approval will be provided necessary training and capacity development on procurement and contract management issues.

23. **Procurement significance.** Out of the total project cost of US$400.0 million, IDA contribution is expected to be US$360.0 million. Out of this, nearly all funds will be utilized through procurement processes. Procurement under this project will largely involve works (including a large performance-based contract), goods, consulting services and some non-consulting services. Most contracts have estimated costs in excess of US$1 million owing mainly to works and services with large scopes, and procurement of technologically advanced high priced equipment.

24. The Project involves one performance-based contract for dredging, and installation and maintenance of navigational aids and six storm shelters according to international standards—spanning 6 to 7 years and a consultancy for supervision and performance monitoring of the works performed under the PBC. These two contracts together represent about 56 percent of the total project cost and therefore entail special provisions for quality assurance and risk mitigation in contract award and contract management.

18. **Procurement responsibility.** The Project Implementation Unit (PIU) at BIWTA will carry out the processes related to all procurement. The Ministry of Shipping (MoS) will carry out oversight functions as provided for in the respective laws and regulations of the country and in the Financing Agreement (FA) of the Project.

25. **Procurement capacity.** BIWTA has experience and capacity in processing donor-funded and Government-funded projects, but does not have recent experience of implementing Bank-financed projects or any experience of processing performance-based contracts. Since the single PBC of this project represents about 63 percent of the total value of procurement under the Project, the procurement capacity of BIWTA will require to be supplemented substantially through practical and adequate measures.

26. Individual departments within BIWTA like Dredging, Marine and Mechanical Engineering, Civil Engineering, Conservancy and Pilotage, Hydrography, Deck and Engine Personnel Training Center, and so on have their own setup for monitoring and evaluation of contract performance. A fair number of BIWTA's personnel have received formal procurement-related training. The existing procurement capacity of BIWTA should be adequate to process the other contracts in its procurement plan.

27. **Procurement risks.** Bangladesh operates in a challenging procurement environment. Procurement risks arise out of many factors like weak capacity, unfavorable market, and weak governance. The last one manifests itself in the form of fraud, corruption, collusion and coercion. BIWTA deals with a limited number of specialized suppliers, which has kept its procurement environment free from fraud, corruption, and collusion. There have been some attempts at coercion,

mainly from politically connected entities trying to influence contract award decisions that is symptomatic of the governance context of the country, but BIWTA effectively resisted those. The works contracts involving civil construction could experience some governance issues as bidders for those types of contracts are known to have a tendency for collusion and coercion. The PBC on the other hand is large and specialized to the extent that the critical mass required for collusion does not exist within the country. In the backdrop of the of the unsupportive country governance context, and weak procurement capacity in relation to PBC and somewhat weak contract management capacity in the implementing agency, overall procurement risk is rated as High.

28. **Managing procurement risks.** The following measures have been agreed upon with BIWTA (and MOS) to minimize the risks associated with procurement. Parts of these measures are already in place, while the remaining will be implemented during project supervision.

(a) **General measures**

(i) **Procurement cell in the agency.** BIWTA shall establish a Procurement Cell composed of at least a procurement focal person for the Project and a local procurement expert having sufficient experience in Public Procurement Act 2006 (PPA-2006), Public Procurement Rules 2008 (PPR-2008), and Bank's guidelines on procurement. The focal person will help the PIU in day-to-day procurement follow-up and preparation of periodic procurement reporting. The procurement cell will serve for the entire duration of the Project.

(ii) **Bid/Proposal Evaluation Committee.** BIWTA shall ensure that its bid / proposal evaluation committees are formed of at least three members representing procurement, finance, and technical specialties. Its final composition will be agreed with the Bank which is a requirement for any future alteration thereto.

(iii) **Introducing STEP system.** Systematic Tracking of Procurement Exchanges system (STEP) will be introduced to prepare and manage procurement plan and procurement transactions under the Project.

(iv) **Project procurement strategy.** BIWTA will develop procurement strategy in agreement with the Bank and in line with the Bank's New Procurement Framework, considering the volume of items to be procured, prevailing market conditions, activity level risks, and so on. Emphasis will be given to designing the procurement packages in a manner that will reduce their number and increase their size without compromising competitiveness—thus ensuring adequate due diligence and control by the implementing agency and the Bank.

(v) **e-Procurement for NCB contracts.** BIWTA has set up the necessary infrastructure to utilize the e-Government Procurement (e-GP) system of the country. BIWTA can expect to be connected to the e-GP system by the time project implementation would begin. The e-GP is currently designed only for NCBs. All NCB contracts of the Project will be processed through e-GP to achieve a high level of efficiency, transparency, effectiveness, and governance in procurement.

(vi) **Due-diligence measures.** Procurement and implementation arrangements will include: (a) all bid evaluation reports will include verification of recommended bidders' post-qualification information; (b) BIWTA will make bidders aware about issues and regulations relating to fraud and corruption; (c) preserve records and all documents regarding procurement (including correspondences with the potential bidders as well as complaints / clarification requests, and so on), in accordance with Bank guidelines and PPA / PPR, to facilitate smooth procurement audit and post-review; and, (e) publish contract award information on CPTU and BIWTA websites—and in UNDB online for ICBs or international consultancies—within two weeks of contract award.

(b) **Special measures for critical contracts**

(i) **Independent Procurement Panel.** Recognizing the inherent risks associated with the procurement of large and complex contract packages, a panel of experts will be employed by the Bank to provide oversight and assurance of the procurement of high-risk and complex contracts. Their services will be intermittent, as and when necessary, and staggered over the initial period of two years of the Project within which it is expected that major contracts' procurement will be completed. It will comprise three members: one international dredging expert; one international procurement expert; and one local procurement expert. It is to be noted that the IPP's role will be advisory in nature and BIWTAA will make the final decision. The detailed terms of reference of the IPP is attached as appendix to this annex.

(c) **Special measures for International Competitive Bid (ICB) contracts**

(i) **Extra due diligence for the local agents.** BIWTA will carry out extra due diligence on the local agents of bidders. Bidding documents of the Bank have explicit requirements for disclosure regarding local agents, if any. As part of bid evaluation, the implementing agency will carefully look at who the proposed local agents are and what their roles are with respect to the particular bidding.

(d) **Special measures for National Competitive Bid (NCB) contracts:**

(i) **Bid Evaluation Committee.** BEC for NCB contracts will be formed in accordance with PPR-2008. As stated before, formation of all evaluation committees shall be subject to Bank's acceptance;

(ii) **Electronic government procurement (e-GP).** All NCB contracts under this project shall be processed using the e-GP system of the country;

(e) **Other measures:**

(i) **Advanced procurement actions.** The performance-based dredging contract (BRWTP-W1), the consultancy for supervision and monitoring of the PBC (BRWTP-S1), consultancy for environmental and social assessment, feasibility study, detailed survey, design, and supervision of new construction / upgradation of passenger terminals / cargo terminals / launch ghats / vessel storm shelters (BRWTP-S3, BRWTP-S4, BRWTP-S5), National Procurement Specialist (BRWTP-S28), and Financial Management Specialist

(BRWTP-S29) will be subject to advance actions so that the contracts can be awarded immediately after credit effectiveness.

29. **Procurement guidelines.** Procurement financed under the Project shall be carried out in accordance with the World Bank's Guidelines: Procurement of Goods, Works and Non-consulting services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers published in July 2014 (procurement guidelines) in the case of goods, works, and non-consulting services; and Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers, July 2014 version (Consultant Guidelines) in the case of consulting services. These provisions shall be stipulated in the Financing Agreement.

30. **Procurement plan.** For each contract to be financed under the Project, estimated costs, procurement methods, consultant selection methods, prior review requirements, whether bidders are to be pre-or post-qualified, and time frame would be agreed between the implementing agency and the Bank in the procurement plan. All expected major procurements will be announced in the General Procurement Notice (GPN)—published in the Bank's external website and in United Nations Development Business (UNDB). The procurement plan will be updated semi-annually (or as required) using the online STEP system of the Bank.

31. **Particular methods of procurement of Goods, works and non-consulting services.** Except as otherwise agreed in the procurement plan, goods and works will be procured through International Competitive Bidding. Contracts of goods and works having estimated costs within the respective ceilings stipulated in the procurement plan may be processed through National Competitive Bidding (NCB), Framework Agreement, and Shopping (Request for Quotations) methods. Direct Contracting is permissible under special circumstances with prior concurrence of the Bank. NCBs will follow Open Tendering Method (OTM) described in PPA-2006 (1st amendment 2009) and PPR-2008 (as amended in August 2009)—governed by the Bank's procurement guidelines and using model tender documents (MTD) agreed with the Bank. Shopping will be carried out based on a model document acceptable to the Bank. For NCB the following shall apply:

- Post-bidding negotiations shall not be allowed with the lowest evaluated or any other bidder.
- Bids shall be submitted and opened in public in one location immediately after the deadline for submission.
- Lottery in award of contracts shall not be allowed.
- Bidders' qualification / experience requirement shall be mandatory.
- Bids shall not be invited on the basis of percentage above or below the estimated cost and contract award shall be based on the lowest evaluated bid price of compliant bid from eligible and qualified bidder.
- Single-stage two-envelope procurement system shall not be allowed.

32. **Methods of procurement of consulting services.** Selection of Consultants will follow the Bank's consultant guidelines and use the Bank's standard documents under all selection methods. The following methods will apply for selection of consultants: Quality and Cost based Selection (QCBS), Quality-based selection (QBS), Fixed Budget Selection (FBS), Selection Based on

Consultants' Qualification (CQS), Least Cost Selection (LCS), and Single Source Selection (SSS). SSS is permissible under special circumstances with prior concurrence of the Bank. Shortlist of consultants for services estimated to cost less than US$500,000 equivalent per contract may be composed entirely of national consultants. The procurement plan will specify the circumstances and thresholds under which specific methods will apply, as well as the Bank's review and implementation support requirements.

33. **Use of standard procurement documents.** For procurement through ICB and for selection of consultants, the Bank's Standard Bidding Documents (SBD) and Standard Request for Proposals (SRFP) will be used, including the form of contract attached with SBDs and SRFPs. For all NCB, Shopping, and Framework Agreements the implementing agencies will use MTDs agreed with the Bank.

34. **Incremental operating costs.** 'Incremental Operating Costs' means the reasonable costs required for the day-to-day coordination, administration and supervision of Project activities to be financed by the Recipient, including leasing and/or routine repair and maintenance of vehicles, equipment, facilities and office premises, fuel, office supplies, utilities, consumables, communication expenses, translation, printing, photocopying and postal expenses, bank charges, advertising expenses, insurance, Project-related meeting expenses, Project-related travel, per diem, allowances and honorarium of officials of the Recipient's civil service and/or other sitting allowances and honorarium of any other nature.

35. **Training.** 'Training' means the reasonable costs required for the participation of personnel involved in training activities, workshops and study tours under the Project which have been approved by the Association in writing on annual basis, including: (a) travel, hotel, and subsistence costs for training, workshop and study tour participants provided that such allowances are paid directly to the eligible recipient using the banking system; and (b) costs associated with rental of training and workshop facilities, preparation and reproduction of training and workshop materials, costs of academic degree studies, costs directly related to training course, workshop or study tour preparation and implementation; but excluding salaries of civil servants and sitting and workshop allowances, cash per diem, fuel, and honorarium of any other nature.

36. **Prior review thresholds.** The Procurement Plan shall set forth those contracts which shall be subject to the Bank's prior-review. All other contracts will be subject to post-review by the Bank. Based on BP 11.00, Annex C – Maximum Prior Review Thresholds for High Risk Implementing Agency, the initial procurement plan agreed with the agency indicate the following prior review thresholds (table 4.5_. These will be updated annually based on the review of the capacity and performance of the procuring entity and will be reflected in the updated procurement plan as appropriate:

Table 4.5. Prior Review Thresholds

Expenditure Category	Contract Value (Threshold)	Procurement Method	Contracts Subject to Prior Review
Goods	>=US$2,000,000	ICB	All contracts valued US$500,000 or more.
	<US$2,000,000	NCB	All contracts valued US$500,000 or more.

	<US$2,000,000	Framework Agreement	All agreements.
	<=US$6,000	DC	All contracts.
	<=US$6,000	RFQ / National Shopping	Post review.
Works / Turnkey and Supply Installation of Plant and Equipment	>= US$10,000,000	ICB	All contracts valued US$5,000,000 or more.
	<US$10,000,000	NCB	All contracts valued US$5,000,000 or more.
	<=US$12,500	DC	All contracts.
	<=US$12,500	RFQ / National Shopping	Post review.
IT Systems and Non-Consultant Services	>= US$2,000,000	ICB	All contracts.
	< US$2,000,000	NCB	All contracts valued US$500,000 or more.
	<=US$6,000	RFQ / National Shopping	Post review.
Consulting Services	>=US$500,000	QCBS / QBS	All contracts valued US$200,000 or more.
	<US$500,000	FBS	All contracts valued US$200,000 or more.
	< US$300,000	LCS	All contracts valued US$200,000 or more.
	< US$300,000	CQS	All contracts valued US$200,000 or more.
		IC	All contracts valued US$100,000 or more. All contracts of procurement consultants.
		SSS	All Contracts.

Note: In case of a contract package containing multiple lots, sub-packages, or slices the sum of estimated costs of all lots / sub-packages / slices in that contract package will determine the procurement method and whether it will be prior- or post-reviewed, in accordance with the thresholds given above.

37. **Post review/integrated fiduciary review.** For compliance with the Bank's procurement procedures, the Bank will carry out sample post-review of contracts that are below the respective prior-review thresholds. Such review (ex-post and procurement audit) of contracts below the threshold will comprise of a sample of about 15 (fifteen) percent of the post-review contracts in the Project. Procurement post-review will be done on annual basis depending on the number of post-review contracts.

Summary of procurement packages

38. Tables 4.6 through 4.9 provide summaries of the planned procurement packages under the Project. Prequalification is ongoing for the PBC contract, and procurement of the Supervision/Performance Monitoring Consultant has initiated. Both contracts are expected to be awarded by December, 2016.

Table 4.6. Summary of Procurements Packages - Goods

Contract Nr	Title/Description-Goods	Procurement Method
BRWTP-G1	New survey vessels	ICB
BRWTP-G2	Multi-beam echo-sounders (5 lots)	ICB
BRWTP-G3	LIDAR survey equipment	ICB
BRWTP-G4	Modern teaching aids, incl essential equipment such as computers, bridge and navigation simulators, modern workshops, equipment for life saving and other drills, a modern library, life boat station, fire-fighting facilities, radar stations, marine radio equipment, equipment for Sediment and WQ testing laboratory, etc..	ICB
BRWTP-G5	Computer and Related equipment for PIU	NCB
BRWTP-G6	Office equipment for PIU	NCB
BRWTP-G7	Telephone/ Telecommunication equipment for PIU	NCB
BRWTP-G8	Furniture	NCB
BRWTP-G9	Vehicles (2 Jeeps, 4 Micro bus , 4 pickups, 10 motor cycles), GoB financing	NCB
BRWTP-G10	Necessary software packages	NCB
BRWTP-G11	ENC hard and software package	NCB
BRWTP-G12	GIS software with necessary extension	NCB

Table 4.7. Summary of Procurements Packages - Works

Contract Nr	Title/Description-Works	Procurement Method
BRWTP-W1	PBC for year-round maintenance of inland waterways with Least Available Depth and Six vessel shelters-safe harbors for vessels in adverse weather conditions	ICB
BRWTP-W2	a) Development of a new common user general cargo terminal with access and necessary infrastructure on the Buriganga River adjacent to the existing Pangaon container terminal; and b) upgradation works in Ashuganj cargo terminal.	ICB
BRWTP-W3	Upgradation and modernization works in existing passenger terminals at a) Chandpur, b) Barisal, and c) Narayanganj	ICB
BRWTP-W4	Development of a new passenger terminal with access and necessary infrastructure works at Shashanghat	ICB
BRWTP-W5	Upgradation works of 14 Existing Landing Stations / Launch Ghats and a general terminal at Bhairab	ICB

Table 4.8. Summary of Procurements Packages – Non-Consulting Services

Contract Nr	Title/Description-Non-Consulting Services	Procurement Method
BRWTP-NC1	Electronic Nautical Charts (ENC) hard and software package	ICB
BRWTP-NC2	Development and implementation of traffic monitoring system for passengers and cargo	ICB

Table 4.9. Summary of Procurements Packages – Consulting Services

Contract Nr	Title/Description-Consulting Services	Procurement Method
BRWTP- S1	Supervision and Performance Monitoring consulting services for PBC dredging works and navigation aids	QCBS
BRWTP- S2	Feasibility study, detailed survey, design, and supervision of new construction / upgradation of Passenger Terminals at a) Shashanghat, b) Chandpur, c) Barisal, and d) Narayanganj	QCBS
BRWTP- S3	Feasibility study, detailed survey, design, and supervision of new construction / upgradation of Cargo Terminals at a) Pangaon and b) Ashuganj	QCBS

Contract Nr	Title/Description-Consulting Services	Procurement Method
BRWTP- S4	a) Feasibility study, detailed survey, design, and supervision for newly proposed and upgrading of existing 14 launch ghats and one terminal at Bhairab; and b) Feasibility study, detailed survey, and design of newly proposed 6 Vessel Storm Shelters along Dhaka -Chittagong inland water route.	QCBS
BRWTP- S5	Environmental & Social Assessment of newly proposed and upgrading of Passenger terminals at a) Shashanghat, b) Chandpur, c) Barisal, and d) Narayanganj. Cargo terminals at e) Pangaon & f) Ashuganj, & g) 14 Launch ghats	QCBS
BRWTP- S6	Collecting and Disseminating Hydrographic Data and Electronic Nautical Charts	QCBS
BRWTP- S7	Complete surveys for all remaining Bilateral Protocol and High Priority routes (from 53- route study)	QCBS
BRWTP- S8	Study for Aid-to-Navigation Monitoring System and automated ticketing and traffic monitoring system	QCBS
BRWTP- S9	Training needs assessment / study and action plan development for establishing / supporting training institutions for inland water transport sector	QCBS
BRWTP- S10	Assessment, design, Environmental Management Plan, and supervision for proposed new construction and rehabilitation for necessary facilities in the training center	QCBS
BRWTP- S11	Study, development of action plan, and capacity building of BIWTA to ensure effective and sustainable long-term maintenance of river terminals, landings and other BIWTA assets	QCBS
BRWTP- S12	Origin destination survey of inland waterways along Dhaka-Chittagong corridor, including understanding which supply chains to promote, and identifying their logistics needs / gaps on inland waterways for development;	QCBS
BRWTP- S13	Social NGO to support BIWTA on implementation of Social Management Plans / RAPs for specific investments	CQS
BRWTP- S14	Third party M&E consultant for social safeguards (including midterm and ex-post evaluations of RAP implementation)	QCBS
BRWTP- S15	Third party M&E consultant for environmental safeguards	QCBS
BRWTP- S16	Environmental NGO or firm to: (a) carry out additional baseline data collection on biodiversity at sensitive locations; and (b) develop and implement biodiversity mgt programs including habitat enhancement and protection for key species	QCBS
BRWTP-S17	User satisfaction survey at project (Baseline Survey (year 1)	CQS
BRWTP-S18	User satisfaction survey at project mid-term (year 4)	CQS
BRWTP-S19	User satisfaction survey at project end (year 7.5)	CQS
BRWTP-S20	Project Manager (Consultant)	IC
BRWTP-S21	Financial Management and Planning Specialist (Consultant)	IC
BRWTP-S22	Procurement Specialist (Consultant)	IC
BRWTP-S23	Environmental Expert	IC
BRWTP-S24	Social Expert	IC
BRWTP-S25	Communication and GRM officer	IC
BRWTP-S26	Dredging Expert (International Consultant)	IC
BRWTP-S27	River Ports Specialist	IC
BRWTP-S28	Bathymetric Hydrographic Survey Expert (International)	IC
BRWTP-S29	International Procurement Consultant (International Consultant)	IC
BRWTP-S30	Internal audit services	QCBS

Appendix to Annex 4

Terms of Reference for an Independent Procurement Panel

Assignment title	Independent Procurement Panel of three members
Composition of IPP	Three Individual Consultants
Assignment duration	120–150 days per Individual Consultant as needed Starting March 24, 2016 for approximately 15 months Further need possible and to be determined after 15 months
Assignment location	Dhaka, Bangladesh and Home Office
Funding source(s)	Trust funds managed by the World Bank
Contracting entity	World Bank

Background

1. BIWTA does not have recent experience in implementing Bank-funded projects and does not have experience of processing large value PBCs. Consequently it is necessary to build an adequate support structure from resources external to BIWTA to process the PBC for dredging and navigational aid under Component 1, and to ensure desired performance through effective management of that contract—which represents a significant portion of the total project cost and has a planned tenure of six to seven years.

