



**Plan and Implementation Support for
Commercialization of NW-1**

Summary of 13th Pilot Movement

Rajmahal/Sahibganj to Kolkata

Electrosteel



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1 Introduction

During recent years, the National Government of India and the Inland Waterways Authority of India (IWAI) as the statutory authority in charge of the nation's inland waterways have undertaken significant efforts to foster freight movements on India's national inland waterways and enhance the navigability of the same. The taken actions aim at the implementation of the government's policy objective to increase the use of inland waterway transport (IWT) and make use of the potential benefits that this mode of transport offers for the country's growing economy.

Given the growth of the national economy, India's existing transport networks are overloaded in many places and transportation of cargo and passengers by road and rail suffers from congestion as well as the presence of infrastructural bottlenecks. Environmental pollution and pursued sustainability goals moreover require a comprehensive as well as coordinated approach to an integrated national transportation policy. Given the existing network of rivers, canals and backwaters and recognizing IWT's mode-specific advantages, the Indian Government intends to make transport by inland barge an integral part of the country's transport system.

Following the Ganga-Bhagirathi-Hooghly river system, National Waterway-1 (NW-1) has the potential to open up large markets in the northeastern states of India for IWT. In order to foster a sustainable and commercially viable development of the IWT sector in these parts of the country, the competent authorities have invited external expertise for the project on Plan and Implementation Support for the Commercialization of NW-1. The given project thereby aims to facilitate actual business development and to stimulate the sustainable development of cargo movements on India's longest National Waterway.

As the commissioned consultants, a Joint Venture of HPC Hamburg Port Consulting GmbH, UNICONSULT Universal Transport Consulting GmbH and its local Partner La Mer Maritime Ltd. have put together a team of experts with comprehensive knowledge of the Indian inland waterway shipping sector and international IWT markets. In the course of the ongoing project work, the Consultants constantly engage into direct interaction with relevant market stakeholders as well as the competent public authorities, primarily aiming at the conduct of pilot movements and the closing of actual working contracts.

This summary of the 13th pilot movement conducted within the scope of the ongoing project provides a documentation of the practical experiences made during the corresponding trial transport. Also building upon the findings of the current field work as well as the Consultant's knowledge of the IWT market in the northeastern parts of India, the given report moreover provides implementation-oriented recommendations for the further development of the necessary infrastructural conditions and processes for a successful and sustainable development of IWT on NW-1.

In the following, Chapter 2 provides an overview on the background of the pilot movement of silica sand in bulk form from Rajmahal/Sahibganj, Jharkhand to Kolkata, West Bengal and the efforts undertaken to initiate it. Chapter 3 presents financial issues while Chapter 4 provides details on the operational aspects. Chapter 5 summarizes relevant findings and experiences while Chapter 6 gives recommendations on further needs for action.

2 Preparation of Pilot Movement

During the continuous market research conducted within the scope of the project, the Consultants' local team of experts has been in regular contact with Electrosteel since March 2018. Headquartered in Kolkata, West Bengal, the company belongs to the leading providers of pipeline solutions in India. Since the establishment of contact, both the potential shipper's expectations regarding the use of IWT as well as potentially feasible O-D pairs for IWT pilot movements on NW-1 have been discussed in the course of various telephone consultations.

As a result of the comprehensive discussions, on 06th July 2018 Electrosteel expressed its interest in the conduct of a first pilot movement on the transport of 1,200 metric tons of silica sand between Rajmahal/Sahibganj, Jharkhand and Kolkata, West Bengal. However due to changing specifications on the shipper's side as well as operational conditions on NW-1 during the monsoon season and cargo availability, final confirmation was delayed until mid of August 2018. With organization and cost for first and last mile transport borne by the shipper, an original freight rate of INR 750 per metric ton was thereby agreed on. The freight rate was later adjusted to INR 650 as the shipper arranged for loading at his own costs of approximately INR 100 per metric ton.

