



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

**Summary of 9th Pilot Movement
Diamond Harbour to Kolkata
Sri Maharishi Shipping Pvt. Ltd.**



Uniconsult
Universal Transport Consulting GmbH

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1 Introduction

In India, the National Government intends to increase the use of IWT and to exploit the potential benefits that this mode of transport offers for the country's growing economy. During recent years, the National Government and the Inland Waterways Authority of India (IWAI) as the statutory authority in charge of the inland waterways have therefore undertaken major efforts to enhance the navigability and boost freight movements on India's national inland waterways.

Given the country's recent economic growth, India's road and rail networks are overloaded in many places and transportation of cargo and passengers suffers from heavy congestion as well as the presence of physical bottlenecks. Moreover, increasing pollution and fundamental environmental goals require a comprehensive and coordinated approach to an integrated national transportation policy. Recognizing its mode specific advantages and given the country's large network of rivers, canals and backwaters, the Indian Government therefore intends to make IWT an integral part of the country's future transport system.

In order to foster a sustainable and commercially viable future development of the IWT sector, the competent authorities have invited external expertise for a project on Plan and Implementation Support for the Commercialization of National Waterway-1 (NW-1). The project thereby aims to facilitate actual business development and to stimulate the further development of freight movements on India's longest National Waterway from Allahabad to Sagar Island.

Having been awarded the contract to conduct the assignment, 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 and long-standing knowledge of both, international IWT markets in general and the Indian inland waterway shipping sector in particular. In the course of the ongoing project work, the Consultants' experts engage into one to one interaction with various relevant market stakeholders as well as the competent public authorities, aiming at the conduct of pilot movements and the closing of actual working contracts.

Considering the practical experiences and also building upon the interim findings of the current project's ongoing field work as well as the Consultant's profound knowledge of the Indian IWT market, this summary of the ninth pilot movement provides implementation-oriented recommendations for creating the necessary conditions for a sustainable development of IWT transports on NW-1.

In the following, Chapter 2 gives an overview of the general background of this specific pilot movement of yellow peas from Diamond Harbour, West Bengal to Kolkata, West Bengal and the efforts undertaken to initiate it. Chapter 3 presents the financial issues while Chapter 4 provides details on the operational aspects. Based on the findings, crucial success factors and relevant requirements for commercially viable transports and their technical feasibility are discussed in Chapter 5. Chapter 6 gives recommendations on needs for action.

2 Preparation of Pilot Movement

Following the successful conduct of a previous pilot movement of 2,000 metric tons of food grains on NW-1's sector from offshore Sagar Island, West Bengal to Kolkata, West Bengal (pilot movement No. 8 conducted within the scope of the current project) Sri Maharishi Shipping Pvt. Ltd. expressed their interest in the prompt conduct of a further/second trial run. Given the need for a prompt lighterage operation from a sea vessel anchoring off the coast of Diamond Harbour, West Bengal, the Consultants' local team of experts developed an applicable and practically feasible transport case.

The proposed pilot movement thereby involved an offshore lighterage operation including the discharge of 2,225 metric tons of yellow peas as well as the prompt and direct onward transport of the cargo from the unloading location in the Hooghly River estuary to Kolkata Port Trust Kidderpore, West Bengal by inland waterway barge. Given the commodity specific requirements in terms of barge configuration and equipment as well as the positive experiences from an earlier pilot movement it was decided to rely on the barge operator V2 Shipping and the inland waterway vessel MV Aarti.

By arranging a second pilot movement involving Sri Maharishi Shipping Pvt. Ltd. as the shipper and V2 Shipping as the Barge Operator, there appears to be the opportunity to confirm and reinforce the positive findings from the earlier trial transport of food grains in between Sagar Island, West Bengal and Kolkata, West Bengal. Moreover, due to the smooth en-route transport during the previous movement, overall cargo volume transported by a single barge movement was once again increased by approximately 11%. This progress shall thereby help to strengthen the ties between shipper and barge operator and demonstrate the reliability and capability of IWT on NW-1's most southern sector.

