



**Request  
for  
Expression of Interest  
Selection of Consultants  
towards  
Risk Assessment and Disaster Management Plan  
for National Waterway-1  
Date of Submission – 14th August 2017**

Project Management Unit  
Capacity Augmentation of the National Waterway – 1 Project (Jal Marg Vikas)  
**INLAND WATERWAYS AUTHORITY OF INDIA**  
(Ministry of Shipping, Government of India)  
Head Office : A-13, Sector – 1, Noida - 201301

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## Expression of Interest

1. Inland Waterways Authority of India (IWAI), Ministry of Shipping, Government of India has applied for financing from the World Bank towards the cost of the Project “**Capacity Augmentation of the National Waterway – 1 (Jal Marg Vikas Project)**”, and intends to apply part of the proceeds for consulting services.
2. The Inland Waterways Authority of India (IWAI) intends to engage a professionally qualified and renowned firm/agency to undertake a ***Risk Assessment*** and prepare a ***Comprehensive Disaster Management Plan (DMP)*** to combat any eventualities of handling an emergency incident along NW-1.  
The proposed study shall assess the risks associated with ongoing and proposed cargo & passenger movement and other navigational activities through NW-1.  
The DMP shall also identify abatement measures towards developing a proposal for integration of IWT related disasters into existing District Disaster Management Plan (DDMP) in line with the wider National Disaster Management Plan along with identifying best management practices and international standards applicable to NW-1.  
Herein after referred as the consulting services (“the Services”) include **Consultancy for Risk Assessment and Disaster Management Plan for National Waterway-1**.  
The study is expected to be completed within six months from the date of engagement of the Consultant.
3. The Project Director, Project Management Unit, IWAI, invites eligible consulting firms (“Consultants”) to submit their interest to provide Consultancy services for “**Risk Assessment and Disaster Management Plan for National Waterway-1**”.  
Those Consultants interested in providing the Service should provide their credentials information to demonstrating that they have the required qualifications and relevant experience to perform the Services.  
Consultants may associate with other firms so as to form of a joint venture or a sub-consultancy to enhance their qualifications. The short listing criteria are:
  - a) Consultant should have been engaged in conducting similar activities for the past 3 years – copy of Certificate of Completions to be submitted along with the EOI.
  - b) Consultant should have a minimum financial turnover of INR 150 lakh during any of the last 5 years – CA certified declaration for last 5 years to be submitted along with the EOI.
  - c) Consultant should be having a minimum of 25 employees on their payroll – declaration to be submitted.
  - d) Profile of the Persons likely to be deployed for this Assignment. *Please enclose the details of methodology to be adopted - the Team Size & CV of the Team leader & others*
  - e) Consultant should have completed 4 such studies of similar / related work during the last 3 years indicating the, Scope of work, date of

commencement, date of completion, Brief synopsis of the assignment under taken, Client's details to be submitted.

Similar/related works may include:

- i) Risk assessment and disaster management plan for waterways.
- ii) Analyse the IWT operational profile of NW - 1 with respect to all potential cargo movement;
- iii) Risk Assessment:
  - a. Identify all HOT SPOT related risks under construction, operation and maintenance activities for NW-1;
  - b. Examine the stakeholders affected by these risks;
  - c. Determine retained and transferable risk; and quantify each risk.
- iv) Identify practically possible safeguard options for integration to IWT operational procedure, this shall include but not be limited to potential offshore & onshore emergencies during construction, maintenance & operation phase of the waterway, river/marine accidents like grounding, collisions, capsizing etc., oil spill disaster contingency plan along NW-1, including plan for hazardous goods and vessels operating and/or carrying LNG/CNG as define by law in India.
- v) Develop an emergency preparedness and response strategy which shall outline the potential foreseeable emergency scenarios, classification, resources, incident command structure and a management plan encompassing prevention, control, recovery and remediation measures to deal with any emergency event that may occur within the project during construction, maintenance & operation phases.
- vi) Preparation of Standard Operating Procedures (SOPs) in line with the Inland Vessels Acts, 1917 as amended from time to time.
- vii) Development and update of following protocol:
  - a. Protocol for speed control, monitoring, and vessel tracking.
  - b. Protocol of waste management for barge operations and terminals.
  - c. Biodiversity protection including accident reporting with aquatic mammals.
  - d. Oil spills reporting and control and remediation.
  - e. Hazardous chemicals as define by law in India.
  - f. Lessons learned and corrective actions programme.
  - g. Risk assessment procedures to assess and manage risks to personnel, vessels and the environment.
  - h. Internal and external audit procedures and frequency.
- viii) Delineate a methodology for integration of operational risk abetment measures to existing District Disaster Management Plan and coordinate with all nodal agencies on behalf of IWAI.
- ix) Formulate capacity building and training strategy for effective implementation of comprehensive Disaster Management Plan.
- x) The Disaster Management Plan for NW-1 shall lay down clear guidelines for execution of mock drills of the plans.
- xi) Validate the cost estimate for each segment of the DMP (i.e. infrastructure cost, equipment cost, and training cost) based on the information collected for the NW-1. If any relevant costs are missing in the studies, the consultant is responsible to make the proper

