I. STRATEGIC CONTEXT

A. Country Context

1. India's growth rate in FY18/19 was 6.8 percent which is lower than 7.2 percent in FY17/18 and 8.2 percent in FY16/17. It is expected to reach 6.0 percent in FY19/20. Despite the deceleration in the last two years, India's growth rate still remains high by global standards. Although the current account deficit widened to 2.1 percent of gross domestic product (GDP) in FY18/19, robust capital inflows during the second half of the year allowed for a buildup of international reserves to US$411.9 billion at the end of the fiscal year (equivalent to 10 months of imports). Going forward, subdued import growth and benign oil prices are expected to contain the current account balance. On the fiscal side, the general government deficit is estimated to have widened to 5.9 percent of GDP in FY18/19. It is expected to consolidate to 5.7 percent in FY19/20.

2. Since the 2000s, India has made remarkable progress in reducing absolute poverty. Between FY11/12 and 2015, poverty declined from 21.6 percent to an estimated 13.4 percent at the international poverty line (2011 purchasing power parity US$1.90 per person per day), continuing the earlier trend of fast poverty reduction. Thanks to robust economic growth, more than 90 million people escaped extreme poverty and improved their living standards during this period. Despite this success, poverty remains widespread. In 2015, 176 million Indians were living in extreme poverty, while 659 million—half the population—were below the higher poverty line commonly used for lower-middle-income countries (2011 purchasing power parity US$3.20 per person per day). Implementation challenges of indirect tax reforms, stress in the rural economy, and a high youth unemployment rate in urban areas may have moderated the pace of poverty reduction since 2015.

B. Sectoral and Institutional Context

3. The proposed project is focused on improving the public passenger transport by river ferries in the state of Assam (primarily on the Brahmaputra but also on the Barak River) and the institutional capacity and framework to develop the sector. Around 31.2 million people live in Assam (census 2011), a population that grew by nearly 17 percent since 2001. GDP per capita in the state is only around two-thirds of India's average, ranking 22 among all Indian states. Most of Assam's people live and work in the Brahmaputra Valley or close to it: the river Brahmaputra (also designated as National Waterways 2) flowing east to west bisects the entire state for 891 km between the Bangladesh Border and Sadiya. It generally varies in width from around 1 to 10 km but in parts it is up to 20 km wide. It contains many inhabited islands, including Majuli Island, the world's largest inhabited river island. Flowing through the heart of the state, the Brahmaputra is a formidable physical barrier, with only five bridges along its entire length, which reflects the high costs of bridging such a river. For that reason, the river is also a vital transport asset: the majority of Assam's more than 361 ferry routes (including 106 notified routes) cross the Brahmaputra or serve its islands, providing a crucial means of transport for thousands of communities in both the urban and rural areas of the Brahmaputra Valley. In addition to the Brahmaputra, navigational facilities are also maintained on the Barak River (designated National Waterway 16), which flows through southern Assam for a stretch of 121 km before flowing into Bangladesh.

4. Of all Indian states, Assam has the largest network of navigable waterways. The Government of Assam (GoA) has taken on the challenge of modernizing the ferries sector which, though vital to the state, remains largely informal and weakly regulated. The challenge is multifaceted: it includes the governance and regulation of the sector; the standards, equipment, and amenity of many vessels; the rudimentary navigational aids currently used; and the condition of many ferry terminals that are no more than improvised moorings needing relocation with changing river conditions, often for substantial distances and to locations with poor last mile connectivity.

5. Assam is vulnerable to climate change due to its location in the Eastern Himalayan periphery and increases in temperatures will affect rainfall and monsoon patterns in the region. The state is already characterized by high rainfall and gets annual floods whose severity has risen due to adverse climatic conditions. Also, several climate models forecast that in the coming decades variability in depth of the river may further increase as a result of more variability in rains. The poor are more vulnerable to extreme climate events and the drastic climate change projections are particularly worrisome for Assam as almost 32 percent of its population lives below the poverty line.

6. Development of waterways and ferry services provides low-cost options to integrate transport networks north and south of the river compared to the construction and maintenance of flood-resilient roads and bridges across the long stretches of the Brahmaputra. Inland water transport (IWT) is also sustainable in that it provides opportunities for modal shift to low-carbon transport option for passenger as well as potential freight movements. However, the development of fixed terminals in the waterways has been challenging due to the long flood season from June to September and the subsequent dry period, which reduces and alters the river flows and navigation channels considerably. The vulnerability of the transport infrastructure to high intensity of floods every year can be extremely detrimental to the economy. There is a need for a transformational shift toward policies and institutions that enable climate-resilient investments. The GoA has constituted the Assam Climate Change Management Society in 2018 to tackle the impacts of climate change and environmental issues.

7. The ferries are used by a wide cross-section of the people of the Brahmaputra Valley despite limited ferry terminal infrastructure and the poor condition of the jetties or landing points. Surveys have identified the self-employed (30 percent) and those in employment (20 percent) as major groups of users. But students are also a large user group (16 percent) as are people not in employment (18 percent), farmers (7 percent), and vendors (4 percent). These passengers rely on ferries for many reasons. Around half of their journeys are to a place of work, 10 percent to schools or colleges, 10 percent for business purposes, 3 percent for medical needs, and the remainder for a wide range of social, recreational, and other purposes (including temple visits). Two-thirds of passengers are purely foot passengers; around 30 percent cross the river with pushbikes or motorcycles; and around 1 in 20 travels with milk, poultry, vegetables, or other traded goods. Assam's ferry services are therefore integral to connectivity, mobility, and livelihoods, doubly so because the alternative would involve long and costly journeys by road. The cost of the alternative in time and money would be prohibitive for many people, restricting their accessibility to jobs, produce markets, and social and educational opportunities.

8. The state is home to diverse cultural and ethnic groups, with the lives of many closely interlinked with the river. About 11 percent of the household heads belong to a scheduled caste, 13 percent to a scheduled tribe, and 27 percent to other disadvantaged classes. The incomes of nearly half of all ferry passengers are equivalent to just over US$1 per day.

9. About a quarter of all ferry passengers are women and girls. Women carrying marketable goods, the elderly, people with disabilities, and children find it difficult to reach the boats and ferries and load/unload their goods. The ghats (ferry terminals) have few facilities, limited seating (if any), or toilets or drinking water. Many waiting areas are overcrowded when ferries are due. Traveling on the vessels can also be uncomfortable and difficult, particularly for women, children, older people, and people with disabilities. Women considered overcrowding the main safety risk and are also fearful of accidents.[1]

10. Safety regulation also needs serious attention. Investigations into a passenger ferry accident in 2012 at Medartari in Assam's Dhubri district, which killed 40 people and injured many, revealed serious deficiencies in regulatory oversight, lack of communication systems and safety equipment, crew training deficiencies, and inadequate disaster response planning. A more recent ferry accident near Guwahati in September 2018 which led to three fatalities indicated overloading, unreliable engine, and lack of crew training to respond properly to the engine failure.

11. The GoA itself is responsible for about 89 operational ferry routes in Assam and there are 272 others overseen by the local (village) and district councils. The GoA ferry routes are managed by the Directorate of Inland Water Transport Assam (DIWTA), either directly (11 routes) or under different contract arrangements with private vessel operators (78 routes). DIWTA has a total of 171 vessels (excluding pontoons and vessels used as terminals), around 60 of which are leased to the private contractors. Traffic information is only available for the DIWTA-administered ferries. The data recorded for the DIWTA-administered ferry routes for 2017–18 indicate annual carriage of just over 9 million passengers and 43,000 tons of accompanied goods. Total passenger flow, including all ferry routes in the state, could well be more than double this estimate.

12. With World Bank support, the GoA is creating a more rigorous, tripartite institutional framework that can provide a stronger foundation for sector governance and sustain the desired sector improvements. Within this framework, the high-level sector strategy and policy will remain the responsibility of the Department of Transport. Regulatory oversight will be reformed: safety, environmental, and economic regulation (shipping, ports, dry-docking facility for inspection, repair, and maintenance) will be the responsibility of a new statutory Inland Water Transport Regulatory Authority (RA), legislation for which was passed by the Legislative Assembly in September 2018 and is under implementation.[2] The GoA's own ferry activities will be corporatized by establishing the Assam Shipping Company (ASC) to operate the government ferries and the Assam Ports Company (APC) to provide terminals and terminal services on a common-user basis to public and private ferry operators. DIWTA will continue to perform other industry-wide functions.

13. This proposed Assam Inland Water Transport Project (AIWTP) is therefore an integrated package of institutional, regulatory and physical measures that will help Assam both to improve specific ferry services and strengthen the capacity of GoA institutions to administer, regulate, and deliver better services throughout Assam. Alongside its support for the sectorwide reform program, the World Bank will finance priority investments in safety management, private and public ferry fleet improvements, and replicable terminal improvements on the major Guwahati and Majuli routes and several pilot rural routes.

[1] Mazars Consultants for World Bank.2018. "Assam Inland Waterway Sector Study on Gender and Trade in Assam."
[2] Government of Assam. Inland Water Transport Regulatory Authority Act, 2018.

14. The proposed project is focused on passenger ferry services. Only a small volume of commercial freight barging activity exists along the Brahmaputra (less than a million tons per year) and even lesser on the Barak. The Inland Waterways Authority of India (IWAI) of the Government of India (GoI), established in 1986, provides and maintains the fairway navigation[3] on national waterways.[4] The IWAI, in coordination with DIWTA, is considering augmenting commercial freight transportation on the Brahmaputra, which is a national waterway (National Waterway 2). That operation would focus on identifying key anchor commodities and heavy cargo for transport on the river and establishing an IWT system for the Northeast region as an efficient alternative mode, given the region's high dependence on the narrow Siliguri corridor for direct connectivity to other parts of India.

15. The efforts of the IWAI and the GoA are being coordinated at both the GoI and GoA level and areas of synergy are being sought. The IWAI participates in the GoA meetings on this project and the GoA participates in the GoI meetings on commercial development of National Waterway 2 and National Waterway 16. One of the key synergies between the projects is that the new Assam Inland Water Transport RA will also regulate commercial freight shipping in the state. The World Bank support for establishing the Authority in this project will therefore also benefit inland waterways freight service. This project will also seek to derive mutual benefits by synergizing with other initiatives in the region including the ongoing flood management of the Brahmaputra and its tributaries supported by the Asian Development Bank, flood protection programs by the Brahmaputra Board, and a newly formulated Technical Assistance Project requested by the Ministry of Development of the Northeast region for planning and management of water resources.

16. The Brahmaputra and the Barak are also international waterways. At the regional level, cooperation policies between India and Bangladesh envisage a crucial future trade and transport role for IWT. The two countries' bilateral protocol on international waterway transit routes (1972) was strengthened in June 2015 by the Coastal Shipping Agreement. In a recent development, Chittagong and Mongla Ports have been opened for riverine traffic from Northeast India on the Indo-Bangladesh protocol route. This agreement allows goods to move by coastal shipping from Kolkata to Chittagong Port in Bangladesh and thereafter by inland waterways (predominantly through the Brahmaputra River) or other modes to Assam and other northeastern Indian states. The two countries also agreed to seek international financing for development of year-round navigability of the protocol (waterway) routes between the two countries, as envisaged in the Bilateral Framework Agreement on Trade and Transit.

C. Relevance to Higher Level Objectives

17. The World Bank's priority objectives and operational approach are set out in the World Bank Group's Country Partnership Framework (CPF) for India (FY18-22; Report No. 126667-IN, July 25, 2018 discussed at the Board on September 20, 2018). The project targets most of the CPF's defined focus areas within the partnership objective of resource-efficient growth, with positive impacts in both rural and urban areas. Assam's ferries are an efficient mode of public transport—saving the much higher operating, time, and accident costs—compared with the alternative of much longer road journeys. Developing the

[3]The fairway is the channel occupied by vessels using the waterway and its main technical parameters are its width, least available water depth, standards of markings/lighting, and so on.

[4] The Brahmaputra is classified as National Waterway 2 under the 1985 Inland Waterway Authority of India Act, which mandates the IWAI to develop navigation infrastructure. The National Waterways Acts (2016) classified many more of India's waterways as national waterways.

basic IWT infrastructure would enable larger segment of the 31.2 million population to use the waterways. In a sprawling city such as Guwahati, service improvements would also contribute to more efficient land use and urban consolidation by allowing the city to develop on its relatively close but underdeveloped north bank instead of just sprawling further along its congested southern bank. Improving ferry services is also inclusive, crucial to some of the most disadvantaged community groups in the state for a wide range of their travel needs, and the project addresses the specific problems of women who use these services. Moreover, the project will target improvements in the resilience of waterway transport to climate change and finance equipment and systems that will permit more effective emergency management on the waterways.

18. The project uses three 'impact multipliers' identified in the CPF that will enhance its benefits and long-term sustainability. First, it is underpinned by the commitment of the GoA to strengthen the public institutions by which the IWT sector is managed: the current cumbersome and internally conflicted apparatus of state management will be replaced by the tripartite structure that will clearly separate state administration, industry regulation, and commercial operations. Second, the project engages directly with the challenges and opportunities of 'Federal India' by a program which, complementary to and coordinated with the IWAI, will have a greater impact than either the GoI or the GoA could attain on its own. Third, the project will help finance an incentive scheme to upgrade safety standards of private vessels as a 'carrot' to help private operators to transition to the more rigorous safety regulatory regime that has been enacted. While current public perceptions of the safety and reliability of private ferries are low, the new regulatory framework should lead to growing public confidence in the private sector's role as a safe and reliable ferry services provider.

19. The project will improve facilities for and give attention to the safety and security of women and girls using ferry services, where gender gaps have been identified. Implementation will also include working with women and marginalized groups to establish how to promote new employment opportunities in the IWT industry. Resilience to climate change has been built into the flexible and modular design of terminal infrastructure. Improvement of ferries will also help lessen pressures for road bridges that would tend to propagate more road-oriented and emissions-intensive transport patterns in the state.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

20. The Project Development Objectives (PDOs) are to (a) improve passenger ferry infrastructure and services in Assam and (b) improve the institutional capacity and framework for inland water transport in Assam.

21. The PDO will be measured by seven PDO indicators given below. These indicators are further detailed in Results Framework in section VI of this document.

Passenger Ferry Infrastructure and Services

- Ferry service hours available in a day - on project supported ferry routes (PDO 1)
- Percent women users of ferries during peak hours (PDO 2)
- User satisfaction (on access, safety, quality of services, facilities etc) disaggregated by gender on project supported ferry routes (PDO 3)

Institutional Capacity and Framework

- Regulation of IWT operations in Assam strengthened (PDO 4, linked to DLI[5] 1)
- Unbundling public sector operations from industry regulations (PDO 5, DLI 5)
- Enhanced IWT sector capacity on safety and modern technologies (PDO 6, linked to DLI 2)
- Establishing an emergency response system including a search and rescue unit (PDO 7, linked to DLI 3)

B. Project Components

22. **The project is supported by an Investment Project Financing (IPF) of US$88 million, which includes a financing of US$53 million based on achievement of DLIs.** The project will support ferry infrastructure and services (terminals and vessels), institutional reforms, consultancies/analytical studies, training and capacity building, goods including information and communication technology equipment, and development of software applications for safe and efficient management of the sector. Details of the components and subcomponents are provided in annex 2.

23. The project activities are organized under the following four components collectively intended to tackle the regulatory, operational, and infrastructure challenges of the sector.

Component 1: Institutional, regulatory and safety strengthening (estimated cost US$21 million)

24. This component will include the following:

a. Technical Assistance: (i) Carrying out technical assessments/studies to prepare an integrated state-wide inland water transport (IWT) strategy and investment plan, to mainstream inland water transport and promote multi-modal integration and last mile connectivity; (ii) carrying out environmental and social impact assessments in relation to inland water transport investments financed under the Project; (iii) carrying out studies on weaknesses, institutional requirements and business plans for the IWT sector, to prepare institutional reforms including basic legislation for the strengthening of Assam Inland Water Transport Regulatory Authority (“AIWTRA”) to develop and enforce safety, environmental and economic regulations for the IWT sector; (iv) unbundling shipping/ferry and terminal operations in Assam by establishing and operationalizing the Assam Shipping Company (“ASC”) and Assam Ports Company (“APC”), developing business plans therefor, and providing technical assistance/guidance during the initial years of operations; and (v) undertaking assessment on, and eventually strengthening, the institutional capacity of the

[5] Disbursement-linked indicator.

Directorate of Inland Water Transport Assam ("DIWTA") including establishing a new hydrography unit, carrying out job-mapping exercises and developing sector competencies (training and re-skilling) (US$11 million).

b. Safety Management: (i) Assessing, procuring and deploying navigations aids in the Brahmaputra and Barak rivers to allow 24-hours/night navigation services in the most trafficked routes/crossing points; and (ii) establishing a search and rescue organization, piloting an emergency response system (including developing policies and procedures, procuring equipment and setting up/supporting management and operation teams), and improving existing systems for emergency preparedness for natural disasters and climate change (US$10 million).