Following approval by the competent authorities, the pilot movement was thereafter initialized and all preparatory actions were taken. As the inland waterway vessel assigned for the transport, MV Beki was relocated to Rajmahal/Sahibganj with loading of cargo starting on 30th October 2018 at 10:00 AM. Specific requirements regarding the choice of vessel thereby included a minimum carrying capacity of 1,500 metric tons, minimum depth of approx. 2.8 meters and an operational speed of around 7-8 knots, as well as the availability of rain protection for the cargo.

3 Financial Aspects

Under the coordination of the Consultants' team of local experts, Electrosteel as the commissioning shipper and IWAI as the barge operator agreed upon the conduct of a first pilot movement on 1,200 metric tons of silica sand on NW-1 from Rajmahal/Sahibganj, Jharkhand to Kolkata, West Bengal.

Electrosteel and IWAI thereby agreed upon a final freight rate of INR 650 per metric ton for barge transport from Rajmahal/Sahibganj Rai Bazar to Kolkata GR Jetty. An original rate of INR 750 per metric ton was thereby adjusted by INR 100 per metric ton as the shipper accepted to arrange for loading of the cargo at Rajmahal/Sahibganj himself. Based on the given bulk cargo transport volume of 1,200 tons of silica sand, IWT related transport costs invoiced to the shipper thus amounted to a total of INR 780,000 and were paid directly by Electrosteel to IWAI.¹

Costs for first mile transport to the loading site at Rajmahal/Sahibganj, Jharkhand as well as for last mile transport from the unloading site at Kolkata GR Jetty, West Bengal to the shipment's final destination were borne by Electrosteel and are not part of the agreement on the pilot movement. As to the financial viability of the agreed freight costs it must be noted that IWAI acted as barge operator. However from the shipper's perspective, it can be assumed that the given overall freight rate of INR 650 per metric ton excluding additional costs for loading as well as first and last mile transport constitutes a financially attractive and economically efficient alternative to current land based transport options.

Table 1 below shows the major cost items of the 13th pilot movement.

Table 1: Freight and Transport Charges

Position (Cost Item)	Charges (excl. Service Tax)
First mile transport to Rajmahal/Sahibganj, Jharkhand	NA
Loading at Rajmahal/Sahibganj, Jharkhand	Arranged by shipper
Vessel transport freight charges	INR 650 per ton
Discharging at Kolkata GR Jetty, West Bengal	Arranged by La Mer Maritime (P) Ltd.
Last mile transport from Kolkata GR Jetty, West Bengal	NA

Source: The Consultants 2018

¹ Costs for discharging were not invoiced separately.

4 Operational Aspects

The 13th pilot movement covered the transport of 1,200 metric tons of silica sand in bulk cargo form from Rajmahal/Sahibganj, Jharkhand to Kolkata GR Jetty, West Bengal. Although other bulk pilot transports have been executed before, this is the first movement on this particular commodity conducted within the scope of the current project on commercialization of NW-1. Moreover it is the first movement involving the Kolkata based company Electrosteel as shipper.

The overall duration of the pilot movement including time for loading and unloading of cargo amounted to 27 days. Throughout all stages of the transport the movement was closely monitored by the Consultants' local team of experts at all times. Close monitoring allows for early detection of potential hurdles and bottlenecks as well as the initiation of countermeasures if necessary, thus mitigating organizational or operational delays.

Loading of cargo at Rai Bazar in the Rajmahal/Sahibganj, Jharkhand area was severely delayed due to a lack of both, suitable jetty infrastructure and availability of adequate loading equipment. With no grab crane available, excavator equipment arranged by the shipper was used to load the silica sand from the river shore onto the vessel's bow from where it was stowed in the cargo holds by means of manual labor. Due to the lengthy operations, loading was thereby further aggravated and delayed by falling water levels, resulting in frequent shifts of the vessel.²

Official documentation issued for the pilot movement included a cargo manifest that had been signed by the master as evidence for the cargo quantity on board. Throughout the course of the movement, the transport was inter alia further delayed due to a lack of adequate night navigation infrastructure on the corresponding sectors of NW-1.