- estimates. The IWAI will facilitate the access of the consultant to the relevant documentation;
- xii) Confirm that each part of the DMP substantially complies with local, state and national international safety, environmental and social requirements, and if not, what additional steps need to be taken in this regard.
  - xiii) The DMP for NW-1 therefore will cover all phases of a disaster and therefore will have three plans - Mitigation Plan, Preparedness Plan and Response Plan.
  - xiv) Assistance of any statutory clearance/approvals for proposed Disaster Management Plan for NW-1.
5. Expressions of interest must be delivered in a written form to the address below (in person, or by post or by e-mail)

**Date of Submission of Proposal:- 14<sup>th</sup> August 2017 by 15:00 hours (IST)**

**Envelope marked with :-**

**Expression of Interest for "Risk Assessment and Disaster Management Plan for National Waterway-1"**

**Address :-**

Project Director (Jal Marg Vikas)

**INLAND WATERWAYS AUTHORITY OF INDIA**

(Ministry of Shipping, Government of India)

Head Office : A-13, Sector – 1, Noida – 201301

**Contact Details:-**

Phone : 0120-2544004, Fax : 0120-2543976 ;

email : [vc.iwai@nic.in](mailto:vc.iwai@nic.in) ; [iwaipmuskp@gmail.com](mailto:iwaipmuskp@gmail.com) ; sy.iwai@hotmail.com

**(Project Director)**

## **Annexure -I**

### **Instructions to Consultants for submission of Expression of Interest:**

1. Accomplished Expression of Interest (Application) must be submitted together with a Letter of Intent not later than 15:00 hours (IST) on 14<sup>th</sup> August 2017. Documents in support of all qualification information shall be submitted with application. Proposal of EOI with qualification information shall be furnished on / before the due date of submission at the address mentioned above.
2. The Application shall be basis of drawing up a shortlist of eligible Consultants who will be invited to submit proposal for services required and the Consultant will be selected in accordance with the Quality and Cost Based Selection method set out in the RFP & Consultant Guidelines.
3. All Applications shall be submitted in English.
4. A Consultant shall submit only one proposal. If a Consultant submits or participates in more than one proposal, all such proposals shall be disqualified. This does not, however, preclude a consulting firm to participate as a sub-consultant, or an individual

to participate as a team member, in more than one proposal when circumstances justify and if permitted by the Request for Proposals.

5. The Application and all related correspondence and documents should be written in the English language. Supporting documents and printed literature furnished by Applicant with the Application may be in any other language provided that they are accompanied with translations in the English language. Supporting materials, which are not translated into English, may not be considered. For the purpose of interpretation and evaluation of the Application, the English language translation shall prevail.
6. IWAI reserves the right to reject any Applications, without assigning any reasons thereof.
7. The Applicant shall provide all the information sought under this Qualification Document. PMU, IWAI would evaluate only those Applications those are received within the specified time and complete in all respects. Incomplete and/or conditional Applications shall be liable to rejection.
8. The attention of interested Consultants is drawn to paragraph 1.9 of the World Bank's *Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers* dated January, 2011 ("Consultant Guidelines"), setting forth the World Bank's policy on conflict of interest.
9. A Firm or an individual Debarred by the World Bank in accordance with the anticorruption guidelines shall be ineligible for this Assignment in any form or way. A list of debarred firms and individuals is available at the Banks external website: [www.worldbank.org/debarr](http://www.worldbank.org/debarr).
10. Further information can be obtained at the address mentioned above during office hours.