2. The Bank and GoB have agreed to a number of institutional arrangements to implement the above support structure. On the one hand, consultancy services will be procured over a seven-year period, from a competent firm of international repute, to monitor and supervise the performance of the dredging and associated works. The Quality and Cost Based Selection method (QCBS), as defined in the Bank's consultant guidelines, will be used to select the firm. On the other hand, a three-member Independent Procurement Panel will be constituted to conduct a parallel process of evaluation for the selection of both the PBC contractor and of the Monitoring and Supervision Consultant, as well as selected large-value contracts.

The Panel

3. The IPP will be constituted of three Consultants as follows:

(a) International Expert—Dredging

(b) International Expert—Procurement

(c) National Senior Specialist—Procurement

4. Selection of the Consultants will follow the method of recruiting Individual Consultants described in the Consultant Guidelines of the Bank. The Bank will be the employer and will bear the cost of the IPP.

5. The terms of contract and the activities of the IPP will be guided by, and in conformity with, the relevant guidelines of the Bank for the procurement of goods, works, and services. These guidelines comprise of, but are not limited to:

(a) *Guidelines, Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*, July 2014.

(b) *Guidelines, Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*, July 2014.

(c) *Standard Bid Evaluation Form, Procurement of Goods or Works*, April 1996

(d) *Sample Form of Evaluation Report, Selection of Consultants*, October 1999.

6. The IPP will also refer to the provisions of the *Public Procurement Act 2006* and the *Public Procurement Rules 2008*—which together constitute the body of statutes governing public procurement in Bangladesh—where such referral has received explicit prior agreement of the Bank.

Activities

7. Responsibilities of the IPP include the following main activities:

(a) Review and finalize the bidding documents for the PBC for dredging and navigational aids.

(b) Evaluate in parallel, received PQ applications and bids and compare with evaluations and recommended award of contract by BIWTA.

(c) Review minutes of negotiations with awardee(s) of the PBC.

(d) Review complete draft negotiated contract resulting from the above.

(e) Review the Request for Proposals (RFP) document for the PBC supervision and monitoring consultancy, and other selected consultancies, as well as procurement documents for selected goods contracts.

(f) Review the technical and financial proposals received from short-listed consultants/firms.

(g) Evaluate the technical and financial proposals in parallel and recommended award of contract. The IPP will share the evaluation report with BIWTA and concurrently with the Bank.

(h) Review minutes of negotiations with the awardee(s) of the consultancy contract.

(i) Review the complete draft negotiated contract resulting from the above.

8. The IPP will advise BIWTA in connection with addressing complaints (if any) arising out of procurement activities of these two contracts, and other selected contracts. In addition, the IPP will communicate to BIWTA in a timely manner any information that may assist in the evaluation of PQ Applications, Proposals or Bids.

9. Complementing the activities of the IPP, responsibilities of BIWTA include the following:

(a) Invite, receive, open and evaluate Applications for Prequalification for the PBC.

(b) Immediately after receipt of applications, make available to the IPP copies of all PQ Applications for their concurrent review.

(c) Provide, or make available any clarifications or requests for information sought by the IPP.

(d) Conduct Pre-application Meetings with prospective bidders.

(e) Prepare and issue Prequalification documents.

(f) Invite prequalified bidders to submit bids for the PBC.

(g) Conduct Pre-bid Meetings with prequalified bidders.

(h) Prepare and issue Bidding documents.

(i) Receive and open bids.

(j) Make available to the IPP copies of all PQ Applications for their concurrent review.

(k) Provide, or make available any clarifications or requests for information sought by the IPP.

(l) Keep all financial proposals in a secure cabinet with double locks, one set to be kept by the PD, and the other set by the Head of the Procurement Entity (HOPE).

(m) Issue notification of award.

(n) Prepare the final Performance-Based Contract document and sign it.

(o) Issue Variation Orders as needed.

(p) Invite, receive, open and evaluate EOIs for the supervision and monitoring consultancy, and other selected consultancies.

(q) Prepare and issue the Request for Proposals (RFP), and selected goods packages.

(r) Conduct Pre-proposal meetings with prospective consultants.

(s) Invite short-listed consultants to submit proposals for the consultancy.

(t) Receive and open Proposals.

(u) Issue invitation for contract negotiation.

(v) Prepare the final Consultancy Contract document and sign it.

(w) Issue Amendments as needed.

10. BIWTA may at different times request the IPP or its members to provide advice on or inputs to these activities. The IPP and its members will provide such advice and inputs.

Scope

11. The IPP will act independently with regard to all evaluations carried out in respect of the PBC dredging and navigation aids contract, the Monitoring and Supervision contract, and selected other contracts. The IPP will compare their own evaluations with those carried out by BIWTA and where necessary, share the results of the evaluations in the form of specific recommendations.

12. It is possible that BIWTA may seek advice from the IPP or its members on critical, and hopefully rare, issues concerning other contracts of the Project. The IPP and its members will respond to those requests with the sole objective of improving the quality of decisions taken by BIWTA without in any way becoming a party to those decisions.

13. BIWTA will refrain from referring any contract or matter outside the BRWTP-1 to the IPP, and the IPP will desist from involving itself in matters that do not concern the Project.

Procedures

14. Key responsibilities of the IPP will include, but not be limited to, the following.

(a) General

(i) The International Expert —Procurement will be the Chair of the IPP and will carry out all necessary communications with the PD[15] of BRWTP-1.

(ii) All decisions of the IPP will be communicated in the form of a written document (generally report or memorandum) to BIWTA and concurrently to the Bank before those decisions may be adopted or implemented, and that document shall bear the signatures of all members of the IPP.

(b) Goods, Works and Non-consultancy Services

(i) The PD has prepared and issued the draft prequalification document (DPQD). He will prepare and issue the draft bidding documents (DBD), either by using BIWTA resources or by engaging consultants, and send those documents to the IPP for review. The IPP will suggest changes that it may find necessary. Once the IPP conveys to the PD its satisfaction with the updated DBD, the PD will forward the same to the Bank for no-objection.

(ii) The PD will publish the Invitation for Bids (IFB) after the IPP finalizes it.

(iii) All procurement-related communications will be with the PD and the IFB will specifically mention it. The PD will promptly send queries / requests / complaints received from bidders to the IPP Chair for review by the IPP.

(iv) In the event of an amendment of the bidding document being required, the IPP Chair will prepare the justifications thereof and send the same to the PD. The PD in turn will forward the proposed amendment to the Bank for no-objection; and issue the amendment to bidders after receiving the no-objection.

(v) The PD will receive the Bids.

(vi) The PD will arrange public opening of Bids in the presence of IPP members (that are able to attend), and thereafter share the records of bid opening with all bidders that attended, with the IPP and with the Bank.

(vii) The IPP will assist BIWTA in finalizing the bidding documents, responding to queries at pre-bid, issuing addendum/a, bid-opening process, and the evaluation

[15] **Note:** The prequalification of bidders for the PBC for dredging and navigational aid is ongoing as an advance procurement action and a senior official of BIWTA, who is the focal person of the Project, is discharging the functions of the PD until the IDA Credit is approved and the PD is appointed. The term 'PD' in this TOR therefore includes the said focal person wherever applicable.

process. The PD will hand over copies of received Bids to the IPP after their public opening.

(viii) The IPP members will themselves evaluate Bids without delegating any of the tasks involved to any other person under any circumstance.

(ix) All IPP members will work during the bid evaluation process preferably in Dhaka at a specified office location until the evaluation is complete. Most pre and post evaluation activities can be done at Consultants' office locations.

(x) IPP members shall not transport hard copies of Bids/ proposals outside the specified office location.

(xi) The PD will obtain clarifications from bidders, (if required, upon request from the IPP.

(xii) The PD will forward the evaluation report to the Bank for review and no-objection. The PD will furnish copies of Bids to the Bank if the latter specifically requests for the same.

(xiii) The PD will perform the actions needed toward issuing Notification of Award, and contract signing.

(xiv) The PD will forward the draft negotiated contract (DNC) to the Bank for review and no-objection.

(xv) The PD will sign the final Contract document after receiving no-objection to the DNC.

(xvi) The PD will obtain concurrence of the respective Approving Authority to the BER / DNC in accordance with the provisions of the country's procurement laws.

(xvii) The PD will promptly send copies of signed contracts to the Bank so that requests for funding the contracts (Withdrawal Requests) can be honored in time.

(c) Consultancy Services

(i) The PD will prepare and publish the Request for Expressions of Interest (REOI).

(ii) All procurement-related communications will be with the PD and the REOI will specifically mention it. The PD will promptly send queries / requests / complaints received from consultants to the Bank for information.

(iii) The PD will receive, open and evaluate the EOIs and prepare the shortlist.

(iv) The PD will forward the EOI evaluation report and shortlist to the Bank for review and no-objection. The PD will furnish copies of EOIs to the Bank if the latter specifically requests for the same.

(v) The PD will arrange to prepare the draft request for proposals (DRFP), either by using BIWTA resources or by engaging consultants, and send it to the IPP for review. The IPP will suggest changes that it may find necessary. Once the

procurement panel conveys to the PD its satisfaction with the updated DRFP, the PD will forward the same to the Bank for no-objection.

(vi) In the event of an amendment of the RFP being required, the IPP Chair will prepare the justifications thereof and send the same to the PD, who in turn will forward the proposed amendment to the Bank for no-objection. The PD will issue the amendment to consultants after receiving no-objection.

(vii) The PD will receive the Technical and Financial Proposals.

(viii) The PD will arrange public opening of Technical Proposals and thereafter share the records of Technical Proposal opening with all consultants that attended and with the Bank.

(ix) The Financial Proposals shall remain sealed, and will be handed over to the IPP along with the opened Technical Proposals.

(x) The IPP members will themselves evaluate the Technical Proposals and prepare the evaluation report without delegating any of the tasks involved to any other person under any circumstance.

(xi) All IPP members will work preferably at a specified office location in Dhaka during the evaluation process until evaluation is complete. The IPP will share the evaluation report with BIWTA and concurrently with the Bank.

(xii) The PD will obtain clarifications from consultants (if required), including at the request of the IPP.

(xiii) IPP members shall not transport hard copies of proposals outside the specified office location.

(xiv) The PD will forward the TPER to the Bank for review and no-objection. He will furnish copies of Proposals to the Bank if the latter specifically requests for the same.

(xv) The PD will arrange public opening (for procurement methods that call for such opening) of Financial Proposals and thereafter share the records of Financial Proposal opening with all consultants that attended, with the IPP and with the Bank.

(xvi) The PD will hand over copies of the opened Financial Proposals to the IPP, in the case of procurement using the Quality and Cost Based Selection (QCBS) method, for combined evaluation.

(xvii) On receipt of the Combined Evaluation Report from the IPP, and on the Government Evaluation Panel having completed its own evaluation, the PD will invite the top ranked Consultant for contract negotiation.

(xviii) In the case of procurement using the Quality Based Selection (QBS) method, there will not be any opening or evaluation of financial proposals. The PD will invite the highest scoring Consultant in technical evaluation for contract negotiation.

(xix) The PD as Government representative makes the Decision.

(xx) The PD will forward the draft negotiated contract (DNC) to the Bank for review and no-objection. A copy of the Combined Evaluation Report will accompany the DNC by way of reference.

(xxi) The PD will sign the final Contract document after receiving no-objection to the DNC.

(xxii) The PD will obtain concurrence of the respective Approving Authority to the Shortlist / TPER / DNC in accordance with the provisions of the country's procurement laws.

(xxiii) The PD will promptly send copies of signed contracts to the Bank so that requests for funding the contracts (Withdrawal Requests) can be honored in time.

Outputs and Deliverables

Table I. Summary of IPP Deliverables and Deadlines

Nr	Deliverable	Completion Deadline
1	Review of Bidding documents / Requests for Proposal (RFP)	Three weeks after IPP receives it
2	Evaluation of Bids / Proposals	Two weeks after IPP receives it
3	Negotiation of contract and preparation of Draft Negotiated Contract.	Four weeks after receiving no-objection from the Bank
4	Review of Variation Proposals	One week after IPP receives it

Required Qualifications

Table II. Requirements Qualifications of IPP Members

Designation	Position in Panel	Qualification	Expertise
International Procurement Expert	Chair	• Post-graduate degree in Law / Finance / Procurement / Economics / Engineering / Statistics / Business Administration / Management. • Membership in professional body of international repute in Procurement / Purchasing / Supply Chain preferred.	• At least 20 years general experience in public / private procurement. • At least 5 years' experience outside home country as procurement professional preferred • Civil engineering qualifications preferred. • Experience in performance based contracts is preferred. • Experience related to Transport sector or river dredging and aid-to-navigation preferred. • Experience of working in the South Asia region is desired.
National Senior Procurement Specialist	Member	• Post-graduate degree in Law / Finance / Procurement / Economics / Engineering / Statistics / Business Administration / Management. • Membership in professional body of international repute in Procurement / Purchasing / Supply Chain preferred.	• At least 15 years general experience in public / private procurement. • At least 5 years specific experience in procurement in the Transport sector. • Civil engineering qualifications preferred. • Experience in performance based contracts is preferred. • Experience with IWT/rivers/waterways is preferred. • Experience of working in donor-funded projects is preferred.

Designation	Position in Panel	Qualification	Expertise
International Dredging Expert	Member	• Degrees or certifications in Engineering, Hydrography, Dredging Technology preferred. • Membership in a professional body of international repute for dredging, hydrography or inland water navigation preferred.	• At least 15 years of experience in inland waterway/fairway dredging. • At least 5 years of experience outside home country preferred • Experience with PBCs for dredging/IWT preferred. • Experience in South Asia is preferred

Reporting Requirements

15. The IPP will prepare evaluation reports using the Bank's standard formats and guidelines. It will submit all reviewed documents and other deliverables to the PD within the respective stipulated times.

Tenure/Duration

16. The IPP members will be recruited for 150 days each—to be on call as and when needed. The National Procurement Specialist may be recruited for a longer tenure as needed to perform other procurement-related tasks of the Project.

Selection Method

17. Selection of all three IPP members will follow the procedures for recruiting Individual Consultants described in the Bank's Consultant Guidelines.

Annex 5: Governance and Accountability Action Plan

BANGLADESH: Bangladesh Regional Waterway Transport Project 1

Introduction

1. Improving governance and fighting corruption are part of the government's development agenda set forth in the SFYP and the Bank's mission of promoting sustainable growth and reducing poverty. The Governance and Accountability Action Plan (GAAP) for the Project contributes to these efforts by outlining a framework for actions, institutional arrangements, and additional specific measures to minimize governance and corruption risks in the Project. This GAAP has been designed to reflect the specific responsibilities of the BIWTA (the implementing agency) and the Bank to facilitate effective and appropriate use of the funds for the Project, preclude the incidence of corruption, and enhance good governance.

2. This plan is based on an assessment of the governance risks, particularly fraud and corruption, the context for addressing governance and anticorruption issues in Bangladesh, and specifically for the entities involved in the Project. The GAAP will be adjusted as necessary during implementation to reflect governance issues which may emerge and/or to strengthen or add actions. It will be monitored regularly through indicators and reflected in monthly progress reports by the implementing agency as well as in the Bank's implementation supervision reports and aide memoires for supervision missions.

Country Context and Background

3. Bangladesh is a high-risk environment for governance. The implementation of Bangladesh's Right to Information Act 2009 has been slow, partly because of poor records, lack of public awareness, and inadequate capacity. Despite some attempts to enhance accountability in the legal framework for corporate governance and public sector regulation, poor performance and taking advantage of office are common in the public sector, including in state-owned enterprises. The Bank's Country Assistance Strategy (FY11–14) for Bangladesh has also defined weak governance as a constraint to inclusive growth and committed the Bank to embedding more systematic approaches to governance challenges across the portfolio.

Governance and Corruption Risks

4. The overall risk rating for the proposed Project is rated high, stemming from risks related to design, institutional, stakeholder and environmental risks. The high risks related to technical design mainly arise from limited experience with performance-based contracting for navigation fairway improvement and maintenance. Although the Bank has more extensive experience with performance-based contracting for road development, the limited experience with inland water transport has also meant limited exposure to newer methods of contracting for the sector. To mitigate this risk, the Bank is studying experiences from other countries that have used performance-based contracting and employing international experts with the requisite experience.

5. **Institutional risks.** Bangladesh Inland Water Transport Authority is the implementation agency for the Project and is responsible for overall implementation, management and monitoring of the Project. It is an autonomous body established under the Ministry of Shipping that came into existence after independence as the successor to the East Pakistan Inland Water Transport Authority. The authority was set up for development, maintenance and operations of inland water

transport and waterways in Bangladesh. However, BIWTA does not have recent experience in implementing donor-funded programs and managing large value performance-based contracts. Stronger accountability for performance and internal controls to counter fraud and corruption are needed. Systems for provision of information to the public and handling complaints or feedback from third parties on performance are required.

6. **Governance risks.** The key governance risks involved in the Project relate to:

- Weak capacity and complex implementation arrangements may adversely affect project implementation.
- The Project's processes may not detect and address problems related to transparency and accountability and may not comply with Bangladesh 's Right to Information Act;
- Weak or ineffective complaint and grievance handling mechanism may affect transparency and contribute for corrupt and manipulative practices.

7. **Procurement risk.** Risks related to implementation of procurement and contract administration procedures, specifically collusion and cartelling among contractors and intimidation of contractors during the bidding and execution of works, need to be managed carefully. The Project involves procurement of large and complex contract packages that will have to be monitor closely. Also the carrying out of the physical works under this project is going to be very complex given the prevailing institutional capacity, procurement and financial management risks and it will require a solid supervision budget, team and transparency measures.

Actions to Mitigate Governance and Corruption Risks

8. **Implementation risks.** Overall, the Project has robust citizen engagement strategy with focus on strengthening accountability within the Project which includes: (a) Consultations as the primary tool to promote stakeholder participation in the process of project design and implementation; (b) Development of Grievance Redressal Mechanism to respond to the needs of beneficiaries and to address and resolve their grievances and serve as a conduit for soliciting inquiries, inviting suggestions, and increasing community participation. The GRM will cover social, environmental, financial and procurement issues. The collected information will be used to improve operational performance, enhance the Project's legitimacy among stakeholders; to promote transparency and accountability, deter fraud and corruption and mitigate project risks; (c) Outreach and information campaign which will include development of project website and project side boards; and (d) User Satisfaction Surveys to obtain feedback on citizens' perceptions of the adequacy and efficiency of services provided through improved cargo and passenger terminals; to monitor citizens' access to services and the facilities, to guide BIWTA's priorities in policy planning and service delivery; and to assess beneficiaries satisfaction with the quality and adequacy of services and further needs. The surveys will be administered three times during the life of the Project: (a) in year one to establish baseline, (b) year 4 to feed in to the Mid Term Review, (c) last year of the Project to generate endline and the results will be captured by Citizen Engagement indicator: Percentage of Beneficiaries satisfied with infrastructure implemented by the Project (disaggregated by gender), as measured by user satisfaction surveys.