Table 2 below presents a summary of information on the movement.

Table 2: Pilot Movement at a Glance

Route	Rajmahal/Sahibganj – Kolkata GR Jetty
Shipper	Electrosteel
Vessel Operator	IWAI
Vessel Name	MV Beki
Commodity	Silica sand (in bulk cargo form)
Cargo Quantity	1,200 metric tons
Distance on NW-1	445 km
Loading at Rajmahal/S., Jharkhand	30 10 2018 – 12 11 2018
Departure at Rajmahal/S., Jharkhand	14 11 2018
Arrival at GR Jetty, West Bengal	17 11 2018
Unloading at GR Jetty, West Bengal	20 11 2018 – 25 11 2018

Source: The Consultants 2018

² In deviation to earlier arrangements and due to delays in public provision, equipment and labor for loading of MV Beki was organized by the shipper Electrosteel.

4.1 Loading Procedure

Following a short first mile transport of just approximately 2 kilometers, loading operations took place at Rai Bazar on the western outskirts of Rajmahal/Sahibganj, Jharkhand. Loading of the bulk cargo silica sand started on 30th October 2018 but was not completed until 12th November 2018. Loading operations were thereby severely lengthened due to the suboptimal shore access of the vessel at the mooring site and unviability of infrastructure and crane equipment suitable for loading the silica sand into the vessel's cargo holds. Under the given infrastructural premises the cargo thus had to be loaded onto the vessel's bow by the use of a grab excavator from where it was then manually stowed in the cargo holds.

Figure 1 below shows the site of the charging location at Rajmahal/Sahibganj Rai Bazar, Jharkhand.

Figure 1: Loading Location



Source: The Consultants 2018, based on Google Earth

Figure 2 below provides illustrations of the charging of cargo at Rajmahal/Sahibganj Rai Bazar, Jharkhand by grab excavator and manual stowage in cargo holds.

