

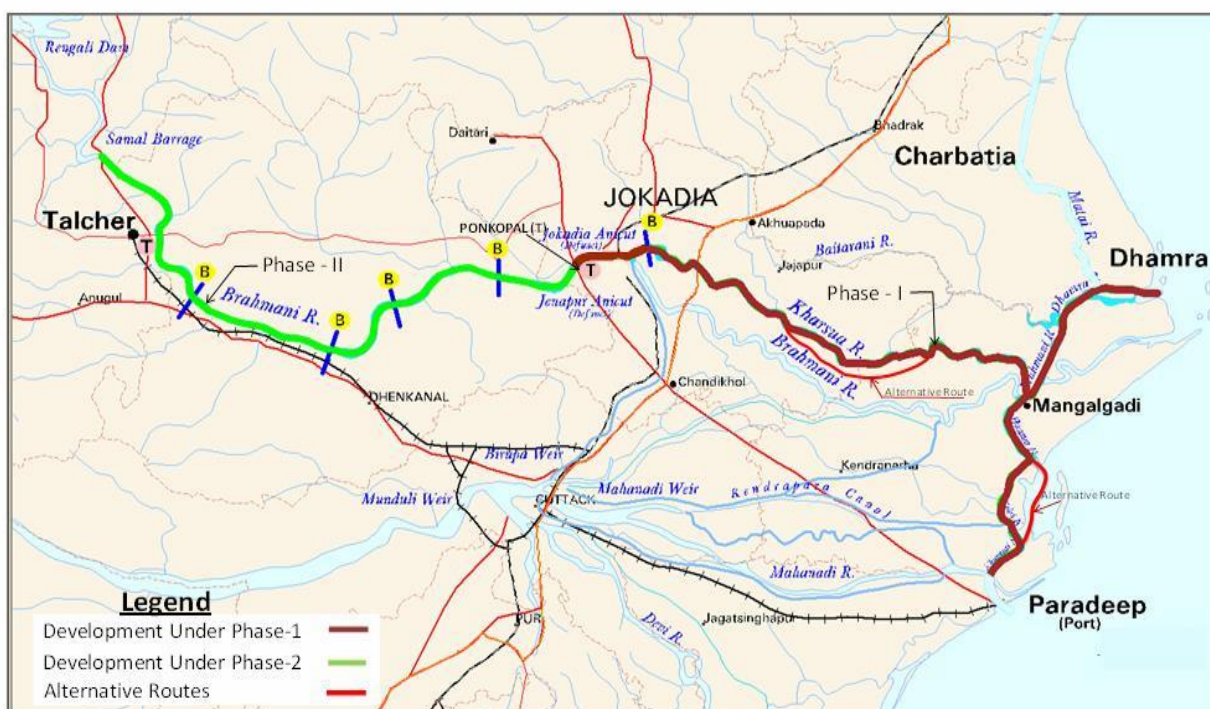
## FEASIBILITY REPORT

### Development of Stretch between Dhamra and Paradip to Pankapal of National Waterway No. 5 in the State of Odisha

#### 1.0 INTRODUCTION AND BACKGROUND

National Waterways No. 5 consisting of East Coast Canal along with Brahmani, Kharsuan, Tantighai-Kani river system and Mahanadi delta rivers for a length of 588 Km has been declared as National Waterways with effect from 25<sup>th</sup> November 2008 for shipping and navigation to promote inland water transport. The stretch wise breakup of NW-5 is as given below:

|   |   |               |
|---|---|---------------|
| 1. River Brahmani- (Talcher to Pankapal)  | - | 120 km        |
| 2. Rivers Brahmani – Kharsua – Kani-Brahmani-(Pankapal to Mangalgadi )                        | - | 117 km        |
| 3. Rivers Brahmani-Dhamra-(Mangalgadi to Dhamra)  | - | 28 km         |
| 4. River Brahmani – open sea-Kharanasi creek-Mahanadi delta rivers<br>(Mangalgadi to Paradip) | - | 67 km         |
| 5. River-Matai - (Dhamra to Charbatia)  | - | 39 km         |
| 6. East Coast Canal (Charbatia - Geonkhali)   | - | <u>217 km</u> |
| <b>Total =</b>  |   | <b>588 km</b> |



**Figure-1 Index map of NW-5**

Inland Waterways Authority of India, a statutory body under the Ministry of Shipping has been entrusted the responsibility for development, management, maintenance and regulation of the waterways with necessary infrastructures to ensure safe navigation. A policy decision has been taken initially to develop the commercially viable stretch

between Talcher to Paradip & Dhamra having a length of 332 km for providing the sustainable and economically viable & alternative mode of transport from the ports to mining area, industrial hubs & vice-versa for movement of coal, iron ore, other minerals, thermal (imported) coals and industrial products etc.

