PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE

Report No.: PIDA91174

Project Name	Capacity Augmentation of the National Waterway -I (P148775)
Region	SOUTH ASIA
Country	India
Lending Instrument	Investment Project Financing
Project ID	P148775
Borrower(s)	Department of Economic Affairs, Government of India
Implementing Agency	Inland Waterways Authority of India
Environmental Category	A-Full Assessment
Date PID Prepared/Updated	25-Nov-2016
Date PID Approved/Disclosed	30-Nov-2016
Estimated Date of Appraisal Completion	
Estimated Date of Board Approval	18-Jan-2017
Appraisal Review Decision (from Decision Note)	

I. Project Context

Country Context

The Indian economy experienced a high rate of growth during 2000-2010, followed by a sharp drop from over 8 percent to below 6 percent in 2011. In 2015 growth rate recovered slightly to 6.4 percent and is expected to achieve over 7 percent in the next two to three years if investment levels are maintained. One of the constraints on India➢(s efforts to accelerate manufacturing-based economic growth and enhance its trade competitiveness is the high cost of logistics in India. It is estimated that logistics currently amount to 15 percent of GDP. This high cost is due to a combination of factors, significant among which are congested road and rail systems and the virtual absence of multi-modalism, or the combination and coordination of individual transport modes (via single transport contracts) to provide more efficient and flexible supply chains.

Inland water transport (IWT) forms an integral part of the transport mix in most countries but India has yet to significantly develop the potential of its many rivers to carry goods and passengers over long distances. In China, the USA and the European Union, for instance, IWT handles between 5-7 percent of all freight traffic, while only 0.5 percent of India➢(s freight travels by water.

While India has a long history of using waterways for transport, these were supplanted as a nationally significant mode of transport in the 19th century by the expansion of the railway system. Thereafter there was little investment in maintaining or modernizing IWT routes and many shipping channels, canals and navigation assets fell into disuse and disrepair. Country boats still continue to

use the waterways with small, shallow draft vessels but a commercial shipping industry using large modern vessels is not currently feasible on most rivers and IWT currently plays a negligible role in national freight transport.

The Government of India►(s Twelfth Five Year Plan (2012-17) now seeks to also develop inland water transport (IWT) as a thrust area. GoI►(s increasing commitment to IWT is reflected in the National Waterways Bill (2015), which will increase from nearly 4,400 km to over 18,000 km India►(s declared National Waterways, thereby transferring from states to the GoI the authority to develop these rivers for commercial shipping. This policy coheres with the GoI►(s port-centric development strategy (►(SagarmalaÃ¢►( ) to exploit underutilised inland and coastal waterway connections, as well as traditional road and railway links, in order to integrate the development of ports, industrial clusters and port hinterlands.

There are potential economic, environmental and social benefits in using inland waterways for transport as carrying bulk goods on waterways is cheaper, more reliable and less polluting than transporting them by road or rail. For instance, the costs to transport of carrying 1 tonne of freight over 1 km is Rs 2.28 for highways, Rs 1.41 for railways, and Rs 1.06 for waterways. Moreover, 1 litre of fuel can move 24 tonnes of cargo per km by road, 85 tonnes by rail and 105 tonnes on water. The Twelfth Plan estimates that the total external costs of inland navigation, after accounting for accidents, congestion, noise emissions, air pollution and other environmental impacts could be one-seventh of those of road transport. The Plan targets an eventual ten-fold increase in the modal share of freight transported by IWT, particularly of bulk and semi-bulk cargo, over-dimensional loads and hazardous goods. While the long-term target could be considered aspirational, the policy direction is firmly set.

Sectoral and institutional Context

National Waterway 1 (NW-1), the longest designated waterway in India, is a natural river system linking the seaport at Kolkata (that includes the Kolkata Docks as well as the deep-water dock at Haldia) to Allahabad, some 1,620 km inland, via the Hooghly/Bhagirathi and Ganga rivers. It offers the greatest potential contribution to economic development of any of India►(s waterways: It passes through four resource-rich but low-income states (West Bengal, Jharkhand, Bihar and Uttar Pradesh); it has the potential to serve the rapidly growing seaports of Paradip and Dhamra in Odisha which lie just south of the river estuary; and it connects to the western end of the waterway route constituting the India-Bangladesh Protocol Route to Bangladesh and the states of north-eastern India.

GOI has sought support from the World Bank for developing the 1,360 km-stretch of this waterway between Haldia and Varanasi as an inland water fairway for bulk cargo. The National Waterway 1, together with the proposed Eastern Dedicated Rail Freight Corridor (running between Kolkata and Ludhiana) and National Highway 2 (Kolkata to Delhi) constitute the Eastern Transport Corridor of India connecting the National Capital Region with Kolkata. It is estimated that the annual freight flow through the corridor is about 370 million tonnes, while the total freight flow generated from or destined to the states in the corridor is a significant 40% of the overall flow in India. NW1 currently however carries only an average of about 5 million tonnes of cargo each year.