Component 2: Fleet safety improvements and modernization (estimated cost US$25 million)

25. This component will include the following:

a. "Jibondinga" incentive scheme: Implementing the "Jibondinga" incentive scheme retrofitting of existing vessels and/or new vessel acquisition by private boat/ferry operators through the provision of Matching Grants (US$10 million).

b. Procurement of New Vessels and Retrofitting of Existing Public Vessels: (i) Procuring approximately twenty (20) passenger ferries for ASC, with capability for carrying motorcycles and cargo, as well as providing longer haul services; (ii) retrofitting existing vessels operated by DWITA and/or ASC; and (iii) repurposing old pubic vessels for the provision of alternative (non-transport) critical public services (e.g. mobile clinics, schools, libraries, etc.) (US$15 million).

Component 3: Improvement in terminal infrastructure (estimated cost US$55 million)

26. This component will support the following:

a. Provision of Priority Terminals and Repair Facilities: Designing and constructing approximately three (3) priority mid- to large-size terminals and repair facilities in congested river crossings, as per standard modular designs for scalable infrastructure adaptable to rural and urban areas and following the "working with nature" approach (US$40 million).

b. Provision of Smaller Terminals: Designing and constructing at least four (4) small and mainly rural terminals, as per standard designs for modular and scalable infrastructure adaptable to rural and urban areas (US$15 million).

27. Component 3 will provide standard designs for modular and scalable infrastructure that can be adapted for other urban and rural ferry terminals. It also includes ancillary infrastructure such as road access, terminal buildings, and other amenities for the differently abled, women, children, old, and infirm.

Component 4: Project management support (estimated cost US$9 million)

28. This component will support implementation of the above three components and provide for costs on project preparation, implementation, coordination, and monitoring and evaluation (M&E). An important element of the component would support capacity augmentation and policy support on climate mitigation and adaptation through consultancies, knowledge events, staff training, and so on.

29. The activities supported under the component specifically include the following:

Providing support for Project implementation, coordination, monitoring and evaluation, through: (i) establishing and ensuring the operability of AIWTDS, including the provision of training, staffing, office modernization and equipment; (ii) ensuring the operability of the AIWTRA, including the provision of training, staffing, office and equipment; (iii) providing technical assistance and management support, including hiring the services of the General Consultant and the Independent Verification Agency; (iv) carrying out Project audits; and (v) setting up monitoring and evaluation systems (US$9 million).

C. Project Beneficiaries

30. The four main beneficiary groups of the project are the users of ferry services throughout the state of Assam, through better and safer services; private vessel owners through fleet modernization and upgrading of the existing fleet to better safety and service standards for operations under a strengthened regulatory regime; government employees in the institutions of the sector who will be trained to fulfill more effective and focused roles in the new institutions in industry; and the citizens of Assam who will benefit from the more efficient and effective public governance of the sector.

D. Project Financing

31. The project is supported by an IPF of US$88 million, which includes incentivizing a results-based approach guided by certain DLIs corresponding to US$53 million. An IPF-DLI operation is considered appropriate, as the PDO will require greater focus over the quality of outputs and complementary institutional reforms. The total project cost is US$110 million, of which US$88 million will be funded by IBRD and the balance US$22 million will be the counterpart contribution. The duration of this operation is five years. Table 1 provides financing by components:

Table 1. Project Cost and Financing (US$, millions)

Project Components	Project Cost	IBRD Financing	% IBRD Financing
1. Institutional, regulatory and safety strengthening	21.0	16.8	80
2. Fleet safety improvements and modernization	25.0	20.0	80
3. Improvement in terminal infrastructure	55.0	44.0	80
4. Project management support	8.8	7.0	80
Front-end fees	0.2	0.2	
Total project costs	110.0	88.0	

32. **Retroactive financing.** The GoA will be seeking retroactive financing, not exceeding US$16 million, with respect to payments made for eligible expenditures under the project on or after July 1, 2019, and till the loan signing date.

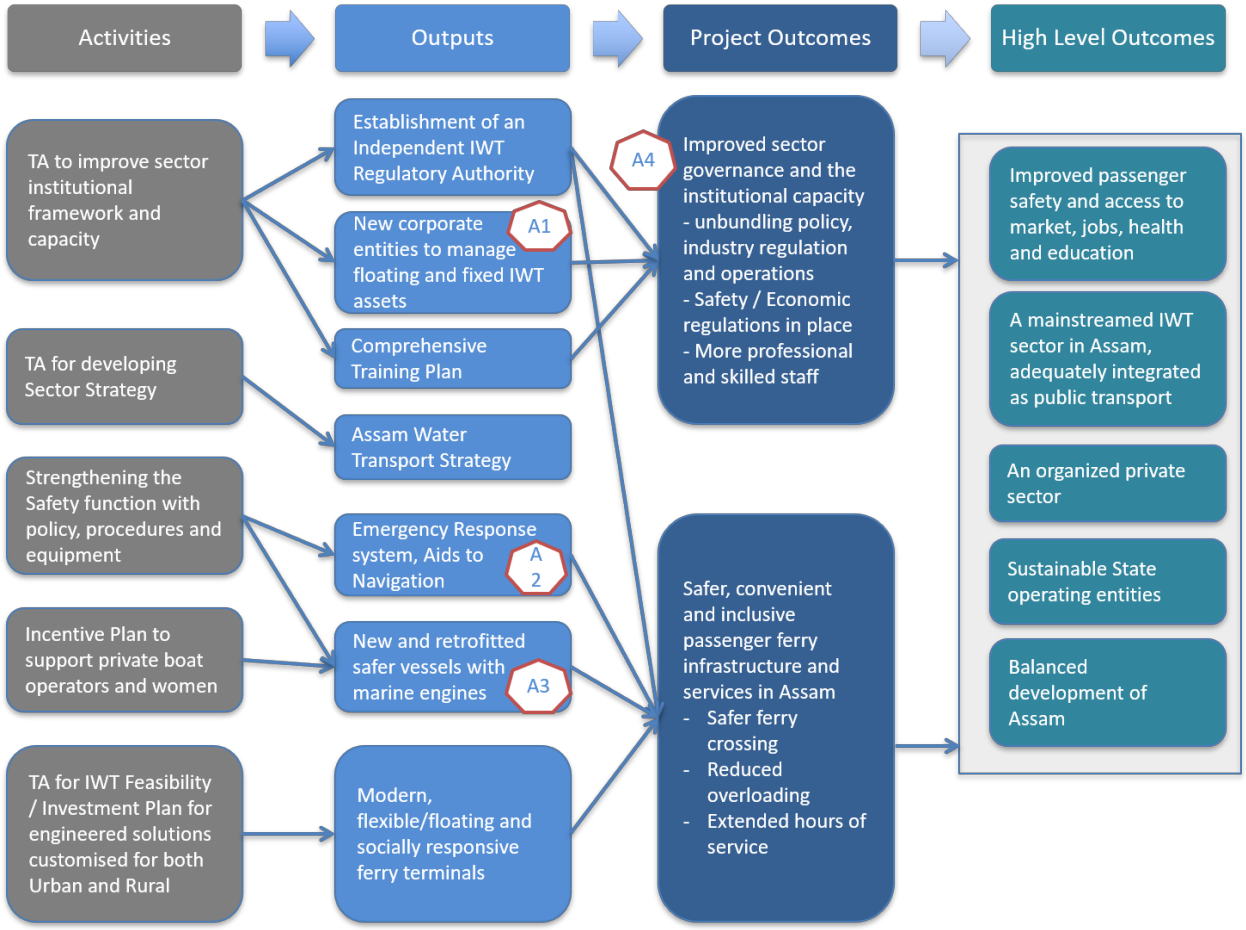
33. **DLIs.** A total of seven DLIs have been agreed which will support and incentivize achievement of desired project outputs/outcomes. These are aligned with the PDO and results indicators and will disburse upon achievement of key results; four DLIs will be measured at the PDO level while three DLIs will be measured at the level of intermediate results. In the pricing of individual DLIs, two factors have been considered: (a) the relative importance of the indicator in the entire set of indicators and (b) the need to match disbursements with cash outflows on project activities.

34. **Eligible Expenditure Program (EEP).** The EEP provides for all project-related investments (goods, works, non-consulting services, consulting services, training, and operating costs) included under the four project components mentioned earlier (detailed in annex 2). These investments broadly include (a) the cost of construction of terminal infrastructure and its operational and maintenance cost during the project lifetime; (b) incentive scheme for the private sector, retrofitting of existing vessels and procurement of new vessels including their maintenance; (c) technical assistance, institutional reforms, and sector modernization needs toward improved safety and efficiency—such as night navigation, emergency response and search and rescue, tools, equipment, software, trainings, and so on—and others; (d) operationalization of the newly established RA and the two proposed companies (ASC and APC), including salaries of staff at the RA through the life of the project and the ASC and the APC until three years after their incorporation; (e) project management support including office modernization of the AIWTDS, consultant/staff hiring and compensation at the AIWTDS, capacity on climate change and resilience, and so on

E. Results Chain

35. Figure 1 describes the results chain expected in this project.

Figure 1. Results Chain



Important Assumptions:
A1 Corporatisation of operations are fully implemented by the Govt.
A2 Adoption, training and voluntary use of technology
A3 Wider boat operator participation and enrolment in the scheme
A4 Institutional unbundling, an independent functioning Regulator and sustained capacity building efforts

Note: TA = Technical assistance.

F. Rationale for Bank Involvement and Role of Partners

36. The World Bank is supporting the state of Assam in delivering this project. The GoA's objective articulated in the new sector law is to promote "safe, efficient, reliable and environmentally sound inland waterway transport services for the benefit of ferry users, freight consigners and water tourism in the state of Assam."[6] The practical experience of countries with mature IWT industries, for example, the Netherlands, Germany, the United States, China, and Vietnam, is that governments and government administrative agencies must actively lead IWT sector development because of the geographically dispersed and fragmented structure of the industry and because of the many legitimate and competing uses of water resources. Most of the investment and maintenance costs of navigation infrastructure in

[6] *Source:* The Assam Inland Waterway Transport Regulatory Authority Bill, 2018.

these comparator countries are publicly provided and funded. Typically, only a small proportion of such costs are charged to waterway users, especially to passenger services. Passenger ferry operations are sometimes privately operated while provincial and local governments are heavily involved in developing ports often with private lessees operating terminals. The project design is based on the expectation of a similar long-term disposition of roles in Assam with public sector management of infrastructure provision and a mix of public and private sector operations in transport services.

37. The GoA seeks not only World Bank financing but also the World Bank's knowledge and experience in strengthening public sector institutions in the transport sector. The World Bank's institutional advice, experience in developing inland waterways with high-level specialist technical inputs, and material support are crucial for the GoA. Although DIWTA has about 4,000 staff, it has limited policy analysis capability, no marine engineers, and only one qualified mechanical engineer in its structure. The project would address these challenges and help ensure that the direct impacts of IWT infrastructure and services on the environment do not detract from the overall environmental merits of IWT as a transport mode in terms of energy efficiency, greenhouse gas (GHG) emissions, land take, and other impacts.

G. Lessons Learned and Reflected in the Project Design

38. Given that IWT in India is being revived, it needs specialized knowledge to address the challenges and realize the potential benefits the mode has to offer. Most waterways need investments in and maintenance of reliable channels, supported with navigation aids, provision of suitable vessels, and landing facilities to make IWT an efficient alternative and/or complementary transport mode to roads and railways. The sector's multimodal potential requires wider understanding of logistics, intermodal connectivity (first/last mile) requirements, the right institutions for sound governance, and so on. The project has built these considerations into its preparation and design. Another important lesson has been the need to explore and develop solutions that reflect the physical characteristics and utilization of the Brahmaputra. The scale and type of ferry use and the operating conditions (river behavior, bank stability, and so on) require a flexible and modular approach to terminal design, with simpler local solutions encouraged for rural areas.

39. The project has drawn on international best practices such as (a) the 'working with nature' - a concept developed for IWT infrastructure construction/management by the European Union (EU) and (b) the unbundling/separation of infrastructure development, regulation, and operations, which is a principle applied in IWT sector management in the United States, EU, China, and Vietnam.

40. The project also benefits from the World Bank's recent experiences in implementing other inland waterways projects within the country (National Waterway 1: Ganga-Bhagirathi-Hoogly River system) and outside (especially Bangladesh). In particular, the ongoing capacity augmentation of the National Waterway 1 has helped assess the right resources and the baseline techno-commercial and institutional assessments needed for project design. Important lessons, such as 'working with nature' that aims to design waterways infrastructure that is least intrusive and flexible in aligning itself to the character of the Brahmaputra, have influenced the project design philosophy. Similarly, 'safety' remains at the core of the project through incorporation of better aids to navigation, improved vessel configuration, terminal infrastructure, staff training, emergency response system, and new regulatory institutions.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

41. The counterpart administration is the Transport Department, GoA. The project has led to the establishment of the AIWTDS under the Transport Department, GoA, to implement the project. The newly formed AIWTDS acts as the Project Management Unit (PMU), which is headed by a State Project Director (SPD) not below the rank of the Secretary, Transport Department, GoA, while the Director, IWTA, acts as the Additional State Project Director (ASPD). The SPD is responsible for overall project control and delivery, while the ASPD supports the SPD in providing day-to-day administrative guidance to the project. The society is supported by professionals in procurement, financial management (FM), transport and logistics, social development, environment safeguards, and so on. A professional consulting firm appointed as General Consultant (GC) to assist the AIWTDS provides day-to-day functional support. Corporate oversight and management of the AIWTDS is provided by a Project Guidance Council (PGC) headed by the Chief Secretary, GoA, as the President and a Governing Body (GB) headed by the seniormost Secretary of the Transport Department as the Chairman.

42. The GC would continue to provide functional support as the project enters the implementation phase when closer ground-level monitoring is needed. A technical services and supervision consultant (TSSC) will be hired to assist with technical design review, construction supervision, quality control, and monitoring of terminal works under the project components. They will work together with the divisional offices proposed to be designated as Project Implementation Units (PIUs) to provide implementation and project management support in the execution of the civil works and installation of key equipment. The PIUs are not expected to manage any funds and will thereby have no fiduciary function in the project.

B. Monitoring and Evaluation

43. The Results Framework provided in section VI will be the main tool for monitoring the outcome and intermediate outcome indicators of the project.

44. The AIWTDS will be responsible for collecting and reporting the M&E framework through quarterly reports. The AIWTDS will also provide a comprehensive midterm report highlighting implementation progress, challenges in achieving the PDO indicators, and mitigation measures. The society will also provide the data for the World Bank to prepare the project's Implementation Completion and Results Report and the Government's assessment of the project.

45. The SPD and the ASPD will be accountable for results M&E. The Chairman of the GB will be responsible for overall project results.

C. Sustainability

46. To be sustainable, the project will need to be socially, environmentally, and financially robust. Social sustainability is at the heart of the project. The PDOs are designed to ensure that the millions of Assamese people who depend on passenger ferry services for work, trade, educational and social interactions have a ferry transport sector that is better administered and regulated, safer for passengers

and crews, and offers higher-quality services. Environmental sustainability has also been built into project design in terms of the higher environmental performance of new vessels, the retrofitting of existing vessels with newer and less-polluting engines under the planned incentive scheme, and design of ferry terminals in an environmentally sensitive way that reduces dredging requirements. More broadly, promoting ferry use instead of road transport substantially reduces energy use and emissions associated with much longer road transport routes and will reduce the pressure on the government to build new bridges which would be both expensive and would also divert traffic to higher-carbon road-based modes.

47. Financial sustainability is subject to greater uncertainty because many of the public ferry services are loss making at existing fare levels and it is likely to take some years until the new RA is able to attain a tariff regulation regime that is both neutral—between public and private operators—and affordable to users and the government. The planned corporatization of public ferry and ports operations will create transparency of commercial performance of ferry services, which is currently concealed within the overall administrative budget of DIWTA and therefore inextricably mixed up with the costs of its numerous nonoperating functions. Therefore, the planned institutional reforms will provide the enabling framework for gradually improving financial sustainability.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

48. The primitive and largely makeshift ferry infrastructure and services across the state are evidence of decades of administrative laxity and underfunding. The untamed character of the Brahmaputra River also makes the provision of fixed infrastructure technically challenging. The Brahmaputra is a braided river system characterized by high sediment delivery and low throughput, highly sensitive to rapid geometry (boundary and channel) changes, channel baring, and flooding. On average about 8–10 km wide, the river widens to 18–20 km in places, occupying a large part of the valley floor. The high water velocities (upwards of 2.5 m/sec on average) and sharp depth variations, with dramatic channel shifts and excessive bank line recession, make all-year navigation extremely difficult. In case of the Barak, Silchar is the main town and the water level variation there is more than 10 m.

49. The project is improving the existing passenger ferry market in Assam through better and technically designed terminals and energy-efficient vessels (both new and retrofitted) and is making these sustainable through a more responsive institutional framework. The infrastructure investments do not envisage any disruption to the water balance, large-scale dredging activity, or land acquisition.