Accordingly, one MOU with the major stake holders i.e. Govt. of Odisha, Paradip Port Trust (PPT) & Dhamra Port Company Ltd. (DPCL) was signed by IWAI on 30.06.2014 for developing the above stretches of NW-5 in two phases.

- 1<sup>st</sup> Phase= 212 km between Pankapal to Dhamra & Paradip
- 2<sup>nd</sup> Phase= 120 km between Talcher to Pankapal

Development of NW-5 under Phase-I is to be taken up on priority basis with the following major work components:

- (i) Fairway Development: with LAD of 3 m, through construction of barrages, check dams and barrages with navigation locks, maintenance dredging wherever required, widening of river, straightening of bends and river training works including bank protection, re-construction of existing bridges and relaying of existing power lines across the waterway to provide required navigational clearance.
- (ii) Terminal facility: with required jetties & cargo handling equipments at Pankapal, whereas existing terminal facilities of Dhamra and Paradip Ports will be utilized.
- (iii) Navigational Aids: To introduce 24 hrs navigation.

## **2.0 DESCRIPTION OF THE WATERWAYS**

### **Phase I - Development of waterway from Pankapal to Dhamra & Paradip via Mangalgadi**

The waterway can be divided into two types, i.e. non-tidal and tidal. The stretch between Pankapal to Padanipal through Brahmani-Kharsuan-Tantighai / Kani river system is non-tidal. The tidal stretches are from Mangarajpur (u/s of Padanipal) to Dhamra and Paradip through Dhamra, Hansua, estuary of Bay of Bengal, Kharnasi creek and Mahanadi delta river system. In the reach between Sujanpur to Padanipal, river Kharsua widens (250m to 500m) and the deep channel becomes relatively shallow and more braided. Survey of a parallel river branch (Tantighai / Kani) from Sujanpur to Padanipal indicated that this river branch is relatively narrow (100 to 125 m) and deeper. Hence it has been decided to develop the route from Sujanpur to Padanipal through Tantighai (Erada-Ratlang-Angeishpur)-Kani (Krishnadaspur-Manpur-Padanipal) river system as shown in Figure – 2.