### **Guidelines for preparation of Expression of Interest**

Following information shall be submitted:

1. Complete name of firm(s), date of establishment and type of organization whether individual, proprietorship, partnership, private limited company, public limited company etc.
2. Exact and complete corporate/registered/home office address, business address, telephone numbers, fax numbers, E-mail and cable address. For Consultant of foreign registry, indicate if there is any branch office(s) established in India with details in aforesaid manner.
3. If present firm(s) is the successor to or outgrowth of one or more predecessor firms, fresh name(s) of former entity (ties) and year(s) of their original establishment with details in aforesaid manner.
4. Present a brief narrative description of the firm(s). Kindly avoid submission of company brochures for the purpose description of the firm.
5. List of not more than two (2) principals who may be contacted by this Office.
6. Listed principals must be empowered to speak for him or for the firm on policy and contractual matters.
7. Indicate financial figures from consultancy business for past 5 (five) financial years.
8. Organizational strength of Consultant shall be given

9. Brief Terms of Reference - Annexure-II.
10. Application Form .. Annexure-III

## Annexure - II

### **Assignment Title: Terms of Reference (ToR) for engaging consultancy towards Risk Assessment and Disaster Management Plan for National Waterway-1**

#### **1. Project Background**

Inland Waterways Authority of India (IWAI) is a statutory body under Ministry of Shipping, Govt. of India. IWAI is primarily responsible for development, maintenance and regulation of Inland Water Transport (IWT) in the country specifically on National Waterways. In this context, the Ganga-Bhagirathi-Hooghly river system from Allahabad to Haldia has been declared as National Waterway-I (NW-I). It is a natural waterway of about 1620 km in length and passes through the states of Uttar Pradesh, Bihar, Jharkhand and West Bengal. IWAI has proposed the Capacity Augmentation of navigational infrastructure of NW-I between Allahabad to Haldia with technical and financial assistance from the World Bank.

The Jal Marg Vikas Project (JMVP), with support from the World Bank, is aimed at creating the required infrastructure, connectivity and institutional support for market development on NW-1 focusing on the stretch between Haldia and Varanasi. The project will also contribute to (i) reducing the growth of transport-related greenhouse gas emissions by rebalancing the freight mode shares and by promoting a new and supplementary mode of transportation; (ii) national as well as international trade, and regional integration through the Indo-Bangladesh protocol route to and from Haldia/Kolkata, and thereafter by inland waterways and road transport to Nepal, Bhutan, and north-eastern Indian states; (iii) economic integration of West Bengal, Jharkhand, Bihar and Uttar Pradesh and augmentation with Eastern Dedicated Freight Corridor; (iv) socio-economic improvement of local communities and stakeholders by providing better connectivity along and between the north and south banks of river Ganga; (v) cheap and bulk passenger transport to the historical and religious places along the river Ganga; (vi) generation of employment opportunity; and (vii) improved safety

and environmental protection in IWT minimizing the negative effects of water transport on the river environment.

## **2. Description of Jal Marg Vikas Project**

The project area includes the entire reach of the River Ganga from Haldia to Varanasi including the areas proposed for development of project related facilities and infrastructure, i.e. Multimodal terminals, Navigation Ship Lock, Ro-Ro jetties and other planned developments. Map showing location of NW-1 stretch from Haldia to Allahabad is depicted in **Figure 1**. The following interventions have been proposed and planned under the Jal Marg Vikas Project.

- Construction of Multimodal Terminals at Varanasi, Sahibganj and Haldia.
- Construction of intermodal terminals at Ghazipur, Tribeni/ Kalyani and Kalughat.
- Construction of a new Navigational Lock at Farakka to facilitate rehabilitation of the existing lock and to allow two-way navigation by the vessels.
- Fairway development to provide the following LAD through maintenance dredging, river training works and re-engineering of river channel bends:
  - ✓ LAD of 3 m on Haldia-Barh stretch;
  - ✓ LAD of 2.5 m on Barh-Ghazipur stretch.
  - ✓ LAD of 2.2 m on Ghazipur-Varanasi stretch.
- Provision of Navigational Aids, such as channel markings, night navigational aids, including deployment of GPS, and river maps and charts for navigation.
- Provision of River Information System (RIS) and Vessel Traffic Management System (VTMS).
- Construction of Ro-Ro Jetties at ten suitable locations.
- Construction of Integrated Ship Repair and Maintenance Complexes at two locations. Likely locations are Kolkata and Patna, depending on availability of land.
- Bank protection works at the sites of the proposed new multimodal/intermodal terminals, existing ten terminals and jetties, Farakka Navigational Lock, Farakka Feeder Canal and Integrated Barge Repair & Maintenance Complexes.