50. The project would improve the landside infrastructure as well as the vessel fleet and navigation aids. They will be innovatively designed and engineered to provide better-quality service to users with least disruption to nature. The investments are planned and prioritized under an integrated strategic development plan (ISDP) for the state, aiming to mainstream IWT as a mode of transport in Assam that is attractive and suited to a much wider user base.

51. Certain priority ferry routes (in Guwahati and Dibrugarh) have been identified for investments under the project. In doing so, the project draws guidance from ‘working with nature’ principles that aim to design new infrastructure or rehabilitate existing infrastructure in a way that works with natural river

processes. The focus is to design and develop infrastructure in a way that is modular and scalable, limiting the need for fixed structures or substantial acquisition of land or heavy capital dredging.

52. **Social informed design.** The terminal facilities will include separate passenger waiting areas (with necessary amenities) for men and women and allow access for pedestrians and differently abled people. The design considers passenger-associated cargo including vendor carts, two-wheelers (bicycles and motor-scooter), and personal belongings. To improve safety, there will be separate lanes for passengers and motorized traffic entering and exiting the terminal, gradient/inclination of the access bridges or causeways design to international safety standards, and medical emergency response systems.

53. **Environmental considerations.** To reduce dredging requirements, the ferry terminals will be developed in the river where water levels provide better depths for berthing of vessels round the year. This approach is expected to significantly reduce costs and delays attributed to constant changes in river morphology.

54. Terminals are planned with waste management facilities so that no solid waste or sewage is released into the river. All sewage generated at the terminals shall be routed to a package treatment plant. Similarly, solid waste arising from the terminal operation shall satisfy statutory provisions. More specifically, waste management will follow the Environment Impact Assessment (EIA) recommendations.

55. The project will support more landings (mostly smaller rural ghats) that will be selected by the GoA based on the strategic development plan and identification of upgrading needs.

56. **Safety.** Navigational aids on the banks or in the water (buoys and markers) are virtually nonexistent at present. Alongside terminal infrastructure, the Guwahati and Dibrugarh (Majuli) ferry corridors will be taken up initially for installing navigation aid facilities. Fixed terminal lights and level markers at the berth and navigational aids to mark fairways for ferries from and to the ghats are being considered. A new state-level RA for IWT is already established under the project, and rules for safe and sustainable operations and management of the IWT system are being drafted. The enforcement of regulations is aimed to transform the operating scenario where only registered vessels are approved for deployment on the ferry services.

57. The existing vessels of DIWTA and the private ferry operators registered with DIWTA are being modernized and upgraded to minimum safety standards through project interventions and incentive schemes. Procurement of bigger and faster vessels for deployment on high traffic routes and specialized fleet of search and rescue vessels for emergency response services are also being mobilized under the project

Economic Appraisal

58. The project will generate direct transport economic benefits in the form of improved services to existing ferry users, benefits from generation of ferry trips (including fewer road trips and savings in their resource costs), time savings from the shorter river crossings along the Brahmaputra where there are only five bridges to commute across the banks, connectivity for largely rural communities in the upper reaches of the river, and possible benefits in vessel operating efficiency. Climate change resilience outcomes will arise from more efficiently designed modular and floating terminals as well as by relieving the pressure to

build new road bridges that would have encouraged a more carbon-intensive transport system. Tertiary benefits include stimulating local economic activity and production in the form of flow-through benefits of boosting shared prosperity by creating more jobs associated with cross-river trade, more livelihood opportunities with improved and more reliable connectivity, increased incomes for farmers and riparian communities, and reduced poverty.

59. The project investments are supporting the sector to make a step-change transition to sustainably superior and safer standards. The economic analysis captures some of the direct benefits from the main fixed investments in ferry infrastructure that are proposed on the identified priority ferry routes between North and South Guwahati and the Aphalamukh-Neamati route serving the Majuli River Island.

60. The economic internal rate of return (EIRR) of the investments is estimated to be 18.9 percent in real terms. Since the benefits of the Brahmaputra River ferries are so valuable to users, the results are robust but differ by location. In the case of Guwahati ferry routes, the average benefit to passengers is lower than on the Majuli route because the alternative road route through the Saraighat Bridge in Guwahati is shorter than at Majuli (which is accessed by a road bridge on the north of the island). This, therefore, results in a higher economic return (of about 24 percent) in the case of Aphalamukh (Majuli). However, the volume of passengers using Guwahati ferries is such that, even with a lower average user benefit, the EIRR of investments at Guwahati alone is estimated to be 11.7 percent. The benefits of improved urban amenity, encouragement of lower-cost land use development on the north bank, and contribution to tourism will be additional to the direct transport benefits measured.

Climate Change

61. River terminals and waterway infrastructure are highly susceptible to climate change given the flood season every year when the water levels rise about 10 m. According to the National Disaster Management Authority of India, riverine flooding is the most critical climate-related hazard in India and floods affect an average area of around 7.5 million ha per year. In major flood years, the area of Assam affected could be more than 4 million ha. Components 1 and 4 focus on creating an enabling policy environment and developing the institutional capability to mainstream climate action within the state. Also, the design of the water transport infrastructure under Components 2 and 3 incorporates resilience parameters to better cope with increased precipitation and flooding. Climate-smart engineering solutions will be applied, including modular floating designs for ferry access points at the passenger terminals. The project will include fleet modernization of the vessels with higher power marine engines with sufficient speed to safely navigate the higher velocity current during the flood season. The safety management system and terminal/vessel operating systems will incorporate climate considerations.

62. As the quality of the IWT services improves, more passengers are expected to use waterways, particularly for the shorter cross-river traffic. The project will thus remove critical transport bottlenecks through modal shift options and reduce the pressure on the government to build new bridges and roads. The diversion of traffic from usually longer and high-carbon road transport to the waterways would also contribute to per trip reduction in GHG emissions.

B. Fiduciary

(i) Financial Management

63. The project has acceptable FM arrangements to account for and report on project expenditures including (a) use of funds in an efficient and economical manner for the purposes intended, (b) preparation of accurate and reliable periodic financial reports, and (c) acceptable audit/assurance arrangements. The FM arrangements for the project are reliant on the use of country fiduciary systems to the extent feasible.

64. **FM staffing and training.** The FM responsibilities for the project will vest with the AIWTDS. The finance function in the AIWTDS will be under the SPD. A Finance Specialist with adequate experience has been engaged in the society and will be responsible for ensuring agreed FM and accounting arrangements under this project. The society is implementing a World Bank-financed project for the first time; adequate training on World Bank procedures will be provided to the staff.

65. **Planning and budgeting.** The GoA is committed to the project and there is no significant risk of noncommitment of funds to the project. Budget estimates will be prepared by the AIWTDS on the basis of annual work plans approved by the GB and will be submitted to the GoA's Transport Department for transmission to the GoA's Finance Department to include in the GoA's annual budget under a separate budget head. Adequate budget provisions of INR 400 million (FY17/18), INR 500 million (FY18/19), and INR 1,000 million (FY19/20) have been made during the life of the project preparation facility (PPF) and for the follow-on operation.

66. **Flow of funds.** The AIWTDS has opened a separate bank account exclusively for project-related activities. The World Bank loan will be available to the GoA in accordance with standard arrangements between the GoI and the states. The budgeted funds for the project will be routed through the GoA's State Treasury into the project bank account periodically on a need basis. All project-related payments will be centralized in the AIWTDS and funds for imprest or advances for specific activities may be provided on a need basis.

67. **Internal control, rules, and regulations**. The AIWTDS's internal control and administrative procedures are laid out in its rules and regulations (bylaws) and these will apply to the project transactions. These include the procedures for budgeting, financial delegation, internal controls, reporting and record keeping, and audit. Further, project arrangements also include regular internal audit (IA), which will review transactions and processes on a sample basis. A private chartered accountant firm will be appointed for this function—the qualification and terms of reference (ToR) for the IA will be agreed with the World Bank.

68. **Accounting.** The AIWTDS will serve as the only accounting center for the project and accounting will be on cash basis in an off-the-shelf accounting package. The AIWTDS shall maintain proper accounts of the project based on generally accepted accounting standards and principles. Bank account reconciliation will be an essential control mechanism. Records, along with supporting documents/vouchers, will be kept at the AIWTDS.

69. **Financial reporting**. The AIWTDS will prepare quarterly unaudited interim financial reports (IFRs) based on these accounting records, reflecting the actual expenditures under the EEP to support the DLIs achieved by the project (see disbursement arrangements agreed against the DLIs in the following paragraph). The IFRs will be submitted to the World Bank within 45 days from the close of the quarter and will include a list of payments against contracts that are subject to the World Bank's prior review. Additionally, the AIWTDS will also prepare the annual financial statements (AFSs) of the society, including separate disclosure for the project's transactions, a statement of receipts and payments, and a statement of expenditure.

70. **Disbursement arrangements**. The applicable disbursement method will be 'reimbursement' of eligible expenditures. Disbursement will be made as follows:

(a) An initial amount of US$33,630,000 (provided for in Category 1 in the disbursement table of the Loan Agreement) will be disbursed pursuant to regular IPF procedures on the basis of expenditures reported in the quarterly unaudited IFRs. The legal documents provide that this category be fully withdrawn as a precondition of the borrower accessing the funds under Category 2.

(b) Access to the remaining fund of the loan (that is, US$53,000,000 provided for under Category 2 of the disbursement table) will be contingent on the achievement of results/DLIs (that is, will be disbursed pursuant to a result-based financing approach). The disbursements will be subject to (i) the achievement of disbursement-linked results (DLRs) corresponding to one of the seven DLIs, as duly verified by the World Bank or the independent verification agency (IVA) according to the agreed verification protocol, and (ii) the incurrence of eligible expenditures to be reimbursed. The basic principles governing the DLI-based component are as follows:

(i) The project will submit reports showing the status of achievement of DLIs. This will be verified, where appropriate, by an IVA to be appointed by the project according to the ToR agreed with the World Bank.

(ii) On validation of DLIs achieved, the project will seek reimbursement from the World Bank for an amount equivalent to the lesser amount of DLI value achieved or the eligible expenditures incurred and to be reimbursed. Where the reported eligible expenditures are less than the aggregate DLI value achieved by the project, disbursement by the World Bank will be limited to the value of the reported eligible expenditures. The balance DLI value will be reimbursed when enough additional eligible expenditures are subsequently reported.

(iii) All DLRs are considered to be 'floating' (as opposed to 'time bound'), which means that DLRs can be achieved and verified at any point throughout project implementation.

(iv) In case the audited eligible expenditure are less than the reported expenditures, the difference will be, at the discretion of the World Bank, either refunded to the World Bank or adjusted against disbursement of subsequent DLRs.

71. **Disbursement schedule.** Loan funds will be disbursed against the following categories subject to the allocated amount, reported eligible expenditure, and the disbursement percentage as indicated in table 2.

Table 2. Disbursement Categories

Category	Amount of the Loan Allocated (expressed in US$)	Percentage of Expenditures to be financed (inclusive of taxes)
(1) Goods, works, non-consulting services, and consulting services; training and workshops; incremental operating costs; and matching grants under the project; as well as salaries, fees, honoraria, bonuses, and any other salary supplements of (a) AIWTDS' and AIWTRA's staff and (b) ASC's and APC's staff during the first three years since incorporation	33,630,000	80%
(2) Goods, works, non-consulting services, and consulting services; training and workshops; incremental operating costs; and matching grants under the project; as well as salaries, fees, honoraria, bonuses, and any other salary supplements of (a) AIWTDS' and AIWTRA's staff and (b) ASC's and APC's staff during the first three years since incorporation	53,000,000	80%
(3) Refund of the preparation advance	1,150,000	Amount payable pursuant to Section 2.07 (a) of the General Conditions
(4) Front-end fee	220,000	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions
(5) Interest rate cap or interest rate collar premium	0	Amount due pursuant to Section 4.05 (c) of the General Conditions
Total Amount	**88,000,000**	

Note: AIWTRA = Assam Inland Water Transport Regulatory Authority.

72. **Statutory audit.** The AFS of the AIWTDS, including separate disclosure of project transactions, will be audited by an independent, private audit firm appointed by the GB based on a ToR agreed with the World Bank. Audit report for the project will be submitted by the AIWTDS to the World Bank within nine months from close of the financial year, that is, December 31. The annual audit reports and audited project financial statements will be disclosed on the GoA and World Bank websites.

73. **PPF.** The PPF was approved for US$2.4 million, of which approximately 47.8 percent (US$1.15 million) has been used until September 30, 2019. As per the World Bank's guidelines, the PPF will be refinanced from the follow-on operation. An audit report of the expenditures incurred during the PPF will be submitted to the World Bank along with the first year's audit report of the follow-on operation.

74. **Implementation support**. As implementation progresses, it will involve review of financial and audit reports. In the initial years, the project staff may require support/training on project FM and disbursement processes/procedures and guidance on contract management. The World Bank will undertake at least semiannual implementation support missions (ISMs) to ensure that agreed FM arrangements are appropriately followed.

(ii) Procurement

75. Procurement for the project will be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers dated July 2016, revised November 2017 and August 2018, and the provisions stipulated in the Legal Agreement. The project would be subject to the World Bank's Anticorruption Guidelines, dated October 15, 2006, and revised in January 2011 and July 2016. Unless otherwise agreed with the World Bank, the World Bank's Standard Procurement Documents, Requests for Proposals, and Forms of Consultant Contract will be used.

76. The AIWTDS has prepared a project procurement strategy for development (PPSD). The strategy presents a view on complex and large procurement contracts, assesses market and implementation risks, and proposes mitigations for the smooth implementation of procurement under the project. The key contracts that present a potential market risk are (a) the construction of the ferry terminals, (b) procurement of vessels, and (c) procurement of night navigation equipment. The PPSD has reviewed the market conditions for these packages and proposed market approaches to mitigate these risks. A Procurement Plan has been prepared and agreed that will set methods and approaches for procurement under the project.

77. **Procurement Plan.** The AIWTDS has developed a Procurement Plan for procurements planned for the first 18 months of the project. The Procurement Plans are updated on the online system for Systematic Tracking of Exchanges in Procurement (STEP). The AIWTDS staff have been trained by the World Bank in use of STEP.

78. **Procurement capacity.** Procurement under the project would be implemented by the AIWTDS. This is the first World Bank-funded project to be handled by the society. A few AIWTDS staff have undergone training on World Bank procurement procedures. A procurement specialist has been engaged in the AIWTDS and will be responsible for ensuring agreed procurement arrangement under the project. Additionally, a professional consulting firm, appointed as the GC to assist the AIWTDS, provides day-to-day procurement and functional support.

79. **Procurement risk assessment and mitigation (PRAMS).** As part of the project preparation process, an assessment of procurement capacity of the implementing entity was conducted using PRAMS and, accordingly, risk mitigation measures have been proposed.

80. **Risks and mitigation measures.** The main areas of potential procurement risks are delays in procurement and contract management process, external interference in the procurement process, poor participation of bidders in bidding process, and lack of satisfactory complaint handling system. Based on discussions held with the implementing agencies, the risk mitigation measures are (a) use of skilled procurement staff for handling procurement activities; (b) monitoring through Procurement Plan; (c) training and hand-holding provided by the World Bank; (d) prior and post reviews by the World Bank; (e)

use of e-procurement; (f) measures to improve competition such as broad technical specifications; realistic post qualification criteria, appropriate contract packaging; (g) disclosure of procurement-related information; and (h) appropriate handling of complaints. The risk rating has been decided based on the risk factors and mitigation measures and the overall procurement risk rating for the project is determined as 'Moderate'. Procurement risk and the progress on various mitigation measures will be reassessed during the implementation phase and risk rating will be done accordingly.

Table 3. Procurement Types and Financial Threshold

Type of Procurement	Method Threshold (US$, millions)	Prior Review Threshold
Works	Open International > 40 Open National < 40 National Request for Quotation < 0.1	All contracts more than US$15 million equivalent
Goods, IT, and non-consulting services	Open International > 3 Open National < 3 National Request for Quotation < 0.1	All contracts more than US$4 million equivalent
Consulting firms	Selection Based on Consultants' Qualifications = 0.3 Least Cost Selection and Fixed Budget Selection - in justified cases Quality- and Cost-based Selection and Quality-based Selection - in all other packages	All contracts more than US$2 million equivalent
Consulting - individuals	No threshold	All contracts more than US$400,000 equivalent
Direct selection	No threshold	With prior agreement based on justification • For goods/works/non-consulting services: As per paragraphs 6.8–6.10 of the Procurement Regulations. • For consultants: As per paragraphs 7.13–7.15 of the Procurement Regulations.
Short list of national consultants	Up to US$800,000	As per paragraph 7.25 of the Procurement Regulations

81. The above thresholds are for the initial 18-month implementation period. Based on the procurement performance of the project, these thresholds may be subsequently modified. Even for post review cases, the inputs of World Bank on technical specifications/ToRs will be obtained by the project.

82. In the case of contracts subject to prior review, the implementing agency shall seek the World Bank's 'no objection' before granting/agreeing to (a) an extension of the stipulated time for performance of a contract that either increases the contract price or has an impact on the planned completion of the project; (b) any substantial modification of the scope of works, goods, non-consulting services or consulting services and other significant changes to the terms and conditions of the contract; (c) any variation order or amendment (except in cases of extreme urgency) which singly or combined with all variation orders or amendments previously issued increase the original contract amount by more than 15 percent; and (d) the proposed termination of the contract.