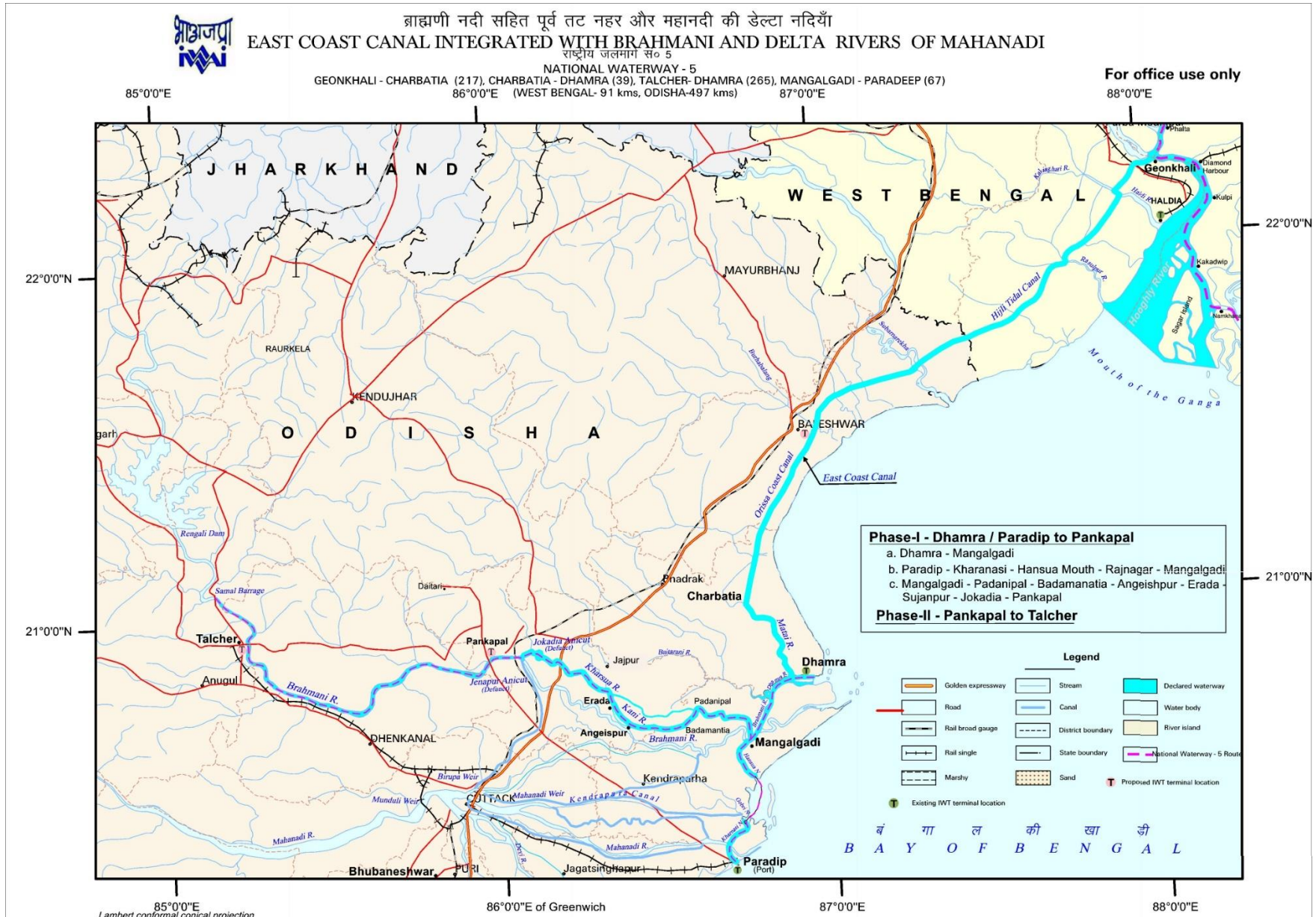


Figure-2 Proposed Phase I of NW-5, Pankapal to Dhamra and Paradip via Mangalgadi

Similarly, as per earlier proposal, Mangalgadi- Paradip IWT route through rivers Hansua, Babar, Nuna, Gobri, Ramchandi Galia, Kharnasi and Mahanadi was not suitable for safe navigation of the vessels of economical size due to the existence of no. of cross structures, river bends, shallow & narrow waterways etc. Hence it was decided to inspect and survey an alternative route running along Hansua, Kharnasi and Mahanadi rivers and through the bay along the coastline near Jambu dweep. After, Joint reconnaissance survey by IWAI, WAPCOS and PPT and subsequent bathymetry survey by IWAI, it has been established that the viability of this route is having many advantages over old route. Accordingly, a decision has been taken for developing this alternative route for movement of economical size and capacity vessels. Further, keeping in view the stretch of waterways passing through Kharanasi creek, the eco-sensitive zone, option is also being explored to utilise the alternative coastal route from Dhamra to Paradip and / or from Hansua mouth to Paradip which is within the baseline.

### **3.0 STUDIES TAKEN UP SO FAR FOR DEVELOPMENT**

The DPR for development of NW-5 in phases was prepared by WAPCOS during 2010 and the cost was updated during 2016 (Executive Summary enclosed as Annexure-I). As per the recommendation in the WAPCOS report of 2016, mathematical model study of the non-tidal stretch from Pankapal to Padanipal was carried out through IIT, Guwahati to ascertain the requirement of cross structures across the above stretch of NW-5 to maintain a LAD (Least Available Depth) of 03m. The outcome of the mathematical model study suggested for intervention of seven cross structures across NW-5. Accordingly one agency has been engaged for preparing the DPRs and Front End Engineering Designs (FEED) of these cross structures. Similarly one agency has also been engaged for preparing Detailed Engineering Report and Detailed Engineering Design and Drawing (DER and DED&D) for modification of existing bridges crossing NW-5.

### **4.0 REVIEW OF THE PROPOSED WATERWAY**

The proposed navigation routes from Pankapal to Dhamra via Mangalgadi and Mangalgadi to Paradip along the revised alignment have been reviewed on the basis of analysis of hydrological data (available discharges and their duration, especially during lean season being critical period due to reduced depths) and hydraulic data, mathematical model results and survey charts. The review has been made taking in to account the following aspects.