9. More specifically, the Project dedicated grievance redresssal mechanism will be closely linked to the Information Disclosure System, to allow for feedback and complaints to reach senior

project officials-via dedicated phone number, fax number, and self-addressed stamped postcards, and the internet. The grievance redressal mechanism goes beyond information disclosure and includes allegations of mismanagement, corruption, and other problems that can emerge during implementation. The GRM will receive and act upon complaints from citizens or organizations in relation to any occurrences for which the Project is directly responsible and which are perceived by the aggrieved party to have involved corrupt, illegal, unjust, or unfair activities, omissions, or behavior. The GRM will be managed by the PIU at Bangladesh Inland Water Transport Authority and may receive submissions directly from stakeholders, through the Project website, and in written or verbal form (if a phone hotline is established). The GRM will directly focus on and seek to resolve those complaints (and requests for information or clarification) that pertain to outputs, activities and processes undertaken by the Project, that is, those which (a) are described in the Project Implementation Manual; (b) are funded through the Project (including counterpart funds); and (c) are carried out by staff or consultants of the organization, or by their partners and sub-contractors, directly or indirectly supporting the Project. It is envisaged that such cases would fall under (but are not limited to) the following categories: (a) request for information, comment or suggestion, for example, request for clarification as to the delay in reimbursing expenses of participants in a given training event; (b) violation of rights or non-performance of obligations, for example, complaint by consultant or firm whose contract is suspended as a result of presumed poor performance or non-delivery of agreed-upon outputs; (c) grievances or offenses involving a violation of law, for example, allegations of corruption; (d) grievances related to project resettlement measures; and, (e) complaints against project staff, members of project committees, consultants, and sub-contractors involved in project implementation.

10. Governance and anticorruption concerns will be addressed through a combination of project design and special measures mentioned above to reflect basic principles: (a) ensure maximum transparency and provision of information about every step or action undertaken, including the individuals or entities involved; (b) transparency and beneficiary outreach., and warning signs to trigger additional review through Bank supervision and/or investigation and (c) improved procurement system. The Governance and Accountability Action Plan in table 5.1 lists specific actions and timeline.

11. **Procurement risks.** These risks will be addressed through the overall design of the Project and through enhanced transparency measures. To avoid undue influence on procurement, a detailed mapping will be established for each step in the procurement process with designation of a finite list of persons who have access to specified documents and associated information. This will be shared with the Bank and monitored/verified through Bank supervision. The mapping will be reviewed by the Bank to ensure appropriate access to sensitive documents on a need-to-know basis and maximum publication of other documents. The Bank team will monitor and compare the Procurement Plan with the procurement schedule of the Project Appraisal Document (PAD) to identify any inconsistencies, such as the use of less competitive methods than those listed in the PAD and will compare the procurement action with the Procurement Plan to determine whether the method used was in line with the approved plan. The team will look for unusual bidding patterns.

12. An Independent Procurement Panel will be set up. Recognizing the inherent risks associated with the procurement of large and complex contract packages, a panel of experts will be employed by the Bank to assist BIWTA. Their services will be intermittent, as and when

necessary, and staggered over the initial period of two years of the Project within which it is expected that major contracts' procurement will be completed. Since BIWTA lacks the necessary experience and skills, the IPP will: (a) assist BIWTA as an Evaluation Committee for the procurement of the PBC, the survey vessels, LIDAR survey, other large value contracts, and the related supervision and monitoring contract, (b) build the capacity and transfer skills to BIWTA Evaluation Committee through focused and on the job training, and (c) assist in the preparation of bidding documents and the procurement of ICB packages for works, goods, non-consultancy services and consultancy services. It will comprise three members (a) one international dredging expert, (b) one international procurement expert, and (c) one local procurement expert. It is to be noted that the nature of IPP role will be advisory and BIWTA's will have to take the final decision.

13. Transparency of the procurement process will be enhanced through multiple measures. The designated communications officer will develop and implement a detailed plan for the disclosure of information by the Project. The disclosure plan should adhere to the country's Right to Information Act and the Bank's Access to Information policy. Disclosure will include all relevant documentation and plans related to the procurement process with the goal of providing access to information to the wider community beyond interested bidders and supporting design, management, and construction consultants. Part of this plan will include a website in Bengali and English dedicated to project, prominently identified on the BIWTA's website with a dedicated page for summaries of procurement actions, the procurement plan, and any updates and all documentation related to the procurements (outside of the proposals themselves). These documents will be placed on the website (including after a Bank no-objection, in cases where this is required). This documentation will include

- Prequalification documents for ICB contracts more than US$10 million;
- All invitations to bid;
- Information about short lists, including a narrative statement regarding the reasons for inclusion or exclusion of the bidders in the short list;
- Bidding documents and drawings;
- Clarification of bids;
- Bid opening minutes; and
- Information on contract award

14. An enhanced complaints receipt and response system will be established in the BIWTA to operate throughout the life of the Project, including during the procurement stage and will be linked to the projects Grievance Redressal Mechanism, Monitoring and Bank Supervision. The four-stage complaints and appeals process in public procurement under the procurement law of Bangladesh will be followed. The four-stage procurement grievance mechanism is part of the procurement law of Bangladesh. This law is generally acknowledged as conforming to global standards. The detailed steps and procedures are included later in this annex. The four-stage complaints and appeals process will be included in the protocol of the Project's overall Grievance Redressal Procedure.

15. The GAAP will be monitored regularly and reflected in progress reports by the implementing agencies as well as in the Bank's implementation supervision reports and aide memoires for supervision missions. Any 'early warning' indicators of governance and accountability risks will be monitored regularly so that corrective measures can be carried out promptly.

16. The Project will require intensive, random, and unannounced supervision by Bank staff. Supervision arrangements for this project are extensive. Bank supervision missions will be more frequent at the start of the Project and will involve qualified staff in all disciplines, including procurement and FM, as well as social and resettlement specialists, and engineers. The Bank will also conduct regular monitoring between supervision missions.

17. The GAAP will be adjusted as necessary during implementation to reflect governance issues which may emerge and/or to add actions. Table 5.1 lists the actions to be implemented under the GAAP.

Table 5.1. Matrix of Action

Issues/Risks/ Objective	Actions	Agency Responsible	Timeline	Verification Means
Procurement Risks				
Integrity and transparency in procurement process	• Project will develop Procurement Strategy • Establish procurement and contract management cell with procurement and contract management specialists. Train the involved persons and evaluation committee members on public procurement principles and specific Bank procurement guidelines. • Appointment of an Independent Procurement Panel • Introducing Systematic Tracking of Procurement Exchanges (STEP) system. • Enhanced complaints mechanism with four stage process and reporting will be established and include follow-up guidelines and linked to the GRM.	BIWTA	First year of effectiveness of the Project	-Project reports -Bid evaluation reports -Record keeping all documents regarding procurement (including correspondences with the potential bidders as well as complaints/ clarification requests, and so on), -Published contract award information on CPTU and BIWTA's website within two weeks of contract award (and in UNDB online for ICBs and international consultancies). Nature and frequency of complaints

Financial Management Risks				
Financial management risks	• Recruit Financial Management Specialist • Finalize Accounting Manual • Open two separate Bank accounts for receipt of IDA and GoB funds • Procure an off the shelf accounting system and configure chart of accounts to meet Project accounting and reporting requirements • Constitute Audit Committee • Appoint Internal Auditor • Agree on Statement of Audit Needs on External Audit with C&AG	BIWTA	Within 1 month of project effectiveness Within 2 months of project effectiveness First year of effectiveness of the project	Confirmation received from project and verification done during implementation support mission. Confirmation received from project and verification done during implementation support mission. Confirmation received from project and verification done during implementation support mission.
Accountability				
Establishment of grievance handling mechanism	• Development of Grievance Redressal Mechanism protocol and policy • Monitoring of grievance redressal system	BIWTA / PIU	Within six months of effectiveness Ongoing	Project report Project report
Satisfaction surveys	• Administer satisfaction surveys to receive feedback from the Project beneficiaries	BIWTA / PIU	Three satisfaction surveys: year 1, midterm, last year	Satisfaction survey reports
Transparency and outreach				
Proactive provision of information and enhanced transparency	• Appointment of communications specialist as part of the PIU. • Creation of a project website to provide regular information on project performance as well as procurement information. • Adopt and implement a communications strategy. • Design and install project information boards at each construction site	BIWTA	Ongoing Website set up by end of Year 1 and regularly updated. Within first year of effectiveness Within first year of effectiveness	Project report Project report Project report and field visit reports
Consultations	• Extensive beneficiary and client consultations • Promotion of stakeholder participation in the process of project design and implementation		Ongoing	ESIA report Project report

Four-Stage Process: Grievance Mechanism (complaints and appeals) in public procurement under the procurement law of Bangladesh

A. Right to Complain

18. Bidders and consultants have a right to lodge a formal complaint against a procuring entity (PE) under the following circumstances.

(a) In the case of pre-qualification

(i) Pre-qualification documents were not ready when the advertisement was published by the PE or were not available when requested by a potential applicant.

(ii) The PE failed to respond promptly to a request for clarification from a potential applicant.

(iii) The evaluation committee failed to evaluate the qualifications in accordance with criteria stated in the pre-qualification document.

(iv) The applicant or potential applicant perceived unfair denial of pre-qualification.

(v) The applicant or potential applicant apprehended possible corrupt or collusive practices.

(b) In the case of open or limited competitive bidding

(i) Advertisement procedures deviated from those prescribed in the rules.

(ii) Bidding documents not ready when the advertisement was published by the PE or were not available when requested by a potential bidder.

(iii) The PE failed to respond promptly to a request for clarification from a potential bidder.

(iv) Technical specification was framed in such a way that only a single manufacturer of a very small number of manufacturers can comply.

(v) Pre-bid meeting was announced in the published advertisement but was not held; or changes in previously announced date, location, or time were not notified in time to potential bidders—which caused one or more of them to fail to attend the meeting.

(vi) The PE failed to open bids / quotations in the manner stated in the advertisement or the conducted the opening in an improper manner.

(vii) Received bids / quotations were mishandled so that one or more bids / quotations were opened before the specified time—causing either a loss of confidentiality or an actual failure to open a bid / quotation publicly.

(viii) The PE failed to open all bids / quotations which were received before the deadline for submission.

(ix) The evaluation committee failed to evaluate bids / quotations in accordance with criteria stated in the bidding documents.

(x) The PE attempted to ‘negotiate’ with the successful bidder.

(xi) The bidder or potential bidder apprehended possible corrupt or collusive practices.

(xii) The bidder perceived unfair or erroneous award of contract.

(xiii) There was a breach of confidentiality during evaluation.

(c) In the case of procuring consultancy services

(i) The PE failed to maintain confidentiality of opened technical proposals before completion of evaluation.

(ii) Financial proposals were opened at the same time as technical proposals were opened.

(iii) The evaluation committee failed to evaluate proposals in accordance with criteria stated in the request for proposals (RFP).

(iv) The PE attempted to force a consultant to revise fee rates during contract negotiation where price was a factor of evaluation.

(v) The consultant or potential consultant apprehended possible corrupt or collusive practices.

(vi) The consultant perceived the contract award as being unfair and not impartial.

B. Procedures for Submitting Complaint

19. The complainant shall submit the complaint in writing within the period specified in the law.

(a) First stage

(i) The complaint will be submitted to official who issued the pre-qualification document, bidding document or request for proposals (for example, Project Director, Line Director, Project Manager, Procurement Officer, and so on).

(ii) The concerned official shall consider the subject matter of the complaint and decide whether to take any corrective action or to reject the complaint.

(iii) The concerned official shall, within the period specified in the law, issue a written decision to the complainant advising what corrective actions have been or will be taken, or stating the reasons for rejection of the complaint.

(b) Second stage

(i) If the complainant is not satisfied with the aforesaid decision and wishes to pursue the complaint, he / she may address the same complaint to the Head of the Procuring Entity (HOPE) within the period specified in the law.

(ii) If the HOPE is a member or chairperson of the evaluation committee, he / she shall forward the complaint to the Secretary of the concerned Ministry or Division within the period specified in the law advising the complainant that the complaint has been so forwarded.

(iii) If the HOPE is in a position to accept the complaint then he / she shall decide whether to implement any corrective actions or to reject the complaint and shall,

within the period specified in the law, issue a written decision to the complainant informing of the corrective action that has been taken or stating the reasons for rejection of the complaint.

(c) Third stage

(i) If the complainant is not satisfied with the decision of the HOPE, he / she shall submit a complaint to the Secretary of the concerned Ministry or Division within the period specified in the law.

(ii) The Secretary of the concerned Ministry or Division shall, within the period specified in the law, consider the subject matter of the complaint and decide whether to make any corrective actions or reject the complaint; and shall issue a written decision to the complainant advising on the corrective action that has been taken or stating the reasons for rejection of the complaint—copying the decision to the PE and the CPTU.

(iii) If the complainant fails to receive a written decision within the time period stated at each stage, then he / she has the right to directly submit a complaint, within the period specified in the law, to the next higher level stated in those stages.

(d) Fourth stage

(i) If the complainant is not satisfied with the written decision of the Secretary of the concerned Ministry or Division, he / she may pursue an appeal through the Review Panel (RP), constituted by CPTU.

(ii) The complainant may submit the complaint in a sealed envelope marked 'CONFIDENTIAL' and addressed to the Chairperson of the RP at CPTU's mailing address within the period specified in the law.

(iii) The complainant shall attach with the complaint a registration fee and refundable security deposit, in the form of a Bank draft in favor of Director General of CPTU, of amounts specified in the law.

(iv) The RP shall, within the period specified in the law, issue a written decision to the complainant with a copy to the Secretary of the concerned Ministry or Division, the CPTU and the Procuring Entity

(v) The decision of the RP shall be final and all concerned parties will act upon such decision.

C. General Considerations

(a) When a complaint is being considered by the PE or RP, Notification of Award (NOA) shall not be issued until a final decision on the complaint or appeal has been made, but the bid / proposal evaluation and approval process will continue.

(b) The suspension of NOA shall not apply if the HOPE, having obtained the approval of the concerned Secretary or Minister, certifies that public interest considerations require the procurement to proceed.

(c) The right of recourse to judicial review by the courts of law remain available to the complainant after the four stage grievance address process has been exhausted.

D. Formation of Review Panels

(a) CPTU shall constitute Review Panels by taking one member from each of the following three groups:

(b) Well-reputed specialists in legal matters, experienced in procurement related legal issues which could also include retired senior officers from, government and semi-government autonomous bodies or corporations.

(c) Well-reputed specialists having relevant technical expertise and experience in public procurement.

(d) Well-reputed experts in procurement and contract management practices having experience in complaints and disputes settlements whose names can be provided by the Federation of Bangladesh Chamber of Commerce and Industry (FBCCI).

(e) No active public servant shall be included in the Review Panel.

(f) The CPTU shall establish a list of well-known specialists in accordance with the law for the purpose of forming Review Panels.

(g) A Review Panel shall have at least three members, one of whom shall be nominated the Chairperson.

(h) Depending on the nature of the complaint, the Review Panel may request CPTU to co-opt two members, on a case-by-case basis, out of the lists of specialists maintained by CPTU.

(i) CPTU shall issue a detailed work procedure governing the functioning of the Review Panel.

(j) CPTU shall under no circumstances be involved in the proceedings of a complaint or appeal but shall provide necessary logistic support to the Review Panel in the discharge of its responsibilities and functions.

Annex 6: Environmental and Social Safeguards Management

BANGLADESH: Bangladesh Regional Waterway Transport Project 1

1. This annex provides additional information on the Environmental and Social safeguards studies and approach of the Project. The studies have been carried out by various consultant teams hired by BIWTA and MoS. These studies consist of four volumes: (a) Environmental and Social Impact Assessment (ESIA), including Environmental Management Plan (EMP) for Component 1 and Resettlement Policy Framework (RPF) for the entire project. (b) Environmental Management Framework (EMF) for Components 2 and 3. The studies have been prepared in accordance with Bank safeguard policies as well as national requirements. The contents of these studies are briefly summarized below. For additional information, please refer to the full safeguards assessments. These documents have been made publicly available both in Bangladesh (on BIWTA's website and locally in hard copy) and on the Bank's Infoshop.

1. Applicable Requirements

1.1 National Requirements

2. Under the Bangladesh Environmental Conservation Rule (ECR '97), the maintenance dredging under Component 1 is designated as red category and hence an Environmental Impact Assessment (EIA) is required. The Department of the Environment (DoE) will need to issue an Environmental Clearance Certificate (ECC), based on the ESIA prepared by BIWTA, prior to initiation of any physical works. Under Component 2, construction of river ports and landing stations are expected to be classified as 'red' category and will also require full EIA to receive the ECC. Other subprojects under Component 2 on improvement of landing stations will fall in to 'Orange B' category, and will require an Initial Environmental Evaluation (IEE) for receipt of ECC. Any activities under Component 3 which have a physical footprint would be expected to fall in to 'Orange B' category; this will be confirmed during project implementation when these components are more fully identified. DOE has been consulted throughout the assessment process, including at the TOR stage.

1.2 World Bank Safeguard Policies triggered

3. The Bank's environmental and social safeguard policies relevant to the Project include the following:

4. **Environmental Assessment (OP 4.01).** The Project has been classified as Category A, since some of the potential impacts associated with dredging and instream construction activities are likely to be significant and diverse. Therefore, a full ESIA has been carried out for Component 1 Works. Similarly, for Component 2 works, a full ESIA will be carried out during project implementation, in accordance with the EMF and RPF documents. For Component 3, any physical activities to be carried out through the Project will undergo environmental and social screening, to identify the appropriate and necessary assessment, stakeholder consultation, and management requirements according to this policy.

5. **Natural Habitat (OP 4.04).** The Meghna river system and its floodplain provides habitat to a wealth of aquatic and terrestrial biodiversity. While no net loss or permanent degradation of critical natural habitat is expected to result from the Project, the proposed activities will have impacts on some areas of natural riverine and floodplain habitat, including legally designated

protected areas; hence, this policy is triggered. A comprehensive Biodiversity Management Plan will be implemented to ensure compliance with this policy. Under the plan, habitat restoration and enhancement measures as well as ongoing ecological monitoring will be included in the Project to mitigate and/or compensate for any adverse impacts in accordance with this policy. Dredge spoils will not be deposited in any areas of critical habitat. Additional rules for dredging and impact management are detailed in the plan to ensure that the mitigation hierarchy is appropriately applied for all potential impacts to natural habitats.

6. **Physical Cultural Resources (OP 4.11).** The Project environmental and social assessment studies did not identify any physical cultural resources which would likely be directly affected or displaced by proposed works. Nonetheless, the development of ports at Shashanghat and Pangaon will affect the access to a Muslim graveyard and a Hindu ashes immersion point. Alternative access will need to be provided to these locations. In addition, 'chance find' procedures will be included in the EMPs for all works activities.

7. **Involuntary Resettlement (OP 4.12).** The Project requires land acquisition as well as displacement of residences and businesses for construction of vessel shelters, river terminals and landing stations. A Resettlement Action Plan (RAP) will be prepared during implementation in accordance with the RPF.

8. **Forestry (OP 4.36).** The policy is triggered since some mangrove and social forestry plantation are located close to the Project influence area; however, none of the Project activities are expected to directly affect any of these forests. Dredged material placement will be prohibited in any forest area, or in locations where negative impacts to forests could result.

9. **International Waterways (OP 7.50).** The Policy is triggered since Project activities will take place mostly on the Meghna River and in the Ganges-Brahmaputra-Meghna river system. Riparians of these rivers include India, Bhutan, China and Nepal. The Bank has determined that the Project qualifies for an exception from the requirement to notify other riparians under paragraph 7(a) of the policy, given that the proposed interventions fit within the ongoing scheme of BIWTA's dredging program and existing facilities. The aforementioned activities to be financed by the Bank (a) will not adversely change the quality or quantity of water flows to the other riparians; and (b) will not be adversely affected by the other riparians' possible water use.

10. **Access to information.** The ESIA, EMF and RPF and the ESA Executive Summary have been disclosed on the BIWTA website in addition to sharing them with the stakeholders including the local communities. These reports have also been disclosed in the Bank InfoShop. The ESA Executive Summary has also been translated into Bangla language and made available on the BIWTA website and locally with BIWTA offices at the existing terminals.

11. **Environmental health and safety (EHS) guidelines.** The general guidelines apply to the Project, particularly with respect to air emissions, ambient air and noise quality standards, waste water quality, hazardous material and waste management, and occupational and community health and safety management. The EHS Guidelines for Ports, Harbors, and Terminals, and EHS Guidelines for Shipping are also applicable to the Project. All applicable guidelines are taken into account in the ESIA and EMF.

12. Environmental and social policies of the Bank that are not applicable to the Project include:

- **Pest Management (OP 4.09).** This policy is not triggered since none of the Project subcomponents will procure any pesticides, nor will they induce an increased use of pesticides. Placement of dredged material placement sites on land may attract mosquitoes in some locations. However, according to existing experience in the Project area with dredge materials management, the scale of the impact is minor and temporary, and pesticides will not be required.
- **Indigenous People (OP 4.10).** There are no indigenous communities residing in the Project influence area and therefore this OP is not triggered.
- **Safety of Dams (OP 4.37).** The dam safety Policy is not triggered since no dams are involved under the Project, nor will the proposed IWT improvement and river terminals depend on existing dams.
- **Projects in Disputed Areas (OP 7.60).** This policy is not applicable, since the Project is not located in or near any disputed territory.