83. **E-procurement system.** The e-procurement system of the GoA, which is an National Informatics Centre developed e-procurement portal (http://assamtenders.gov.in), shall be used, wherever possible, for all goods and civil works procurements (national competitive biddings as well as international competitive biddings) under the project using agreed Standard Procurement Documents. For procurement of consultancy services, the use of e-procurement shall be subject to the World Bank's approval based on capacity building on e-procurement.

84. **National procurement procedures.** The national competitive bidding method for procurement of goods and works as per the above value thresholds will be conducted in accordance with paragraphs 5.3–5.6 of the Procurement Regulations.

85. **Complaint handling mechanism.** To address procurement complaints received by the proposed project, the borrower will implement a complaint handling mechanism. The AIWTDS is required to ensure recording of procurement-related complaints in the STEP system. Both the World Bank and borrowers will use STEP to track complaints. The borrower will be responsible for performing the following actions in STEP: (a) promptly record all complaints relating to procurement process in IPF operations; (b) for procurement process complaints received on contracts subject to the World Bank's prior review, submit the borrower's proposed response to each complaint before issuing it to the complainant(s); (c) record the borrower's response to the procurement process complaints upon issuance to the complainant(s); and (d) promptly register requests for debriefings and update STEP with the record of the debriefings to interested parties.

86. **Record keeping.** The AIWTDS will retain all records pertaining to award of tenders, including bid notification, bid opening minutes, bid evaluation reports, and all correspondence pertaining to bid evaluation, communication exchanged with the World Bank and the bidders/consultants in the process, bid securities, and approval of invitation/evaluation of bids.

87. **Oversight and monitoring by the World Bank.** All contracts not covered under prior review by the World Bank will be subject to post review during ISMs and/or special post review missions, including missions by consultants hired by the World Bank. To avoid doubts, the World Bank may conduct, at any time, independent procurement reviews of all the contracts financed under the loan.

88. **Frequency of procurement supervision.** The World Bank will normally carry out ISMs, including review and support on procurement, on a semiannual basis. Mission frequency may be increased or decreased based on the procurement performance of the project.

C. Safeguards

(i) Environmental Safeguards

89. IWT is generally environmentally benign compared to other modes of transport with respect to GHG emissions per unit moved, but some issues such as water quality, aquatic and terrestrial ecology along the route and close to onshore facilities, soil quality and material extraction, as well as local drainage and noise and vibration, especially during construction period, may need to be managed properly. In addition, safety issues also assume significance—for passengers and public as well as for construction workers and crew during operations. Since the project will support improved vessels, including early

retirement of unsafe ones, safety aspects during operation are mainstreamed into the project design. By deploying improved vessels and retiring older polluting ones, the project also endeavors to address concerns around operation phase pollution. The 'working with nature' approach adopted for the project design has meant little proposed modification to the watercourse for project activities. However, negative impacts could occur during both construction and operation stages given that project activities will be undertaken on land and waterside to improve transportation facilities. In light of potential impacts, in the context of the sensitive water environment-related impacts, the project has been classified as Category A. The following operational policies have been triggered for the project: Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), and Physical Cultural Resources (OP 4.11).

90. The project has triggered the Environmental Assessment (OP 4.01) policy to analyze the potential impacts of the project using a multistage environmental assessment, which started with a screening and scoping stage. Since all the designs for investments to be supported under the project have not yet been finalized, an Environmental Management Framework (EMF) has been prepared to guide the preparation of the EIA with consequent Environmental Management Plan (EMP). The EMP describes the feasible and appropriate measures to be implemented during subsequent stages of the project and assigns responsibilities for supervision and monitoring of these along with a budget estimate. This has been undertaken by consultants not involved in the design of the project activities. The EMF and the draft final EIA for the investments already identified have been disclosed on the World Bank's website and on the AIWTDS' website following World Bank review. This process will also be followed for subsequent EIAs as these are prepared and reviewed. A cumulative impacts assessment is under way and its draft has been reviewed by the World Bank. It is being revised in light of the comments provided. The findings from this assessment will also inform the design of facilities under the project.

91. Since the Brahmaputra is one of the least modified rivers, it is an important habitat—for instance, it is a haven for turtles and Gangetic dolphins. To ensure that the impacts on these species are appropriately managed, the project has triggered OP 4.04 - Natural Habitats. As part of the EIA, the potential impacts on the local flora and fauna has been analyzed. A multiseason study focusing on Gangetic dolphin habitat and its behavior in the project area is also under way. Its findings will be part of the final EIA. Measures are in place to manage potential impacts that construction and operation phase activities can have on these and other important species as part of the EMP.

92. To meet the requirements of OP 4.11 - Physical Cultural Resources, the EIA has identified the resources that could be potentially affected. Plans are in place to avoid undesirable impacts while providing (safer) access to sites such as the Umananda temple where a ghat exists and may require improvement. Procedures to handle chance finds in line with applicable laws are integrated into the EMP.

93. Consultations have been held at various stages of project preparation, including screening and scoping, after the draft EMF was prepared and also after the draft EIA and EMP were available.

Table 4. Public Consultations on Environment Safeguards

Location	Date	Document (s) Consulted	Participants (M/F)
Guwahati	October 8, 2018	1. Environmental Screening & Scoping Report 2. Social Screening & Scoping Report	Male - 52 Female - 16
Majuli	February 7, 2019	1. Draft EMF	Male - 28

		2. Draft SMF	Female - 24
Guwahati	June 7, 2019	1. Draft EIA 2. Draft SIA	Male - 63 Female - 11
Majuli	July 22, 2019	1. Draft EIA 2. Draft SIA	Male - 72 Female - 23

94. Relevant portions of the EMP have been integrated with the works/equipment contracts as part of the bidding documents. This includes specifications for vessels to be purchased—as well as material, plants, and equipment—and also for timing of construction of terminals to avoid undesirable impacts, for instance, on aquatic life. Workers' and public safety have been specifically considered. To prevent additional pressure on local resources, facilities for workers, which must be provided in the campsites, have been described. Specifications for the equipment, including vessels, and facilities being provided in the ghats have been made environmentally sound. A separate budget of INR 9.1 million has been estimated for the implementation of the EMP measures for the subprojects currently selected for implementation, beyond the costs integrated with design and specifications of the project components.

95. Supervision consultant support has been provided to ensure that there is adequate environmental supervision and monitoring of equipment supply and execution of works. Third-party monitoring of EMP implementation is included in the EMF and specific EIA for activities is already identified. This support will be made available in synchronization with the construction and delivery schedule. In addition, since this is the first project handled by the AIWTDS, capacity building on environmental management aspects of its staff and PIU members is also being supported in line with the training plan developed as part of the EIA.

96. An integrated grievance redress mechanism (GRM) for social and environmental aspects is being developed building on the complaint handling system already in place in the AIWTDS. This will avoid duplication and ensure that the right measures are undertaken to remedy the situation when any grievance is recorded. Further, information regarding environmental impacts and mitigation measures of the project will be/has been disclosed on the website of the AIWTDS.

(ii) Social Safeguards

97. The potential positive social impacts of the project include safer, reliable, and socially inclusive IWT resulting in improved access to economic, educational, and social opportunities for all groups including women, children, the elderly, and the differently abled. Operational policy on Involuntary Resettlement (OP 4.12) is triggered as construction of new terminals and upgrading of existing terminals to be financed under Component 3 could result in land acquisition and resettlement impacts. Operational policy on Indigenous Peoples (4.10) is also triggered as the project's investment cuts across districts in Assam, which has a significant population of scheduled tribes.

98. Since the specific alignments with detailed technical design for investment to be supported under the project are being finalized, a Social Management Framework (SMF) and a Resettlement Policy Framework-cum-Indigenous Peoples Development Framework (RPF-cum-IPDF) have been prepared to guide the Social Impact Assessment (SIA) to prepare site-specific Social Management Plan, Indigenous Peoples Development Plan-cum-Resettlement Action Plan (SMP, IPDP-cum-RAP). Following public consultations, the SMF and RPF-cum-IPDF have been disclosed on the World Bank's website and on the

AIWTDS' website. The three priority terminals, which are already identified, are located on government land. The framework guided the preparation of SIA and IPDP-cum-RAP for these identified terminals and were disclosed. These may be updated during the implementation following design modifications, if required.

99. **Labor influx.** The share of interstate in-migration in Assam has increased (0.69 percent to 2.02 percent) from 1991 to 2011 (census 2011). Therefore, adequate monitoring and adaptive management of potential impacts from project-related labor influx are required. The consolidated SMF and RPF-cum-IPDF, includes labor influx risk assessment to guide the preparation of site-specific Labor Influx Risk Mitigation Plan. The SMP to be prepared by the contractor will include the site-specific Labor Influx Risk Mitigation Plan, Gender-Based Violence (GBV) Action Plan, and the Code of Conduct to be signed by all workers before start of work.

100. **Institutional arrangement.** Oversight of the implementation of social safeguards requirements is undertaken by the Social Development Specialist appointed at the AIWTDS. At the divisional level, a nodal officer for social safeguard will be designated for coordinating the field-level activities related to implementation of the SMP/IPDP-cum-RAP. RAP implementation agency (supporting nongovernmental organization) will be engaged to facilitate the process of consultations and support each affected household to resettle and rehabilitate.

101. **Monitoring and capacity building.** An e-RAP management information system and mobile application will be managed by the AIWTDS for real-time monitoring of land acquisition process and R&R as per the requirements of the Assam Land Acquisition and Rehabilitation and Resettlement Rule, 2015. Independent consultants (Safeguard Monitoring Consultants) will be deployed for third-party monitoring of all social safeguard aspects. To build the capacity of the AIWTDS, contractors and vessel crew on social safeguards and management (land acquisition, R&R, labor standard compliance, GBV, gender sensitization, GRM, RTI, among others), a three-year training plan has been developed. The AIWTDS will be responsible for coordinating the trainings at the state and divisional levels including preparation of training calendars and modules on different aspects of social safeguard and for facilitating all information, education, and communication (IEC) activities under the project.

102. **Citizen engagement (CE).** CE for the AIWTP includes stakeholder/community consultations, a multilevel GRM, and beneficiary survey on draft designs for the terminals to be constructed/upgraded (Component 3), including activities listed under other components. Stakeholder mapping, analysis, and detailed consultations with relevant stakeholders and beneficiaries were carried out during the project preparation stage. On February 7, 2019, a public consultation was organized to discuss the draft RPF-cum-IPDF at Majuli (Jorhat division) with the affected community and stakeholders. A workshop was organized to discuss the draft IPDP-cum-RAP in Guwahati (Guwahati division) on June 7, 2019. Various methods of CE including citizens' charter and user satisfaction survey will be carried out to improve the development results and reduce community grievances during the implementation stage. Toward this end, a Stakeholder Engagement Plan has been prepared to ensure that effective consultations and community feedback are continued throughout the project cycle.

103. **Grievance redress mechanisms.** The current complaint handling system was reviewed to identify key bottlenecks and propose measures for improvement of GRM system under the project. The assessment noted lack of knowledge among users of existing GRM and absence of dedicated staff and

procedures to track and assess grievance resolution. For addressing grievances related to land acquisition and R&R provisions, divisional- and AIWTDS-level GRCs have been established. The AIWTDS has designated the Adviser (Administration) in the AIWTDS as the officer-in-charge of GRM, for addressing complaints related to the project activities. Further, a toll-free number for grievance redressal is being established under the project for efficiently registering and tracking grievances for timely resolution of grievances. To address complaints of GBV/sexual harassment, an Internal Complaints Committee (ICC) has been established as per the requirements of the Sexual Harassment at the Workplace Act, 2013. A Standard Operating Procedure (SOP) will be developed, which would include procedures and communication strategy for information dissemination on GRM among project employees, users, and ferry operators. The SOP will also have specific procedures for GBV including confidential reporting with safe and ethical documenting of GBV cases reported at the terminals/ferries and at the institutional level.

104. **World Bank grievance redress.** 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 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 World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

(iii) Other Safeguards

105. **OP/BP 7.50 - Projects on International Waterways.** The World Bank's OP 7.50 is triggered since project activities will take place on the Brahmaputra and possibly also on the Barak River, which are international waterways with implications for Bangladesh, Bhutan, and China, in addition to India. The World Bank, on behalf of India, notified the riparian countries—Bangladesh, Bhutan, and China in March 2019. China issued its 'no objection' to the project on April 26, 2019. The Bangladesh Government asked for additional information on May 2, 2019, which was responded to on June 13, 2019. Subsequently, another communication dated August 1, 2019 was received and responded to on October 25, 2019.

106. All planning and design considerations for proposed infrastructure for the AIWTP have been aimed at fully avoiding (or absolutely minimizing), where possible, any potential adverse transboundary affects (which could have had impacts such as reduction and/or modification of flow of water or sediments and increased water pollution). The avoidance of any obstruction to or modification of flow, the designs that ensure that there is no pollution of the river, and the limits placed on dredging and disposal of dredged materials mean that there will be no impact on the quality and quantity of flow in the transboundary rivers.

107. To conclude, the World Bank has determined that due to the location and nature of project activities, the proposed project will not cause any appreciable harm to the interests of the other riparian

countries nor be appreciably harmed by the other riparian countries' possible use of the Brahmaputra or the Barak Rivers.

D. Gender Development

108. **Gender informed design.** A study on Gender-Inclusive IWT and Trade Facilitation in Assam (henceforth called the study) was carried out as part of the project preparation. It highlights that poor access, lack of basic amenities such as toilets and drinking water, infrequent ferry services, potential for sexual harassment, and ineffective complaints mechanism are some of the challenges faced by women users. To address these challenges, the project incorporates gender-inclusive design and planning in the IWT services and infrastructure. The design specifications of the terminals and ferries include gender-segregated and wheelchair-accessible toilets, nursing room, dedicated area for differently abled passengers, and appropriate gradient/inclination of causeways with protective hand rail for barrier-free access, among others. Dedicated seats for women, well-lit spaces, installation of CCTV, and public address systems at the terminals have also been considered. More specifically long access bridges/causeways with low-level gradient/inclination to allow barrier-free access to women carrying load, wheelchair users, and people with mobility problems will be provided. Handrails and surface and tactile markings in the passages have also been incorporated into the terminal design.

109. A GBV Mitigation Plan as part of the IPDP-cum-RAP has also been developed to mitigate risks of sexual harassment by co-passengers during construction and at the institutional level.

Addressing Gender Gaps

Employment Opportunities for Women

110. **Gap analysis.** The female-to-male work participation rate in Assam is 0.40 as compared to the national average of 0.45 (census 2011). As per the Economic Survey of Assam 2016–17, the number of women employed in organized sector was 410,000 during 2016, which is just 26.5 percent of the total employment. During the same year, the percentage share of women employees in public sector and private sector to the total employment was 5.9 percent and 20.6 percent, respectively. The findings from the study establishes that IWT is a major contributor to direct and indirect economic growth and employment opportunities in the state. However, the participation of women in employment and decision making in the IWT sector is relatively marginal, where women are mostly employed in low-skilled jobs such as *Khalashi* (55 out of a total of 519 in DIWTA). Most of the country boats (approximately 2,000 registered boats) transporting goods and passengers are operated by private ferry operators, mainly under DIWTA, and some under Zilla Parishad/Anchalik Panchayat/Gaon Panchayat and Autonomous Councils. Currently, there is no information available on the number of vessels owned and operated by women.

111. **Action**: **Incentives for women to avail the Jibondinga Scheme.** The project will finance the 'Jibondinga' scheme with an objective to provide safe, secure, and sustainable ferry services in IWT by replacement or conversion of existing in-use semi-mechanized country boats to mechanized boats as per the approved design and specifications certified by DIWTA. The scheme provides 'additional' incentives/subsidies to encourage women entrepreneurs (additional 5 percent) and registered women self-help groups (SHGs) (additional 5 percent) who want to be self-employed as vessel operators/owners

in the IWT sector. As per the scheme, each of the private boat owners shall be given 70 percent incentive for replacement of existing engines (with marine engines) for registered boats that are up to 10 years old and in good condition. Subsequently, to meet the insurance cost of passengers and the boats for three years, additional finance will be provided under the scheme. In addition to existing boat owners, incentives under the scheme shall extend to both women SHGs and individual women entrepreneurs intending to enter into operating vessels to provide IWT services. Loans at special terms shall be provided to boat owners and new entrepreneurs including women SHGs as incentive for buying new boats and operating services as registered service providers, as part of the subsequent phase of the Jibondinga scheme.