- Depths available for navigation
- Structures (weirs, bridges) across the proposed route and vertical and horizontal clearance
- Radius of bends on the route
- Dredging quantity involved

#### **4.1 Flow Depths**

The waterway is to be developed for a fairway having channel width of minimum 50.0m and LAD (Least Available Depth) of 3.0m and bend radius of approximately 700m conforming to Class - III standard as per the classification of waterways of IWAI. Available river bathymetry data indicates that in Kharsua river reach downstream of Padanipal being tidal, generally depth more than 4 m below Chart Datum (CD) prevail even during lean season and high tide condition. The problem of required LAD during lean season exists in the reach upstream of Padanipal where depth is mostly controlled by discharge, channel geometry and bed slope. Hydraulic calculations as well as preliminary mathematical model studies for this reach through a trapezoidal channel section of 50m width with assistance of dredging operation or river training works indicate that for 2m and 3m flow depths, the required discharge will be in the range of 60 cum/sec and 125 cum/sec respectively. The analysis of hydrological data indicate that in post Rengali period (1986 to 2013) the lean season flows in river Brahmani at Jenapur have improved significantly. Flows less than 50 cum/sec may prevail for 7 to 15 days in a year. During lean season, almost entire flow goes through Kharsua and Tantighai / Kani. Discharges in the different range will prevail for period as below:

- 50 to 100 cum/sec : 20 to 90 days
- 100 to 200 cum/sec : 60 to 150 days
- Above 200 cum/sec : 150 to 240 days

Therefore, navigation shall be possible for a period of about 300 days in a year excluding flood periods and period of flow less than 50 cum/sec. The only challenge will be to confine flows of 50 to 125 cum/sec in dredged channel width of 50 m in alluvial rivers with natural width varying from 100 to 500m. Without any special protection measures the dredged channel in alluvial bed will tend to be wider and shallower due to flow. To assess the requirement of additional cross structures between Pankapal and Padanipal for having 3.00m LAD, mathematical model study of the stretch was taken up through IIT, Guwahati. As per the outcome of the study, seven nos. of cross structures are required to be constructed for having suitable navigational depths throughout the waterway in all seasons. Subsequently, it has also been decided to replace the existing Jenapur weir with a weir-cum-Barrage.

#### **4.2 Vertical and Horizontal Clearance, Bend Radius**

The configuration of the navigation channel for class-III waterway shall be minimum 1.7 m depth, 50m bottom width, 700m bend radius, 6 meter vertical clearance and 50m horizontal clearance between the piers for rivers. For canals, the minimum depth

required is 2.2m with 40m bottom width, 700m bend radius, 6m vertical clearance and 40m horizontal clearance between the piers. The reference level for vertical clearance in rivers is the Navigational High Flood Level (NHFL) which is flood level corresponding to 20 year return flood (5% frequency). For the proposed routes under consideration there are bridges and power lines crossing the river channels as detailed below:-

#### **4.2.1 Review of Pankapal – Mangalgadi to Dhamra Route**

Pankapal - Mangalgadi to Dhamra (Along Brahmani-Kharsua-Tantighai-Kani-Kharsua-Tantighali-Kani-Kharasua system)

Existing Bridges: 09 Nos. of road bridges (01 on Brahmani, 08 on Kharsua) with vertical clearance of less than 6m from Navigational High Flood Level (NHFL). The horizontal clearance varies between 23 m to 98 m. All the existing road bridges will require modification / reconstruction. There are 03 railway bridges between Jokadia and Pankapal.

Existing Power lines: 40 Nos. with clear vertical clearance of 2m to 10m and adequate horizontal clearance. All these power lines will be rerouted through 19 lines with required vertical clearance above NHFL.

Ongoing bridges (under construction) - 02 Nos. State authorities have been requested to obtain clearance from IWAI for construction.

#### **Bends along the Route**

On the route from Pankapal to Dhamra, there are many bends along Kharsua as well as Tantighai / Kani River.

##### **▪ Kharsua River Reach from Pankapal to Sujanpur:**

From Jokadia to Sujanpur (the location of bifurcation of Tantighai and Kharsua) there are two bends at chainages 117.4 km and 123.5 km where radius of curvature is 525 m and 432 m respectively.