2. Project Alternatives

13. **No project alternative.** Though IWT in Bangladesh is a cheaper and environmentally-friendly mode of transport, the sector is not fully developed and is underutilized, due in particular to unreliable maintenance of advertised depths, lack of aids to navigation, inadequate facilities at inland ports and landing stations, and lack of storm shelters or other protections against cyclones and storms which make navigation hazardous. Investment in the IWT sector has been decreasing continuously for the last few decades, heightening all of these problems. Without the Project, the navigational routes will continue to deteriorate. Roads servicing the same origin-destination trips will become increasingly congested, with associated negative air quality and noise impacts and high accident rates. Rail as an alternative transport mode is more environmentally-friendly than road transport, but carries higher unit costs per ton-km. The unit cost of transporting one ton of goods for a length of one kilometer will cost only 0.99 BDT for IWT compared to road (4.50 BDT) and road (2.74 BDT).[16] In addition, not all villages are serviced by roads or rail linkages, so deteriorating conditions on the IWT routes will particularly harm isolated populations who depend heavily on waterway transport for connectivity to markets, schools, and employment opportunities.

14. **Alternative means of maintaining the navigation routes.** The general means of maintaining the navigation routes are dredging and systematic river training works such as revetments, spurs and groins on both sides of the river. Such infrastructure will help in developing the navigation channels away from the banks. Revetments along the river banks will also help in developing channels close to the river banks. However, experience in Bangladesh shows that these channels also require further improvement through annual dredging. These type of river training structures may be useful for smaller rivers, but for mighty braided and multi-channel rivers like the Lower Meghna where the river width varies from 5 to 12 km, the river training structures are not useful in isolation. Further they are very expensive (about 3000 to 6000 US$ per running meter) and also create lot of morphological impacts on the river regime such as erosion of river bank between two river training structures. The river bank erosion will lead to erosion of floodplain

[16] World Bank. 2007. Bangladesh - Revival of Inland Water Transport: Options and Strategies.

agricultural land and terrestrial habitats, and resettlement of floodplain dwellers. Maintenance by dredging is presumed to be necessary for waterways included in the Project. However, to minimize the dredging and other maintenance needs through application of river training schemes will be studied in Component 2 and some pilot projects (US$ 0.75 million) will be developed.

15. **Alternative methods of dredging.** General types of dredging suitable for the Project IWT routes are mechanical and hydraulic dredgers. Under the structure of the Performance Based Contracts for route maintenance, the contractors will be given discretion in selecting the dredging technology to use. Different technologies have different environmental impacts, which need to be considered while selecting type of dredgers. Such issue include: (a) risk of sediment dispersal during excavation (most of the sediment excavated should be captured by the dredger to minimize sedimentation); (b) risk of sediment releases from lifting (most of the sediment captured should be lifted efficiently to minimize the re-suspension of sediments); and (c) risk of leakage from transportation. The ESIA includes a full discussion of the various dredging techniques and compares their relative performance on environmental management aspects, and the EMP specifies thresholds and criteria to ensure that contractors appropriately manage impacts and opt for less environmentally sensitive methodologies. RPF specifies a dredge disposal plan in accordance with the National laws with preference to dispose the material in the river. In case land will be acquired, the adverse impacts will be mitigated in accordance with the RPF.

16. **Alternatives to dredged material management.** Various options have been considered for dredged material management. These include beneficial use on the land and in water where there is a demand and material is suitable; disposal of excess material in the water; and disposal in the confined disposal facility if the material is contaminated. Possible beneficial uses for dredged material (if suitable, environmentally acceptable and there is a demand) for on land use is engineering fill (foundation basis for construction, earth fill); construction (reclamation of new land, aggregate, roads); and for aquatic use is construction (dikes and bunds), coastal defense (filling of scours, beach creation and nourishment, mud-shore profile engineering); and habitat development (aquatic habitats, intertidal mudflats). Nonetheless, these benefits are counterbalanced by the implementation complexity and risks related to on-land disposal, particularly where land acquisition could be necessary. From an environmental perspective, disposal in the river wherever technically feasible is the preferred option, particularly in the estuarine zone where removing sediment from its natural path or cycle may disturb the balance between erosion and accretion. Furthermore, if any dredge material is contaminated, the national Department of Environment has indicated that all such material should be disposed of in-river as long as it is technically feasible (that is, it would not affect the navigation channel). Therefore, under the Project, placement of the material in the river or estuary is the preferred option. To minimize the impacts from aquatic disposal, sensitive areas for fish spawning and habitats of threatened species will be avoided for placement of dredged material and operational modifications such as limiting the quantity or timing of disposal), use of submerged discharge and diffusers (to reduce exist velocity of the sediments to minimize turbidity and extent of impact) are recommended.

17. **Alternative contracting approaches.** Traditionally the BIWTA is following ‘bill of quantities’ based contracting approaches, where the contractors will be paid based on the volume of the dredging. Performance-Based Contracting is recommended in this Project due to the following advantages: (a) Contractor discretion to adjust the detailed alignment of the route (and

correspondingly move the aids to navigation) to follow changing riverbed morphology, and (b) Payment based primarily on depth maintained rather than volume dredged—meaning that no detailed dredging plan is provided ex-ante to the contractor, and instead it is up to the contractor to conduct continuous surveying, determine appropriate dredging equipment needs, and maintain the channel (while conforming to environmental and social requirements such as staying under threshold turbidity / other water quality levels, avoiding sensitive habitats during specified seasons, disposing of spoils in pre-authorized locations, and so on), while being subjected to continuous third party monitoring to verify compliance.

18. **Alternative locations and design aspects of terminals and landing stations.** The alternate locations for siting of terminals and landing stations and also their alternative design aspects will be analyzed as part of the detailed ESIA for these components during project implementation.

3. Environmental Baseline

19. **Definition of the study area or project influence area**: The influence area of the overall Project is defined as areas that are likely to be directly or indirectly affected by the proposed dredging and construction activities. The influence area has been defined as the entire river reach between the Project routes and extending one kilometer on each side of the river bank. In the estuarine areas, a wider influence area of up to 7 km has been considered due to large tidal zone.

20. **Physiography.** The physiography in this area is dominated by characteristics of the Ganges, Brahmaputra, Upper Meghna and Lower Meghna rivers and their tributaries with braided and meandering channels, chars (shoals), mud flats and alluvial floodplains. The Lower Meghna carries annually approximately one billion tons of sediment feeding the Bengal Fan, the largest depositional system in the world. The eastern active part of the delta is characterized by opposing influences of fluvial and marine processes. The fluvial processes are driven by the high sedimentation (and seasonal change), while the marine processes are a semidiurnal tide with strong fortnightly variation. Fluvial influences are most pronounced between the Bishkhali and Tentulia estuaries, and marine influences in the Hatia and Sandwip channels where strong tidal currents are the principal cause of morphologic change. The Shahbazpur channel (and Bhola Island) is influenced by both fluvial and tidal dynamics, which can lead to a complex morphologic processes.

21. **Hydrology.** River systems under Dhaka-Chittagong Corridor can be mainly divided in four sections: (a) Main Dhaka-Chittagong Route consists of Buriganga, Dhaleshwari, Lower Meghna and Meghna Estuary; (b) Narayanganj Extension Route consists of Shitalakhya and Upper Meghna; (c) Ashuganj Extension Route consists of Upper Meghna; and (d) Barisal Extension Route consists of Lower Meghna, Meghna Estuary, Arial Khan, Naya Bhagnani, Tentulia, Maskata, and Kirtonkhola. The monthly mean discharge of the Lower Meghna varies from 5800m^3/s in the month of February to 72,000m^3/s in August. The entire project area is subject to at least some tidal influence, although the effects in the northern reaches is minor, with Ashuganj experiencing a tidal range of 0.2m. In the coastal area around Sandwip, the tidal range is about 6.6 m. Wave modeling in the Meghna estuary indicates that the average wave height varies between 0.6–1.5m in the nearshore zone to 0.1–0.6m in the landward zone. In the dry season, waves are generally less than 0.6m with peak wave period of 3–4seconds. During monsoon season, wave heights exceed greater 2m with periods more than 6 seconds.

22. **Climate.** The climate of Bangladesh is sub-tropical with three seasons; namely summer from March to May, monsoon from June to October, and winter season from November to February. Mean annual rainfall in this region is about 2,100mm at Dhaka and 3,480mm at Sandwip. About 75 to 80 percent of annual rainfall occurs during June to October. During the dry season the prevailing winds are calm. In the monsoon season the prevailing winds are from South-Southeast direction with an average speed of about 3–7.6 knot in the Meghna estuary. The maximum wind speed can be in the range of 32–99 knot. Cyclonic storms, occasionally of severe intensity, can occur in the months of March–May and October–November, accompanied by storm surges, high winds and intense rainfall. During recent cyclones, storm surges have reached about 9 m height in some areas

23. **Surface water and river bed sediment quality.** Sampling and analysis of surface water and river bed sediments were carried out at 12 locations during high flow season of September and October 2015. The samples were analyzed for all major ions, metals, and pollutants. Water quality samples were compared with national standards and EHS Guidelines. Riverbed materials were compared with OPSAR guidelines (Oslo/Paris convention for the Protection of the Marine Environment of the North-East Atlantic). Sampling and analysis is being carried out during low flow season of February 2016. Groundwater sampling from floodplains was also carried out near these locations. Findings from the high flow season sampling indicate that surface water quality is generally suitable for both fisheries and irrigation uses according to Bangladeshi standards, while all 12 riverbed material samples are within the acceptable limits of OSPAR guidelines for heavy metals and ions. No pollutants such as PCBs, POPs and hydrocarbons were detected in the sediments.

24. **Groundwater quality.** On the floodplains, groundwater is found at shallow depths (1.1 to 4.2 m) and used extensively for drinking purposes. At some places, groundwater is also being used for irrigation. Sampling of groundwater was carried out in locations near to the surface water sampling locations. In general, the groundwater was found to be suitable for drinking purposes with TDS ranging from 198 to 841 mg/l. Iron and manganese levels nonetheless exceeded national and WHO standards in most samples.

25. **Air and noise quality.** Air and noise quality was measured at six locations in the Project area, focusing on sites of current or proposed river terminals and ghats. Ambient air quality in the influence area has shown exceedances in particulate matter when compared to the Bank EHS standards of ambient air quality. Concentrations of PM10 are particularly high (ranging from 49.67 to 127.18 $\mu g/m^3$) exceeding ambient air quality standards of the WBG EHS (50 $\mu g/m^3$). Ambient noise levels also generally exceeds the national as well as WBG EHS standards. The day time noise levels were found in the range of 53 to 65 dBA (national and Bank Group standards for residential areas are 45 and 55 dBA respectively).

26. **Biological environment: general biodiversity.** The Project area spans multiple ecosystems including terrestrial, riverine, estuarine, and charland. About 17 percent of all the species recorded in Bangladesh occur in the Project area. These include 367 species of flora, 25 species of mammals, 255 species of birds, 36 species of reptiles, 15 species of amphibians and 156 species of fish. Within the flagship animal species, Ganges River Dolphin (*Platanista gangetica*) Crowned River Turtle, Northern River terrapin (*Batagur baska*), Three-striped Turtle (*Batagur dhongoka*) are the nationally endangered species located in the Project area. In addition, Fishing

Cat (*Prionailurus viverrinus*) and Jungle Cat (*Felis chaus*) are nationally endangered mammals; and Yellow Monitor (*Varanus flavescens*) and Binocellate Cobra (*Naja naja*) are the two nationally endangered reptiles that are rarely seen in the Project area. Several of these are also globally endangered. Olive Ridley, Green turtle and Hawksbill turtle, all globally endangered, and the globally vulnerable peacock softshell turtle are also present in the Project area. Of the fish species, 89 are commercially important and 53 are nationally threatened.

27. The Upper Meghna Flood Plain is a dominant freshwater environment inhabited by freshwater plant and animal species. The floodplain comprises a nutrient rich freshwater ecosystem supporting high fish production, and many aquatic species some of which are now endangered. The Lower Meghna River supports both the Gangetic Dolphin and Irrawaddy Dolphin. The Meghna estuary along with Hatiya and Sandwip channels lies within the globally important migratory bird flyway which acts as staging, feeding and wintering ground of species belonging to East-Asia Australasian and Central Asian Flyways. The coastal ecosystem of the Project area is also important habitat for globally endangered Irrawaddy dolphin and several turtle species.

28. **Protected and sensitive areas.** Hilsa spawning and breeding areas are considered critical habitats, and there are several government declared hilsa sanctuaries in the Project area. During months of March and April, no hilsa fishing is to be carried out in the sanctuaries. Further, all types of fishing are banned in these sanctuaries during 11 days in the Bangla month of Ashwin (5 days before and 5 days after the full moon, including the day of full moon). Ashwin month usually occurs between October and November. Buriganga and Shitalakhya rivers are declared as Ecologically Critical Areas by the DOE to minimize development of unplanned industrial activities around the river. DOE clearance is required for projects along these rivers. Chars, especially their submerged extensions, generally qualify as sensitive natural habitat as they act as reproduction area for many riverine fish and crustacean species. Aquatic reptiles (including endangered turtles) lay their eggs in the sandy beaches on the chars, and they provide important refuge to numerous migratory birds. Given the shortage of land in Bangladesh, stabilized charlands are quickly occupied by farmers and fishermen, profiting from the natural richness of these new and fertile lands.

29. **Bird migration.** Huge congregations of migratory winter birds can be seen during November–March in the Meghna estuary. Winter birds from the Himalayas, Central Asian highlands and faraway places like Siberia move to relatively warm coastal mudflats in Bangladesh including the Project influence area to escape the cold, and feed on various animal and plant food that are abundant in the mudflats, sandflats, rice fields and other areas. Birds start arriving from early November and stay till March–April. An estimated 500,000 birds of about 150 species (mainly ducks, waders and warblers) travel to Bangladesh each winter. Critically endangered migratory birds recorded include Spoonbill Sandpiper (*Calidris pygmaea*), Asian Dowitcher (*Limnodromus semipalmatus*), Nordmann's Greenshank (*Tringa guttifer*). Greater Spotted Eagle (*Aquila clanga*) and Painted Stork (*Mycteria leucocephala*) are vulnerable species and Eurasian Curlew (*Numenius arquata*) is near threatened species recorded in the Project area. The major threats to migratory birds are habitat degradation, hunting, and human disturbances.

30. **Fisheries.** Both capture and culture fisheries practices exist in the Project area. The river contributes the largest share of this production followed by floodplains, beels and khals. Fish production from khals is insignificant as most of those are either dried up during the peak dry

season or remain closed by flood control structures. In recent years, however, capture fish production has declined to about 50 percent, with a negative trend of 1.24 percent per year. In spite of these in 2013–14, Bangladesh has produced 3.5 million tons of fish of which 83.22 percent and 16.78 percent comes from inland and marine fisheries respectively. Fishing is one of the few available livelihood opportunities for most of the landless people of the Project area.

4. Social Baseline

31. **Demography.** The Project influence area falls in to 10 districts and 17 upazilas (sub-districts). The districts covered under the Project area are: Dhaka, Kishoreganj, Narsingdi, Brahman Baria, Chandpur, Laksmipur, Noakhali, Bhola, Chittagong and Barisal. The 17 upazilas covered under the Project are: Bhairab, Roypura, Ashuganj, Keraniganj, Chandpur Sadar, Haimchar, Matlab South, Matlab North, Laksmipur Sadar, Hatia, Bhola Sadar, Doulatkhan, Tojumuddin, Monpura, Sandwip, Barisal Sadar and Dhaka Metropolitan. The total population of all 17 upazilas is 14 million and the average population density is 1,382 persons per km^2 (comparatively above the Bangladesh average of 1,200 persons/km^2). The average household size is 4.72.

32. **Income and occupation.** Based on socioeconomic surveys of 585 households in the Project area, it is estimated that nearly 15 percent of all households have an income below the Bangladesh poverty line of 6,367 BDT (about 80 US$) per month. Nearly 60 percent households have an income around 10,000 BDT (US$ 120) per month. Major income sources in the Project area are agriculture, business, fishing (7 percent) and day labor (2.41 percent). About 9 percent of surveyed people are unemployed and unemployment is a major problem for rural communities, especially for women and young people.

33. **Education.** The overall education level in the Project area is low. Literacy rate is under 50 percent in eight Upazilas of the Project area. Education level of the surveyed population is lower than that of the advanced area of Bangladesh. Among the total population male are more educated than female as there is religious and social obstacles in free movement of the female students. Dropout rate is also very high for female students.

34. **Land use.** Land use pattern adjacent to the river route has different scenarios for rural and urban project areas. Terminals are established in urban or semi urban areas that have developed the Ghat areas as commercial centers of the region with shops and markets. These terminals generate sources of livelihoods for thousands of households. On the contrary, the terminals in rural regions with minimal transportation facilities are mostly surrounded by fallow land, cultivable land, ponds, ditches and canals. Almost 65 percent of the private lands around the Ferry Ghats a Launch Ghats are found to be used for agricultural production. A majority of the titleholders use their land for commercial purposes, while most non-titleholders are using GoB land for business and other purposes.

35. **Health services.** All villages have access to rural dispensary, community clinics and welfare centers, but bigger facilities are available only in the towns. Absence of doctors and lack of doctors and facilities are common problems in the public health sectors especially in the rural settings. Most of the people of project area have their health facilities and service within 1–5 kilometers.

36. **Agriculture.** The floodplain areas are traditionally fertile land with fine-grained alluvium deposits, but their productivity is limited due to the depth of flood water during the monsoon. Along the river routes from Dhaka to Chittagong most of the areas are now being used for commercial purposes. Some of the areas nearer to the Project routes, such as Comilla, South Matlab are fertile areas with high yield rates. Local aman rice, potato, vegetables, water melon, corn, gram pulse, chili, and some other Robi crops are hugely produced in this area. Farmers use large amount of chemical fertilizers as of other areas of the country.

37. **Gender issues.** Similar to many other regions of Bangladesh, the efforts of women in socioeconomic development and wellbeing of their family and surroundings is under-recognized. Household surveys, which were mainly administered near river terminals and bordering shops and business centers, found that most employers and workers at these sites are men, despite 45 percent of the population in surveyed households being female. In addition to that, the study also reveals that decision making role of women in the household is negligible with only 1.03 percent households being headed by women.

5. Climate Change Considerations

38. **Climate change impacts on IWT.** There are a lot of uncertainties associated with climate projections for Bangladesh. Nonetheless, climate change is likely to result in increased rainfall intensities during monsoon period, decreased rainfall during the dry season, rise of future sea levels, higher temperatures, higher wind speeds, and higher cyclone induced storm surge height and wave run-up in Bangladesh. These changes may consequently result in changes in flood regimes due to changes in precipitation pattern, changes in sediment load, changes river water levels, and effects on riverbank erosion patterns, which are all factors that may affect the river navigation as well as IWT terminals and other on-shore infrastructure.

39. **IWT Impact on Climate Change.** IWT vessels generate greenhouse gases such as carbon dioxide, contributing to global climate change. However, the fuel efficiency per ton-km hauled for typical IWT vessels is lower than that of typical trucks and other vehicles on the roads. The Project's improvements to the waterways will also further enable larger vessels to consistently ply the routes, which will result in further fuel efficiency gains from greater economies of scale in cargo transport. Therefore, the additional IWT-related GHG emissions due to increased overall IWT traffic as a result of the Project are expected to represent a net reduction in GHG emissions over what would otherwise be expected through equivalent growth of road-based traffic.