Indicator. Percentage of vessels owned by women entrepreneurs and self-help groups under the incentive scheme

Trade and Entrepreneurship

112. **Gap analysis.** The study revealed that only a small proportion of female respondents (68 out of 1,200) interviewed were using IWT for transporting tradeable goods, while most women used the IWT services for social activities including accessing of markets across river for household retail (291 out of 1,200). The highest ratio of women traders was found in rural upstream areas of Majuli, Kabuli, and Morotpur in the Barak urban area of Silchar and the urban downstream areas of Dhubri. About 35 percent of the women respondents engaged in trading activities expressed their reluctance to use ferries as a means of transportation due to (a) lack of proper and well-maintained approach roads, (b) infrequent and unreliable time schedules of ferry services, (c) poor access to the pontoons (floating terminals), and (d) overloading of goods on ferries/boats which makes them unsafe. The focus group discussions (FGD) in the project location, Majuli, revealed that restrictive timings of ferry services (till late afternoon) and poor last mile connectivity limited women weavers' ability to reach distant markets. Thus, they depend on selling to traders in a buyers' market and forego the potential value of their products. Similarly, the FGD in Guwahati revealed that women fish traders do not use IWT to bring their fish to the market, even though IWT is the fastest and cheapest transport mode for commuting to Guwahati. Women find it difficult to board the boat with a load, which is made even more difficult by the absence of permanent jetties. Lack of last mile connectivity, both to and from the ghats, further dissuades them from using IWT.

113. **Action.** The gap analysis clearly indicates the need for upgrading IWT facilities to facilitate women's use of IWT for trade-related activities. These measures include project informed design and support for value addition of goods.

(a) **Last mile connectivity.** Upgrading and rehabilitation of approach roads up to the terminals will be considered under the project. Additionally, memorandum of understanding to establish links with different land transport authorities will be considered to ensure intermodal connectivity for feeder services and other paratransit modes to and from the terminals.

(b) **Frequency and timing of services.** The number of ferries plying in a day will be increased to meet the demand. Timings and frequency of the ferry services will be regulated to meet the requirement of all user groups. For instance, in certain places, time schedules would account for women traders traveling to distant markets on designated market days (Rajaduar and

Kuruwa) or festivals (Hajo). Timetables will be developed in consultation with users, particularly women, to account for travel patterns and demands of different stakeholders. Based on their suggestion and footfall of passengers, night navigation facilities will also be provided.

(c) **Facilities for value addition of goods near the terminals, Guwahati and Majuli.** The AIWTDS will consider, in coordination with other state agencies, facilities at the terminals to store, sort, and grade the goods to achieve higher value for the goods in the market.

114. **Indicator.** Percent women users of ferries during peak hours.

Gender-based Violence

115. **Gap analysis.** Statistics maintained by the National Crime Record Bureau (2017) on 'crime against women' indicate a rise in cases of human trafficking (79), molestation (3,595), and kidnapping of girls/women (5,186) in the state. Against this backdrop, a study undertaken by 'Save the Children' indicated that 65 percent of adolescent girls interviewed in Assam did not feel safe traveling on public transport, while 51 percent find the roads to their schools, local markets, and private tuitions unsafe. A similar study on Safe Mobility for Women in Guwahati found that women felt unsafe in both deserted and crowded spaces. They claimed that there was greater fear of assault or rape in deserted spaces, while men took advantage of the crowd to sexually harass women. A few respondents to the gender and trade survey (less than 20 percent) admitted to experiencing sexual harassment onboard IWT. A majority of those who were harassed experienced it on a daily basis. The study further revealed that none of the users interviewed were aware of the existing complaint mechanism.

116. **Action.** While specific measures such as a dedicated helpline number will be integrated into the GRM system for the Assam IWT project to address and monitor GBV cases, the project will also provide the following digital media and Internet-based communication tools to enhance safety and security of the ferry service users/passengers.

- SMS-based alert systems, information sharing sites, social networking service, and SMS-based support groups
- Electronic monitoring systems including CCTV at IWT terminals in areas that are remote and prone to violence or harassment
- Installation of wi-fi or telephone reception facilities onboard ferry vessels and additional phone charging facilities onboard the vessels and IWT terminals at the seating areas designated for women

117. Additionally, the SOP that outlines the steps with guidance for safety and security of passengers relating to GBV on IWT will be drawn up, followed and used in the training of all IWT operators, terminal staff, and river police. The SOP will also include procedures and IEC strategy for information dissemination on GRM. The SOP will be displayed prominently in IWT vessels and terminals. Beneficiaries satisfaction survey (biannual) will be conducted to evaluate how users, particularly women and girls, experience IWT travel in terms of their safety and security. To address sexual harassment at the workplace, ICCs will be

established at the AIWTDS and by the contractors in all selected terminals. Further, curriculum followed at the crew training center (CTC) will be upgraded to include trainings on gender sensitization and GBV and awareness on laws related to women safety—such as Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013—for PIUs, AIWTDS, crew staff, operators, consultants, and contractors.

118. **Indicator.** Percent complaints resolved of the total complaints received using the dedicated helpline number and Internet-based communication tools to report sexual harassment and GBV issues.

V. KEY RISKS

119. The overall risk of the proposed project is rated 'Substantial'. Two of the key risks, namely safeguards and institutional capacity for implementation and sustainability, are rated Substantial. The substantial risk in institutional capacity for implementation and sustainability partly derives from perceived client capacity and also from the challenges of (a) major organizational change that might not be welcomed by all stakeholders and (b) the need for effective coordination by the World Bank and client with many departments at national, state, and local levels with specific roles and interests in the development or management of waterways or IWT. The project will therefore apply an appropriate communication and consultation strategy, working closely with the World Bank's communications team.

120. The safeguard risk, particularly 'Environment' is rated Substantial. The project activities will be undertaken in the river, where important flora and fauna species have been recorded. Since this is the first project being undertaken by AIWTDS, management of potential impacts on these important ecosystem components, as well as from construction of landside facilities, can be a challenge. The project has undertaken a detailed assessment of potential impacts on the gangetic dolphin to inform the design to mitigate potential impacts. In addition, the project has adopted an approach of 'working with nature' that aims to design waterways infrastructure that is least intrusive and flexible in aligning itself to the character of the river. The fiduciary risk is assessed as Moderate. The project has acceptable FM arrangements. Also, as part of the project preparation process, an assessment of procurement capacity of implementing entity was conducted using PRAMS and accordingly risk mitigation measures have been proposed. The potential areas of procurement risks are delays in procurement and contract management process, external interference in the procurement process, poor participation of bidders in bidding process, and lack of satisfactory complaint handling system. The risk rating has been decided based on the risk factors and mitigation measures**.** Procurement risk and the progress on various mitigation measures will be reassessed during the implementation phase and risk rating will be done accordingly.

VI. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: India

Assam Inland Water Transport Project

Project Development Objectives(s)

The objectives of the Project are to: (a) improve passenger ferry infrastructure and service in Assam, and (b) improve the institutional capacity and framework for inland water transport in Assam

Project Development Objective Indicators

Indicator Name	DLI	Baseline	Intermediate Targets				End Target
			1	2	3	4	
Passenger Ferry Infrastructure and Services							
Ferry service hours available in a day - on project supported ferry routes (Hours)		10.00	10.00	14.00	14.00	16.00	16.00
Percent women users of ferries during peak hours (Text)		About 25% of ferry users are Women and children (to be reassessed)	No change expected	Expect at least 5% increase over baseline	Expect at least 5% increase over last target	Expect at least 5% increase over last target	Expect greater than 30% women users
User Satisfaction (on access, safety, quality of services, facilities etc) dis-aggregated by gender on project supported ferry routes (Text)		To be measured	No change expected in the first year	10% increase in user satisfaction over baseline	10% increase in user satisfaction over level reported in immediately preceding stage / target	10% increase in user satisfaction over level reported in immediately preceding stage / targe	More than 70% User satisfaction
Institutional Capacity and Frameowork							
Regulation of IWT operations in Assam strengthened (Text)	DLI 1	RA Established under new Act of State Legislative Assembly	Assam's state government has appointed the	AIWTRA has adopted and notified new Assam Vessel Rules	AIWTRA has: (a) developed draft Safety Regulations for the		AIWTRA has: (a) adopted and notified

Indicator Name	DLI	Baseline	Intermediate Targets				End Target
			1	2	3	4	
			Chairperson and all Members of the AIWTRA, as per the AIWTRA Act		operation of passenger ferry services and published them for public consultation; and (b) developed draft Economic Regulations for transparent and sustainable operation of passenger ferry services and published them for public consultation."		new Safety Regulations for the operation of passenger ferry services; and (b) adopted and notified new Economic Regulations for transparent and sustainable operation of passenger ferry services."
Unbundling public sector operations from industry regulations (Text)	DLI 5	Internally conflicted institutional setup	The State Public Investment Board has: (a) approved the business and feasibility plan for the establishment of Assam Ports Company (APC); and (b) approved the business and feasibility plan for the establishment of Assam Shipping Company (ASC)	The Transport Department has: (a) (i) registered the Assam Ports Company under the Companies Act; and (ii) adopted the respective asset devolution plan; and (b) (i) registered the Assam Shipping Company under the Companies Act; and (ii) adopted the respective asset devolution plan."			The Transport Department has: (a) transferred all fixed assets identified in APC's asset devolution plan (primarily public ferry terminals) to the Assam Ports Company; and (b) transferred all floating/ movable assets identified in ASC's asset devolution plan (primarily public vessels) to the Assam Shipping Company."
Enhanced IWT sector capacity	DLI 2	Weak sector capacity.	Training of 100 people	Training of 300 people	Training of 400 people		500 staff from DIWTA,

Indicator Name	DLI	Baseline	Intermediate Targets				End Target
			1	2	3	4	
on safety and modern technologies (Text)		A comprehensive training plan under review by the Govt.	(including DIWTA, ASC, APC staff and private boat operators, with at least 20% of them being registered private boat operators	(including DIWTA, ASC, APC staff and private boat operators, with at least 20% of them being registered private boat operators	(including DIWTA, ASC, APC staff and private boat operators, with at least 20% of them being registered private boat operators		ASC, ASP and / or private boat operators have been trained on best practices for navigation safety and modern technologies, with at least 20% of them being registered private boat operators
Establishing an emergency response system including a search and rescue unit (Text)	DLI 3	No specific capacity exists	DIWTA and/or AIWTDS have / has prepared and approved a concept note to develop an emergency response, search and rescue system/unit (ER&SAR)	DIWTA and/or AIWTDS have / has established a coordination mechanism with the State Disaster Management Agency, the State Climate Cell and AIWTRA to prepare and respond to water transport related emergencies	The Transport Department and/or DIWTA have/has notified the establishment of the ER&SAR		The ER&SAR has been made operational

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
Institutional, regulatory and safety						
Access to modern information (advance weather forecast, electronic charts, night navigation) to assist safer navigation (Text)		Poor availability / access to information to assist navigation	Detailed activity scoping and Bid process initiated for the project routes	Vendor selected and system procurement / installation done on project supported	Initiate process to expand coverage to other routes	Improved access to climate / weather information and night navigation support

Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
				routes		available on project supported routes
Adoption of Assam Water Transport Strategy (Text)	DLI 4	No Inland Water transport strategy available for Assam	The Transport Department has approved / adopted an intra-state water transport strategy			Transport Department has approved/adopted an Intra-State Water Transport Strategy
Percent complaints resolved of the total complaints received using the dedicated helpline number and internet-based communication tools to report sexual harassment and GBV issues (Text)		No reporting mechanism exists specific to the sector	Atleast 50 percent resolved out of total complaints received.	Atleast 60 percent resolved out of total complaints received.	Atleast 70 percent resolved out of total complaints received.	Atleast 90 percent resolved out of total complaints received.
Fleet Safety and Modernisation						
New, modern and safer public vessels with gender inclusive design (Text)	DLI 6	Tender issued for procurement of new vessels	DIWTA and/or Assam Shipping Company has/have received ten (10) new vessels from the shipyards (corresponding to 50/100 pax capacity), all in compliance with the Assam Vessel Rules	DIWTA and/or Assam Shipping Company has/have received additional ten (10) new vessels from the shipyards (corresponding to 50/100 pax capacity), all in compliance with the Assam Vessel Rules		DIWTA or Assam Shipping Company, as the case may be, is operating the twenty (20) new vessels received from the shipyards, all of them with crew in compliance with Assam Vessel Rules and Safety Regulations"
Retrofitted/new, safer country boats for private sector supported under the “Jibondinga” incentive scheme (Text)	DLI 7	Old and unsafe private country boats	Total of 50 or more boats with 5% to eligible Women / SHG boat operators	Total of 100 or more boats with 5% to eligible Women / SHG boat operators	Total of 200 or more boats with 5% to eligible Women / SHG boat operators	More than 200 private sector country boats made safer and efficient
Terminal Improvement						
Modern, floating and engineered ferry terminals with improved access and socially inclusive design (Number)		0.00	0.00	1.00	3.00	7.00

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Ferry service hours available in a day - on project supported ferry routes	The indicators tracks improved services through extended hours of available operation, with implementation of modern technology (night navigation etc)	Annual / Semi-annual	RA / DIWTA notice on service schedules, Terminal operator record, Survey of actual ferry operations	Checking service schedule notice and daily records - Schedule monitoring of actual operations	DIWTA / AIWTDS
Percent women users of ferries during peak hours	The indicator is intended to assess change in perception of safety among women as users of improved mobility beyond usual daytime	Annual	DIWTA records / Gender study Sample head count for peak hour ferries on project routes Survey consultant report	Review the baseline Carry out regular, random field surveys on project routes	AIWTDS

User Satisfaction (on access, safety, quality of services, facilities etc) dis-aggregated by gender on project supported ferry routes	The indicator tracks the change in user satisfaction as ferry infrastructure and services are improved gradually.	Annual	Survey results on established baseline and intermediate / yearly passen ger surveys	Carry out user satisfaction surveys both for baseline and intermediate / yearly assessments	AIWTDS
Regulation of IWT operations in Assam strengthened	Tracks expected progress from a functioning and independent regulatory authority in strengthening regulatory framework for the IWT sector in Assam	Annual / semi-annual	Minutes of meeting / orders and notifications of the Government of Assam, Government of Assam / RA notification on revised Assam Vessel Rules, Assam Transport Department website and / or RA website, Gaz ette Notification	Target 1: Review the Assam IWT RA Act for the number of members of RA specified Target 2: Verify Govt. / RA notification on revised Assam Vessel Rules (specifying conditions for operation of vessels in Assam such as registration, crew, fitness certification, passenger protection, insurance) Target 3: Verify from the official Assam Transport Department website and/or RA website for the relevant	AIWTDS

			of the Govt. of Assam and/or relevant Govt. orders	Govt. order and publication of draft Safety Regulations and draft Economic Regulations for intra-state passenger ferries, calling for public consultation / and feedback within 30 days of publication. Target 4: Verify Gazette notification on Safety and Economic regulations for passenger ferries in Assam.	
Unbundling public sector operations from industry regulations	The indicator aims to measure the continued institutional reforms undertaken to separate / unbundle industry regulation from sector operations	Annual / Semi-Annual	Govt Notification	Review orders / notifications from Transport Dept Govt of Assam	AIWTDS
Enhanced IWT sector capacity on safety and modern technologies	The indicator measures efforts to improve institutional capacity in delivering safer and efficient ferry services	Annual / Semi-annual	Training plan approved by AIWTDS AIWTDS record on training provi ded to DIWTA, APC,	Review AIWTDS record on trainings approved and provided on safety, emergency response, navigation etc.	AIWTDS

			ASC staff and the private operators (with minimum 16 training hours for each trainee)		
Establishing an emergency response system including a search and rescue unit	Measures enhanced institutional capability to respond to water transport related emergencies / accidents in Assam	Annual	Terms of Reference by AIWTDS and relevant Govt. notifications	Review relevant progress documents by AIWTDS and Govt orders on establishing the unit, staffing and coordination mechanism etc.	AIWTDS

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Access to modern information (advance weather forecast, electronic charts, night navigation) to assist safer navigation	Measures improvement in deployment of tools, navigation aids and modern communication technologies to provide necessary information that reduce travel risk	Annual	Procurement Plan - Letter of Award - Work completion certificate - Records / outputs from the	Monitoring the bid process - Verifying records of the ouputs from the systems, tools etc. - Speaking wit h Boat masters on availability / use of information	AIWTDS

			commissioned systems		
Adoption of Assam Water Transport Strategy	Measures progress to support broader transport policy for the State	Annual / Bi-annual	Govt. Notification	Review Govt Notification/ Transport Dept. official portal	AIWTDS
Percent complaints resolved of the total complaints received using the dedicated helpline number and internet-based communication tools to report sexual harassment and GBV issues	The indicator measures system effectiveness in recording and resolving reports of GBV and sexual harassment to help and empower women	Annual	Grievance redress unit / officer	Check records from the grievance redress unit / assigned officer	AIWTDS
New, modern and safer public vessels with gender inclusive design	Measures introduction of modern, safe and gender inclusive passenger ferry vessels and services	Annual	Project procurement plan - Design specifications - Vessel delivery confirmation - Route deployment record	Review procurement process, letter of award, design specs and vessel delivery confirmation - Review route deployment record from public ferry company / DIWTA or RA	AIWTDS
Retrofitted/new, safer country boats for private sector supported under the “Jibondinga” incentive scheme	Measures effectiveness of the incentive scheme in supporting private sector to own / operate safer and safety compliant country boats	Annual	RA record / Incentive Scheme Registration	Review information / record of incentive scheme registrations	AIWTDS
Modern, floating and engineered ferry terminals with improved access and	Measures modern and gender inclusive ferry	Annual	Procurement plan, bid	Review bid process and contract award - Check	AIWTDS

socially inclusive design	landings developed at identified urban and rural locations		process and implementation Plan - Project progress reports	progress reports by the contractor and by independent engineer (TSSC)	