The project also envisages the creation and improvement of integration opportunities with other surface transport modes such as roads and railways, so as to improve the overall efficiency of the logistics chain by linking the waterways through various well equipped terminals and jetties. The salient features of JMVP has been given in **Table 1**.

Cargo being transported on NW-1 includes cement, fly ash, iron ore, iron ore fines, coal, steel shed, tyres, iron fines, iron ingots, galvanized steel plain sheets, stone chips, furnace oil, high speed diesel, lube oil, boulders, pulses, aluminium block, sand, chips, ship block, food grains, Manganese ore, Petroleum, Coke, Cooking coal, Rock Phosphate, Timber, Peas, Slag oil, and Non-cooking coal. The fairway may also be used for transportation of hazardous goods on NW-1 and the vessels operating will be powered by LNG and/or carrying LNG. Traffic projections for the planned infrastructure site are given in **Table 1**.



**Figure 1: Location Map of NW-1**



**Table 1: Salient Features of Jal Marg Vikas Project**

Salient Features	Capacity/Quantity/Nos.			
Facilities Planned	3 Multi-modal terminal sites (Sahibganj, Varanasi &Haldia) 1 new Navigation lock- Farakka River bank protection works at planned terminal sites and along Feeder canal			
Facilities under Planning Stage	3 additional terminal sites (at Ghazipur & Kalughat-site finalized and at Tribeni-under consideration) 5 pair of ro-ro crossings Barge repair and maintenance facilities River training works River bank protection works at the proposed civil intervention sites			
Designed capacity of Terminals	Infrastructural Facility	Projected Cargo-2015 (MTPA)	Projected Cargo-2030 (MTPA)	Projected Cargo-2045 (MTPA)
	Sahibganj Terminal	2.24	4.39	9.00
	Varanasi Terminal (with current land)	0.54	1.22	1.22
	Haldia Terminal	3.18 MTPA		
Navigation Channel	Channel Width-45 m LAD-3 m from Haldia (0 Km) to Barh ( 980 Km) , 2.5 m from Barh to Ghazipur ( 1250 Km) and 2.2 m from Ghazipur to Varanasi ( 1360 Km)			
Design Vessel Specifications	Vessels of maximum length of 110 m, beam of 11.4 m, draught of 2.5 m-2.8 m and air draught of 9 m will be required in NW-1.			
Size of Vessels	1500-2000 dWT			
River Slope	Haldia to Farakka-1 in 11000 Farakka downstream-1 in 18000 Farakka to Allahabad-1 in 17,000			
Maintenance Dredging	Within Navigation Channel-14,850,000 cum/year*			
Type of Dredgers	Cutter Suction dredgers (CSD), Water Injection dredgers, Agitation/Plough dredgers and Back-hoe dredgers			

Salient Features	Capacity/Quantity/Nos.
Dredge disposal	Preferably off-shore, onshore only if sediments are found to be contaminated
Cargo being transported on NW-1 includes	Cement, fly ash, iron ore, iron ore fines, coal, steel shed, tyres, iron fines, iron ingots, galvanized steel plain sheets, stone chips, furnace oil, high speed diesel, lube oil, boulders, pulses, aluminium block, sand, chips, ship block, food grains, Manganese ore, Petroleum, Coke, Cooking coal, Rock Phosphate, Timber, Peas, Slag oil, and Non-cooking coal. The fairway may also be used for transportation of hazardous goods on NW-1 and the vessels operating will be powered by LNG and/or carrying LNG. Traffic projections for the planned infrastructure site