40. **Climate change mitigation and adaptation.** An Environmental, Social and Climate Change Unit will be established in the BIWTA for mainstreaming the climate change issues in the Project and sector-wide planning and implementation. In addition, the Bank will provide complementary technical assistance to Ministry of Shipping and its agencies, as well as other relevant agencies, in parallel to project implementation, to develop a strategy and action plan for 'greening the waterways', included recommended actions and pilots to test approaches and generate lessons learned to enable scaling up in a potential future operation. This Bank technical assistance will include a large focus on identifying mitigation measures to reduce carbon dioxide and other greenhouse gases emissions from ships, cargo handling equipment and related hinterland transport. Possible such activities to be included in the action plan are:

- Preparing GHG emissions inventory (from the current operations) and setting goals to reduce emissions. Also periodic reporting.
- Exploring the introduction of cleaner fuels such as compressed natural gas (CNG, comparatively less emissions) in the vessels owned by the ministry to set a good example for others to follow.
- Developing an incentive scheme to encourage vessel owners to upgrade vessel engines, such as conversion to CNG or installation of emissions control measures.
- Educational campaigns for users of the waterways to tackle behavioral aspects of reducing emissions and other forms of pollution.
- Improving efficiency within the logistic chains by streamlining the movement of cargo, truck traffic and inland navigation access
- Reduce energy dependence with in the ports by developing and using renewable energy sources

41. On the adaptation front, the Project will ensure that river terminals and landings are designed in consideration of maximum flood levels expected with climate change, as well as potential decreases in minimum flows during dry season. In addition, the Bank will support, through complementary technical assistance in parallel to the Project, a detailed climate change vulnerability assessment and development of an adaptation/resilience strategy for the IWT sector as a whole, which could be taken up by BIWTA's proposed new permanent Environmental, Social and Climate Change Cell, and supported financially through a potential follow on investment project. Potential adaptation measures to be explored at the sector level include:

- Climate change modeling and developing forecasts for river water levels and changing sedimentation patterns
- long term planning and design for new infrastructure in consideration of climate vulnerabilities
- Identify the vulnerabilities in the IWT sector and proactive actions
- Design of new wider vessels that could accommodate low drafts
- Planning for future upgrading / modification of additional BIWTA-owned facilities to account for future flood levels expected from climate change

6. Potential Environmental Impacts and Mitigation Measures

42. The negative impacts associated with the Project are mostly related to dredging activities for maintenance of navigation routes, ferry crossings and vessel shelters. However, the extent of dredging to be carried out for these activities is less than 1 percent compared to the annual sediment load of one billion tons carried out by the Lower Meghna. Similarly, the 76.22 m width of channel to be dredged is also minimal compared to the width of the Lower Meghna which varies from 5 to 12 km. Nonetheless, without mitigation measures, various negative impacts can be expected from river maintenance / dredging activities as well as from construction and operation of river terminals, landings, and vessel shelters. The main anticipated impacts, and key mitigations, include the following.

43. **Impact of dredging on aquatic and benthic habitat.** Dredging will be required to maintain navigability of river routes and ferry crossing and construction of river terminals and vessel shelters. Maintenance dredging will also be required annually along the navigation routes and at least once in a few years at the river terminal and vessel shelter sites. Dredging activities may cause several negative impacts on the aquatic habitat and fauna due to generation of high sediment flows, disturbance of benthic habitat, noise and emissions from construction machinery, and accidental spillage of fuels. Dredging activities in the Lower Meghna may particularly impact the hilsa if they are carried out during its spawning season of March–April and October–November.

44. The impacts from dredging can be minimized by avoiding the sensitive habitats of fish and other important species during their breeding and spawning period. The locations of the sensitive areas are given in ESIA. For example, dredging in Lower Meghna River and estuary should be avoided in the hilsa sanctuaries during the months of March and April. The Contractor will be required to keep suspended sediment concentrations at the dredging sites below 4,000 mg/l near the dredger (a threshold value being followed in other projects in Bangladesh). In ecologically sensitive locations, the Contractor will additionally keep total suspended solids levels below a 20 percent increase over baseline levels. Inspection and monitoring of dredging activities should be conducted to evaluate the effectiveness of impact prevention strategies, and re-adjusted where necessary. An ongoing ecological monitoring will be in place to evaluate the impacts of the dredging and develop additional mitigation measures as required.

45. **Impact of dredged material placement on land.** Under the Project, almost all dredge material is expected to be disposed in-river; therefore, impacts related to placement of the material on land will be minimal. Nonetheless, in the event that material does need to be placed on land due to lack of appropriate in-river disposal options, only in such cases will government land free from encumbrances will be provided. With respect to potentially contaminated sediments, the ESIA baseline testing found contamination exceeding applicable Bank and national standards in one part of the Project area—the Buriganga River near Dhaka—and contamination was only detected during the low flow season. Dredging in the Buriganga River is likely to be required related to construction of the Shashanghat and Pangaon terminals. Additional samples will be taken and findings reconfirmed during the detailed ESIA process for these facilities, and specific disposal plans developed for the required dredge volumes. With respect to IWT route maintenance activities, according to recent available hydrographic surveys, the need for dredging on the Buriganga River is not anticipated. Nonetheless, testing will be required of the contractor as part of the detailed dredge planning process to confirm whether contamination is present. The national Department of Environment has indicated that, if any contaminated sediment is present in the Project area and would be dredged under the Project, disposal should be in-river wherever possible. No agriculture land will be used for permanent or temporary filling up of the areas. If temporary filling is required, only government owned khas lands will be used. Any sediments disposed on-land will be placed in containment bunds, with proper drainage provisions to control impacts from surplus water runoff. In the extremely unlikely case that sediments brought on shore are contaminated (for example, only if the in-river disposal option is not possible due to inadequate river depth within a reasonable distance of the dredge site), containment facilities will have special measures for appropriate isolation and treatment if possible.

46. **Impact of dredge material placement in the river and estuary.** The dredged material will be used for beneficial uses in the river such as construction of break waters, spurs, filling of the scour areas in the estuarine areas. Two locations in Meghna estuary, one on the northern shoreline of Hatia Island and the other on eastern shoreline of Bhola Island have been identified for dredged material placement on the scours. A sediment dispersion modeling was carried out to study the fate of these dredged material and it was found that this dredged material is distributed naturally with high and low tides without causing any major morphological changes. The dredged material will be placed in the river at all times unless technically infeasible (that is, where in-river deposition would interfere with channel draft maintenance, and riverbanks are unsuitable due to environmental sensitivity or community use). The ESIA has pre-identified in river locations that are environmentally and technically appropriate, including scour holes and adjacent to eroding river banks, which will also reduce the rate of erosion. The consultations with the DOE also suggested that dredged material placement in the river is comparatively better alternative than the placement on the land. The impacts from aquatic placement of dredged material will result in generation of high turbidity levels which may affect organisms that depend on light for their existence (photosynthesis) and fish. For fish, high concentrations clog the gills and affect the growth and survival of eggs and larvae, diet and reproduction. Indirect effects include deterioration of spawning beds and loss of food-benthos. Aquatic placement will be avoided in the spawning and nursing grounds, known migration routes of fish, habitats of unique, rate and endangered species, commercial fishing areas, and the navigation routes. The impacts on turbidity associated with aquatic placement can be minimized by submerged discharge (placing the pipe line vertically one meter below the water column or just above the river bottom) which result in a decreased resuspension and spread of the lateral extent material. The bottom relief created by mounds of dredged material may also provide refuge habitat for some fish.

47. **Impact of instream construction activities in the river on the aquatic habitat.** Construction works in the river for terminals such as bank protection works and jetties may generate sediment load in the river and can thereby affect the aquatic habitat. Underground noise and vibration levels caused by instream construction activities (such as piling and dredging) may cause disruption to fish migration and disturbance to dolphins. The instream construction works should adopt a ‘soft start’; using a low energy start to the piling/dredging operations to give dolphins an opportunity to leave the area, gradually ramp up the sound levels to scare the dolphins and other cetaceans away before piling/dredging commences. The contractor will also be required to use pingers upstream and downstream to chase away dolphins and other aquatic species from the construction areas.

48. **Impact on charland habitat.** Construction activities on the land and dredging activities in the river or dredged material placement on the floodplains are not likely to affect wintering birds that are mainly found on chars and mudflats spread across the estuarine areas. Contractors will be required to use mufflers or acoustic enclosures for equipment, and to ensure that their workers refrain from disturbing and poaching. To mitigate light pollution on the birds, contractors will be required to use lower wattage flat lens fixtures that direct light down and reduce glare, and avoid use of floodlights. In addition, a biodiversity management plan was developed as part of the ESIA and will be implemented targeting important chars.

49. **Impacts from IWT and river terminals during operation and maintenance.** Key impacts associated with ongoing use of the IWT routes, as well as operation and maintenance stage

impacts of the river terminals, include localized air pollution from vessel engines and land-based vehicles and equipment, water pollution from discharges of untreated waste water and storm waters, unplanned spills and leaks, waste water releases from ships, and health and safety concerns for vessel and terminal workers as well as surrounding communities. For the river terminals, these impacts will be assessed in more detail, and management measures fully specified, as part of the full ESIA to be carried out for these subprojects during project implementation, in parallel to the detailed design stage for these facilities. To support appropriate management of impacts and issues related to ongoing use of the IWT routes, various capacity building measures as well as additional studies and pilot initiatives will also be undertaken through the Project.

50. **Cumulative and induced impacts.** A cumulative and induced impact assessment (CIIA) was undertaken as part of the ESIA to evaluate potential impacts resulting from the Project combined with other ongoing or planned development activities in the Project influence area. To focus the study, two aquatic biodiversity related valued environmental components (VECs) were selected, as described below:

- **River dolphins.** River dolphins are among the world's most threatened mammal species. Their populations have declined dramatically in recent years and much of their range has been lost. They are threatened by overharvesting of fish, deforestation and intensive floodplain farming which increases the sediment load of river channels and degrades their habitat, and deteriorating water quality due to industrial effluents, human sewage, mining waste, and agricultural runoff, among other threats. The Project may exacerbate these trends when taken together with other developments in the Project area. Very little is known about the effects of vessel traffic on river dolphins and porpoises. Ferry crossings, commercial ports, and primary fishing grounds in rivers are generally located downstream of convergent channels or sharp meanders, which are also the preferred habitat of river dolphins. River dolphins are often observed swimming in areas with high vessel traffic, that includes small boats, motorized ferries, and in some locations large container ships and oil tankers, with no visible damaging effects.

- **Hilsa fish.** Hilsa (*Tenualosa ilisha*) is one of the flagship diadromous fish species of Bangladesh that migrate only through the Ganges-Meghna river system route. Hilsa is a major cash crop of Bangladesh and the hilsa fishery contributes to about 1 percent of the national GDP. The confluences of Padma-Meghna and Tetulia River are very significant habitat. It plays an important role as the major nursery and breeding ground of hilsa and many other commercially important riverine fishes. Hence, the Department of Fisheries (DOF) has earmarked sanctuaries for hilsa in the Lower Meghna and associated rivers. Hilsa fishing is banned in the sanctuaries during months of March and April, and also for 11 days in Bangla month of Ashwin (October/November). Due to these conservation efforts, there has been a significant rise in hilsa catches during recent years. The potential developments in the IWT sector including development of terminals and landing stations may potentially affect the breeding grounds of hilsa due to dredging activities and waste water discharges.

- **Mitigation measures.** To address the potential cumulative impacts associated with future dredging and induced environmental impacts from port development on these VECs as well as other aquatic biodiversity, detailed ecological monitoring will be carried out during

implementation of the Project. The Project will also support environmental enhancement, including habitat restoration and conservation activities for endangered river dolphins, hilsa, and other aquatic biodiversity, along the Project waterways.

7. Potential Social Impacts and Mitigation Measures

51. **Social impacts from construction activities.** Most of the terminals are on GoB land, but proposed launch terminal facilities will require approximately 2.06 ha of land. The proposed six vessel shelters are planned to be constructed on public land to avoid any negative impacts on the population near project sites. At most of the project locations, land belongs to BIWTA. This land is used for common purposes such as Ghats for boats, by the nearby communities. There are Persons without title to the land on the BIWTA land with shop and residences. Places of worship are built on BIWTA Land. BIWTA has built shops and leased them to shop keepers. This will lead to loss of livelihoods of approximately 300 households. At some locations access to common property resources such as Burial grounds will get restricted due to the present interventions. At some locations access granted to cultural practices such as immersion of ashes of the dead in rivers at certain ghats, will be impacted. Further access infrastructure such as roads will cause impacts as the present roads are narrow and they need to be widened for optimizing the capacity of the facilities built. According to the ESIA, there are no small ethnic communities; indigenous people, at the Project locations. The key social impacts due to project interventions are land acquisition and subsequent resettlement; loss of livelihoods; inconvenience and nuisance during construction; loss of access to CPRs and likely increase in transport costs. For each of these sub-projects an RAP will be prepared, where required during the planning and design stage.

52. **Land acquisition and resettlement.** The Project will follow World Bank Operational Policy 4.12 and GoB policy to avoid, minimize and mitigate any adverse land acquisition and resettlement impacts to the communities to be affected by the Project. Land acquisition and resettlement will likely be required for all the proposed terminals, landing stations and vessel shelters. For the terminal sites, all activities will be carried out in BIWTA land but resettlement of squatters are required. For vessel shelters, about 2.06 ha land acquisition will be required. The loss of land and structures will be compensated by replacement value based on current market prices and standing crops. Other resettlement benefits associated with structure, trees, business, wage, share cropping, crops, fish stock, and so on, will also be paid. Vulnerable and female-headed households will receive special assistance. Resettlement Action Plan (RAP) will be prepared for all the sites following the guidelines given in the RPF.

53. **Impact on livelihood sources.** Construction of terminals and landing stations will negatively affect the livelihood of the squatters and the nearby business owners. Some agriculture land also will be affected due to land acquisition. Livelihood and restoration programs including skill development will need to be proposed in RAP. However, the construction of the proposed facilities, particularly landing stations will greatly improve the livelihoods of the rural business community as thousands of shops are located around the ferry ghats and landing stations.

54. **Impacts on places of religious significance.** Though there are no identified PCRs located in the Project area which would likely be directly affected or displaced by proposed works, the development of ports at Shashanghat and Pangaon will affect the access to a Muslim graveyard and a Hindu ashes immersion point. Alternative access will need to be provided to these locations. In addition, ‘chance find’ procedures will be included in the EMPs for all works contracts.

55. **Impact on community facilities.** The potential impacts of the Project on the community could include relocation, air quality deterioration, noise, and safety hazards. The construction activities can potentially damage the existing public and private infrastructures such as local roads, foot paths, and boat jetties. For noise, air quality, and safety hazard, the contractors will be required to ensure that activities in the vicinity of the sensitive receptors such as schools are carried out in a manner so as to minimize these risks (for example, carrying out the construction activities after the school time). The construction site will be fenced near such places to minimize safety hazards. Safety signage will be placed and coordination will be maintained with the facility management as well as with the community to minimize the risks. Finally, any complaints of related to project impacts on the sensitive receptors will be addressed through a grievance redress mechanism.

56. **Occupational health and safety.** Construction activities may pose health and safety hazards to the workers at site during use of hazardous substances, lifting and handling of heavy equipment, operating machinery and electrical equipment, working near water or at height and more Inappropriate handling or accidental spillage/leakage of these substances can potentially lead to safety and health hazards for the construction workers as well as the local community. The contractor will prepare and implement Health, Safety and Environment (HSE) plan in compliance with WB EHS guidelines and ECoPs.

57. **Community health and safety.** During the construction phase, the population living in close proximity to the construction area, the construction workforce and individuals drawn to the area in search of income opportunities will all be exposed to a number of temporary risks such as safety hazards associated with the construction activities and vehicular movement, exposure to dust, noise, pollution, infectious disease, and various hazards, including potential conflict with 'outsiders' to the Project influence area about employment and income. The influx and accommodation of a large work force will result in increased concerns for the health and safety of local population, including the spreading of sexually transmitted diseases such as HIV/AIDS. Contractor's HSE plan will also include measures and protocols to protect the nearby community against the risk of accidents and mishaps. In addition, the HSE plan will also include emergency response procedures to be followed in case any accident does take place.

58. **Social impacts of dredged material placement on land.** The dredged material will be disposed in the river. In rare cases where it is not feasible to deposit in the river, government land free from encumbrance will be utilized for non-contaminated material and will not lead to any adverse impact on people.

8. Environmental Management Plan (EMP)

59. To address the myriad impacts identified, an EMP has been prepared as part of the Project ESIA, encompassing the following categories of mitigation measures and plans: (a) generic and non-site-specific measures in the form of environmental codes of practices (ECoPs); (b) project-specific and site-specific mitigation measures, including measures to be undertaken by contractors as well as measures to be implemented directly by BIWTA; and (c) monitoring and reporting requirements, institutional arrangements, and budget. To make contractors fully aware of the implications of the EMP and responsible for ensuring compliance, technical specifications in the tender documents will include compliance with mitigation measures applicable to contractors proposed in the EIA and in WBG EHS guidelines. Contractors need to prepare site-specific management plans to address various environmental issues, showing how will comply with the

requirements of ECoPs and EMP. Plans will be reviewed and approved by construction supervision consultant (CSC) and project implementation unit (PIU) before implementation of construction works. For river terminals and landings, which are not yet designed in detailed, the EMF outlines management requirements that shall be further detailed and tailored to the specific subprojects as part of the comprehensive ESIA study to be carried out during project implementation

9. Resettlement Policy Framework (RPF)

60. The primary objective of the RPF is to improve the standard of living of the affected population. The other objectives of the RPF are to (a) Ensure the principles of Social Justice is adhered to at all times; (b) Avoid or minimize any negative impacts on the communities; (c) If land is required for project facilities, then same may be purchased under Willing Buyer-Willing Seller norm; (d) Assist affected population in improving their living standards, income earning capacity, and production levels, and so on; (e) Encourage and enable community participation in planning and implementing project components; and (f) Provide assistance to affected communities in redressing their grievances. The RPF addresses social issues such as Land Procurement, Community Engagement, Special Attention to Women and Other Vulnerable Groups and Grievance Redressal. BIWTA will use the following principles to minimize adverse impacts on affected persons and their community:

- Avoid or minimize acquisition of private lands and use as much public land as possible;
- Avoid or minimize displacement of people from homesteads, land valued higher with regard to productivity and uses, buildings/structures that are used for permanent business and/or commercial activities;
- Follow a willing-buyer willing-seller approach where possible;
- Avoid or minimize displacement of people from homesteads, land valued higher with regard to productivity and uses, buildings/structures that are used for permanent business and/or commercial activities, dislocation of squatters/encroachers; and impacts on community facilities, such as educational institutions, places of worship, cemeteries, and so on, and buildings/structures that are socially and historically important.
- Where the portion of a plot remaining after acquisition becomes economically unviable, the landowner will have the option to offer the entire plot for acquisition.
- The policy principles adopted are inclusive and cover both titled and non-titled persons. The affected without title will also be entitled for resettlement benefits.

61. The RPF provides the following options for land procurement:

- **Land acquisition.** When land needs to be acquired according to the Act, BIWTA produces Land Acquisition Proposal (LAP) to DCs with Administrative Approval from the Ministry of inland water transport on the acquisition. After a feasibility study of the acquisition and other necessary procedures the land is acquired. Upon approval of the LAPs, BIWTA field office makes the payment to affected persons.
- **Compensation payment norms.** BIWTA will ensure that the properties (land, structure, and non-structured assets) to be affected by the Project will be compensated at their full

replacement cost determined by a legally constituted Resettlement Sub-committee (RSC) according to structure and mandated outlined in the RAP. Regardless of their tenure status to the lands used for project component, the Project-affected persons/ households identified in the affected area prior to the cutoff date will be eligible for compensation and assistance, based on loss and impact categories identified through census survey in respect of the policy guidelines adopted for the project. An Entitlement Matrix has been prepared for the project on the basis of field study and consultation with government officials as a part of preparing the Resettlement Policy Framework.

62. The implementation of the RFP and RAP will be supervised by BIWTA and its representatives through a Supervision and Monitoring Evaluation Audit Learning (MEAL) protocol, Quarterly Monitoring and Evaluation and Bi-Annual Social Audit and Learning.

63. **Communication and engagement strategy.** BIWTA recognizes the fact that affected communities are primary and key stakeholders of the Project. Under the Project, BIWTA will ensure the engagement of target communities in the detailed site planning including detailed ESIA, Social Assessment and RAP planning, as well as implementation and monitoring of sub-project activities. Consultations will be held at regular intervals with target communities, including vulnerable groups such as Women Headed Households, Below Poverty Line families, Old Aged, Differently Abled, and so on. In addition, a formal communication strategy has been prepared for the Project laying out various communication needs and outreach tools and explaining the responsibility of PIU to convey the Project impacts and its implications for various stakeholders. A key aspect of this strategy shall be the communication of any Project-related impacts.