Disbursement Linked Indicators Matrix

DLI 1	Regulation of IWT operations in Assam strengthened			
Type of DLI	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	No	Text	11,000,000.00	10.00
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	Weak sector regulation			
Target 1	1.1. Assam's state government has appointed the Chairperson and all Members of the AIWTRA, as per the AIWTRA Act		4,000,000.00	
Target 2	1.2. AIWTRA has adopted and notified new Assam Vessel Rules.		2,000,000.00	
Target 3	1.3. AIWTRA has:(a) developed draft Safety Regulations for the operation of passenger ferry services and published them for public consultation; and (b) developed draft Economic Regulations for transparent and sustainable		3,000,000.00	USD 1.5 M each upon completion of (a) and (b)

	operation of passenger ferry services and published them for public consultation.		
Target 4	1.4. AIWTRA has:(a) adopted and notified new Safety Regulations for the operation of passenger ferry services; and(b) adopted and notified new Economic Regulations for transparent and sustainable operation of passenger ferry services.	2,000,000.00	USD 1 M each upon completion of (a) and (b)

DLI 2	Enhanced IWT sector capacity on safety and modern technologies			
Type of DLI	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	Yes	Text	7,000,000.00	6.40
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	Training Plan being developed			
Target 1	500 staff from DIWTA, ASC, APC and / or private boat operators have been trained on best practices for navigation safety and modern technologies, with at least 20% of them being registered private boat operators		7,000,000.00	Upon at least 50 staff trained, USD 14000 for every person
Target 2	NA		0.00	
Target 3	NA		0.00	
Target 4	NA		0.00	

DLI 3	Establishing an emergency response system including a search and rescue unit			
Type of DLI	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	No	Text	5,500,000.00	5.00
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No specific capacity exists			
Target 1	3.1. DIWTA and/or AIWTDS have / has prepared and approved a concept note to develop an emergency response, search and rescue system/unit (“ER&SAR”)		1,000,000.00	
Target 2	3.2. DIWTA and/or AIWTDS have / has established a coordination mechanism with the State Disaster Management Agency, the State Climate Cell and AIWTRA to prepare and respond to water transport related emergencies.		1,000,000.00	
Target 3	3.3. The Transport Department and/or DIWTA have/has notified the establishment of the ER&SAR		1,500,000.00	
Target 4	3.4. The ER&SAR has been made operational		2,000,000.00	

DLI 4	Adoption of Assam Water Transport Strategy			
Type of DLI	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	No	Text	3,000,000.00	2.70
Period	**Value**		**Allocated Amount (USD)**	**Formula**

Baseline	No specific water transport strategy, and weak overall State transport policy		
Target 1	The Transport Department has approved/adopted an intra-state water transport strategy	3,000,000.00	
Target 2		0.00	
Target 3		0.00	
Target 4		0.00	

DLI 5	Unbundling public sector operations from industry regulations			
Type of DLI	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	No	Text	12,000,000.00	10.90
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	Internally conflicted institutional setup exists			
Target 1	5.1. The State Public Investment Board has: (a) approved the business and feasibility plan for the establishment of Assam Ports Company; and (b) approved the business and feasibility plan for the establishment of Assam Shipping Company.		4,000,000.00	USD 2 M each upon completion of (a) and (b)
Target 2	5.2. The Transport Department has: (a) (i) registered the Assam Ports Company under the Companies Act; and (ii) adopted the respective asset devolution plan; and (b) (i) registered the Assam Shipping Company under the Companies		4,000,000.00	USD 2 M each upon completion of (a) and (b)

	Act; and (ii) adopted the respective asset devolution plan.		
Target 3	5.3. The Transport Department has: (a) transferred all fixed assets identified in APC's asset devolution plan (primarily public ferry terminals) to the Assam Ports Company; and (b) transferred all floating/ movable assets identified in ASC's asset devolution plan (primarily public vessels) to the Assam Shipping Company.	4,000,000.00	USD 2 M each upon completion of (a) and (b)
Target 4		0.00	

DLI 6	New, modern and safer public vessels with gender inclusive design			
Type of DLI	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	Yes	Text	10,000,000.00	9.10
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	Tender issued for procurement of new vessels for improved safety and comfort with an inclusive design			
Target 1	6.1. DIWTA and/or Assam Shipping Company has/have received twenty (20) new vessels from the shipyards (corresponding to 50/100 pax capacity), all in compliance with the Assam Vessel Rules		8,000,000.00	USD 2M for every five (5) vessels received
Target 2	6.2. DIWTA or Assam Shipping Company, as the case may be, is operating the twenty (20) new vessels received from the shipyards, all of them		2,000,000.00	USD 0.1M for every new vessel in operation with crew

	with crew in compliance with Assam Vessel Rules and Safety Regulations		
Target 3		0.00	
Target 4		0.00	

DLI 7	Retrofitted/new, safer country boats for private sector supported under the “Jibondinga” incentive scheme			
Type of DLI	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	Yes	Text	4,500,000.00	4.10
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	Old and unsafe private country boats			
Target 1	DIWTA has approved a total of two hundred (200) Matching Grants, under the “jibondinga” incentive scheme, with at least 5% of such grants being awarded to women or self-help group boat operators		4,500,000.00	USD 1.125M for every fifty (50) Matching Grants approved
Target 2			0.00	
Target 3			0.00	
Target 4			0.00	

Verification Protocol Table: Disbursement Linked Indicators	
DLI 1	Regulation of IWT operations in Assam strengthened
Description	The DLI intends to incentivise expected progress in strengthening regulatory framework for the IWT sector by the RA.
Data source/ Agency	1. Minutes of meeting / orders and notifications of the Government of Assam 2. Government of Assam / RA notification on revised Assam Vessel Rules 3. Assam Transport Department website and / or RA website 4. Gazette Notification of the Govt. of Assam and/or relevant Govt. orders
Verification Entity	World Bank
Procedure	World Bank will monitor the DLI based on self-certification by Govt. of Assam and/or relevant Govt. orders. Target 1: Review the Assam IWT RA Act for the number of members of RA specified. Verify Govt order / self-certification by Govt of Assam on appointment of the Chairperson and the required members of the RA. Target 2: Verify Govt. / RA notification on revised Assam Vessel Rules (specifying conditions for operation of vessels in Assam such as registration, crew, fitness certification, passenger protection, insurance) Target 3: (a) Verify from the official Assam Transport Department website and/or RA website for the relevant Govt. order and publication of draft Safety Regulations for intra-state passenger ferries, calling for public consultation / and feedback within 30 days of publication. (b) Verify from the official Assam Transport Department website and/or RA website for the relevant Govt. order and publication of draft Economic Regulations on route licensing and tariff rationalization for operations of intra-state passenger ferries, calling for public consultation / feedback with 30 days of publication Target 4: Verify Gazette notification on Safety and Economic regulations for passenger ferries in Assam. The safety regulations are to be in line with Assam Vessel Rules as approved by Government of Assam. Economic regulations to include route licensing and tariff rationalization.
DLI 2	Enhanced IWT sector capacity on safety and modern technologies
Description	The DLI will measure efforts to train and improve institutional capacity in delivering safer and efficient ferry services. The DLI is scalable.
Data source/ Agency	AIWTDS record on approved nominations. Self-certification by AIWTDS on trainings (atleast 16 hours each) provided to staff and private boat operators

Verification Entity	General Consultant and Independent Verification Agency
Procedure	Review AIWTDS approved Training plan for staff (including private sector) and the trainings needs identified on safety, emergency response, and modern navigation technology. Verify number of trainees (from DIWTA, ASC, APC and/or private boat operators) based on self-certification by AIWTDS. The self-certification shall be accompanied by list of participants, duration of training, course agenda and training certificate. The minimum duration of training acceptable is a minimum of 16 training hours for each participant. General consultant (GC) carries out the initial monitoring till identification of trainings needed. IVA later verifies the actual trainings received. Formula: Upon at least 50 staff trained, USD 14000 for every person successfully completing the training, up to an amount not to exceed USD 7,000,000; provided that at all time there is a minimum 20% ratio of registered private boat operators trained
DLI 3	Establishing an emergency response system including a search and rescue unit
Description	The DLI measures enhanced institutional capability to prepare and respond to water transport related emergencies / accidents in Assam.
Data source/ Agency	Approved Concept note on ER&SAR Self-Certification by AIWTDS and relevant Govt. orders
Verification Entity	World Bank
Procedure	Target 1: Governing Body has approved Concept Note on emergency response and rescue system (with staffing / workforce requirements; equipment needs; short, medium and long-term operational budgets; reporting lines and coordination mechanisms/linkages with other agencies, departments and institutions; training needs and staff capacity requirements; etc) developed by AIWTDS (in consultation with DIWTA) for setting up of an emergency response and rescue system. Target 2: AIWTDS has confirmed consultations carried out with state disaster management, state climate cell, RA and other relevant agencies. Verify Govt. order and ratified MoU on coordination mechanism established and assignment of roles and responsibilities across the agencies. Target 3: Govt. order on establishment of a new Emergency Response and Rescue system has been issued. Target 4: AIWTDS has confirmed in writing the formal launch of the emergency response and rescue system, functional with necessary staff and equipment / tools (atleast 3 shore station based search and rescue cum surveillance vessels + 3 man over board boats) having been acquired by Govt for the purpose

DLI 4	Adoption of Assam Water Transport Strategy
Description	The DLI assesses progress to support broader transport policy for the State
Data source/ Agency	Transport Department (Govt of Assam) notification
Verification Entity	World Bank
Procedure	An approved Intra-State Water Transport Strategy (include but not limited to Water transport networks, implementation plans, investment priorities, and water transport improvement program, integration with other modes, vision for increase in modal share) for Assam has been made publicly available on the official govt. website
DLI 5	Unbundling public sector operations from industry regulations
Description	The DLI intends to incentivize the progress on reforms to corporatize public terminal operations and ferry services
Data source/ Agency	State Public Investment Board notification/letter; Govt notifications and certificate from registrar of companies; Transport Department, Government of Assam notification
Verification Entity	World Bank and IVA
Procedure	Target 1: a. Review approval letter from State Public Investment Board (SPIB) on the Business plan / feasibility of the APC, clearing the way for its incorporation. The business plan / feasibility should typically (while SPIB's own guideline will prevail) include details on the capital structure, capitalization levels, investment plan and staffing. b. Review approval letter from State Public Investment Board (SPIB) on the Business plan / feasibility of the ASC, clearing the way for its incorporation. The business plan / feasibility should typically (while SPIB's own guideline will prevail) include details on the capital structure, capitalization levels, investment plan and staffing. Target 2: a. Review the registration fee receipt and the company registration certificate issued for APC. The Transport Department self certifies an approved asset devolution plan for APC. The devolution plan at minimum includes details of the assets, their location and approximate valuation and time line for the devolution.

	b. Review the registration fee receipt and the company registration certificate issued for ASC. The Transport Department self certifies an approved asset devolution plan for ASC. The devolution plan at minimum includes details of the assets, their age, approximate valuation and time line for the devolution. Target 3: a. Govt order on asset devolved to APC or Audited Balance Sheet of APC validating transfer of fixed assets (primarily public ferry terminals) b. Govt order on asset devolved to ASC or Audited Balance Sheet of ASC validating transfer of floating assets (primarily public vessels) The DLI will be monitored by the World Bank (for target 1 and 2) while IVA will verify Target 3.
DLI 6	New, modern and safer public vessels with gender inclusive design
Description	This DLI will be met with introduction of better designed, safer and socially inclusive passenger ferry services. The DLI is scalable to permit flexibility in disbursement where annual targets fall short of full achievement.
Data source/ Agency	Delivery receipt of vessels / Self certification by Transport Department Registration Certificate from AIWTRA
Verification Entity	Independent Verification Agency
Procedure	Target 1: IVA to verify the delivery note / receipt of class certified vessels conforming to bid specification (50/100 pax) as per the agreed delivery schedule. Formula: USD 2,000,000 for every five (5) vessels received from/delivered by the shipyards, up to an amount not to exceed USD 8,000,000 Target 2: Review Govt. order on deployment of the new vessels along with crew on specific routes. Also review the Vessel specs and Crew deployed against Assam Vessel rules and safety regulations to ascertain compliance. Formula: USD 100,000 for every new vessel in operation with appropriate crew, up to an amount not to exceed USD 2,000,000
DLI 7	Retrofitted/new, safer country boats for private sector supported under the “Jibondinga” incentive scheme
Description	The DLI assesses the effectiveness of the incentive scheme in supporting private sector including women and self-help groups to own / operate safer and regulation compliant country boats. The DLI is scalable to permit flexibility in

	disbursement where annual targets fall short of full achievement.
Data source/ Agency	Matching Grant Agreements, Self certification by AIWTDS and/or Govt order on approved scheme beneficiaries under 'Jibondinga'; Registration certificate from AIWTRA
Verification Entity	Independent Verification Agency
Procedure	Verify Matching Grant Agreement, Govt Order / Self certification by AIWTDS on approved incentive scheme beneficiaries i.e eligible private boat operators for retrofitting / new country boats (dis-aggregated by gender, women self-help groups) to assess total number of approvals under the Jibondinga incentive scheme. Verify Vessel registration certificate to establish ownership by gender Formula: USD 1,125,000 for every fifty (50) "*jibondinga*" incentive schemes approved up to an amount not to exceed USD 4,500,000

VII. INDICATIVE TERMS AND CONDITIONS FOR THE GUARANTEE

Not Applicable

ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: India
Assam Inland Water Transport Project

1. The project is anchored with the Transport Department, GoA. The project has precipitated establishment of an AIWTDS under the Transport Department to prepare and implement the project. This society is a state-level, registered, autonomous body under the GoA.

2. The newly formed AIWTDS acts as the PMU, which is headed by an SPD not below the rank of the Secretary, Transport Department, GoA, while the Director, IWTA acts as the ASPD. DIWTA was established in 1958 as part of the Assam Transport Department. It is headquartered in Guwahati and employs around 4,000 staff. It has divisional offices in Guwahati, Dibrugarh, and Silchar, five subdivisional offices, three commercial offices, and a CTC.

3. The SPD is responsible for overall project control and delivery, while the ASPD supports the SPD in providing day-to-day administrative guidance to the project. The society is supported by professionals in procurement, FM, transport and logistics, social development, environment safeguards, and so on. A professional consulting firm appointed as GC to assist the AIWTDS provides day-to-day functional support. Corporate oversight and management of the AIWTDS is provided by a PGC headed by the Chief Secretary, GoA, as the President and a GB headed by the senior most Secretary of the Transport Department as the Chairman.

4. Coordination of day-to-day project implementation, planning and scheduling, procurement management, financial control, and reporting and monitoring will be the responsibility of the AIWTDS. The AIWTDS will be primarily responsible for (a) preparing annual work plans and budgets; (b) undertaking actions for approving the annual work plan by the GB/PGC, financial control, procurement management, monitoring progress of project components, and preparing quarterly and other progress reports; (c) ensuring that financial reports are available, audited, and submitted to the World Bank within the stipulated time; and (d) undertaking procurement of high-value and complex goods, works, non-consulting services and hiring technical experts, and key consultants, as needed, for project implementation, monitoring, and technical evaluation.

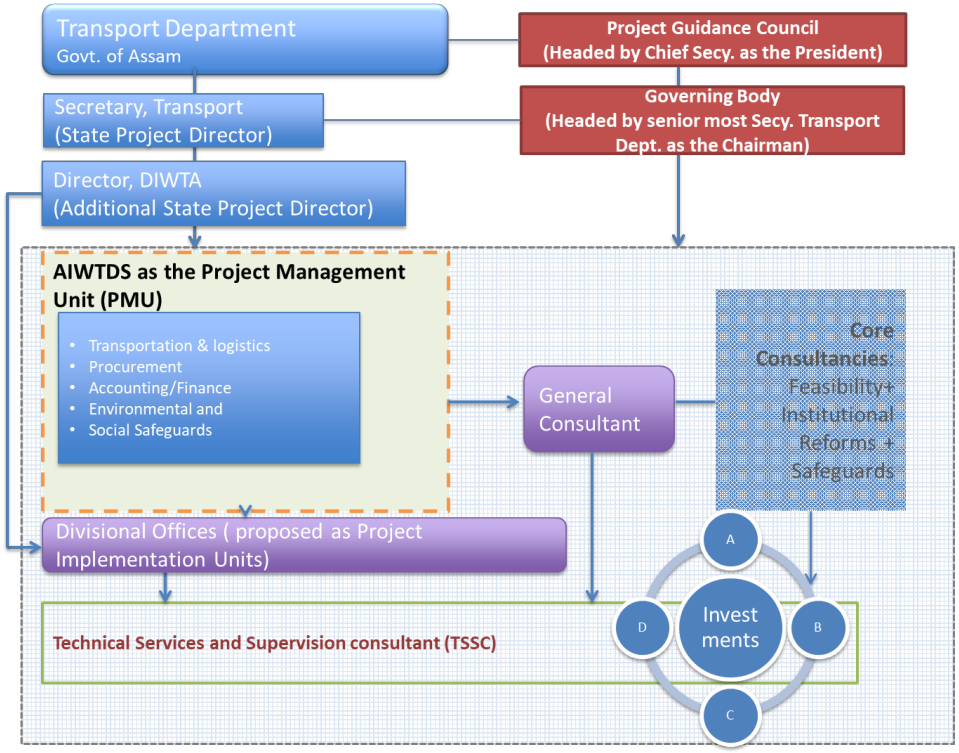
5. Where institutional capacity is limited and special skills are required, the project will acquire outside expertise, including international technical assistance and consulting services. The AIWTDS currently draws on technical resources from DIWTA on need basis and the project will support establishment/strengthening of a Hydrography Unit that shall be manned by dedicated river engineers, technical surveyors, and so on.