##### **▪ From Sujanpur to Padanipal along River Tantighai / Kani:**

In this reach of about 45 km in Tantighai / Kani River, there are 24 bends and the radius of curvature in these bends varies from 190 m to 620 m against the requirement of 700 m as per Class-III Waterways.

Attempts may be made to provide cutoffs (where site conditions permit) to increase the radius of curvature or to avoid acute bends. This may involve land acquisition. It is also suggested that the width of dredged channel may be increased on bends which will facilitate better navigation along the bends.

#### **4.2.2 Review of Mangalgadi to Paradip Route (Revised Proposal)**

On this route, there is only one bridge (chainage 6.70 Km) and three power lines (chainage 6.50 Km and 7.00 Km) at Rajnagar and one at Kharanasi fishing jetty. Vertical clearance above HWL is 5.70 m and 7.0 m for the bridge and the power line. In Hansua river, depth of the order of 4 m to 6 m below CD is available and no dredging is required except in some portion before mouth. In the estuary of Bay of Bengal portion and Kharnasi River, with the proposed maintenance dredging of about 2 m below CD, adequate depths will be available for navigation.

On the proposed alignment through Hansua River, there are 3 bends with radius of curvature close to 700 m. On river Kharnasi there are 3 bends with radius less than 300 m. especially near fishing jetty. At village Badatubai Kharnasi River undergoes through a U shape bend where radius is 250 to 300 m. Rest of the route through Kharnasi, Mahanadi and through estuary between Hansua and Kharnasi outfall is free from any restrictive bends.

This route being in tidal reach, adequate depths will be available after proposed maintenance dredging for a quantity of about 2.66 MCM. Maintenance dredging may be necessary in the estuary portion as Hansua and Gobri Rivers are expected to bring in sediment during monsoon. This sediment is likely to settle in the creek portion (on downstream of outfalls of these rivers) where navigation route is proposed. The boundary of Gahirmatha Wild Life Sanctuary is located on east of the proposed navigation route in this creek.

Keeping in view the ecological sensitivity of Kharanasi creek, possibility to operate the inland vessels from Hansua mouth to Paradip or from Dhamra to Paradip through coastal waters which is within the coastal base-line, is being explored.

### **5.0 STRUCTURES FOR DEMOLITION & MODIFICATION/RECONSTRUCTION**

#### **5.0.1 Weirs :**

Along the route Pankapal to Mangalgadi there are two existing old & damaged structures which are required to be demolished and reconstructed with suitable navigation locks for safe movement of the cargo vessels. These are:-

- a) **Sujanpur weir** is on river Tantighai, a branch of Kharsua, about 400m downstream of bifurcation from Kharsua at Sujanpur (Figure – 3).



**Figure-3 Existing Sujanpur Weir on Tantighai / Kani River (U/s view)**

b) **Jokadia weir** (Figure-4) is on river Kharsua about 6 Km downstream of railway bridge



**Figure-4 Jokadia Weir on River Kharsua (D/s view)**

Both the structures are to be replaced with suitably designed barrages with navigation locks of appropriate size for safe navigation of vessels of above 1500 tonnes capacity. The design is being developed in consultation with State Water Resources Department, taking into account various aspects including flood control, irrigation as well as navigation requirement with adequate ponding area. The construction and maintenance of the barrages will be taken up through one agreed arrangement between State Government Departments and IWAI. However, the operation and maintenance of the navigation locks shall be responsibility of IWAI.

c) **Defunct Jenapur weir:** The defunct Jenapur weir will be replaced by one Weir cum Barrage.



**Figure-5: Defunct Jenapur weir (View from right bank)**

#### **5.0.2 Bridges :**

Existing nine road bridges having less horizontal and vertical clearance as per the IWAI regulations will be either replaced by new bridges or modified to have required horizontal clearance of more than 50m and vertical clearance of more than 6m from NHFL. Agreed implementation arrangement between the State and IWAI will be followed for construction and maintenance of these bridges. As a representative sample Manpur bridge is shown at figure-6 below.