\* Quantities are tentative and subject to change with revision in planning

### 3. Risk Assessment and Disaster Management – Treat and Responses

Developing sustainable inland water transportation (IWT) requires transit risk analyses of waterways components and relationship between factors such as environmental conditions, vessel characteristics, operators' information about the waterway, as well as the incidence of groundings and collisions, using available data. Data on the calamities in inland waterways are limited and consultant may need to source the relevant data from national and international database agencies. [References: (i) O.S. Olanrewaju (2013) *Apply Safety Risk and Reliability Analysis of Marine System*, Xlibris Corporation LLC. (ii) O. O.Sulaiman, A.S.A. Kader (2015) *Techniques of Safety and Environmental Risk and Reliability Modelling for Sustainable Inland Water Transportation System*. Danubius. <http://danube-cooperation.com>].

Damage to water transport occurs as a result of accidents, spills of oily water and low levels of protection at work. Apart from infrastructure impairment, it also creates hindrance and financial losses for waterway users. According to the statistics of the American Waterway Organization (AWO), most damage during the voyage on inland waterways is caused by human error. In order to reduce the damage and the number of accidents, the analysis of the occurrence of accidents on inland waterways and their possible causes is required.

A risk assessment should entail a careful examination of what, in the range of operations, could cause harm, with a view to deciding whether the precautions are adequate, or whether more should be done to minimise accidents. The risk assessment should first establish the hazards that are currently present on NW1 and then identify the significant risks arising out

of expected short and long-term developments in waterways transport. The assessment should take into account any existing precautions to control the risk, such as permits to work, restricted access, use of warning signs, agreed procedures and personal protective equipment.

The consultant should develop protocols as per the national and international standards. The protocol shall have a decision making tree or matrices, a flowchart for action to be taken during emergency situations like oil spill, vessel – collisions, obstruction of waterways and any problem(s) during (un)loading.

Similarly, the plan shall also have a risk analyses for the onshore activities resulting from any day to day operations at terminals, besides an action plan for emergency response and abatement measures. These measures should be on the basis of permits and (E)IAs.

During operation phase where a number of vessels and barge movement is expected near the loading and unloading platforms, at least the following Off-Shore and On-Shore scenarios are envisaged and should be further elaborated:

**3.1 Off-Shore emergencies** such as major incident on-board a vessel such as fire, flooding or cargo related; collision between vessels or between a vessel and a fixed object; grounding and drowning of a Vessel; major oil spillage from a Vessel or Jetty; major oil spill at river or oil entering the bay from a source upriver; major incident involving small craft within the ports and terminals jurisdiction; security incident, involving vessels, which has the potential to escalate into an emergency situation. Special attention should be given to emergency protocols in case of groundings and collisions of or with passenger (cruise) vessels.

**3.2 On-Shore Emergencies** such as major fire; spill of oil and hazardous material.

Assessment of risks to waterway transport and infrastructure as a result of hydrological events, and natural and environmental disasters, such as:

3.2.1 *Cyclone*: Cyclone originates in the Bay-of-Bengal which is most vulnerable to this type of hazards. It causes damage to terminal infrastructure, vessels/ships, jetties and launches/boats etc.

3.2.2 *Flood*: The monsoon rain and sometimes cyclone causes flood in the river which may create scouring of foundation of water front structures such as jetties, damages approach road. In case of extreme or high water discharge and extreme low water discharge, the consultant also needs to determine till what level on NW-1, safe navigation is

guaranteed and at which water levels NW1 will need to be closed for commercial waterway transport.

3.2.3 *Earthquake*: It may cause damages/collapses the terminal infrastructures and jetties according to its severity.

3.2.4 *Tsunami or a tidal bore*: It may damage/ collapse terminal infrastructure, jetties, vessels/ships, launches/ boats etc.

3.2.5 *Oil Spill*: It may pollute the water body which affects aquatic life, birds, animals, banks of the river.