Figure 2: Loading operations



Source: The Consultants 2018

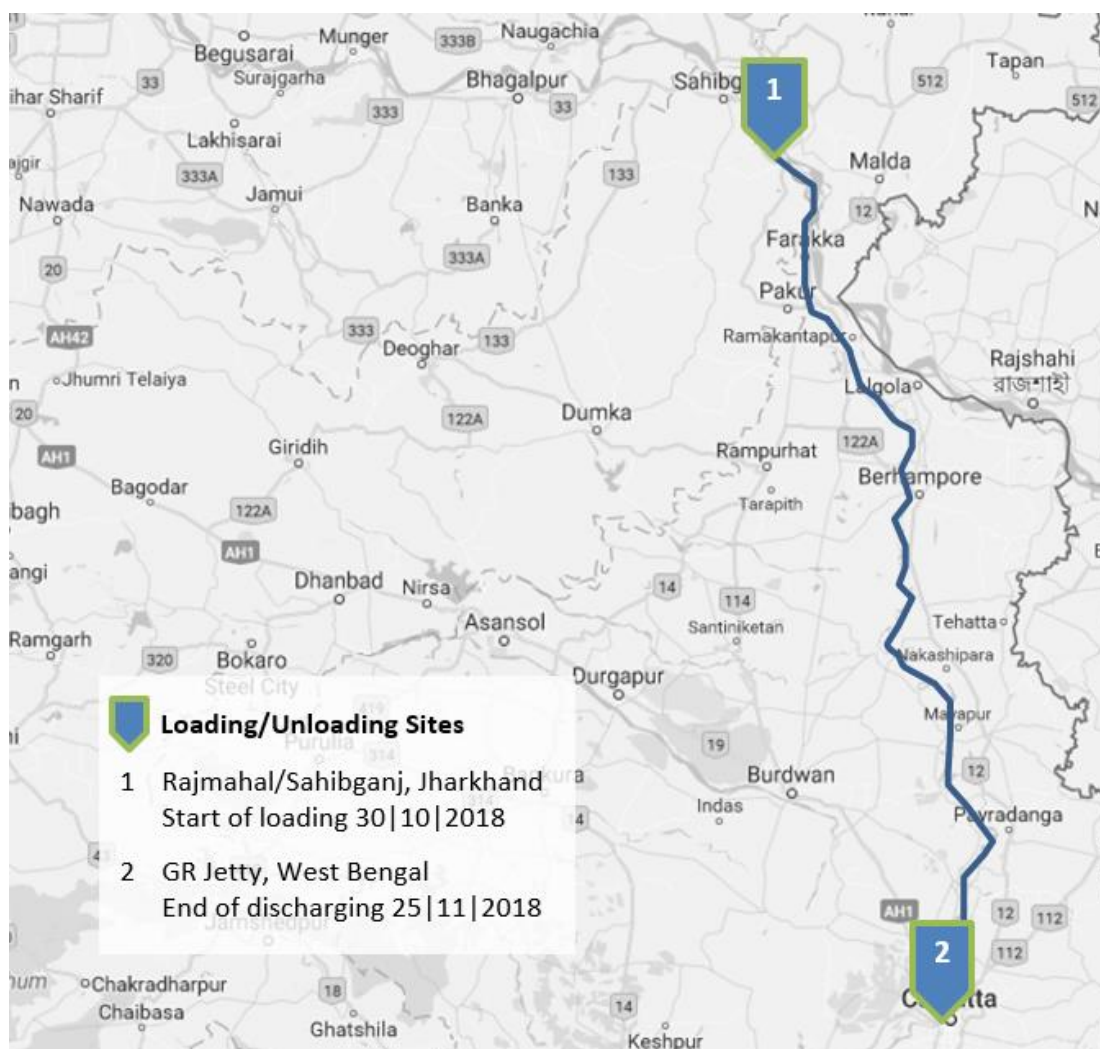
4.2 In-transit Procedure

Following the charging of 1,200 metric tons of bulk cargo silica sand at Rai Bazar on the western outskirts of Rajmahal/Sahibganj, Jharkhand, inland waterway vessel MV Beki departed on 14th November 2018.

On board mounted covers were used to close the cargo hold throughout the course of the movement and protect the silica sand from moisture, wind and rain as well as other external influences. Due to generally good navigational conditions on NW-1's southern sector, the pilot movement was able to operate on the Ganga River during day time hours without significant restrictions. Having passed Farakka lock, it continued its voyage on the Hooghly River and reached GR Jetty in Kolkata, West Bengal on 17th November 2017.

Figure 3 below provides a map of the IWT movement plan covered by this pilot movement.

Figure 3: Movement Plan



Source: The Consultants 2018, based on Google Maps

Throughout the vessel's journey, no en route groundings or other severe disturbances occurred. However, missing adequate night navigation facilities restricted operations of the pilot movement to daylight hours only. Moreover, some idle time occurred waiting for passage through the lock complex at Farakka, West Bengal.

Figure 4 below shows MV Beki while mooring at the loading site at Rai Bazar on the western outskirts of Rajmahal/Sahibganj, Jharkhand. The on board rail-mounted cover structure protecting the cargo from external influences is clearly visible.

Figure 4: Cargo Vessel MV Beki



Source: The Consultants 2018

4.3 Unloading Procedure

Discharging of the shipment of bulked silica sand took place at Kolkata GR Jetty, West Bengal. Unloading operations thereby started on the 20th November 2018 at around 10:30 AM and were completed by 02:00 AM on 25th November 2018.

Unlike to loading operations at Rajmahal/Sahibganj, Jharkhand, infrastructure and mooring conditions at Kolkata GR Jetty allowed for the use of advanced handling equipment for discharging of the cargo. In addition to an onshore grab crane, excavators were used both onboard MV Beki as well as on land in order to pile up the silica sand and load it onto waiting trucks for last mile transport. The vessels rail-mounted cover structure thereby permitted good access to the cargo holds, thus allowing for smooth and fairly efficient unloading of the bulk cargo. Last mile transport covered a distance of approximately 25 kilometers to Electrosteel's storage facilities in the Kolkata, West Bengal area.