Despite the significant difference in geographical distance, the hinterland states of Bihar and Uttar Pradesh prefer the western sea ports of Mumbai and Kandla over Kolkata, while port usage for

Jharkhand is almost equally divided between the western ports and Kolkata. This is largely due to the limited choice of transport mode, poor hinterland connectivity and to some extent sub-optimal port infrastructure and efficiency in Kolkata port. Further, the Waterway has the potential to become the gateway for trade with the East given the linkages to the north east region (via National Waterway --- on the Brahmaputra) and link also to Bangladesh (via the Indo-Bangladesh Protocol Route), and thence to Myanmar, Thailand, and other south-east Asian countries.

A value chain analysis of freight flows in the corridor, supported by consultations with freight shippers, indicates that agriculture is the single most important economic activity in the corridor containing NW-1. The four states produce surpluses which are traded with the rest of the country, generating inbound flows of fertilizer, poultry feed and agricultural equipment, and outbound flows of wheat, rice, sugar, vegetable oil, and other produce. The region also produces high volumes of construction materials (aggregates, limestone, sand and cement); mineral and industrial commodities (coal, iron ore, fly ash, plastics, paper, etc.) as well as over-dimensioned cargo for the mining and construction industries. These are all commodities for which IWT has proven most successful in China, Europe, the USA and elsewhere. There is also some containerized cargo flow of industrial inputs and outputs (textiles, cars, carpets, motorbikes, etc.) which mirror intermodal cargo flows by IWT in China (on the Yangtze) and Europe (on the Rhine). The current capacity of warehousing and logistics centers in the area is also sub-optimal and impedes potential future growth of intra-regional and international trade.

The main constraint on NW1 today is weak navigation infrastructure. Currently, IWAI targets a navigation fairway of 45 m width, with least available depth of that varies at different reaches -- 3.0 m between Tribeni and Farakka; 2.5 m depth between Farakka and Barh; 2.0 m between Barh and Ghazipur; and, 1.5 m between Ghazipur and Allahabad. However, the year-round availability and reliability of navigation, particularly upstream of Farakka, is not assured. The situation is compounded by an ageing ship-lock at Farakka, which is a slow, low-capacity and high-maintenance facility built more than 40 years ago and now in need of major rehabilitation. The river also lacks modern navigation aids to allow safe round-the-clock operation. There are also very few cargo handling facilities that could serve larger vessels in an environmentally sound manner. The existing infrastructure thus does not provide confidence to potential freight shippers or to barge operators that inland water transport could deliver a competitive advantage over other transport modes. The proposed project seeks to provide the infrastructure and services that are need to secure the viability of the waterway, including low draft and fuel efficient vessel design, modern terminals, and good inter-modal connectivity.

The Ministry of Shipping is responsible for national IWT policies, while the day-to-day sector administration is undertaken by the Inland Waterways Authority of India (IWAI). IWAI was established by statute in 1985 as an executive authority to develop, regulate and encourage better transport utilization of India➢(s National Waterways. Its aim is to be an infrastructure provider, while the operation of shipping services is to be provided by shipping companies with cargo levels determined by market forces. The GoI has progressively permitted IWAI a more proactive role in developing markets, creating market incentives, and encouraging private sector participation.

However, IWAI has lacked financial and institutional resources to make much headway, and its challenge has become sharper with the scaling up of the inland water transport program planned by GOI. Notwithstanding the recent creation of more than 100 new positions, the current skill mix in

IWAI needs to undergo significant change in favor of asset management, logistics and market development. It is funded from the national budget, and between 2010 and 2015, its average annual expenditure (operations, maintenance and investment) was less than US$ 30 million equivalent. About a third of these funds were allocated to NW-1, which has seen an increase in traffic task of around 77 percent over the five years (from a very low base) to about 5.0 million tonnes/year.

II. Proposed Development Objectives

The Project Development Objective is to enhance transport efficiency and reliability of National Waterway 1 and augment institutional capacity for the development and management of India➢(s inland waterway transport system in an environmentally sustainable manner.