3 Financial Aspects

Following the clarification of operational details and in the aftermath of bilateral and internal consultations under the lead of the Consultants' local team of experts, Sri Maharishi Shipping Pvt. Ltd. as the cargo owner and V2 Shipping as the IWT barge operator agreed upon the short-term realization of a second trial IWT pilot movement on NW-1's southern stretch.

Given the successful earlier movement of 2,000 metric tons of yellow peas from Sagar Island, West Bengal to Kolkata, West Bengal, both parties agreed to conduct a trial transport featuring an increased volume of 2,225 metric tons of the food grain on the NW-1 sector in between Diamond Harbour, West Bengal and Kolkata Port Trust Kidderpore, West Bengal.

As to the financial aspects of this ninth pilot movement conducted within the scope of the ongoing project, both parties agreed upon a freight rate of INR 230.00 per metric ton for barge transport on the approximately 38 kilometers long stretch from the anchorage site at Diamond Harbour, West Bengal to Kolkata Port Trust Kidderpore, West Bengal.

Given the transport volume of 2,225 metric tons of yellow peas, the total IWT related transport costs for the shipment thus amounted to INR 511,750.00 and were paid directly by Sri Maharishi Shipping Pvt. Ltd. to the barge operator V2 Shipping. Costs for loading and unloading of the cargo were not part of the pilot movement agreement.

As loading operations at Diamond Harbour, West Bengal involved direct lighterage from a sea vessel onto the IWT barge, no first mile cost occurred. Costs for onward transport from Kolkata Port Trust Kidderpore, West Bengal to the shipments final destinations were borne by the cargo owner and were thus also not part of the pilot movement arrangement.

Table 1 provides a summary on the major cost items of the given pilot movement.

Table 1: Freight and Transport Charges

Position (Cost Item)	Charges (excl. Service Tax)
First mile transport to Diamond Harbour, West Bengal	Not applicable
Loading at Diamond Harbour, West Bengal	NA
Vessel transport freight charges	INR 230 per ton
Discharging at Kolkata Port Trust Kidderpore, West Bengal	NA
Last mile transport from Kolkata Port Trust Kidderpore, West Bengal	NA

Source: The Consultants 2017

4 Operational Aspects

The ninth pilot movement covered the transport of 2,225 metric tons of food grains from Diamond Harbour, West Bengal to Kolkata Port Trust Kidderpore, West Bengal. While it is the second transport of this commodity and also the second trial run on this O-D pair conducted within the scope of the current project on Commercialization of NW-1, the given pilot movement features the first transport of this bulk commodity in between the two locations.

In order to ensure an equally smooth and efficient operation, the execution of the movement was monitored by the Consultants' local team of experts throughout the course of the transport. This is thereby also done in order to detect operational problems early on and to prevent or mitigate potential resulting delays.

As loading took place in the form of a direct lighterage operation from the mother vessel MV Roberta onto the IWT barge MV Aarti, no separate first mile transport was needed. Throughout the transport MV Aarti was staffed with a total crew of nine. Additional manpower was engaged during lighterage and loading operations (involving crew members from the mother vessel) as well as during discharging at Kolkata (in total approximately 10-15 additional staff).

While the straightforward transport time on NW-1 was well within the expected time range for the duration of the barge movement, notable delays occurred during discharging of the cargo at Kolkata Port Trust Kidderpore, West Bengal. Last mile distribution by truck was arranged by and conducted at the cost of Sri Maharishi Shipping Pvt. Ltd.

Table 2 below presents information on the operational details of the pilot movement.

Table 2: Pilot Movement at a Glance

Route	Diamond Harbour – Kolkata
Shipper	Sri Maharishi Shipping Pvt. Ltd.
Vessel Operator	V2 Shipping
Vessel Name	MV Aarti
Commodity	Yellow Peas
Cargo quantity	2,225 metric tonnes
Distance on NW-1	38 km
Loading at Diamond Harbour, West Bengal	10 11 2017 – 12 11 2017
Date of Departure at Diamond Harbour, West Bengal	13 11 2017
Date of Arrival at Kolkata, West Bengal	14 11 2017
Unloading at Kolkata, West Bengal	15 11 2017 – 27 11 2017

Source: The Consultants 2017

4.1 Loading Procedure

Loading operations were performed in form of a direct lighterage of the yellow peas off the mother vessel MV Roberta (operated by Starbulk SA) and onto inland barge MV Aarti. During the lighterage operations both vessels anchored in the Hooghly river estuary off the coast at Diamond Harbour, West Bengal. Lighterage using the mother vessel's on-board mounted cranes started on 10th November 2017 and was finished by 12th November 2017 without encountering severe problems.