Figure 5 below shows the unloading location of the 13th pilot movement at Kolkata GR Jetty, West Bengal.

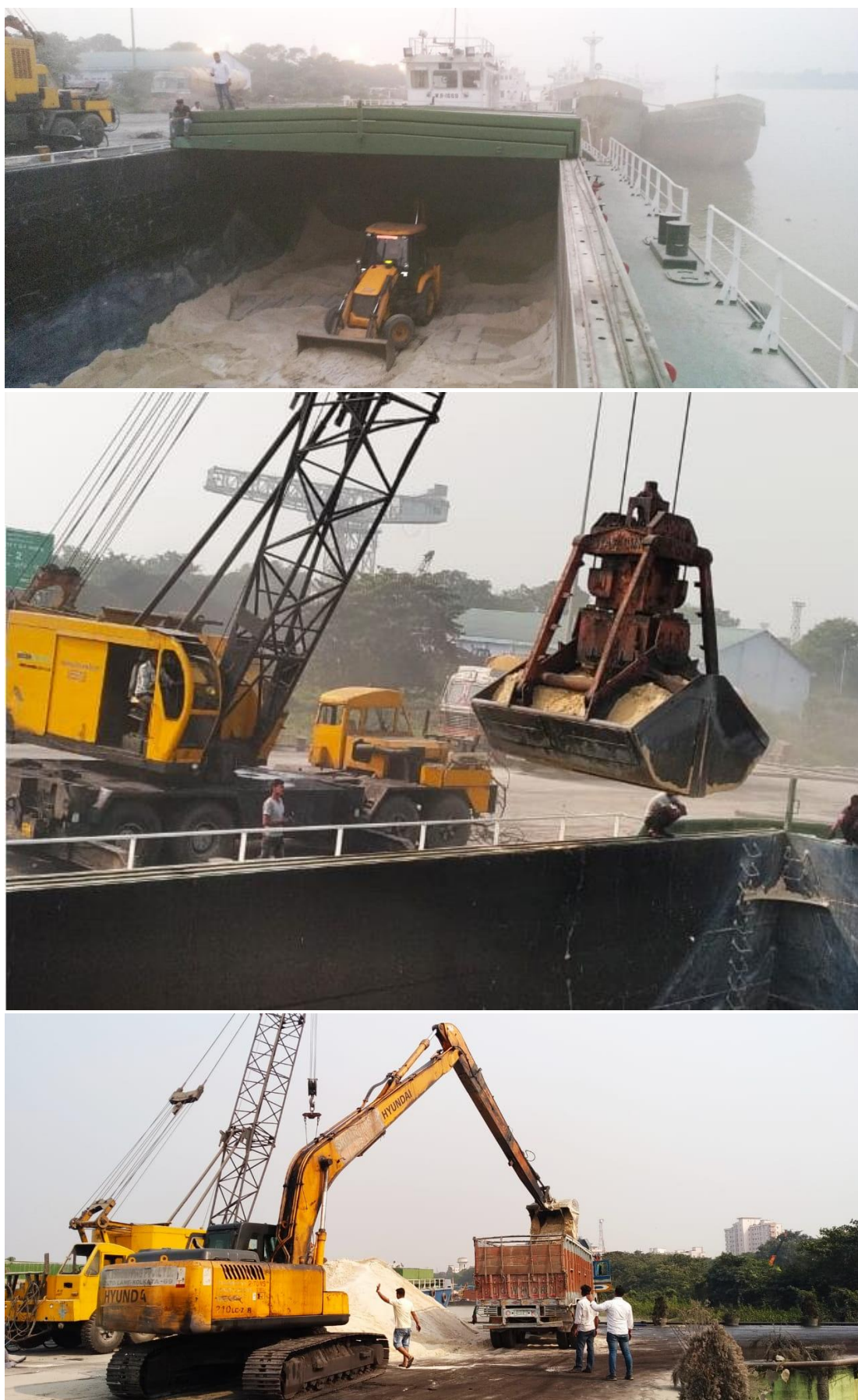
Figure 5: Unloading Location



Source: The Consultants 2018, based on Google Earth

Figure 6 below provides illustrations of discharging operations at Kolkata GR Jetty, West Bengal.