**Figure-6: Manpur bridge (Up stream view)**

### **5.0.3 Power lines :**

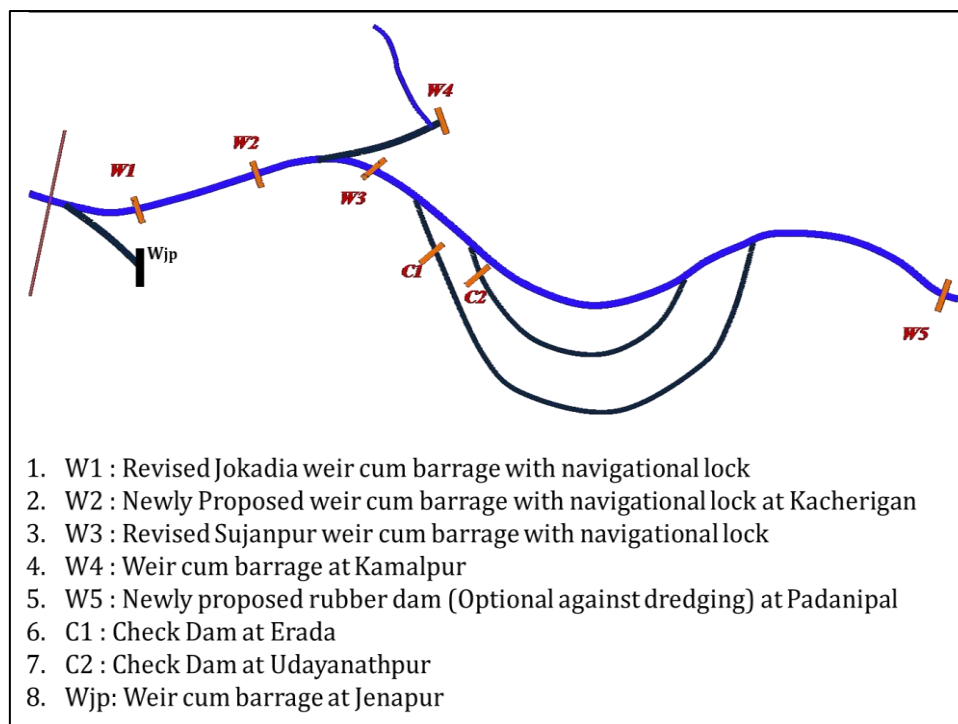
Existing 40 nos. of power line crossings having less vertical clearance as per IWAI regulations will be rerouted to cross the waterway at 19 locations. The work has already commenced on deposit basis through the State distribution companies.



**Figure-7: Jokadia barrage, bridge and powerlines (D/s view)**

### **6.0 New structures and structural inventions with ancillary works :**

One barrage with lock gates will be constructed in between Jokadia and Sujapur at a place called Kacherigaon. Two check dams with gates near Erada and Udayanathpur, one rubber dam with lock gate near Padanipal and one weir-cum barrage at Kamalpur, below the confluence point of Budha and Kharasrota rivers are proposed to be constructed. Existing embankments will be raised and / or strengthened with adequate nos. of sluice gates for release of rain water from the country side to prevent water logging. Bank protection and river training works will also be provided wherever necessary. One map showing the proposed structures is at Fig-8.



**Figure-8: Proposed cross structures**

## 7.0 CARGO & TRAFFIC DETAILS

### 7.1 Cargo & Traffic Analysis

For development under phase-I, a fresh cargo traffic and projection has been estimated and according to such estimation, there is a cargo potential of 13.75 MTPA for onward cargo (towards Pankapal i.e. upstream (u/s) cargo) and a return cargo of 5.36 MTPA from the ports and industries and mines of Kalingnagar. The consolidated details of cargo potential are tabulated below:

**Table-1 Details of Cargo projections / forecast for year 2030**

| Sl. No.                   | Sources of Cargo        | Upstream (u/s) cargo in MTPA | Downstream (d/s) cargo in MTPA |
|---------------------------|-------------------------|------------------------------|--------------------------------|
| 1.                        | Kalinganagar Industries | 1.87*                        | 1.66                           |
| 2.                        | DPCL (Adani)            | 10.40                        | -                              |
| 3.                        | Paradip Port Trust      | 1.48                         | 3.70                           |
| <b>Total Cargo (MTPA)</b> |                         | <b>13.75</b>                 | <b>5.36</b>                    |

\* A cargo of 1.87 MTPA has been considered after deducting some of the cargo like coal, chrome and limestone which have been already considered in DPCL (Adani) cargo data.