6. The AIWTDS will place specific efforts into institutional coordination across departments.

7. To strengthen the project management capacity early, a professional consulting firm has been competitively selected and appointed as GC to assist the AIWTDS in providing day-to-day functional/management support. The project implementation will itself be facilitated by early improvements to the institutional makeup that are expected to address conflicting interests and any blurring of lines, which currently constrain sector management. The process to unbundle policy and

planning, industry regulation, and sector operation has been initiated with support from the project.

Figure 1.1. Institutional Arrangement for the Project



8. TSSCs will be hired for Component 3, as the project enters the implementation phase and closer ground-level monitoring is needed. These consultants will assist with technical design review, construction supervision, quality control, and monitoring of works under the project components. They will work together with the proposed PIUs (divisional offices) to provide implementation and project management support in the execution of the civil works, bill and quantity verification, and installation of key equipment.

9. Safeguards monitoring consultants, independent of the supervision consultants, will be hired to inform the AIWTDS regarding the extent to which safeguards are being implemented in project activities. Their reports will be shared with the TSSC and contractors by the AIWTDS to ensure that the relevant measures are implemented in parallel with works on site.

ANNEX 2: Project Components and Cost

COUNTRY: India
Assam Inland Water Transport Project

1. The project is focused on improving ferrying of cross-river passengers in Assam and seeks to use the opportunity to establish a tenable foundation for development of a modern IWT sector in Assam. The long absence of adequate policy response and piecemeal investments in IWT in the state (as also nationally) has resulted in a somewhat unorganized and poor condition for the sector, which is not predisposed to a linear scale-up. Despite the odds, however, Assam manages to provide ferry services to about 9 million people annually, usually along with their vehicles, livestock, or goods. Supporting the functioning but ill-equipped IWT sector therefore requires a more granular approach encompassing a range of supply- and demand-side factors. As such, the project is guided by a binding philosophy that admits wider and even incremental interventions as long as they contribute to strengthening institutions and planning, operational efficiency and safety, and importantly, sustainability. The project has four components collectively intended to tackle the regulatory, operational. and infrastructure challenges of the sector including one component supporting project management.

Component 1: Institutional, regulatory and safety strengthening (estimated cost US$21 million)

2. This component will have two subcomponents.

a. **Sector planning, design and rollout, operationalization of new Regulatory Authority (RA), business planning and operationalization of Assam Shipping Company (ASC) and Assam Ports Company (APC), including remuneration of staff/specialists hired at the RA, ASC, APC, and Assam Transport Policy; modernization of crew training center and training of staff to fulfill new roles in the restructured industry (US$11 million)**

3. The subcomponent has essentially provided for technical assessments/studies to form the basis for sector-level strategic plans and institutional reforms. An ISDP for water transport in the state is being prepared. The exercise involves preparing a water transport strategy for Assam and an investment plan to help mainstream water transport in the state including multimodal integration and last mile connectivity. Studies on EIA and SIA are also being undertaken.

4. Complementing the investments in infrastructure, the project aims to strengthen the Assam IWT sector through a supportive institutional framework. A wide-ranging consultancy on the Institutional Strengthening and Business Plan (ISBP) is assigned to study the system weaknesses in detail and develop prescription for more effective institutions. In doing so, the study has already provided the basic legislation for an independent IWT RA to carry out the safety, environmental, and economic regulation of the sector (shipping, ports, and shipbuilding). An important emphasis of the subcomponent while assessing sector laws and regulations is particular attention to safety regulations for vessel and passenger movement, even more specifically for women and children. Recently, the bill has been passed by the state in November 2018 for establishing an independent RA for IWT. The operationalization and salaries cost of the RA will be financed under this subcomponent through the life of the project.

5. Further, the operational and commercial functions of the government's shipping operations and terminal services have been decided to be vested in two new companies: the ASC and the APC respectively. The two new corporations will be constituted under the Companies Act (2013) and subject to rigors of the market. The ISBP will develop a business plan for the two companies and guide them through the initial period of independent operation. The incremental operational cost and salaries cost of the ASC and the APC will be financed under this subcomponent for the first three years after incorporation of these companies. The water transport strategy will assist the state in developing a water transport policy with a broad road map for future investments that promote a more balanced modal mix, improved modal integration, mainstreaming of IWT, and better climate adaptability/resilience and emission reduction.

6. Another important element supported under the component is sector capacity. The capacity of institutions needs to improve to deliver roles effectively in the upgraded sector. The consultancy studying institutions (ISBP) will undertake a detailed assessment of capacity-building needs of DIWTA staff from the point of view of their professional development, re-skilling, and job mapping needs. In particular, developing or consolidating capacity to undertake regular surveys, charting of the river, and recording and analysis of data, which in turn helps institutionalize knowledge on river navigation, is of immense importance. The project therefore proposes to establish a Hydrography Unit under the DIWTA of IWT Assam. The component would also support modernizing the CTC, embedding the Lighthouse India Initiative.

b. **Safety management: river navigation aids, night navigation technology on some routes, and emergency response system (policy, procedures, vessels, and equipment) (US$10 million)**

7. The subcomponent would draw on national/international experience in assessing appropriate aids to navigation, procurement, and deployment to allow 24-hour services/night navigation on the most vulnerable, trafficked routes, or crossing points. Beginning with pilots at 2–3 crucial locations, deployment of navigation aids will be scaled up based on the investment strategy for the sector.

8. An important objective will be to support the establishment of a Search and Rescue Unit; or pilot an emergency response system (policy, procedures, equipment, and management); and improve systems for emergency preparedness including climate and natural disasters. The emergency mechanism to respond to expected climate risks would involve advance weather information systems, which would help better schedule inspections to ensure resilience of old/new structures to climate change pressures and improve and integrate emergency evacuation procedures into operations.

Component 2: Fleet safety improvements and modernization (estimated cost US$25 million)

9. This will include financing of the two subcomponents.

a. **GoA incentive scheme (known as Jibondinga) to assist industry transition to the new regulatory regime; it is designed to help retrofit existing but acceptable vessels with modern marine engines**

and safety equipment and support scrapping and replacement of unsafe or obsolete private vessels with new vessels (US$10 million)

10. The objective of supporting an incentive scheme is to ensure safe, secure, and sustainable transport and to encourage investment in modern shipping technology including adoption of more efficient, greener, and safer technologies, through review of fiscal and other barriers affecting quality of boat construction and maintenance. The GoA has prepared a draft proposal entitled '*Jibondinga*' - boat for livelihood, which provides incentive both for retrofitting of existing vessels (so long as they are found riverworthy) as well as acquisition of new vessels. The scheme considers special incentives to encourage women entrepreneurs and women SHGs. Vessel design and specifications for procurement and retrofitting will be standardized to have better regulation as well as for ease of repair and maintenance. However, the incentive scheme is designed to assist industry transition to the new regulatory regime beginning with direct support on retrofitting existing but acceptable vessels with modern marine engines and safety equipment. Subsequently, a market-based financing framework will be developed to support the scrapping and replacement of unsafe or obsolete private vessels with new vessels, the expected capital cost and financing requirements for which will need much deeper assessment. But it will be a high borrowing amount for private boat operators, and due to the small-scale business (small and medium enterprises /micro, small, and medium enterprises) nature of many operators with a weak balance sheet and insignificant personal collaterals, accessing financing from commercial sources remains extremely difficult. Further, due to lack of familiarity and high-risk perception, commercial banks may also not be willing to lend to private operators with vessels as collaterals, thus further limiting access to long-term financing. Without an affordable cost of financing, the private operators would not be able to upgrade to new and safer vessels and eventually not participate in the program, thus affecting the overall development objective. The component will therefore provide for a detailed analysis to assess financing requirements and structure a government program that mitigates the risk perception of commercial banks and increases access to financing for private boat operators to procure new vessels. The component will identify suitable interventions needed by the Government through design of appropriate incentive mechanisms specifically targeting increasing private participation in vessel purchases and operations. Both IBRD loans and guarantees will be contemplated and structured in a way to meet this objective in subsequent projects, which may include a combination of government incentive and/or IBRD loans and guarantees to be structured through a financial intermediary (a domestic commercial bank or financial institution) to provide loans at competitive financing terms to private boat operators.

b. **Procurement of new vessels for the Assam Shipping Company and retrofitting of existing public vessels (US$15 million)**

11. To begin with, the project is assisting the GoA to procure 20 passenger ferries with the capability of carrying motorcycles in two sizes. One ferry can carry 50 passengers and 25 motorcycles while the other can carry 100 passengers and 50 motorcycles. Allowance has also been made for carrying substantial amount of hand-carried cargo in line with local customs and practices. To ensure substantially improved stability, the two-wheelers will be carried below the gunwales of the vessels. The vessels will be built to the rules of a major classification society to ensure that they are both robust and safe. The vessels are intended for operation as ferries across the river.

12. Simultaneously, the project has initiated condition surveys of the existing government fleet, hull and machinery, and deck and outfit items for their suitability, impact stability (for the area of operation),

loading, and other conditions. Select vessels may be retrofitted. This will also include measures to 'green' the vessel fleet, including adoption of good waste management practices. A few medium-speed shallow draft roll-on/roll-off (Ro-Ro) passenger/cargo catamarans for selected major traffic routes are also planned for procurement.

13. The project would also like to improve connectivity/access to basic services for many islands, villages, and far-off chars by using additional floating stock which is customized to specific needs. Discussion with the district administration and local governments during early preparation missions, particularly to the upper reaches of Brahmaputra (Dibrugarh, Jorhat, and Majuli), had revealed serious connectivity constraints to basic public services such as health and education for numerous small islands and remote chars. These have had profound impacts on health (high maternal and infant mortality), education, jobs, and trade. For example, many inhabited islands do not have medical facilities and people have to travel to other nearby bigger towns to access services, which become critical during emergencies and disasters. For this, the project plans to use the existing government fleet, which may no longer be suited for intensive passenger ferrying but could be usefully converted into mobile clinics, schools/library, and for other such important services. These vessels will be suitably retrofitted and customized to their intended use.

Component 3: Improvement in terminal infrastructure (estimated cost US$55 million)

14. This component will support development of improved and technically designed/engineered ferry landings at feasible locations along the Brahmaputra in Assam. The project will finance the activity under two subcomponents.

a. **Provision of priority terminals including repair facilities (US$40 million)**

15. In particular, this subcomponent will finance the design and construction of few priority terminals at identified busy crossings (such as Guwahati and Majuli). The infrastructure improvements/designs will in particular adopt a 'working with nature' approach which ensures that project objectives are satisfied in a way that places natural ecosystem at center stage, thereby making solutions non-damaging and sustainable (limit dredging, use portable/modular infrastructure design adaptation for landing stations to enhance climate change resiliency, low draft vessel designs, and so on). The developments would offer opportunities for ecotourism development, rejuvenating the river waterfront and integrating quality ferry terminals in the urban context.

b. **Provision of smaller terminals at other locations (mainly rural routes) (US$15 million)**

16. This subcomponent will provide standard designs for modular and scalable infrastructure that can be adapted for other urban and rural ferry terminals. It also includes ancillary infrastructure such as road access, terminal buildings, and other amenities for the physically challenged, women, children, the elderly, and the infirm.

Component 4: Project management support (estimated cost US$9 million)

17. This component will support implementation of the above three components and provide for costs on project preparation, implementation, coordination, and M&E. This will include establishment and operation of the AIWTDS and financing of the attendant project operating costs (project staffing,

consultancies, training, office modernization/equipment, and other operational costs); the IVA; audit; and M&E systems. An important element of the component would support capacity augmentation and policy support on climate mitigation and adaptation through consultancies, knowledge events, staff training, and so on. These initiatives will help the state develop the knowledge and capacity to deal with and address risks associated with climate induced extreme events.

18. The activities supported under the component specifically include the following:

Providing support for Project implementation, coordination, monitoring and evaluation, through: (i) establishing and ensuring the operability of AIWTDS, including the provision of training, staffing, office modernization and equipment; (ii) ensuring the operability of the AIWTRA, including the provision of training, staffing, office and equipment; (iii) providing technical assistance and management support, including hiring the services of the General Consultant and the Independent Verification Agency; (iv) carrying out Project audits; and (v) setting up monitoring and evaluation systems.

19. The total cost of the project is estimated at US$110 million. The IBRD support is estimated at US$88 million while the GoA share will be US$22 million. From the IBRD US$88 million, US$1.4 million will finance repayment of the Project Preparation Advance (US$1.2 million) and the capitalization of the front-end fee (US$0.2 million). The remainder of the loan will be disbursed pursuant to regular IPF procedures (US$33.6 million) and results-based lending procedures (US$53 million) for the financing of the same eligible expenditures. The disbursement of the results-based portion of the loan will be contingent on the satisfactory achievement of DLIs and their associated results.

Table 2.1. Project Cost and Financing (US$, million)

Project Components	Project Cost	IBRD Financing	% IBRD Financing
1. Institutional, regulatory, and safety strengthening	21.0	16.8	80
2. Fleet safety improvements and modernization	25.0	20.0	80
3. Improvement in terminal infrastructure	55.0	44.0	80
4. Project management support	8.8	7.0	80
Front-end fees	0.2	0.2	
Total project costs	110.0	88.0	

ANNEX 3: Technical Analysis

COUNTRY: India
Assam Inland Water Transport Project

1. The project is improving the existing passenger ferry market in Assam through better and technically designed terminals and energy-efficient vessels (both new and retrofitted) and making these sustainable through a more responsive institutional framework. The infrastructure investments do not envisage any disruption to the water balance, any large-scale dredging activity, or land acquisition.

2. The primitive and largely makeshift ferry infrastructure and services across the state are evidence of decades of administrative laxity and underfunding. The untamed character of the Brahmaputra River also makes the provision of fixed infrastructure technically challenging. The Brahmaputra River originates in the Himalayas of Tibet and flows through India and Bangladesh, with tributaries from Bhutan. The river basin is one of the largest and most complex in the world for a variety of reasons, including its challenging topography and hydrological environment. It is a braided river system characterized by high sediment delivery and low throughput, highly sensitive to rapid geometry (boundary and channel) changes, channel baring, and flooding. On average about 8–10 km wide, the river widens to 18–20 km in places, occupying a large part of the valley floor. The high water velocities (upwards of 2.5 m/sec on average) and sharp depth variations, with dramatic channel shifts and excessive bank line recession, make all-year navigation extremely difficult. Heavy sediment load raises the channel bed making floods commonplace each year during monsoon, intensifying the rate of erosion. In case of the Barak, Silchar is the main town and the water level variation there is more than 10 m.

Table 3.1. Water level Variation across Three Main Corridors in Assam

Corridors (Mapped to DIWTA Divisional Areas)	Lowest Water Level, m	Highest Flood Level, m	Variation, m
Guwahati	41.40	51.46	10.0
Dibrugarh	79.90	87.37	7.5
Silchar (Barak valley)	8.41	21.37	13.0

3. The authorities constantly struggle to shift and reposition the location of ghats (ferry landing stations), in response to changing river geometry and seasonally varying water levels. The result is often un-engineered, steep, and slippery embankments, making passenger access arduous and unsafe. Such informal and temporary landing arrangements discourage attention to service quality, manifest today in the poor passenger waiting areas, inadequate public utilities, unregulated safety standards, and mostly neglected special needs of the old and infirm and women. The ferries are similarly rudimentary, unergonomic, and ill equipped. While DIWTA is responsible for services on 89 designated routes, it has contracted 78 of them to private operators (in many cases using leased DIWTA vessels). Most services on other (non-DIWTA) routes are currently met by the informal sector operating traditional country boats without supporting infrastructure of any kind. The inability to run services after dark further imposes travel restrictions and limits access to opportunities.

4. The project would improve the landside infrastructure as well as the vessel fleet and navigation aids. They will be innovatively designed and engineered to provide better-quality service to users with least disruption to nature. The investments are planned and prioritized under an ISDP for the state aiming to mainstream IWT as a mode of transport in Assam, attractive and suited to a much wider user base.