Grievance Redress Mechanism

64. The Project will establish a grievance redress mechanism (GRM) for addressing grievances and complaints received from the Project-affected persons. The fundamental objective of GRM will be to resolve any project-related grievances locally in consultation with the aggrieved party to facilitate smooth implementation of the social and environmental action plans. The procedures will however not affect a person's right to go to the court of law pre-empt. The existing grievance management will be automated be establishing toll free helpline number to receive, register and track redress process.

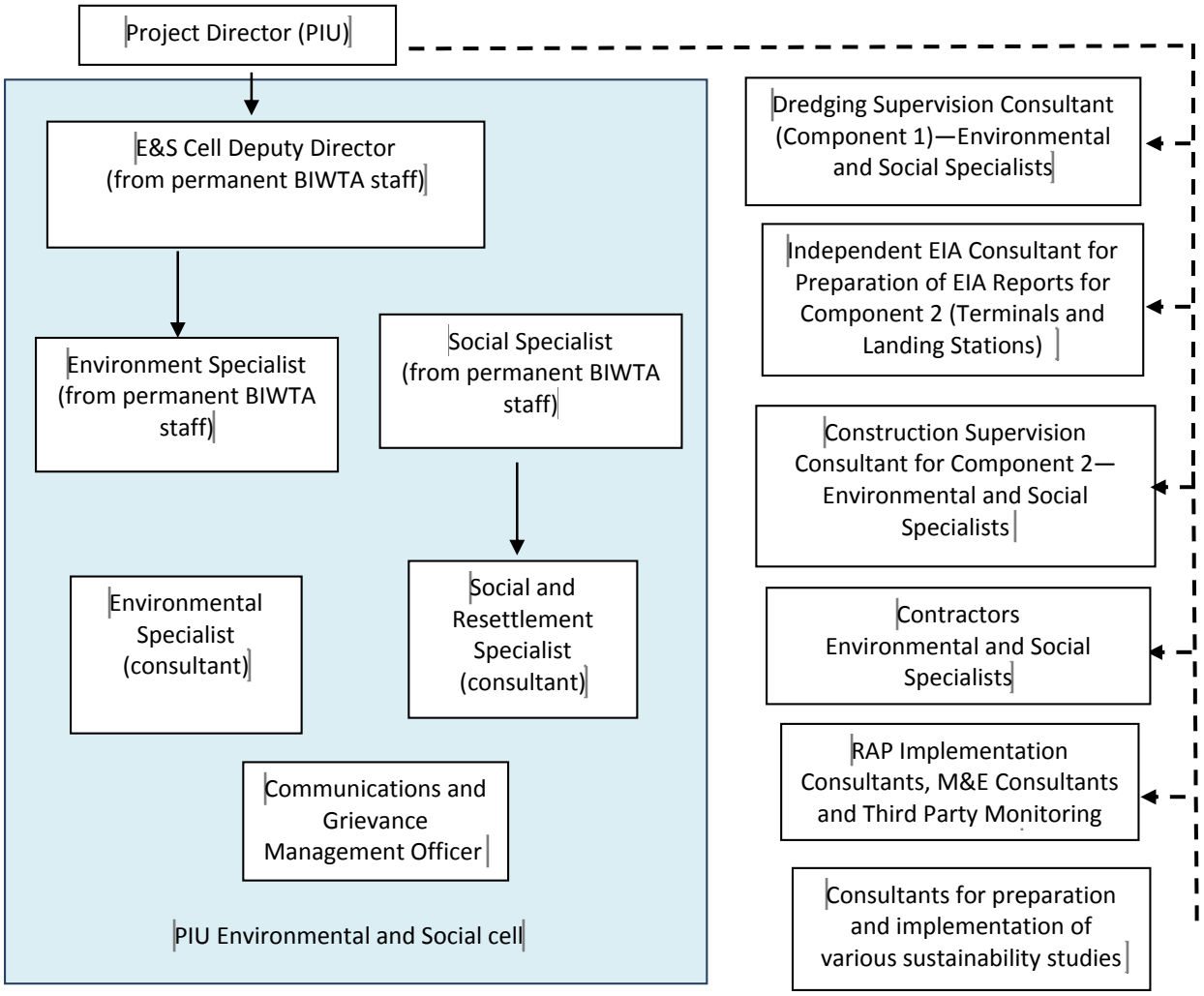
Institutional Arrangements

65. The proposed organizational structure under PIU for environmental and social management is shown in figure 6.1. Key roles are described below:

- BIWTA's Project Implementation Unit will include an Environment and Social (E&S) Cell with qualified staff. This E&S Cell will assist the PD on issues related to environmental and social management. This includes direct project supervision as well as overseeing the various consultants hired through the Project to monitor contractor performance and develop and implement detailed studies and plans. The E&S Cell will compile quarterly monitoring reports on EMP compliance, to be sent to the Project Director and also shared with the Bank. The Cell will also provide trainings to the BIWTA field personnel responsible for monitoring of environmental compliance during both construction and O&M phases of the Project.

- Contractors are also required to appoint appropriate number of environmental specialists, occupational health and safety specialists, environmental technicians, and community liaison officers for the implementation of EMP in the field, particularly the mitigation measures. The contractor will also be responsible for communicating with and training of its staff in the environmental/social aspects.
- Dredging Supervision Consultant (DSC) for IWT route maintenance and Construction Supervision Consultants (CSC) for terminals and landing stations will each be required to have environmental and social specialists as part of their teams, to oversee the day to day compliance with applicable E&S requirements.
- **EIA and SIA consultants for Component 2.** PIU will hire consultants for carrying out EIA and SIA studies for Component 2 works in compliance with the GoB and Bank guidelines following the EMF and RPF. They will be responsible for preparing EMPs for inclusion in the bid documents as well as RAPs.
- **Other study consultants.** The Project will also hire several other consultants to carry out studies on: Aid-to-Navigation Monitoring System; training; ESIA studies if needed for Component 3, collection of baseline data on biodiversity at sensitive locations, sustainable long-term maintenance of river terminals, landings and other BIWTA assets; and ESIA studies for preparation of a second potential investment project.
- External Monitoring and Evaluation consultants will be engaged by the PIU to conduct external and independent monitoring and evaluation of the EMP and RAP implementation. The main purpose of the external monitoring will be to ensure that all the key entities including E&S Cell, CSC, and contractors are effectively and adequately fulfilling their designated role for EMP and RAP implementation and that all the EMP and RAP requirements are being implemented in a timely and effective manner.
- **RPF and RAP implementation and monitoring.** BIWTA will arrange a three level RPF implementation and monitoring mechanism. At national level over all RPF oversight will be ensured by MoS through BIWTA. The individual International Social Consultant will assist MoS during RPF implementation, monitoring and evaluation. The Regional Offices will ensure implementation of RPF and do regular monitoring. The field offices will assist the Regional Offices in supervision of RPF implementation. The field offices will ensure day to day aspects RPF implementation and data collection for monitoring. BIWTA will be climate sensitive of project investments as well as other activities across the organization.

Figure 6.1. Institutional Structure for Environmental and Social Management of the Project



Cost of Environmental and Social Management

66. The total cost for the environmental and social management and monitoring activities has been estimated to be US$14.9 million (table 6.2).

67. The total administrative budget for RPF implementation and resettlement action plan under this project has been worked out as US$3.8 million. The cost of implementing the proposed mitigation measures under respective Resettlement Action Plans (RAPs), staff costs and NGO costs are not included in this costing. These costs need to be included in the respective sub-projects' budgets.

Table 6.2. Cost Estimates for Environmental Management and Monitoring of the Project

	Description	Amount, million US$	Project Component (See Table 5)
1.	Contractor's Budget (for development and implementation of management plans, staff, training, and so on	1.0	Component 1: IWT
2.	Sediment, water, soil, air and noise quality monitoring during construction (quarterly for 6 years)	0.5	
3.	DSC Environmental and Social Staff	1.0	
4.	CSC Environmental and Social Staff	1.0	Component 2: Terminals
5.	Contractor's Budget (for development and implementation of management plans, staff, training, and so on)	1.5	
6.	Sediment, water, soil, air and noise quality monitoring during construction (quarterly for 6 years)	0.5	
7.	Administrative budget for RPF activities	3.8	
8.	Study, development of action plan, and capacity building of BIWTA to ensure effective and sustainable long-term maintenance of river terminals, landings, other BIWTA assets	0.5	Component 3: Institutional Capacity Development and Sustainability
9.	Origin destination survey of inland waterways along Dhaka-Chittagong corridor, including understanding which supply chains to promote, and logistics gaps for development	0.35	
10.	Social NGO to support BIWTA on implementation of Social Management Plans / RAPs for specific investments	0.2	
11.	Third party M&E consultant for social safeguards (including midterm and ex-post evaluations of RAP implementation)	0.25	
12.	Third party M&E consultant for environmental safeguards	0.25	
13.	Environmental NGO/firm to: (a) carry out additional baseline data collection on biodiversity at sensitive locations; and (b) develop and implement biodiversity management programs including habitat enhancement and protection for key species	0.5	
14.	Implementation of additional EMP programs (such as management of dredge spoils, biodiversity conservation, capacity building support to establish the permanent Environmental, Social and Climate Change Cell, and so on)	2.0	
15.	PIU Environmental staff	1.5	
	TOTAL	**14.9**	

Stakeholder Consultations and Disclosure

68. Extensive consultations were carried out by both social and environmental study teams during project preparation. Initial consultations, including a national level workshop in Dhaka, were held during September and October 2015 to share the Project's objectives and Terms of Teferences (ToRs) of the proposed Environmental and Social Assessment studies for the Project (for example, ESIA, EMF and RPF). Additional consultations were carried out during December 2015 with the communities at the anticipated dredging locations for planning of dredged material disposal. Consultations involved multiple methods—for example, key informant interviews, village wise meetings, focus group discussions and workshops. Details of participants consulted are given in table 6.2 and they include (a) affected communities and population around the Project area, (b) farmers, fishing community, passengers using launch, disabled persons, business men, day labor, women, (c) national and local government authorities responsible for district administration, rural development, agriculture, fisheries, wildlife and environmental protection, and (d) nongovernmental organizations. First round of public consultations were held in November

2015 to disclose the results of the original ESIA and seek feedback from stakeholders. Newspaper advertisements and invitations were sent to relevant stakeholders before carrying out public consultations. A final national level workshop, attended by over 120 stakeholders from government, the private sector, NGOs and civil society, was held in Dhaka on March 31, 2016 to receive feedback on the assessments. Table 6.3 lists the stakeholders consulted.

Table 6.3. Number of Persons Covered in Various Consultation Meetings

	Activities	No. of Participants
1.	Individual household meetings (through questionnaire surveys of 585 households)	2,793
2.	Village meetings (31 meetings)	877
3.	Focus group discussions (29 meetings)	296
4.	First National Consultation Workshop (at Dhaka on 14 October, 2015)	127
5.	Public Consultations (at Ashuganj and Barisal on 17th and 18th November 2015, respectively)	106
6.	Second National Consultation Workshop (at Dhaka on 31 March, 2016)	120
Total		**4,199**

69. A summary of main issues raised by various stakeholders and how these issues are addressed and incorporated are shown in table 6.4.

Table 6.4. Key Issues Raised and Plans to Address the Issues

Stakeholder Type	List of Concerned Raised	Responses and Mitigation Measures Under the Project - Summary
Shopkeepers	Shopkeepers opined in favor of the Project but they want to see the launch ghat improved with more facilities such as toilets, sufficient space for shops on a designated area so that they will be bound to shift their structure frequently. They expressed that the Project will increase their business opportunities and new venture of business will be open after completion of the Project.	Toilets and drinking water facilities will be included in the design of launch ghats and river terminals. The designs of terminals will also include shops and while leasing out these shops, priority will be given to the affected communities.
Physically Disabled	There is no special facility for the disabled people in the launch terminals and water vessels. But they want separate place in ghat and launch terminals for their easy movement. Wheel chair and bed facilities are available only for patients and for emergency situation. There are no doctors permanently on duty. Disabled persons want proper safety and security in terminal and launch as well. Disable persons do not know the facilities about river transports. Most of the people think that road transport is easier than river transport especially for the disables persons as they cannot swim. They want separate space/seat for them in the launch/ferry and easy riding facility such as smooth way, wheel chairs, and so on. If such facilities are provided for the disable people, then they may comfortably use the river transport.	Ramps will be provided at the terminals for embark and disembark of disabled people. Other aspects will be explored in full in the detailed ESIA and design studies to be carried out during project implementation.
Fishermen	Fishermen communities are mostly living along the river or within one km from the river. They want modern signalling system and safety and security	Navigational signals will be provided along the navigational channels. Spawning areas of fish, migratory routes

Stakeholder Type	List of Concerned Raised	Responses and Mitigation Measures Under the Project - Summary
	during fishing. Some time they are to face trouble from pirates or even some politically influenced persons who made them bound to pay money for fishing. They welcomed the Project but requested to keep in mind about fish moving routes, season and fishing areas during dredging so that their livelihoods will not be disturbed.	and commercial areas for fishing will be avoided for dredging and dredge material placement.
Launch and Ferry Workers	Launch and ferry workers expressed their views in favour of the Project. They are concern about dredging and signalling system in the river routes as there are some incidents of collision among the water vessels. Improved signalling system may decrease accidents. They want sufficient personal protective equipment (PPE) for their safety in the launch and other water vessels. PPE can also be available for the passengers.	Safety measures are included in the project planning and such as provision of river information, VHF equipment and search lights.
Women	Female particularly housewives of the Project routes move here and there by launch along with husband or even only with children for their needs. Safety and security, separate space for them in the launch terminals and vessels, separate ticket counter, and so on are their needs.	Separate ticket counters, waiting rooms and toilets will be provided at the women passengers near the terminals. Separate toilets will also be provided at the landing stations. Specific design features to maximize women's needs, comfort and safety in using IWT will be studied in more depth during the detailed design and ESIA stage for river terminals and landings, as well as through a study to develop a gender action plan for the IWT sector, to be carried out during project implementation.
Mobile Vendors	Usually mobile vendors deal in the ferry/ launch ghats as well as in water vessels. They always move from one ghat to another and sell their goods. They need safety and security in the ghats as well as in the transport. Sometime they face trouble by the policemen and guard of the ghats and vessels	BIWTA will need to provide licenses to the mobile vendors. During the Project implementation, the social consultants will assist BIWTA in identifying these vendors and support their licensing process.

70. **Disclosure:** All safeguards documents for the Project, including the ESA Executive Summary for the overall project, full ESIA of Component 1, EMF for Components 2 and 3, and RPF for the overall project have been disclosed on the BIWTA website. The Executive Summary of the Environmental and Social Assessment for the Project as well as the RPF have been translated into Bengali, and have also been disclosed on BIWTA's website, as well as made available in the BIWTA district level offices across the Project area. The documents have also been disclosed at the Bank's Infoshop. The first disclosure of Bank-approved documents took place in December 2015, and updated versions were re-disclosed in February, 2016. BIWTA subsequently further enhanced the documents, and the final versions were re-disclosed both in-country by BIWTA, and on the World Bank's Infoshop, in May 2016.

Annex 7: Calculating Project Contributions to GHG Emissions

BANGLADESH: Bangladesh Regional Waterway Transport Project 1

1. To calculate the Project's effects on net GHG emissions along the main Dhaka-Chittagong corridor, emissions from both IWT and road modes of transport along the Corridor were analyzed, as follows.

IWT GHG Accounting

2. In the analysis, the baseline annual cargo volume on the Dhaka-Chittagong IWT route in 2014 was 24.8 million tons. The length of the Dhaka-Chittagong inland waterway is approximately 300 km. This leads to 7,446 million ton-km of cargo transported via waterway between Dhaka and Chittagong in 2014. The analysis focus on importing and exporting containers and bulk and general cargos through Chittagong Port. Passengers and other categories of cargo vessels are assumed not to largely affect change in emissions considering many are more local traffic; modal or vessel types are less likely to change due to the Project, nor significant economies of scale expected. Therefore it is estimated that the incremental GHG emissions for passengers is considered as marginal and not accounted for.

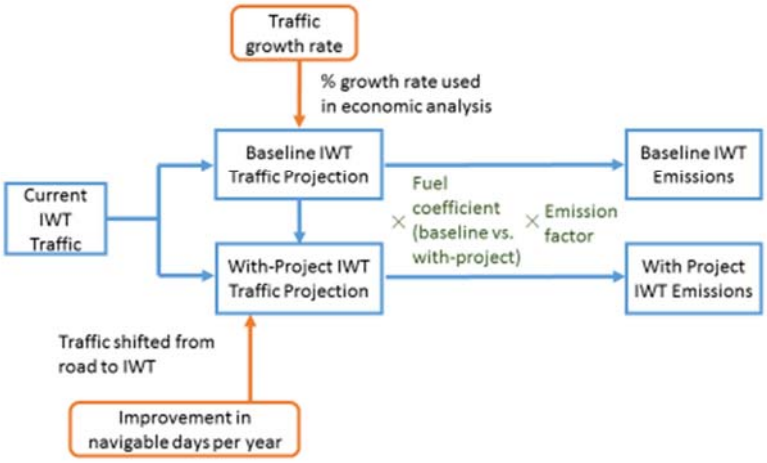
3. Baseline (for example, without project) GHG emissions projections for IWT-based ton-km, projected over the Project period, are based on annual percent traffic growth rate of 6 percent (mirroring the rate used in the Project economic analysis). Then corresponding vessel-km are calculated. Baseline vessel-km is calculated separately for containers, and bulk and general cargos through Chittagong Port. For each, vessel-km is calculated as twice of importing ton-km divide by typical ton per importing vessel, assuming same number of trips for importing and exporting. The Project-induced increase in ton-km transported via IWT is derived from the projected increase in number of annual navigable days (from 150 navigable days per year to 347 navigable days, or 95 percent availability) resulting from project activities, which will begin in year three of the Project and continue for the duration of the performance based IWT maintenance contract. Following the economic analysis projections, induced increase in traffic on IWT will achieve toward the end of the Project period, staring from Year 6. The increase in ton-km is also calculated to vessel-km as in the baseline case. The with-project annual vessel-km for container cargos equals the sum of the baseline (without-project) vessel-km plus the attracted vessel-km from the road. For bulk and generals cargos, with-project annual vessel-km is recalculated assuming larger vessel sizes to reflect economies of scale.

4. To estimate CO_2 emissions, the with-project vessel-km and baseline without-project vessel-km transported on the waterway are multiplied by a fuel coefficient (l/ km), and then multiplied by an emission factor (ton CO_2 / l). Different fuel coefficients are used for containers, and bulk and general cargos[17]. Lower fuel coefficient is used for exporting trips compared to importing trips, assuming after importing goods are unloaded, exporting vessels are emptier. Higher fuel coefficient is used in the with-project case compared to baseline for bulk and general cargos through Chittagong Port, starting from year three, to reflect the expected increase in average vessel size. According to 2006 IPCC Guidelines for National Greenhouse Gas Inventories, default CO_2 kg/TJ for Gas/ Diesel Oil is 74100. Gas oil (petro diesel) has an energy value of 36.55 MJ/l.

[17] Van Essen, H. P., Olivier B., Jos D., and Robert V.D.B. (2003). To Shift or Not to Shift, That's the Question. Delft, the Netherlands: CE Delft. Annex A and team calculation.

[18] Thus, the emission factor for diesel is 0.00271 ton CO_2/l. The net IWT emissions equal the difference between project emissions and baseline emissions. The methodology is summarized in figure 7.1 below:

Figure 7.1. GHG Emissions from IWT Mode



Road GHG Accounting

5. The length of the Dhaka-Chittagong highway is approximately 250 km. The table below shows Annual Average Daily Traffic (AADT) data for this highway in 2013, as provided by the Bangladesh Roads and Highways Department (RHD), for each type of vehicle. The resulting total annual vehicle-km (veh-km) for this highway is also shown in table 7.2.