### 7.2 Scenarios of Cargo Potential

This total traffic potential is shown in three different scenarios. Low case i.e. considering

10% conversion rate; medium case i.e. considering 30% conversion rate and high case i.e. considering 60% conversion rate. The rationale behind giving these three scenarios is that these percentage levels are suitably distributed over the 100% potential. It covers the entire range of possible future scenarios, from pessimistic to optimistic. The traffic of pessimistic scenario provides an understanding of minimum guaranteed traffic that can be expected, whereas the optimistic or the high case scenario gives the maximum potential that can be generated giving us an understanding on the upper mark of the feasible investments that can be made in developing the transportation system. The moderate scenario is the average scenario which provides a safer option where the risk is low. The annual cargo traffic as per low case, medium case & high case are given in Table-2.

**Table-2 - Scenarios Annual Cargo (Low, Medium and High Cases)**

| Sl. No.                   | Sources of Cargo        | Ultimate cargo for year 2030 (MTPA) | Low case (10%) (MTPA) | Medium case (30%) (MTPA) | High case (60%) (MTPA) |
|---------------------------|-------------------------|-------------------------------------|-----------------------|--------------------------|------------------------|
| 1.                        | Kalinganagar Industries | 3.53                                | 0.353                 | 1.059                    | 2.118                  |
| 2.                        | DPCL (Adani)            | 10.40                               | 1.040                 | 3.120                    | 6.240                  |
| 3.                        | Paradip Port Trust      | 5.18                                | 0.518                 | 1.554                    | 3.108                  |
| <b>Total Cargo (MTPA)</b> |                         | <b>19.11</b>                        | <b>1.911</b>          | <b>5.733</b>             | <b>11.466</b>          |

The total cargo projected as shown above is only for development of fairway up to Pankapal under Phase-I where as the projection may change to the order of around 75.00 MMTPA considering the fairway development up to Talcher. This will bring in upward changes in the different scenarios of modal shift in cargo transportation.

### 7.3 Safe Navigation and Movement of Cargo Vessels

The demolition and reconstruction of the existing weir and barrage at Sujanpur and Jokadia respectively with suitable navigation locks may take minimum three years. Similarly, the development of fairway with LAD of 3.0m with acceptable river bends and adequate navigation clearances may also require time for the safe navigation of desired capacity of cargo vessels. Taking into consideration all the required activities for navigation initially with 2.00m LAD and subsequently with 3.00m LAD, it may take another five years for developing the fairway from Dhamra-Paradip to Pankapal considering grounding of the construction proposals as zero date.

## 8.0 TERMINAL FACILITIES AND PLANNING

Under phase-I development, it is proposed to construct, operate and manage three

permanent terminal facilities with required jetties & cargo handling equipment for catering to the projected cargo. Paradip Port and Dhamra Port Company Ltd. has already agreed to dedicate one terminal each as captive facilities at their own premises. The permanent terminal at Pankapal is going to be developed, operated and managed jointly by one SPV, Inland Water Consortium of Odisha Limited (IWCOL) constituted for the purpose with both the ports and State Govt. as constituent members. Land measuring 115.41 acres has been identified in the village Pankapal for the permanent terminal and steps for acquisition of land are being taken by the SPV, IWCOL.

## **9.0 DREDGING OPERATION**

### **Dredging Quantity:**

In order to develop the fair way with LAD of 3.0 m, maintenance dredging for a quantity of **16 M cum** is proposed to be undertaken during different period. The dredging quantities have been computed for 2m depth initially and 3m depth subsequently with respect to chart datum keeping the bottom base width as 45m.

### **Disposal of Dredged Material:**

This dredged material can be used for infrastructure development activities i.e. strengthening / extending the existing flood embankment on both sides of the river; constructing new embankment; reclaiming land in low lying areas; in construction of roads etc. The unused material can be dumped in adjoining government lands or land under control of State Government, especially in the flood plains of the river with appropriate arrangements to arrest back flow of the dredged material to the river channel during floods. These dumping grounds should not cause obstruction to the flow during flood. The dumping grounds above flood level can also be utilized as rescue platform during floods.

## **10.0 WIDENING OF WATERWAYS & BANK PROTECTION**

The critical stretch with less width and river bends shall be widened to ensure safe navigation. The stretch once widened may be protected with suitable bank protection work. The bank protection of the waterways at present is being carried out by the State Irrigation Department with respect to flood and embankment protection. However, while the movement of the vessels will be increased, more bank protection in the vulnerable stretch may be required & same to be carried out either by the State Government on deposit basis or directly by IWAI through a standard operating procedure.