Ferry Landings and Terminals

5. In consultation with the GoA, the project has prioritized the following high-demand ferry routes for development.

Table 3.2. Identified Priority Ferry Routes

Corridor	North Bank	South Bank	Priority
Guwahati	North Guwahati	South Guwahati (Lachit Ghat)	• The pair of ghats connecting North and South Guwahati has the highest traffic potential. • Despite an existing bridge and another planned, the passengers from north bank settlements will continue to prefer traveling to Guwahati City using ferries as roads in these villages are much closer to the ferry ghats than the main road to the bridge(s). • Also, ferry transport is substantially cheaper than road transport. • Ferries allow carrying two-wheelers, market vendor carts, or accompanied luggage.
Dibrugarh	Aphalamukh	Neamati (likely in next phase)	• Aphalamukh is an important south bank location to access the culturally significant Majuli Island (one of the largest inhabited natural river islands in the world). • The south bank location (Neamati) is also a project priority but as the state government is considering developing it jointly with the IWAI, it will be taken up subsequently.

6. These priority ferry routes (located in Guwahati and Dibrugarh) are serviced by DIWTA and private ferries but more stable locations for the ferry landings (coordinates within ±100 m) have now been assessed for techno-commercial feasibility. In doing so, the project draws guidance from 'working with nature' principles that aim to design new infrastructure or rehabilitate existing infrastructure in a way that works with natural river processes. The focus is to design and develop infrastructure in a way that is modular and scalable, limiting the need for fixed structures or substantial acquisition of land or heavy capital dredging.

7. **Identifying feasible locations.** In addition to the geotechnical and topographic investigations, location assessment required understanding the riverbed and bank stability. While the existing water depth at a potential location is important, design also requires investigation of a long-term stable and safe embankment for the lowest recorded water levels. At the feasibility stage, a time series of satellite imagery triangulated with sample field readings has been carried out instead of indicative cross-sectional bathymetric surveys (detailed design and Detailed Project Report preparation are based on actual bathymetric surveys). Secondary information was also drawn from the fortnightly 'Thalweg' readings of

the navigation channel being undertaken by the IWAI as well as the seasonal-level variations being recorded through the Central Water Commission's Flood Forecast Monitoring Directorate.

8. **Social informed design.** The terminal facilities will include separate passenger waiting areas (with necessary amenities) for men and women and allow access for pedestrians and differently abled people. The design considers passenger-associated cargo including vendor carts, two-wheelers (bicycles and motor-scooter), and personal belongings. To improve safety, there will be separate lanes for passengers and motorized traffic entering and exiting the terminal, gradient/inclination of the access bridges or causeway design to international safety standards, and medical emergency response systems.

9. **CCTV and public address system.** This is planned to supervise the terminal operations, monitor high-risk areas, and ensure the overall safety and possessions of all individuals. A public address system is required mainly to announce the operating status of the terminal apart from safety issues.

10. **Environmental considerations.** To reduce dredging requirements, the ferry terminals will be developed in the river where water levels provide better depths for berthing of vessels round the year. This approach is expected to significantly reduce costs and delays attributed to constant changes in river morphology.

11. Terminals are planned with waste management facilities so that no solid waste or sewage is released into the river. Estimation of the sanitary sewage flow is 20 percent above the water supply rate and it will be routed to a package treatment plant. Similarly, solid waste arising from the terminal operation shall satisfy statutory provisions. More specifically, waste management will follow the EIA recommendations.

12. The project will support more landings (mostly smaller rural ghats) that will be selected by the GoA based on the strategic development plan and identification of upgrading needs.

13. **Ferries.** The design of passenger ferries is being standardized for improved efficiency and sustainability.

14. The ferry operations will be improved through better engines (from automobile grade engines to marine engines), improved speeds, and safety equipment. New public vessels will have adequate washrooms, separated by gender, and for persons with special needs. For maintenance, the vessels will be serviced at suitable locations where refueling (bunkering), supply with freshwater, and disposal of wastewater and solid waste as well as cleaning and repairs can take place.

15. A GoA incentive scheme (known as Jibondinga) to assist industry transition to the new regulatory regime will begin with direct support on retrofitting existing but acceptable vessels with modern marine engines and safety equipment. Subsequently, a market-based financing framework will be developed to support the scrapping and replacement of unsafe or obsolete private vessels with new vessels. Detailed analysis will be developed to assess financing requirements and structure a government program that mitigates the risk perception of commercial banks and increases access to financing for private boat operators to procure new vessels. Suitable interventions needed by the Government shall be identified through design of appropriate incentive mechanisms specifically targeting increasing private participation in vessel purchases and operations. Both IBRD loans and guarantees will be contemplated and structured

in a way to meet this objective in subsequent projects, which may include a combination of government incentive and/or IBRD loans and guarantees to be structured through a financial intermediary (a domestic commercial bank or financial institution) to provide loans at competitive financing terms to private boat operators.

16. **Night navigation.** Navigational aids on the banks or in the water (buoys and markers) are virtually nonexistent at present. Communications capability is usually absent or informal, relying largely on hand phones. This not only limits services beyond daylight but also imposes a serious safety risk in case of urgent ferrying at night or during inclement weather conditions; tardy information can delay receipt of administrative response in case of distress and mishaps, even if available. The project will strengthen the presence of physical navigation aids as well as suitable communication technology on land as well as on the ferries.

17. Alongside terminal infrastructure, the Guwahati and Dibrugarh (Majuli) ferry corridors will be taken up initially for shore-based pilots for installing navigation aid facilities. Fixed terminal lights and level markers at the berth and navigational aids to mark fairways for ferries from and to the ghats are being considered.

18. In parallel, the project will help set up a Hydrography Unit at DIWTA by consolidating and strengthening capabilities, which would provide the necessary technical capacity to regularly scan and understand changes in the riverbed. An important activity for efficient navigation guidance will be to continuously update electronic river charts by responses from traveling ferries equipped with echo sounders and onboard global positioning system.

19. **Safety.** The state-level RA is already established under the project, and rules for safe and sustainable operations and management of the IWT system are being drafted. The enforcement of regulations is aimed to transform the operating scenario where only registered vessels are approved for deployment on the ferry services. Besides safety specifications and modern communication systems for all vessels, the IWT vessel rules would state the operating conditions, training and qualifications for the vessel crew and shore staff, mandatory requirement for vessels to display safe passenger load painted on the vessel hull, stringent monitoring of ferry service operations, and suspension of operating licenses for nonconformance to the rules.

20. The existing vessels of DIWTA and the private ferry operators registered with DIWTA are being modernized and upgraded to minimum safety standards through project interventions and incentive scheme. Procurement of bigger and faster vessels for deployment on high traffic routes and specialized fleets of search and rescue vessels for emergency response services are also being mobilized under the project. The terminal infrastructure will be designed with emphasis on safe transfer of passengers between the ferry terminals and the vessels including women, children, differently-abled and senior citizens; enhanced last mile connectivity; secure waiting areas; and amenities catering to the varied passenger needs.

ANNEX 4: Economic Analysis

COUNTRY: India
Assam Inland Water Transport Project

1. **The project is expected to have economic and social benefits much wider than the direct improvements in transport service.** The project will generate (a) direct transport economic benefits in the form of improved services to existing ferry users, (b) benefits from generation of ferry trips (including fewer road trips and savings in their resource costs), (c) time savings from the shorter river crossings along the 891 km where there are only five bridges to commute across the banks, (d) connectivity for largely rural communities in the upper reaches of the river, and (e) possible benefits in vessel operating efficiency. Climate change resilience outcomes will arise from more efficiently designed modular and floating terminals as well as by relieving the pressure to build new road bridges that would have encouraged a more carbon-intensive transport system. Tertiary benefits include stimulation of local economic activity and production in the form of flow-through benefits of boosting shared prosperity by creating more jobs associated with cross-river trade, more livelihood opportunities with improved and more reliable connectivity, increased incomes for farmers and riparian communities, and reduced poverty.

2. **The project investments are not intended to deliver incremental improvements, rather they envisage helping the sector to make a step-change transition to sustainably superior and safer standards.** The economic analysis captures some of the direct benefits from the main fixed investments in ferry infrastructure that are proposed on the identified priority ferry routes between North and South Guwahati and the Aphalamukh-Neamati route serving the Majuli River Island.

3. **Since the benefits of the Brahmaputra River ferries are so valuable to users, the results are robust but differ by location.** In the case of Guwahati ferry routes, the average benefit to passengers is lower than on the Majuli route because the alternative road route through the Saraighat Bridge in Guwahati is shorter than at Majuli (which is accessed by a road bridge on the north of the island). This, therefore, results in a higher economic return (of about 24 percent) in the case of Aphalamukh (Majuli). However, the volume of passengers using Guwahati ferries is such that, even with a lower average user benefit, the EIRR of investments at Guwahati alone is estimated to be 11.7 percent. The benefits of improved urban amenity, encouragement of lower-cost land use development on the north bank, and contribution to tourism will be additional to the direct transport benefits measured.

4. **The main assumptions for the assessment**. The analysis applies local private (unsubsidized) bus and ferry fare per passenger as being a reasonable proxy for long-run avoidable costs (including vehicle per vessel capital) of each mode, other than for the upfront cost of new international standard ferry terminals to be developed which is considered as upfront capital cost. A 10 percent bus operator surplus has been allowed for a non-air-conditioned bus with operating costs of about INR 1.1 per passenger-km. The direct transport economic benefits stem from enhancement to ‘user surplus’ because of much lower ‘user general cost’ relative to the ‘without-project’ situation. The analysis evaluates the following economic parameters, based on certain assumptions or inputs shown in table 4.1.

(a) **The value of time (VOT).** Different values have been assumed for Guwahati and Majuli. While the average income of Assam as a whole is about INR 50,000 per capita,[7] it is higher on average for the largely urban Guwahati compared to the more remote and rural Majuli Island. In addition, the commuters are assigned a 'non-work' VOT, as 35 percent of the work VOT.

(b) **Safety.** About 16–17 fatalities per billion vehicle-km have been applied for an Indian urban setting, with a higher fatality rate of 25 pertinent for rural and less-developed areas such as Assam; 40 per billion vehicle-km is considered for major injuries. Accident costs are INR 7.6 million per fatality and INR 1.3 million per major injury. Fatality is based on 50 times GDP per capita for India, a figure based on estimates used internationally. Accident rates have been reduced over time by 3.6 percent per year. The discussion on economic analysis also reviews results on safety.

(c) **Fuel consumption and GHG.** Based on average fuel consumption for a non-air-conditioned bus of about 3 km per liter (at 2.63 kg CO_2 per l of diesel), the carbon emission per trip is 265.3 kg in case of Aphalamukh and 22.1 kg in case of Guwahati at an average occupancy of 40 persons. In the case of ferries, with 200 persons capacity and 70 percent load factor, the carbon emissions are 43.1 kg and 5.7 kg respectively.

Table 4.1. Main Inputs to the Assessment

Distance (Aphalamukh)	**Without**	**With**
Ferry distance (km)	0	15
Bus distance (km)	300	0
Time (h)		
Ferry	0	1.88
Bus	20	0
(Ferry speed: 8 km per h, Bus: 15 kmph)		
Distance (Guwahati)	**Without**	**With**
Ferry distance (km)	0	2
Bus distance (km)	25	0
Time (h)		
Ferry	0	0.25
Bus	2	0
(Ferry speed: 8 km per h, Bus: 15 km per h		
VOT (Aphalamukh)		
Average earnings per month (INR)	3,000 estimate	
VOT work per hour (INR) (Considering 160 hours per month)	19	

[7] The per capita income of the state in terms of NSDP at constant (2011–12) prices is estimated at INR 51,126 .00 for 2016–17 (Source: Government of Assam, Directorate of Economics and Statistics).

Percentage work per commute	30%	
VOT leisure	70%	
Time cost (INR per person per h)	10.22	
Bus, GHG cost per trip (INR)	650.0	
Ferry GHG cost per trip (INR)	105.5	
VOT (Guwahati)		
Average earnings per month (INR)	8,000 estimate	
VOT work per h (INR) (Considering 160 hours per month)	50	
% work per commute	30%	
VOT leisure	70%	
Time cost (INR per person per h)	27.25	
Bus, GHG cost per trip (INR)	54.2	
Ferry GHG cost per trip (INR)	14.1	
Unit operating cost		
Ferry	2.5	per person per km
Bus	1.0	per person per km

5. The passenger traffic demand numbers are taken, as assessed by the feasibility report.

Table 4.2. Aphalamukh, Number of Passengers (in thousands)

2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
678	748	826	912	1007	1112	1228	1356	1497	1653	1585	1750	1932	2134	2356	2018	2059	2100	2142	2185	2228	2273	2318

Table 4.3. Guwahati, Number of Passengers (in thousands)

2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
1044	1144	1254	1374	1506	1651	1810	1984	2175	2384	2480	2718	2979	3266	3580	4178	4262	4347	4434	4523	4613	4706	4800

Economic Analysis Results

6. **The EIRR of the investments is estimated to be 18.9 percent in real terms.** The user benefits of these ferries were estimated as the socioeconomic costs saved by the availability of ferry services compared with the shortest available road route. The cost savings estimated include travel time savings which reduce the general user cost (considering use of buses as most likely alternative to ferries),

avoidance of trip suppression costs,[8] and carbon cost savings per trip. The capital costs of vessels have been incorporated in vessel operating costs, as has the capital cost of buses in the operating cost estimates for buses.

Table 4.4 Traffic Estimates

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
APHALAMUKH																							
Without	637	648	661	674	688	702	717	733	750	767	778	789	801	813	825	838	851	865	879	893	908	923	939
With	160	161	162	163	164	166	167	169	170	172	173	174	175	176	177	179	180	181	182	184	185	187	188
% incr GC without	299	303	308	313	318	323	329	334	340	346	350	354	357	361	365	369	373	378	382	386	390	395	399
GUWAHATI																							
Without	178	180	183	186	189	192	195	199	203	207	209	212	214	217	220	222	225	228	231	235	238	241	245
With	113	113	114	114	115	115	116	116	117	117	118	118	118	119	119	120	120	120	121	121	122	122	123
% incr GC without	57	59	61	63	65	67	69	71	74	76	78	79	81	83	84	86	88	89	91	93	95	97	99

7. A reality to reckon, however, while reviewing the economics associated with the investments is the fact that the sector, which has remained underfunded, rudimentary, and unsafe for decades (while being operational somehow), is now being scaled up to international engineering standards with due consideration also to sustainability.

8. Further, the economic analysis estimates an increase in net accident costs because of the project. This should not, however, be interpreted as creating additional dangers to society. It is due to the large increase in travel when ferries are available compared with the situation if they are not available when many trips would be suppressed. Additional travel creates what are known as trip-end benefits. Many of these are monetized in the economic analysis while many others that are not easy to quantify have been excluded from the assessment, particularly the benefits from better and more frequent access to health facilities, either directly or because of the improved job prospects from the project. Health facilities in this part of rural India are often limited and this greatly improved accessibility will undoubtedly save lives, not necessarily for the travelers themselves but for their families in the villages by accessing medicines and medical advice. It would be a complex challenge to provide a detailed estimate of such benefits and so this has not been attempted given the scale of the other benefits. However, it is certain they would be significant and would greatly outrank the rather limited increase in travel accidents.

9. The overall results for the assessment and sensitivity tests performed are presented in tables 4.5 and 4.6.

[8] Because of the much higher time and fare costs of travel by road, many trips would not take place if ferry services were not available creating losses in consumer surplus. These trips have been given a penalty in the 'without-project' case equal to half the additional cost experienced by the passengers who would not be suppressed but would continue to travel. This is known as the 'rule-of-a-half' and is a standard approach in transport project evaluations.

Table 4.5. Results

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Capital expenditure (CAPEX)	−962	−962	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
User time savings	0	0	244	274	307	346	389	429	473	521	576	622	669	720	775	835	914	946	980	1,015	1,051	1,088	1,127	1,167
Operator costs	0	0	−6	−10	−14	−19	−25	−30	−35	−40	−45	−51	−56	−61	−66	−72	−78	−84	−86	−89	−91	−94	−96	−99
Accidents	0	0	2	1	1	1	0	0	−1	−1	−2	−2	−3	−3	−4	−4	−5	−6	−6	−7	−7	−8	−9	−10
GHG	0	0	0	0	−1	−1	−1	−1	−1	−2	−2	−2	−2	−2	−3	−3	−3	−3	−3	−4	−4	−4	−4	−4
Total	−962	−962	240	265	294	326	363	397	435	479	527	567	608	653	702	755	828	854	884	916	948	982	1,018	1,055
NPV	3,649																							
EIRR	18.9 %																							

Table 4.6. Sensitivity Analysis

Parameters	CAPEX increases by 10%, time savings decline by 10%, and operator cost increases by 10%	CAPEX increases by 20%
CAPEX	10%	20%
User time savings	−10%	0%
Operator cost	10%	0%
EIRR	**16.1%**	**16.5%**
NPV (INR, million)	**2,816.4**	**3,276.3**