Table 7.2. Annual Average Daily Traffic for Dhaka-Chittagong Highway

	Truck	Buses	Cars and Utilities	Auto - Rickshaw and Motor Cycle
AADT	12,874	7,736	3,105	4,721
Annual vehicle-km	1,174,745,982	705,949,107	283,311,696	430,791,250

6. In the GHG model, emissions from road traffic were calculated for each category of vehicle. All categories are included to calculate traffic speed on the road, which affect fuel consumptions and emissions for vehicles. The baseline projection for each type of road traffic was calculated using an annual traffic growth rate of 6 percent (mirroring the rate used in the Project's economic analysis).

[18] "Energy Efficiency Inland Water Transport in Bangladesh", Table 7.2

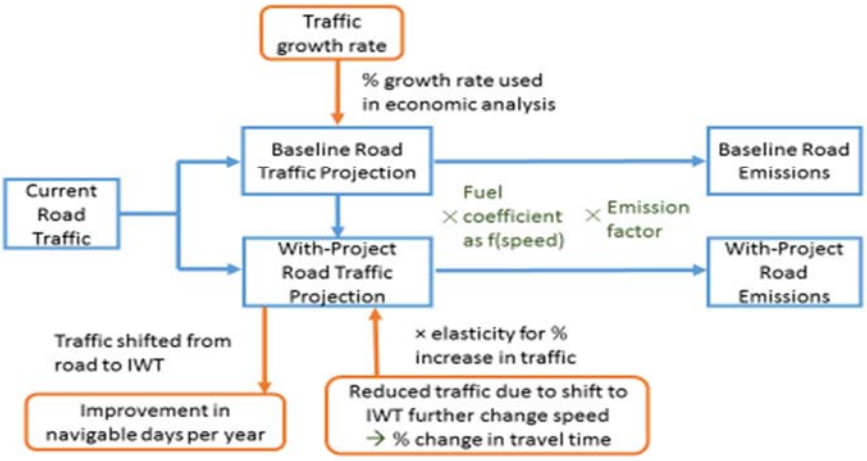
7. Baseline speed for road travel was calculated using a series of equations[19] as a function of traffic/capacity. Average traffic includes traffic from all type of vehicles. It is further assumed that the Dhaka-Chittagong Highway will be upgraded to 4 lanes before the start of the Project, thus 4-lane capacity of 4000 PCU/hr is used in the calculation.

8. The Project's effect on total veh-km along the Dhaka-Chittagong Highway were projected for each type of vehicle. The attraction of ton-km of container cargo to the IWT corridor from the road as a result of Project interventions is represented here as a reduction of ton-km of trucks, which is then converted to veh-km However, this reduction of container-based traffic is moderated by the fact that the increased speed on the road is expected to in turn attract traffic back to the road to some extent (calculated as the percent change in corresponding travel time * elasticity). For trucks, buses and cars and utilities, elasticity is estimated to be -0.57. For auto-rickshaws and motorcycles, elasticity is taken as 0, under the assumption that these transport modes cater only to local traffic, and therefore increased road speeds will not meaningfully affect their total volumes. Road speed factoring in project-induced modal shift of some traffic to the IWT corridor is then re-calculated using the same series of equations as for baseline speed. To address the fact that road-based traffic volumes are partially induced by increased speeds, the yearly average traffic is approximated by yearly baseline traffic—yearly traffic attracted by IWT + speed affected traffic from previous year. However, in the actual calculation, as the reduction of traffic by modal shift ends up as less than the increase in traffic due to baseline traffic growth, this did not lead to a further increase in speed or induced traffic.

9. To obtain net CO_2 emissions from road-based traffic, the with-project veh-km and baseline veh-km are multiplied by a fuel coefficient (l/km), and then multiplied by an emission factor (ton CO_2 / l). Unlike IWT, different fuel coefficients are used for different speeds and types of vehicles. An emission factor for diesel of 0.00271 is used for trucks, while an emission factor of 0.00162 is used for busses to consider use of both diesel and CNG, and emission factor of 0. 00143 is used for cars and utilities to consider the use of both gasoline and CNG. The net road-based emissions, or avoided emissions from road traffic due to the Project, equal the difference between project emissions and baseline emissions. The methodology for road-based emissions is summarized in figure 7.3 below.

[19] Equations taken from the STEAM model [DeCorla-Souza, P., Cohen, H., Hailing, D., and Hunt, J. (1998). Using STEAM for benefit-cost analysis of transportation alternatives. Transportation Finance, Economics and Management, 63–71.Cited in Kopp, A. (2015). GHG Analysis for Low-emission Transport. The World Bank.].

Figure 7.3. GHG Emissions from Road Mode



Net Project Emissions

10. Calculating the net project emissions, the net road and net IWT emissions calculations are combined. The values of net emissions for each mode are added together. The total net project emissions between year 3 to year 8 of the Project are estimated to be -419,203 ton CO2. Assuming maintenance activities will be continued after the Project, total net emission up to year 20 is -1,998,759 ton CO2.

Annex 8: Economic Evaluation

BANGLADESH: Regional Waterway Transport Project 1

A. Introduction

1. The main objective of improvements to the performance of trade corridors is to increase trade, either by volume or by value. Therefore, the economic evaluation of a corridor project attempts to determine whether the reductions in cost of current trade and the generation of new trade are worth the investment cost that is needed to bring them about. Even though the development objective of the Project might be expressed with regard to trade growth, the economic evaluation should also take account of the reduction in transport and logistics costs and generation of additional trade volumes. Trade includes domestic as well as international trade, so the impacts of cost reduction and volume generation of domestic trade should be included in the economic evaluation.

2. Changes in corridor costs are expected to serve as a stimulus for the reorganization of economic activity outside of the transport sector. From the change, a manufacturer could alter the source of inputs or destination of products or relocate production thereby reconfiguring the topology of their supply chains (for example, Ghani et al., 2013 for the experience in India from the development of the Golden Quadrilateral road network).[20] A retailer may centralize their operations to serve a larger market area or farmers may change their crops to a more marketable combination. In a network setting such location decisions can quickly become complex to model and require large amounts of data. In logistics data poor environments such as Bangladesh, as simple an approach is preferable to evaluate projects (an Occam's razor approach).

3. It is important also to acknowledge that corridor projects are incremental in nature. As is the case with the current project, a network (infrastructure, services, and institutions) already exists in which case an assumption is made that the Project will not necessarily be radically transformational. Under such circumstances, three objectives of the economic evaluation of a corridor project are to:

(a) optimize the design of the Project components,

(b) ensure that the package of Project components is the most appropriate in achieving the Project objectives, and

(c) ensure that the sum of the benefits of the components is worth the investment and other costs that must be incurred to achieve them.

4. The relative importance of each of these three objectives for any particular corridor project can help determine what corridor components are included in the economic evaluation and what evaluation method or methods are used to estimate the net economic benefits of the Project. Corridor projects of the type being evaluated typically include many more components than a single investment project (such as highway development project), and even more than a typical policy oriented project (such as a railway restructuring or a port reform project).

[20] Ejaz Ghani, Arti Grover Goswami, and William R. Kerr (2013) Highway to Success in India: The Impact of the Golden Quadrilateral Project for the Location and Performance of Manufacturing, World Bank Policy Research Working Paper No. 6320, Washington, DC http://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-6320

5. The evaluation of corridor improvement projects can be either for the package of investment and policy components, for each of them separately, or both. In this case, the approach taken is to evaluate the total package on interventions. There are two main reasons for opting to assess the total investment package the first being lack of data for robust analysis of the individual components and secondly there are indivisibilities, in that the various interventions are complementary and the results may not be realized as efficiently by focusing only on individual pieces. In fact, it is assumed that the benefits of the package of measures for the corridor as a whole will be greater than the sum of those of the individual components. Hence the economic evaluation of the present project tests the economic feasibility of all the components together.

B. Economic Evaluation of the Project

6. Where a corridor is already well developed and economic rigidities are not very strong cost benefit analysis can be used to assess likely impacts.[21] Cost-benefit analysis in corridor projects involves estimating the cost and time savings of implementing a proposed project rather than not implementing it. The costs savings typically include those of operating and maintaining vessels as well as reductions in the cost of deterioration and loss of goods in transit. The time savings include those related to vessel operations (such as reductions in vessel transit time) and the inventory costs of goods in transit and kept in storage to cover the risk of delays in transit and uncertainty of delivery times. Where feasible, the time savings are converted into equivalent cost savings. These cost and time savings are compared with the infrastructure and investment and maintenance costs needed to achieve them. This comparison is usually through comparing the stream of all cost and time savings and investment costs and either discounting the net annual costs to a net present value or calculating an internal rate of return for the stream of annual net costs.

Expected Project Impacts

7. The Project is expected to improve the performance and capacity of the inland waterway transport and logistics system connecting three important economic centers in Bangladesh, namely, Chittagong, Dhaka, and Ashuganj. The system is used for ferrying both passengers and goods and for the latter it handles domestic trade as well as regional and international trade flows.

8. Based on the proposed interventions to be financed by the Project there are several impacts that can be expected (table 8.1). Several of the impacts, especially those that affect time, cost and reliability of components of the system are amendable to monetization and the use of standard cost benefit analysis. However, some activities, for instance those relating to training and capacity building, and improvements in policy cannot be monetized. Consistent with the approach to evaluate the total package of interventions these activities are included in the costs even though their impact is not captured in the benefits. The benefits of the Project are therefore underestimated.

[21] World Bank (2005) TRN-19 Projects With Significant Expected Restructuring Effects, World Bank.

Table 8.1. Expected Economic Impacts

Activity	Expected Impact
Component 1: Improved Inland Water Navigability (US$261 million)	
Maintenance of fairway and provision of Navigational aids	□ Reduced costs from use of larger vessels
	□ Reduced transit times for domestic and regional traffic
	□ Improved reliability
	□ Reduced road congestion from traffic diversion
	□ Reduced GHG emissions
	□ Reduced accident costs
Shelters for vessels in adverse weather conditions	□ Reduced vessel and cargo losses during adverse weather events
Component 2: Improved Services at Selected Inland Waterway Terminals and Landing Stations (US$83 million)	
New common user general cargo terminal	□ Reduced cargo handling and transport costs □ Improved vessel utilization through reduction in delays at terminals □ Passenger time savings due to increased service frequency □ Improved convenience for passengers □ Improved safety for users (excluded from economic analysis)
Rehabilitation and modernization of the existing general terminal at Ashuganj.	
Development of a new passenger terminal at Shashanghat	
Rehabilitation of passenger terminals at Narayanganj and Chandpur, extension of existing passenger terminal at Barisal	
Upgrade of 14 Existing Landing Stations	
Component 3: Capacity Development and Sector Improvement (US$56 million)	
Seafarer Training	□ Improved safety, regulatory compliance and oversight (excluded from economic analysis)
Hydrographic Survey Improvements	
Environmental Safeguards Improvement and Sustainability including piloting innovations in vessel technology	□ Increased climate resilience and reduced GHG emissions (excluded from economic analysis) □ Reduced costs and GHG reductions from use of larger vessels and cleaner engines (excluded from economic analysis) □ Increase in utilization of IWT (excluded from economic analysis) □ Enhanced environmental performance of IWT sector (excluded from economic analysis)
Continuing Sector Improvement and Sustainability	□ Increase in utilization of IWT (excluded from economic analysis)

Estimates of the Expected Impact of the Project

9. The economic evaluation of the proposed improvements along the corridor is based on a generalized cost function for passengers and trade flows. The analysis utilizes two distinct but complementary approaches, one for expected project impact on passenger traffic and the other on trade logistics. Both are founded on well-established techniques and apply generalized cost functions to the changes in monetary and time costs to be brought about by the Project

interventions. As argued above, some of the Project interventions, such as safety improvements, are required under international best practice and are therefore not monetized. The Project evaluation therefore presents a conservative estimate of the expected impacts.

10. For purposes of evaluation the various impacts in table 8.1 can be grouped into six broad categories: (a) logistics costs impacts on shippers; (b) vessel operator costs; (c) reduced loss mitigation costs for vessel owners and shippers; (d) reduced passenger waiting costs; (e) reduced accident losses; and (f) reduced carbon footprint.

Logistics Costs

11. The economic evaluation of the Project is based on a supply chain approach which provides a convenient conceptual framework to disentangle logistics costs deriving from the sequence of cargo movements, and subsequently assess the impact of regulatory or investment measures. Supply chain modelling is one of the simple approaches to assessing the likely impact on logistics costs of changes in transport systems. Such an approach is suited to situations where reduced uncertainty in time and cost through the implementation of the corridor components is considered important. This is certainly the case here. Arvis, Raballand and Marteau (2010)[22] use a supply chain model originally proposed by Baumol and Vinod (1970) to develop a logistics costs model for a corridor. The model, which has been used on other Bank-financed trade and transport facilitation projects[23], is developed from the perspective of the shipper and seeks to determine the total logistics costs associated with the time, cost and reliability performance of a corridor. This end-user supports costs directly or through fees paid to agents providing services such as freight forwarders or transport operators.

12. The model for goods employed has been used in other Bank financed projects including the East Africa Trade and Transport Facilitation Project as well as the Nepal-India Regional Trade and Transport Project. The economic evaluation was based on target reductions in times and costs and their uncertainties and not on modeled estimates of the impact of the Project subcomponents. A quantitative supply chain model is developed identifying the impact of cost, delays and uncertainty in lead time. A shipper bears the costs of transport and logistics from/to the port and to/from warehouse or factory (of both containerized and bulk cargo).

13. Based on the model total logistics costs can be estimated as specified in table 8.2.

Table 8.2. Logistics Costs Model

Logistics costs	=		Transportation Costs		(Costs incurred by shipping firms)
		+	Moving inventory costs		(tied up capital)
		+	Delay Hedging Costs		(induced costs to hedge unreliability inventory and warehousing costs, or shift to faster more expensive mode of transportation)

14. **Moving inventory costs.** For simplicity, the evaluation was based on the following time linear formula based on the operational value of time and the mean lead time in transit:

[22] The model is describe in detail in Arvis, J. F., Raballand, G. and Marteau, J. F. 2010. The Cost of Being Landlocked: Logistics Costs and Supply Chain Reliability. Washington, DC: World Bank

[23] See for example East Africa Trade and Transport Facilitation project (PO79734) and CEMAC Trade and Transport Facilitation project.

$mobile\_inventory = m \times T_{mean} \times V$, where m is a cost per day of the mobile inventory.

15. Optimal inventory management faces constraints from:

- Supply chain unpredictability and uncertainty in shipment delivery time. That is, lead time is a random variable.

- The level of demand, whether predictable or stochastic. For the same industry, volumes are typically lower in a landlocked region as compared to the gateway region. This leads to higher inventory costs in the former.

16. Again for simplicity, the value of the optimal inventory is the sum of the classical (s,S) buffer to satisfy demand in between two shipments. The average level of the buffer is $V \times S/2$ in value, and the average cost of this buffer is $w \times V \times S/2$, where w is the cost of warehousing by unit of value and time.

17. **Hedging inventory to account for unpredictability.** Several recent studies have highlighted the importance of reliability and confidence of traders in the times and costs of transport in a corridor. To take account of these in the economic evaluation of a corridor, measurement of the variability of time and cost was included. This is easier stated than applied, since variability of time and cost do not figure in the standard measures of economic benefit of a project—net present value or internal rate of return. However, as explained above a model that has been applied in similar projects financed by IDA was adopted. The model depends on variance in lead time. A simple strategy would be based on the following parameters to determine the safety inventory level.

- A buffer to hedge delivery delays not exceeding a threshold lead time value T.

- The cost of stock-out exceeding the cost of warehousing w by a factor γ.

- A probability distribution of lead time P(t).

18. Using the above formula, estimates of the costs and cost savings for the case with and without the Project were estimated. The estimates are based on very conservative estimates of the likely impact of the Project and traffic projections. The main assumptions are the following:

- Gains resulting from implementing the Project are estimated only for delays and uncertainty related to shipments coming from or going to the Port of Chittagong. A large proportion of the traffic on the corridor to the port is related to international trade traffic flows. As such any interventions that reduce costs for imports will also reduce costs for trade in the corridor.

- Parameters for elements such as the value of time are estimated at very conservative levels, based on empirical evidence form similar projects and elsewhere in the world.

Vessel Operator Costs

19. The Project is expected to impact vessel operator costs through two main channels, namely, making it possible for them to a) introduce vessels with greater carrying capacity and therefore leading to a reduction in cost per unit of cargo carried, b) operate for more hours per day and more days per year thereby increasing fleet utilization and reducing the proportion of fixed costs per unit of cargo carried and c) increased operating speed which will increase fleet productivity. For modeling purposes operators costs are decomposed into fixed and variable costs. The costs are obtained by using the equation

$\alpha + \beta \times Dis$ = cost of operating a vessel

where α is the fixed cost, β is the variable cost per km and *Dis* is distance.

20. Costs are estimated excluding any empty running where a function Dis*λ is the average distance covered with a commercial load, and $\frac{\alpha}{\lambda \times Dis} + \frac{\beta}{\lambda}$ (1) is the cost per ton per km (ptkm) charged to the user (that is, price of service). The cost ptkm is widely used in developing countries as a reference (including in freight contracts).

21. The estimates of vessel operator cost impacts were based on the reference vessel sizes and characteristics listed in table 8.3:

Table 8.3. Estimated Vessel Operator Cost Impacts

	Without Project	**With Project**
Carrying capacity (DWT)	500	3000
Channel availability (days per year)	150	347
Average distance with load	300	300
Fixed cost per operating day (US$)	267	231
Variable cost ptkm (US$)	0.009	0.003
Total cost ptkm (US$)	0.01	0.003

Passenger Time Savings

22. In common with other transport projects, the economic benefit of the interventions to passengers will be through savings in time and greater shipping schedule reliability. Without shipping, the only other mode of transport would be road which is not as readily available for a significant proportion of the Bangladesh population. A common approach is to convert the time savings of transport improvements in monetary terms, using a determined value of time. There are different approaches to estimating the value of time some based on hourly wages in the economy and others based on surveys to determine trade-offs that users make. For this project a value of time of 96 US$ cents per hour is employed. Passenger time savings are expected to derive from lowered waiting times at terminals to be improved. The terminal will make vessel handling faster and attract more traffic thereby reducing the waiting time for all passengers.

Weather Related Loss Mitigation

23. Estimates of reduced vessel losses during adverse weather events are based on a simple model of the aggregate impact of possible catastrophic weather events. The model is based on the use of Binomial distributions, which are suited to discrete-type events. The model estimates the likely loss amount that is likely not to be exceeded under different weather assumptions. Data were

obtained from BIWTA on the number of known vessel, cargo and lives lost over the past 30 years, from which estimates were made of the probability of loss due to weather events.

Accidents

24. Accident savings are estimated for reduced accident rates arising from the shift of some road traffic to IWT. The rates are based on accident and fatality rates per hour based on historical data for Bangladesh. Following iRAP approach,[24] the value of injuries and fatalities are based on recommended rates of 70 times per capita income for fatalities and injuries at one-quarter of fatalities.

25. Through a reduction in accidents, the Project is expected to reduce the probability of pollution, including oil spills, occurring on the waterway. Such events result in pollution to soil and water bodies and costs of cleaning up. The Project can therefore be expected to reduce both the pollution effects as well as cleanup costs for agencies with that responsibility. However, as there are no good data to attempt cost estimates, these cost savings are not included in the analysis. This is consistent with the conservative approach that has been adopted.

Carbon Footprint

26. Estimates of the carbon footprint of the without and with project situations are described in Annex 7. Those estimates were monetized using prevailing rates for a ton of carbon in the cap and trade markets. Guidance within the Bank is that:

- economic analysis should be done with and without the social value of carbon ; and
- the baseline estimate of social value of carbon should start at US$30 in 2016 and increase to US$80 in real terms by 2050.

27. Based on the guidance, the following values were utilized for the monetization of the GHG emissions impact of the Project (table 8.4).

Table 8.4. Social Values of Carbon Recommended for the Bank Group in US$ per 1 Metric Ton of CO_2 Equivalent (in Real 2014 US$)

	2015	**2020**	**2030**	**2040**	**2050**
Low	15	20	30	40	50
Base	**30**	**35**	**50**	**65**	**80**
High	50	60	90	120	150

Source: Guidance note on social value of carbon in project appraisal, July 14, 2014.