III. Project Description

Component Name

Component A: Improving the navigability of NW-1 (Haldia to Varanasi)

Comments (optional)

Component Name

Component B: Institutional Strengthening and improving the investment climate, vessel design and construction framework

Comments (optional)

IV. Financing *(in USD Million)*

Total Project Cost:	800.00	Total Bank Financing:	375.00
Financing Gap:	0.00		

For Loans/Credits/Others	**Amount**
Borrower	425.00
International Bank for Reconstruction and Development	375.00
Total	800.00

V. Implementation

The proposed project seeks to provide the infrastructure and services needed to secure the viability of NW1 as an efficient and effective transport and logistics solution in this important economic corridor. The infrastructure created under the project will include six multi-modal freight terminals (at Varanasi, Gazipur, Kalughat, Sahibgunj, Triveni and Haldia); two vessel repair and maintenance facilities; and five Roll On-Roll Off (RO-RO) crossings at different locations. The construction of Varanasi terminal has already been initiated, while the procurement process for Haldia and Sahibgunj terminals is in the final stages. The development of the Gazipur, Kalughat and Triveni terminals will be taken up during 2017. The project will also entail rehabilitation of the existing ship-lock in Farakka and the construction of a new parallel lock to allow concurrent two-way passage of barges. These interventions will help reduce time taken for crossing the lock from the current 120 minutes to 30 minutes. The project will also support: (i) installation of navigational aids such as night navigation facilities and channel marking; (ii) enhancement of existing river information system through addition of app-based systems, improved communication platform and

expanded user reach; and (iii) provision of other support services e.g. search and rescue, distress response and casualty incident management, and upgrading vessel and river monitoring systems.

The Project will help create job opportunities for communities living around the six major multimodal terminals and other infrastructure facilities such as vessel repair yards, and Roll-on Roll-off (ro-ro) truck crossings. The direct job creation potential for this project is estimated to be about 25,000 while the indirect job creation potential could be much greater estimated around 125,000, of which it is estimated that 5 percent could go to women.

Given the iconic status of the Ganga river and its significance as a critical environmental resource for India, sincere efforts have been made to integrate sustainability into the design of the project, aligned with IWAI►(s operating principle of ►(working with nature►(. Various design alternatives have been analyzed (which avoids creating potential impacts on critical environmental resources of the Ganga basin), detailed studies and surveys, environmental and social impact assessments (including their own set of detailed studies and surveys; prepared in consultation with experts and stakeholders, disclosed and available in IWAI websites) were conducted to arrive at the least-intrusive design for developing the waterway. In addition, a cumulative impact assessment conducted to inform the design choices has also recommended additional guidance to make the construction of the project, and operations thereafter to be environmentally sound, to avoid pollution, and to make the waterway infrastructure, facilities and operation energy-efficient. These guidance have been incorporated in the designs.

A large meandering river system such as the Ganga is highly complex dynamic ecosystem due to its high levels of sediment transport. The river has large water level fluctuation and unreliable water depths; leading to unavailability of adequate depth suitable for navigation. Several design options were investigated for the fairway depending on the trade-off of between Least Available Depth (LAD) and associated dredging quantity and cost. A strategy was adopted for optimal LAD and minimal dredging coupled with operation of low draft vessels. The final LADs proposed are 3.0 m between Haldia (km. 0) to Barh (km. 980), 2.5 m from Barh (km. 980) to Gazipur (km. 1,250) and 2.2 m from Gazipur (km 1,250) to Varanasi (km 1,360), with a channel width of 45 m. This would support two-way movement of commercial barges carrying an average payload of 1500 to 2000 tonnes. The estimated annual dredging quantity would be 10-11 million cubic m which is less than 1% of the sediment load carried by the river. Non-permanent structures like bamboo bandals will be used to channelize water flow and reduce the need for dredging. The adoption of an assured-depth contract will also incentivize reduced dredging. Whatever minimal dredging is required will be done mainly with the low-intrusion water injection method wherein the dredged material is transported horizontally along the waterbed and the sediments are retained within the ecosystem. Low draft vessels will be introduced to navigate the stretches with lower LAD.

Strict operating protocols have been put into place to minimize impacts on aquatic fauna (such as dolphins, turtles, fish). Critical habitats such as the Kashi Turtle Sanctuary and the Vikramshila Dolphin Sanctuary have been identified as ►(no go►(areas for dredging activities. Barge movement in these stretches will be restricted a speed up to 5km/h and all cargo vessels will have to install propeller guards to protect aquatic wildlife and sound mufflers to reduce underwater noise. Vessel traffic will be avoided in these sanctuary areas during nights and during the basking hours of the key species. The promotion of clean fuel (including LNG) vessels and construction of zero discharge terminals and other riverside facilities will help reduce the risk of environmental pollution. The use of low-draft, clean-fuel vessels, as well as GRIHA certified green building design

for terminals will also reduce fossil fuel dependence, and help the project avoid GHG emissions to the tune of 151,400 t CO2 per year.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	×	
Natural Habitats OP/BP 4.04	×	
Forests OP/BP 4.36		×
Pest Management OP 4.09		×
Physical Cultural Resources OP/BP 4.11	×	
Indigenous Peoples OP/BP 4.10		×
Involuntary Resettlement OP/BP 4.12	×	
Safety of Dams OP/BP 4.37		×
Projects on International Waterways OP/BP 7.50	×	
Projects in Disputed Areas OP/BP 7.60		×

Comments (optional)

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