Sample bank protection activities are shown below.



## 11.0 PRELIMINARY COST ESTIMATES

Present cost estimate is based on the indicative cost as shown in the DPR prepared by WAPCOS during 2016. The base cost has been updated to the 2019-20 price level considering escalation. Overall provisions for escalation has been kept as 10% and contingency as 5%. The preliminary cost of development of the waterways under phase-I has been assessed for providing the fairways of 3.0 mt LAD to facilitate the cargo movement between the Ports up to Pankapal with structures and structural interventions, reconstruction of bridges and powerlines, dredging, bank protection raising and strengthening of embankments, terminal at Pankapal, navigational aid etc. The annual operation and maintenance cost the terminals and of fairway has not been included as these will be recurring costs per annum of the order of around 5% of the investment cost.

The capital cost is presented in Table-3.

**Table-3: Capital Cost**

| <b>Sl. No.</b> | <b>Description</b>   | <b>Amount (Rs. In Crores)</b> |
|----------------|--|-------------------------------|
| 1.             | Civil Structures (Fairway development)   |                               |
|                | a. Land  | 206.00                        |
|                | b. Dredging and widening   | 353.00                        |
|                | c. Structures (Barrage with navigational lock, weirs & barrages, check dams, rubber dam) | 1860.00                       |
|                | d. Bank protection, raising and strengthening  | 277.00                        |
|                | e. Modification / shifting of existing structures (Powerlines-Bridges)                   | 706.00                        |
| 2.             | Terminal at Pankapal   | 1391.00                       |
| 3.             | Navigational aids  | 12.00                         |
| 4.             | Statutory clearances, compensatory afforestation   | 13.00                         |
| 5.             | Ferry, tourism, CSR activities etc.  | 18.00                         |
|                | <b>Sub Total</b>   | <b>4836.00</b>                |
| 6.             | Contingency (5%)   | 242.00                        |
| 7.             | Escalation (10%)   | 484.00                        |
|                | <b>Total (in Crore)</b>  | <b>5562.00</b>                |

**NB:** This updated feasibility report has been prepared incorporating the progress made so far since 2015 (Annexure-I). In the meantime, the project proposal was processed for clearance as per the Terms of Reference issued by MOEF&CC, Government of India vide F.No. 10-27/2014-IA-III dated 12th January, 2015. The required Environmental Impact Assessment study and documentation for clearance has been taken up by one M/s Cholamandalam MS Risk Services Limited. And the proposal was presented before the Odisha Coastal Zone Management Authority (OCZMA) in its 31st meeting held on 25.01.2019. Observations of OCZMA has been received and compliance is being prepared. In the meantime, the extended validity of the ToR had expired on 11.01.2019 and thus a fresh application for obtaining the ToR is being submitted.

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## ANNEXURE-I

Below is the table presenting the changes in the proposed project from the first application submitted to the MoEF&CC for ToR that was issued on 12<sup>th</sup> January 2015.

| <b>FEATURES</b>               | <b>FIRST PROPOSAL</b>           | <b>SECOND PROPOSAL</b>                                |
|-------------------------------|---------------------------------|---|
| Fairway Depth                 | 3.0m LAD                        | 3.0m LAD  |
| Length of NW5 Phase I         | 201 Km (Dhamra-Paradip-Jokadia) | 212 Km (Dhamra-Paradip-Pankapal)                      |
| Temporary Terminal            | At Jokadia – Later at Erada     | No Temporary Terminal                                 |
| Maintenance Dredging          | Throughout the Stretch          | Throughout the Stretch                                |
| Construction of Weir/Barrages | At Jokadia and Sujanpur         | At Jokadia, Sujanpur, Jenapur, Kamalpur, & Kacherigan |
| Bridges to be modified        | 09 Nos (03 Nos within CRZ)      | 09 Nos (03 Nos within CRZ)                            |
| T/L to be raised              | 39 HTL                          | 35 HTL (09 within CRZ)                                |
| Check Dams                    | -                               | Two (None within CRZ)                                 |
| Rubber Dams                   | -                               | One within CRZ  |
| Cargo Potential               | 1.65 MTPA (Temporary Terminal)  | 19.11 MTPA (Upto Pankapal)                            |
| Project Cost                  | 824.24 Crore                    | 5562 Crore  |