Regional Traffic

28. Inland water transport offers great potential for movement of regional traffic between Bangladesh and her neighbors, especially India. Presently the inland waterway network is extensive though largely underutilized. Through the bilateral protocol on IWT the governments of

[24] Dahdah S, McMahon K (2010). *The True Cost of Road Crashes: Valuing life and the cost of a serious injury,* International Road Assessment Programme, Basingstoke, United Kingdom.

Bangladesh and India are keen to develop this mode for the cross border movement of trade. Interventions to be supported by the Project will help enhance the capacity and attractiveness of the IWT system to protocol traffic. Such traffic will benefit through time and cost savings. The impacts on such traffic were estimated using the same approach as utilized for Bangladesh international trade flows.

Assumptions

29. Several assumptions were made in implementing the model. The assumptions were kept as simple as possible, considering the paucity and generally poor quality of available data:

- There will be no major change in mode share for bulk transport services. IWT will continue to capture a large share of the market for bulk while there will be a marginal shift in containerized traffic from road to IWT.
- Projections of the volume of trade through the corridor that would be expected even if the Project were not to be implemented were estimated. A simple linear growth factor was assumed based on trends over the past several years. The same projections were made for all trade that would benefit from implementation of the Project.
- Gains resulting from implementing the project are estimated only for delays and uncertainty related to bulk shipments. IWT carries around 80 percent of the bulk shipments in Bangladesh. As such any interventions that reduce costs for bulk logistics costs will also reduce costs for all other shipments, especially those that are containerized.
- Parameters for elements such as value of time are estimated at very conservative levels, based on empirical evidence from similar projects and elsewhere in the world. A reduction in turn-round time for vessels is assumed to translate into a proportional reduction in this time. However consistent with the conservative approach and to minimize the influence of changes in vessel operator policies on empty vessel running, such savings would be additional, and therefore not included in the cost-benefit analysis.
- Changes in freight rates are not modeled due to lack of data. The main savings are therefore assumed to derive mainly from greater utilization of vessels deriving from reductions in time and uncertainties.
- A quarter of the vessel fleet will be the large size vessel following project improvements.
- Rail traffic will not play an important role in cargo movement. Even if rail shipments were to grow, it is expected that they will impact road transport volumes more than IWT. Rail will likely attract containerized cargos which are not the main target market for IWT.
- Consistent with the literature maintenance costs as a percentage of the investment costs are averaged out and assumed to be a constant rate per annum.
- Costs and prices are economic prices, including direct and indirect costs. Further, the costs are assumed to include all taxes.

Summary of Cost-Benefit Analysis

30. The economic evaluation of the proposed improvements of the IWT system within the corridor is based on a generalized cost function for trade flows and passengers. The analysis

utilizes two distinct but complementary approaches, one for expected project impact on passenger traffic and the other on trade logistics. Both are founded on well-established techniques and apply generalized cost functions to the changes in monetary and time costs to be brought about by the project interventions. Some of the project interventions, such as security and safety improvements are required under best practice standards and recommended practices and are therefore not monetized. The economic evaluation therefore presents a conservative estimate of the expected impacts of the project.

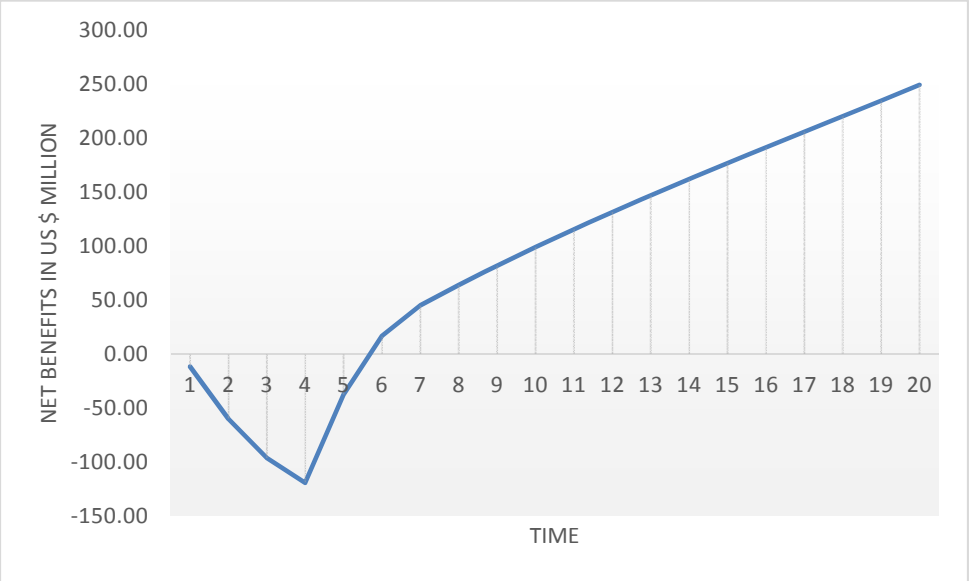
31. The generalized costs of the interventions supported by the project are based on several numerical assumptions of which the most critical are the following:

- Traffic volume between Chittagong and Dhaka — 40.86 million tons pa
- Traffic volume between Dhaka and Ashuganj — 1.83 million tons
- Traffic growth rate: percent pa for regional — 6 percent pa for Bangladesh and 5
- GHG value per ton — US$30
- Average passenger waiting time — 3 hours
- IWT share of bulk traffic — 63 percent
- IWT share of container traffic: — 2.6 percent
- Road trip time between Chittagong and Dhaka — 18 hours
- IWT time between Chittagong and Dhaka — 40 hours
- Average annual maintenance costs — US$20 million pa starting in year 9
- Expected economic life of terminals — 20 years

32. Using the cost and time and uncertainty measures related to each project component as defined by the sequence of movement of cargo along a corridor, estimates of costs and benefits were derived for the six expected impacts of the Project. The net present value of the total benefit of the Project over 20 years is estimated at approximately US$365 million (using a discount rate of 12 percent) and the EIRR of the Project is estimated at 14 percent.

33. The cumulative net benefits were estimated as the sum of the cost savings for each of the categories identified above. The net flow of benefits is shown in figure 8.5. As expected, given the initial capital investment, the flow of benefits is negative during the major works financed by the Project before they turn positive between years 5 and 6 of implementation.

Figure 8.5. Flow of Net Benefits of Project



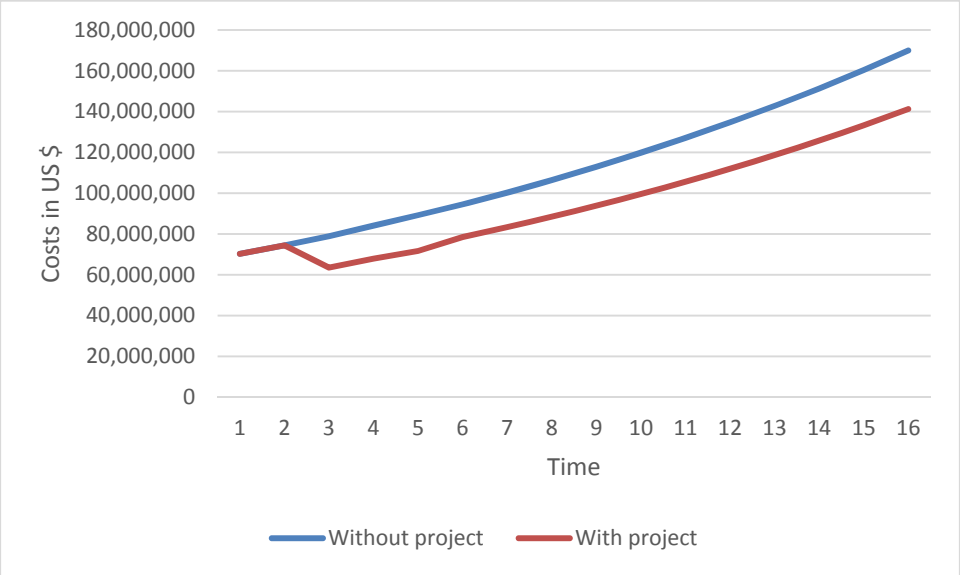
34. As argued above, the impacts can lead to reorganization of activities for specific supply chains, which in turn may feed into regional impacts within the country and the wider region served by the corridor (table 8.6).

Table 8.6. Distribution of Impacts of Corridor Improvement

Expected Impact	Estimated Value over 20 Years (US$, millions)	Proportion of Total
Logistics costs savings	242.77	47%
Operator cost savings	113.31	22%
Loss mitigation	69.73	14%
Reduction in GHG emissions	15.74	3%
Reduction in road accident costs	5.36	1%
Passenger time savings	48.56	9%
Regional traffic logistics costs savings	16.53	3%

35. While logistics and other costs on the corridor are expected to continue to increase, with economic growth and growing traffic, the Project is expected to result in a downward shift in costs during the last few years of project implementation (figure 8.7). The downward ratchet of logistics costs in the corridor occurs soon after the major works have been completed on the segment of the corridor that carries the most traffic, between Dhaka and Chittagong. The reduction in costs derives mainly from improvements in reliability as the channel becomes more consistently available.

Figure 8.7. Expected Impact of Project on Corridor Related Logistics Costs



Sensitivity Analysis

36. The various assumptions were tested on their influence on the Economic Internal Rate of Return of the Project and the results are summarized in table 8.8.

Table 8.8. Estimated EIRR for various Project scenarios

Test	Estimated EIRR
Costs increase by 5%	11%
There is no increased supply of passenger vessels	12%
Non-inclusion of GHG emissions	12%

37. In each case it is expected that these thresholds are not likely to be exceeded, due to:

(a) the use of performance based contracting where the onus is on the contractors to manage their costs,

(b) the trend in traffic growth over the past several years has been close to 10 percent;

(c) Growth in demand for passenger services will always trigger supply as most passenger services are provided by the private sector. The shipping market in Bangladesh is relatively with a thriving services sector; and

(d) There is a social costs associated with carbon emissions. Such costs are important in Bangladesh where there have been various initiatives to reduce emissions especially from transport.

38. The sensitivity analyses suggest the Project is viable within the feasible ranges of the key variables. Importantly, the models used clearly underestimate the overall benefits of the projects: they do not include the impacts of the safety improvements and the likely shortened transit passenger and cargo times due to ability to offer night operations. Were the positive impacts of these other aspects to be included then the impact of the project would be greatly enhanced.

Annex 9: Implementation Support Plan

BANGLADESH: Bangladesh Regional Waterway Transport Project 1

Strategy and Approach for Implementation Support

1. The first year will focus on: (a) completion of procurement of key contracts; (b) staffing for the Project Implementation Unit; (c) setting up systems for project implementation including project reporting templates, monitoring and evaluation formats, setting up project Designated Account and fund flow processes as well as financial management reporting templates; and, (d) getting staff trained on the Bank's procurement, financial management and safeguards systems and policies.

2. The Project has significant procurement, technical/engineering and safeguards aspects, and therefore at least one full time procurement staff will need to be dedicated to the supervision of the Project, as well as half-time of: an IWT specialist; a dredging expert, a river port expert; a social safeguards specialist; and an environmental safeguards specialist. Support from the Climate Change, Climate Finance, and Jobs CCSA teams, Trade Facilitation staff, and gender specialists will also be required during all years of project implementation.

Implementation Support Plan

3. Total resources of US$300,000–US$360,000 will be required per year to support implementation based on the following resource estimates (table 9.1):

Table 9.1 Estimated World Bank Budget-Resources Needed for Project Supervision

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First 12 months	Completion of procurement for key contracts including review of ToRs and designs, and initiation of selected works and studies Setting up FM and disbursement systems Staffing for PIU Setting up Project Implementation Unit, development of project management and M&E manual and systems	- TTL/Project Mgt - Co-TTL, country-based - Procurement - FM/ Accounting - Environmental Specialist - Social Specialist - GAAP/Citizens Engagement - Gender Expert - Trade Facilitation/ Competitiveness/ Supply Chain/ Jobs Expert - IWT Expert - Dredging Expert - Bathymetric and Hydrographic Survey Expert - River Ports Expert	US$360,000	Proposal for DFAT, DFID or other TF sources to fund time and costs of gender expert, citizen's engagement expert, trade facilitation assessments, jobs assessment
12–84 months	Review and finalization of designs Initiation of selected works and studies Contract Management	In addition to all of the above skills in Year 1, technical skills in IWT training needs and institutional development	US$300,000 per year times 7 years	Proposal for DFAT, DFID or other TF sources to fund time and costs of gender expert, citizen's engagement expert, trade

	Project Management Monitoring and evaluation Environmental and Social Safeguards Monitoring Climate Finance Assessments			facilitation assessments, PPP specialists, training and institutional development expert

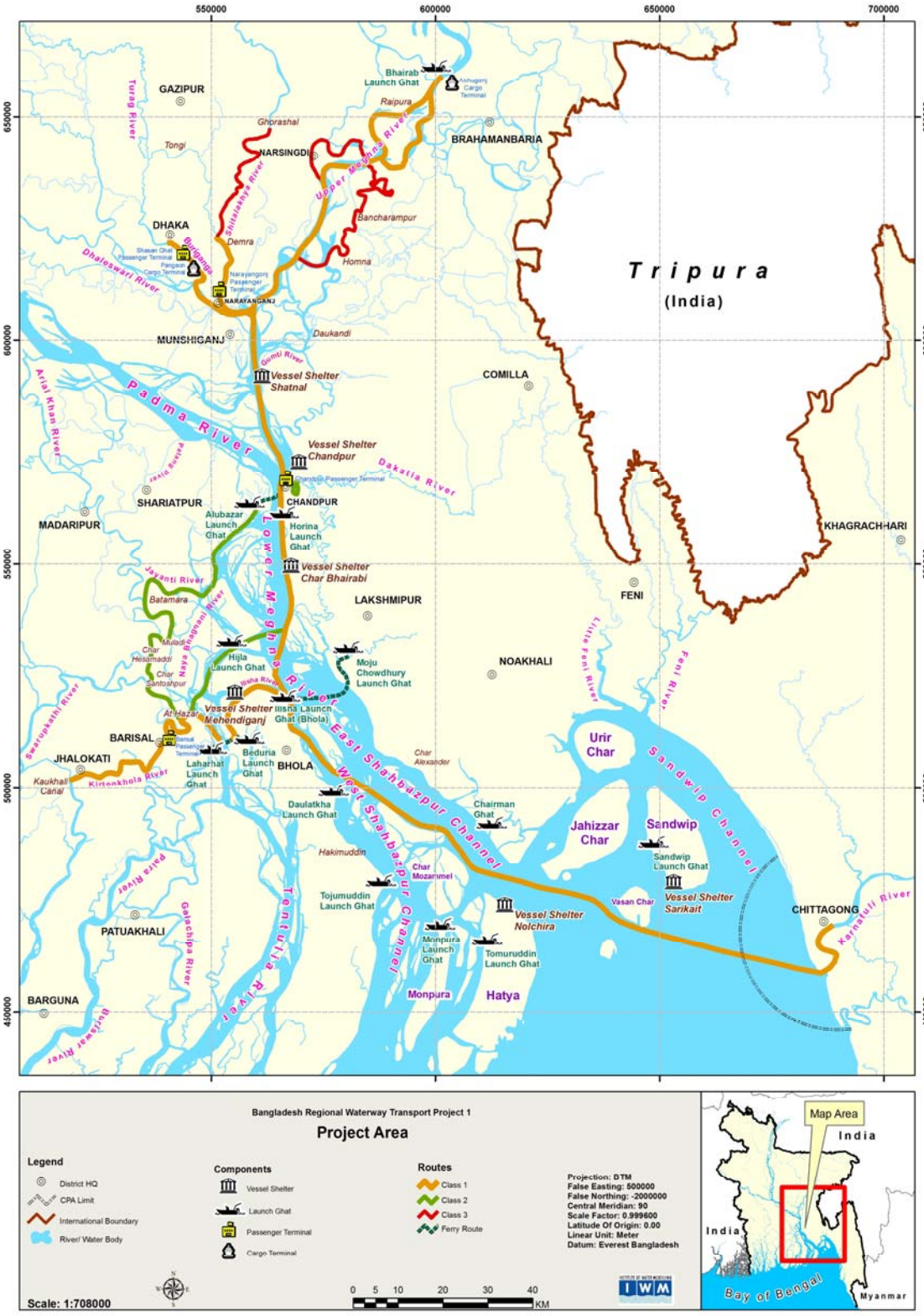
Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
TTL and Co-TTL/ Project Management	44 weeks per year	3 trips per year	Full-time split between two people
Procurement	33 weeks per year	3 trips per year	Half-time of local consultant 25 percent of staff time
FM	4 weeks per year	2 trips per year	
Environmental Safeguards	16 weeks per year	3 trips per year	Intensive monitoring for high-risk project and extensive scope
Social Safeguards	8 weeks per year	2 trips per year	
Citizens Engagement/GAAP	2 weeks per year	1 trip per year	To provide guidance on citizen's engagement and GAAP monitoring efforts
Gender Specialist	2 weeks per year	1 trip per year	To mainstream gender considerations into project, including enhancing employment opportunities, and improving conditions for women on IWT
IWT Expert	10 weeks per year	3 trips per year	Significant time required for refining survey data, refining and monitoring PBC contract
Dredging Expert	10 weeks per year	3 trips per year	
River Port Expert	10 weeks per year	3 trips per year	To review river terminal ToRs, designs, and implementation, contract management
Jobs Expert	4 weeks per year	2 trips per year	To support Jobs Assessment and Action Plan
Trade Facilitation/ Customs Expert	4 weeks per year	2 trips per year	To assess TF and Customs barriers in Logistics system

Partners

Name	Institution/Country	Role
DFAT	Australia	TF/Governance
DFID	UK	TF/Governance

Annex 10: Map


550000
600000
650000
700000
650000
600000
550000
500000
450000
GAZIPUR
Turag River
Tongi
Ghorashal
NARSINGDI
Shitalakshya River
Upper Meghna River
Raipura
Bhairab Launch Ghat
BRAHAMANBARIA
Bancharampur
Homna
DHAKA
Buriganga
Demra
Dhaleswari River
Shasan Ghat Passenger Terminal
Pangaon Cargo Terminal
Narayanganj Passenger Terminal
NARAYANGANJ
MUNSHIGANJ
Daukandi
Gumti River
Vessel Shelter Shatnal
Tripura
(India)
COMILLA
Padma River
Arial Khan River
Vessel Shelter Chandpur
Dakatia River
Meghna River
Padma River
SHARIATPUR
CHANDPUR
Chandpur Passenger Terminal
Alubazar Launch Ghat
Horina Launch Ghat
MADARIPUR
KHAGRACHHARI
Vessel Shelter Char Bhairabi
Lower Meghna River
Jayanti River
Batamara
LAKSHMIPUR
FENI
Little Feni River
Feni River
Hijla Launch Ghat
Moju Chowdhury Launch Ghat
NOAKHALI
Char Hesamaddi
Char Santoshpur
Naya Bhagnani River
Vessel Shelter Mehendiganj
Ilisha Launch Ghat (Bhola)
Ilisha River
Barisal River
BARISAL
Barisal Passenger Terminal
Laharhat Launch Ghat
Beduria Launch Ghat
BHOLA
JHALOKATI
Kirtonkhola River
Kaukhali Canal
Char Alexander
Urir Char
Sandwip Channel
Daulatkha Launch Ghat
West Shahbazpur Channel
Chairman Ghat
Jahizzar Char
Sandwip
Sandwip Launch Ghat
Hakimuddin
Char Mozammel
Tojumuddin Launch Ghat
Vessel Shelter Sarikait
Vasan Char
Vessel Shelter Nolchira
CHITTAGONG
Karnafuli River
Patra River
Tentulia River
PATUAKHALI
Gazchipa River
Monpura Launch Ghat
Tomuruddin Launch Ghat
Monpura
Hatya
BARGUNA
Baleswar River
Bangladesh Regional Waterway Transport Project 1
Project Area
Legend
District HQ
CPA Limit
International Boundary
River/ Water Body
Components
Vessel Shelter
Launch Ghat
Passenger Terminal
Cargo Terminal
Routes
Class 1
Class 2
Class 3
Ferry Route
Projection: DTM
False Easting: 500000
False Northing: -2000000
Central Meridian: 90
Scale Factor: 0.999600
Latitude Of Origin: 0.00
Linear Unit: Meter
Datum: Everest Bangladesh
Scale: 1:708000
0 5 10 20 30 40
KM
Map Area
India
India
Bay of Bengal
Myanmar