3.2.6 *Toxic cloud dispersion*

3.2.7 *Emission flammable liquid*

3.2.8 *Toxic contamination of surface water*

### **3.3 Purpose of Disaster Management Plan:**

3.3.1 Design contingency plan, taking into account the accident scenario and natural disasters;

3.3.2 Safeguard people to prevent injuries or loss of life by protecting them from the hazard and evacuating from the site on short notice or from the affected area;

3.3.3 Obtain early warning of emergency conditions so as to prevent or minimize the impact on human life, assets and environment, both offshore and onshore;

3.3.4 Minimise impact on people, protect the environment and safeguard commercial considerations;

3.3.5 Ensure immediate response to emergency situation with effective communication network and organized procedures;

3.3.6 Provide guidance (Do's and Don'ts, flowchart etc.) to help stakeholders to take appropriate action to reduce risks of accidents and to mitigate adverse effects of accidents that do nevertheless occur; and

3.3.7 Minimize overall impact of an adverse event on the waterway and associated infrastructure (including terminals, locks, weirs, bridges, etc).

The preparation of the Disaster Management Plan (DMP) is therefore an essential initiative in the Jal Marg Vikas Project to research, prepare, train and support the commitment of IWAI to strengthening good practices and sharing a common commitment in responses. IWAI is committed to integral mission, and this includes working alongside local communities to ensure the relationship and capacity is there to foster a united response.

### **3.4 Key Elements of Disaster Management Plan:**

- Identification and assessment of hazards is crucial for on-site emergency planning and it is therefore necessary to identify what emergencies could arise pertaining to the waterway and vessels in the navigable waters of NW-1 including various products / cargoes and their storage. Hazard analysis or consequence analysis gives the required results.

- Activities during emergencies require coordination of higher order than for planned activities carried out according to fixed time schedule or on a routine day-to-day basis. To effectively coordinate emergency response activities, an organizational approach to planning is required. The important areas of emergency planning are Organization and Responsibilities, Procedures, Communication, Transport, Resource requirements and Control Centre. Offsite emergency requires additional planning over and above those considered under onsite plans, which should be properly integrated to ensure better coordination.
- On-site Disaster Management Plan and Off-site Disaster Management Plan should be prepared for the activities / incidents anticipated during assessment.
- The emergency planning includes anticipatory action for emergency, maintenance and streamlining of emergency preparedness and ability for sudden mobilization of all forces to meet any calamity.

#### **4. Objective**

Objective of the study is to assess the risk associated with ongoing and proposed cargo & passenger movement and other navigational activities including maintaining fairway through NW-1 and identify abatement measures towards developing a proposal for integration of IWT related disasters into existing District Disaster Management Plan (DDMP). This should be in line with National Disaster Management Act, 2005 along with identifying best (management) practices and international standards applicable to waterways, ports and coastal shipping as far as possible and applicable.

The Emergency Preparedness and Response Strategy will outline the potential foreseeable emergency scenarios, classification, resources, incident command structure, and a documented emergency management plan encompassing prevention, control, recovery and remediation measures to deal with any emergency event that may occur within the project during construction and operation phase. The consultant should provide a clear overview of identified hazards and risks, including responsibilities of stakeholders in the level of response and communication protocols (e.g. by means of decision trees).

#### **5. Scope of Work**

The main objective of the present assignment is to prepare a detailed Disaster Management Plan for NW-1 in compliance with the recommended project.

The study will be made in two parts:

- (i) for the waterway activities (offshore)
- (ii) for the waterway activities (onshore) activities/interventions  
(i.e., Jetties, terminals, RIS/ DGPS stations, ship repair facilities, lock gate, other assets etc) for National Waterway -1.

The consultant will evaluate each aspect of NW-1; independently based on its respective vulnerabilities to find and declare “**hot spots**” along NW-1 and will make a recommendation to the IWAI to identify the more promising development of the DMP, which will include allocation and stockpile of resources at the designated hot spots. For this project, the consultant will:

- i. Review and adopt the international standards used in the DMP for inland waterways;
- ii. Analyse the IWT operational profile of NW - 1 with respect to all potential cargo movement;
- iii. Risk Assessment:
  - a. Identify all HOT SPOT related risks under construction, operation and maintenance activities for NW-1;
  - b. Examine the stakeholders affected by these risks;
  - c. Determine retained and transferable risk; and quantify each risk.
- iv. Identify practically possible safeguard options for integration to IWT operational procedure, this shall include but not be limited to potential offshore & onshore emergencies during construction, maintenance & operation phase of the waterway, river/marine accidents like grounding, collisions, capsizing etc., oil spill disaster contingency plan along NW-1, including plan for hazardous goods and vessels operating and/or carrying LNG/CNG as define by law in India.
- v. Develop an emergency preparedness and response strategy which shall outline the potential foreseeable emergency scenarios, classification, resources, incident command structure and a management plan encompassing prevention, control, recovery and remediation measures to deal with any emergency event that may occur within the project during construction, maintenance & operation phases.
- vi. Preparation of Standard Operating Procedures (SOPs) in line with the Inland Vessels Acts, 1917 as amended from time to time.
- vii. Development and update of following protocol:
  - a. Protocol for speed control, monitoring, and vessel tracking.
  - b. Protocol of waste management for barge operations and terminals.
  - c. Biodiversity protection including accident reporting with aquatic mammals.
  - d. Oil spills reporting and control and remediation.
  - e. Hazardous chemicals as define by law in India.
  - f. Lessons learned and corrective actions programme.
  - g. Risk assessment procedures to assess and manage risks to personnel, vessels and the environment.
  - h. Internal and external audit procedures and frequency.
- viii. Delineate a methodology for integration of operational risk abatement measures to existing District Disaster Management Plan and coordinate with all nodal agencies on behalf of IWAI.
- ix. Formulate capacity building and training strategy for effective implementation of comprehensive Disaster Management Plan.
- x. The Disaster Management Plan for NW-1 shall lay down clear guidelines for execution of mock drills of the plans.

- xi. Validate the cost estimate for each segment of the DMP (i.e. infrastructure cost, equipment cost, and training cost) based on the information collected for the NW-1. If any relevant costs are missing in the studies, the consultant is responsible to make the proper estimates. The IWAI will facilitate the access of the consultant to the relevant documentation;
- xii. Confirm that each part of the DMP substantially complies with local, state and national international safety, environmental and social requirements, and if not, what additional steps need to be taken in this regard.
- xiii. The DMP for NW-1 therefore will cover all phases of a disaster and therefore will have three plans - Mitigation Plan, Preparedness Plan and Response Plan.
- xiv. Assistance of any statutory clearance/approvals for proposed Disaster Management Plan for NW-1.

## **6. Methodology**

An indicative series of tasks as presented below shall be executed & covered under proposed study however all such works which needs to be executed in order to achieve IWAI's objective shall form part of scope of this assignment. The consultant shall adopt standard approach & methodology which will be evaluated based on IWAI's expectations and interactions for mutual agreement on way forward.

- **Task One:** Establish all types of emergencies, including but not limited to oil pollution contingencies, passenger vessel contingencies, local storms, grounding, dredging for which preparedness is necessary along NW-1. Subsequently plan the list of emergencies and accidents;
- **Task Two:** The emergencies concluded in task one will be applicable for and between the inland vessels and the cargo terminals along NW-1 as a consequences of (un)loading and other natural/manmade activities. Taking in to account such emergencies concluded in task one and suggest the regulatory aspect for the effective development and use of the Disaster Management Plan (DMP) so developed;
- **Task Three:** Completed a baseline assessment on the existing capacity of the waterway and terminals in disaster preparedness and ability to handle any emergency.
- **Task Four:** Baseline analysis and survey of identified high risk areas (HOT-SPOTS) along NW-1. Map the hot spots and the key hazards along with the stakeholders need to be engaged with.
- **Task Five:** Outline what capacity building interventions should be provided.

- **Task Six:** Prepare a plan on the basis of this assessment to augment the capacity in consultations with various stakeholder.
- **Task Seven:** Design a project implementation plan [based on the Disaster Management (DM) proposal and baseline findings].
- **Task Eight:** Capacity Building of stakeholders and awareness campaigns among local communities along NW-1:
  - Capacity and expertise to respond to emergencies and reduce the risk of disasters.
  - Capacity and ability to respond through an integral mission approach.
- **Task Nine:** Promote and support the stakeholders to advocate for actions to reduction of risk and impact (link to disaster risk reduction) and improve the post disaster response and recovery management.
- **Task Ten:** Promote and support learning, good practice and international quality standards in inland waterways disaster management.

**A. Some items to consider that could be included or mentioned more explicitly:**

- a) Prospective view of ongoing studies and expected innovations in calamity abatement and emergency response (technologies);
- b) Summary of the findings in the form of a 'best practices' overview, and first idea on possible implementation of innovative systems.