Figure 1 below shows the approximate location of anchorage of the two vessels at Diamond Harbour, West Bengal.

Figure 1: Loading Location



Source: The Consultants 2017, based on Google Earth

Due to direct lighterage of the yellow peas off the sea vessel MV Roberta and onto IWT barge using the mother vessel's on-board mounted cranes, no restrictions due to tide-dependent variations of the water level were encountered. Moreover, offshore lighterage operations could thus be performed independent of fixed local port infrastructure equipment.

Figure 2 below provides some illustrations of the lighterage operations on the Hooghly River estuary off the coast at Diamond Harbour, West Bengal.

Figure 2: Loading operations



Source: The Consultants 2017

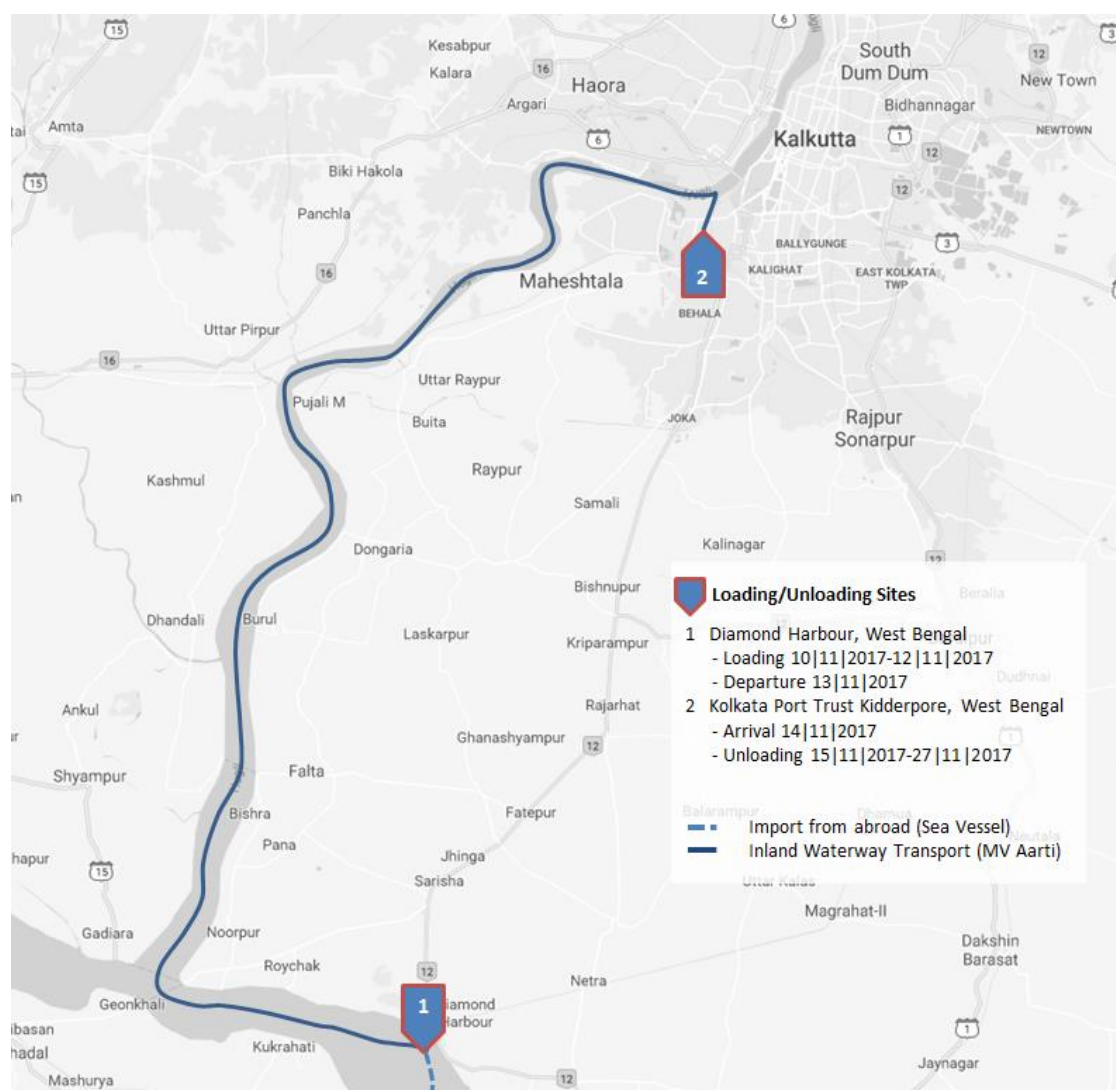
4.2 In-transit Procedure

Following the loading of 2,225 metric tons of yellow peas, inland waterway barge MV Aarti departed Diamond Harbour, West Bengal on 13th November 2017 and reached its destination at Kolkata Port Trust Kidderpore, West Bengal the following day. Throughout the straightforward barge movement on the approximately 38 kilometers long southern sector of NW-1 no severe disturbances were encountered.

Adequate river draft of more than 3.2 meters throughout the voyage prevented en-route groundings and allowed for the successful transport of 2,225 metric tons of yellow peas within the course of a single barge movement at an average sailing speed of seven knots. Due to the availability of adequate navigational aid systems, night time barge operations were possible.

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

Figure 3: Movement Plan



Source: The Consultants 2017, based on Google Maps

Throughout the transport on NW-1, the bulk cargo of food grains was protected against moisture and other whether related influences by a cover of tarpaulins fastened and hold in place by ropes.

Figure 4 below provides illustrations of the en-route operations during the ninth pilot movement.

Figure 4: In-transit Operations



Source: The Consultants 2017

4.3 Unloading Procedure

Unloading of this second pilot movement of food grains took place at Kolkata Port Trust Kidderpore, West Bengal. Having arrived at the docks complex the previous day, preparations for discharging of MV Aarti started on 15th November 2017 and unloading operations were finished by 27th November 2017, thus lasting a total of 13 days.

The foremost reason for this fairly long duration of the discharging operations can thereby be found in the requirement to pack the bulk cargo of yellow peas into bags before discharging by shore mounted cranes could proceed. These operations were thereby done while inland vessel MV Aarti was at berth at Kolkata Port Trust Kidderpore and were severely delayed due to a lack of available workforce.

Figure 5 below shows the unloading location at Kolkata Port Trust Kidderpore, West Bengal.