Figure 6: Unloading Operations



Source: The Consultants 2018

5 Experiences and Findings

During the 13th pilot movement several issues have been documented by the Consultants' team of experts. These include in particular:

- First movement of silica sand, protected from moisture and other external weather conditions by an on-board rail-mounted cover structure.
- Long negotiation due to changing specifications on the shipper's side as well as long coordination processes needed for approval and confirmation of the movement
- Loading operations severely complicated and lengthened due to missing infrastructure, difficult mooring conditions, and unavailability of adequate crane equipment.
- Issuance of necessary transport documentation, including cargo manifest signed by the master as evidence of cargo quantity carried on board.
- Smooth transport on NW-1 from Rajmahal/Sahibganj, Jharkhand to Kolkata, West Bengal, including passage of Farakka lock.
- Night time operations not possible en route due to unavailability of adequate night navigation facilities, limiting vessel operations to daytime only.
- No en route groundings due to sufficient available water depth at all stages throughout the course of the voyage.
- Unloading operation (also during night time hours) including the use of both grab crane and excavator equipment allowed for efficient discharging of the silica sand.
- Direct payment of the vessel operator by the cargo owner (Electrosteel), general overall economic viability assumed.
- However commercial viability on the shipper's side affected by significant operational delays during loading of the cargo, resulting in a missed on-time delivery of the cargo.

6 Recommendations

Based on the findings of the 13th pilot movement of silica sand in bulk cargo form, the following actions are recommended:

- Take measures to enhance waterway access at Rajmahal/Sahibganj, Jharkhand, also providing adequate infrastructure and shore access both from water and land.
 - Suggestion: Improve both landside and waterside access to the Ganga river in the Rajmahal/Sahibganj area, e.g. by construction of jetty infrastructure
- Ensure short-term availability of adequate handling equipment for fast and cost-efficient loading and unloading of goods also in areas away from main cargo terminals.
 - Suggestion: Improve availability of grab crane and excavator equipment, e.g. by creating directories on authorized local contractors for equipment provision
- Ensure technical and operational feasibility of night time navigation.
 - Suggestion: Improve navigational aid infrastructure (inter alia navigation lights) on all stretches of NW-1.

7 Conclusion

Covering the transport of 1,200 metric tons silica sand on the NW-1 stretch from Rajmahal/Sahibganj, Jharkhand to Kolkata, West Bengal the 13th pilot movement conducted within the scope of the current project provides new and additional insight and evidence on the potential benefits and capabilities of IWT. Moreover it highlights fields of action that have to be addressed in order to improve the operational reliability and overall competitiveness of IWT in northeastern India.

The 13th pilot transport of silica sand from Rajmahal/Sahibganj, Jharkhand to Kolkata, West Bengal demonstrated that given the availability of suitable vessel equipment and under adequate navigational conditions, IWT on both the Ganga and Hooghly River sections of NW-1 may offer a reliable as well economically efficient alternative to land transport. In particular, competitive advantages of inland waterway barge transport appear to be potentially given for the transport of larger lots of bulk cargo over greater distances.

As to the deficits encountered during the given pilot movement it should be noted that loading at Rajmahal/Sahibganj, Jharkhand was severely delayed due to inadequate river access and missing handling equipment. Moreover, lengthily administrative coordination processes resulted in further delays in the preparation and conduct of the movement. As during earlier pilot transports, barge operations were limited to daytime hours only due to missing night navigation infrastructure.