Figure 5: Unloading Location



Source: The Consultants 2017, based on Google Earth

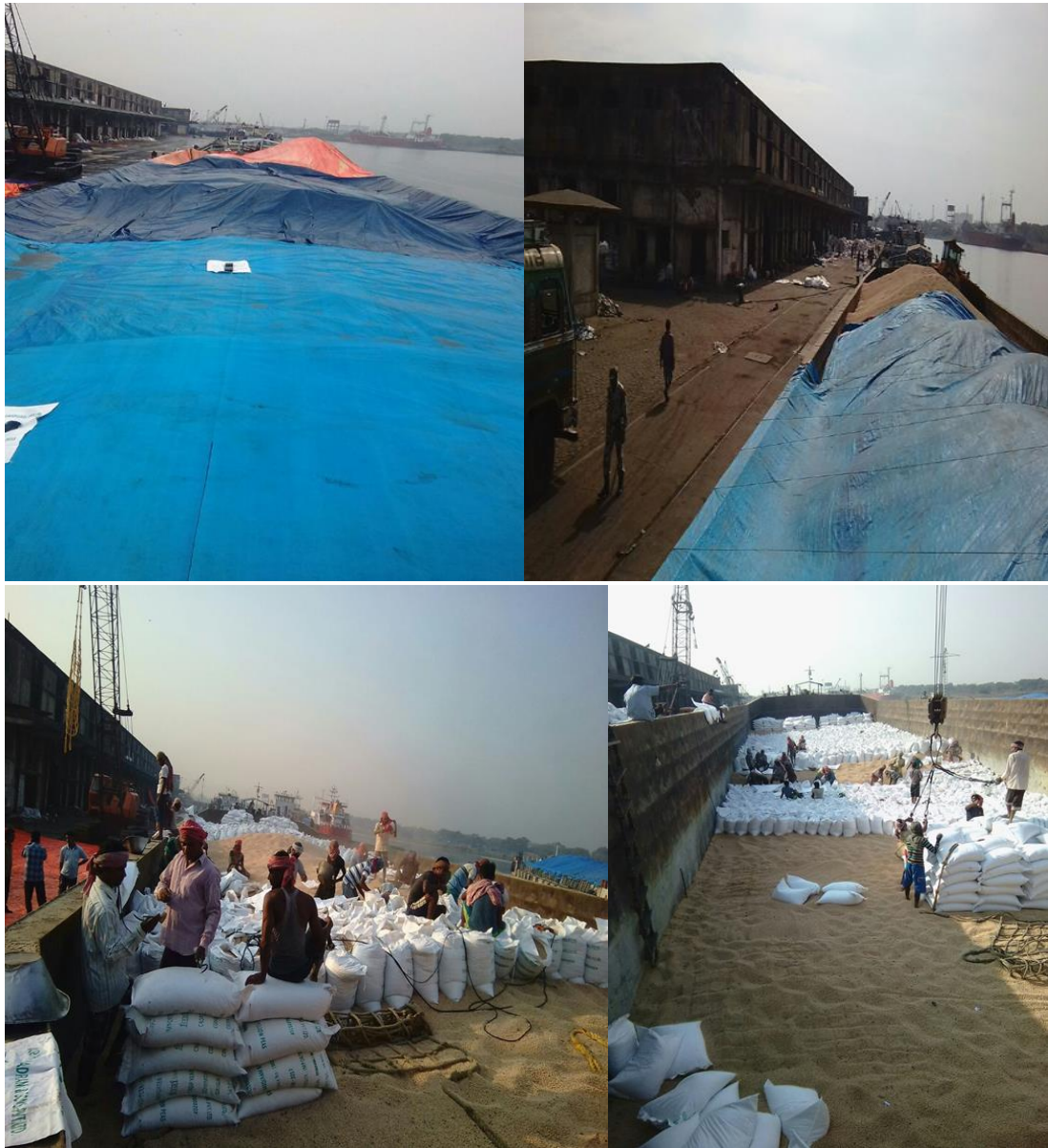
Given the otherwise smooth and fast en-route transport on NW-1, the above-mentioned delays experienced during discharging of the cargo have thereby a fairly strong impact on the overall efficiency and performance of the transport by inland waterway barge.

In the given case of the ninth pilot movement, the delays encountered during discharging may thereby be described as particularly noteworthy when put in relation to the otherwise fairly short straightforward transport duration.

As with the earlier pilot movements of bulk and break bulk cargo, the given findings once again make it clear that further efforts have to be taken to provide adequate equipment and superstructures as well as a sufficient number of trained workforce at the waterway's main port locations.

Figure 6 below provides some photographs of the discharging operations at Kolkata Port Trust Kidderpore, West Bengal.

Figure 6: Unloading Operations



Source: The Consultants 2017

5 Experiences and Findings

During the course of the ninth pilot movement a number of issues have been documented by the Consultants' team of experts. These include in particular:

- Second pilot movement involving the transport of food grains as a fairly high value cargo that must be protected from external weather conditions and moisture.
- Cargo volume increased by approximately 11% compared to the previous pilot movement of yellow peas from Sagar Island, West Bengal to Kolkata, West Bengal.
- Preparation and implementation of the transport case successfully performed by the Consultants' local team of experts at short notice.
- Crane system mounted onboard of the mother vessel MV Roberta ensured fast lighterage operations and efficient loading of food grains onto inland barge MV Aarti.
- Relative short straightforward transport duration on the approximately 38 kilometers long segment from Diamond Harbour, West Bengal to Kolkata, West Bengal.
- Adequate night navigation facilities allowed for night time transport at an average barge speed of approximately seven knots.
- Available draft of more than 3.2 meters at all stages throughout the course of the voyage resulted in no en-route groundings.
- Unloading operation delayed as bulk form of cargo required packing of food grains into bags before discharging at Kolkata Port Trust Kidderpore, West Bengal could commence.
- Unloading operations performed using the dock's shore cranes, shortage of available workforce and equipment caused some further delay.
- Direct payment of V2 Shipping as barge operator by Sri Maharishi Shipping Pvt. Ltd., overall economic viability for both parties results in no requirement for gap funding.

6 Recommendations

The experiences made during the ninth pilot movement conducted within the scope of the ongoing project on Commercialization of NW-1 correspond with the findings of the two earlier trial transports conducted on the southern stretch of NW-1 in between Sagar Island, West Bengal respectively Diamond Harbour, West Bengal and Kolkata, West Bengal.

Major overlaps can thereby especially be found with the findings of the eighth pilot movement, in particular with regard to delays encountered during discharging of the bulk cargo at Kolkata Port Trust Kidderpore, West Bengal. In order to improve the feasibility and economic viability of future movements of food grains or other bulk commodities, the following actions are recommended, two of which have already been proposed in the previous summary on the eighth pilot movement:

- Decrease time required for discharging of cargo and increase unloading efficiency in order to accelerate vessel turnaround times in inland ports.
 - Suggestion: Provide adequate excavator equipment / corresponding bulk grab extensions for shore cranes at main IWT terminals in order to allow for efficient and fast discharging of bulk cargo without the need of packing into bags on board the inland vessels.
- Improve equipment at main inland ports in order to allow for the provision of efficient onshore value added services and to reduce in-port transshipment times.
 - Suggestion: Provide adequate onshore equipment (e.g. hopper machinery) for efficient onshore packing of bulk cargo and the provision of further value added services in inland port areas.
- Ensure the availability of a sufficient number of trained workforces for safe, fast and efficient loading and unloading operations at the main IWT terminal facilities.
 - Suggestion: Employ an adequate number of staff for fast and efficient handling of cargo in ports. Staff should be trained in order to ensure work safety and prevent accidents during loading, unloading and handling operations.

7 Conclusion

The ninth pilot movement covered the transport of 2,225 metric tons of yellow peas on the Hooghly River stretch of NW-1 from Diamond Harbour, West Bengal to Kolkata, West Bengal. The pilot movement thereby provides some affirmative and valuable insight on the operational capabilities and benefits of IWT transports on NW-1's most southern sector and their potential future commercial viability.

The transport featured an increased transport volume compared to an earlier pilot movement of the same commodity on a similar O-D pair. Despite increasing the cargo load by approximately 11% (2,225 metric tons instead of 2,000 metric tons), no groundings or other operational problems were encountered en-route.

Like in the eighth pilot movement, the availability of appropriate night navigation aids once again allowed for a fast transport by inland barge also during dawn and night hours. This helps to reduce overall transport durations and ensure commercial viability of the transport for both, shipper and barge operator.

For the third time within the scope of the pilot movements conducted under the ongoing project, a direct lighterage operation using cranes mounted onboard the sea vessel proved to be an economically viable and technically feasible option for a fast, safe and efficient transshipment of cargo in between a sea vessel and an IWT barge.

As to the bottlenecks identified during the course of the given pilot movement it must be noted that once again notable delays occurred during the discharging operations. A lack of adequate equipment in the inland port terminals as well as complicated discharging procedures caused a significant delay of discharging operations.

In the given case, the bulk cargo of yellow peas had to be packed into bags before it could be unloaded using the dock's shore cranes, thus resulting in a fairly long overall discharging time. Adequate equipment (e.g. bulk grabs for shore cranes and hopper machinery) could help to facilitate discharging operations and accelerate in-port cargo handling.