**B. The analysis will at least contain the following topics:**

- a. River Information Services
- b. Dynamic sensing
- c. Public information service platforms
- d. Analyses and protocols for transport of Dangerous goods ([https://www.unece.org/trans/danger/publi/adn/adn\\_e.html](https://www.unece.org/trans/danger/publi/adn/adn_e.html))

## **6.1 Data Collection and Review of Operation**

Cargo movement through NW-1 system has various components playing key roles in operation including technical aspects of vessels, infrastructure facilities, transport of goods and people, operational management etc. Starting from the storage or transit of cargo at terminal, the risks should be identified for all activities associated with handling of cargo in the IWT terminals and through the waterways which include storage, loading and unloading and movement of all such cargo.



As an initial step towards the risk assessment, data related with the existing operational profile for IWT through NW1 shall be collected and analyzed which shall include but not be limited to the following:

- a) The channel details such as length, width, depth, traffic management and infrastructure facilities available.
- b) The existing user profile of NW-1 in terms of cargo and passenger vessels, time and operational aspects in detail.
- c) Other dependent activities in the project region viz. utilization of the water body for activities such as fisheries, irrigation/agricultural use, industrial purposes, tourism etc.
- d) Literature on the ecological and environmental setting of project region.
- e) Various rules & regulations at national and state level applicable for IWT and river sea vessels operation for safe and efficient transport.

***Outputs:***

- I. Understand the operational profile of NW-1 i.e., cargo and other dependent activities in detail.
- II. Understand the ecological and environmental sensitivity of project area.
- III. Advantages and limitations of utilizing waterway for proposed cargo movements considering the channel characteristics, operational profile and other water dependent activities in the project region.

***6.2 Detailing of the Cargo Movement***

Data related to cargo movement statistics including quantity, quality, origin-destination, types of vessels operation, time of operation, fleet time, etc. shall be collected and analyzed to understand the existing cargo movement pattern for NW-1. Physical characteristics of the cargo transported shall be collected along with details of vessels under operation. The cargo packaging, loading, transport and unloading practices shall be reviewed to understand the activity and identify the risk elements involved.

The expansion plans of the existing users for transport of cargo shall be collected in consultation with respect to their planned utilisation of NW-1. Socio economic profile of the project area along the proposed stretch shall also be collected from the secondary sources.

***Outputs:***

- ✓ Understand the existing and expected cargo movement pattern in detail — delineate the risk elements involved in the present operational profile.

***6.3 Risk Assessment and Proposal on Risk Abatement Measures***

Risk associated with cargo movement causing unreasonable damage or harm to property, the assets of IWAI/stakeholders, the environment/ causing death or injury to human life shall be analyzed in detail.

In order to analyse the risk involved in the movement of the cargo, the intrinsic properties of the cargo transported need to be studied carefully. The cargo characteristics shall be analysed for inter compatibility while transporting through the same channel to understand the safety gaps. The existing cargo characteristics and operation profile shall be compared with the proposed cargo movement pattern and based on the same, a comprehensive risk assessment study shall be commissioned.

While conducting risk assessment for dangerous goods, it will be important to also consider the chemical and physical properties of goods and the critical activities and operations associated with their storage, handling and transportation.

***A. In order to understand the risks associated with the operation, detailed evaluation shall be carried out for:***

- a) Identifying the risk related to storage and transit at terminals and movement through IWT.
- b) For each risk the likelihood/probability of the same turning to an incident.
- c) Identifying extent of harm to people, property and environment that might result from Incident.

**B. The risk assessment would be carried out for**

- a) Channel related risks in river
- b) Cargo related risks
- c) Vessel related risks
- d) Maintenance dredging related risks

The channel characteristics can contribute for risks associated with operation due to limitations in channel width, depth and changes accrued due to weather conditions such as tide, wind, rainfall, obstructions (fishing net etc.), multipurpose utilisation of NW-1 channels (e.g.: passenger vessel operations in parallel to hazardous cargo transport) etc.

While assessing cargo related risk, the critical factors to be considered include type and quantity of goods transported, storage and/or handling requirements of those goods and their compatibility issues due to the inherent nature of the goods transported etc.

While accessing vessel related risks, critical factors to be considered include technical aspects of the vessels operated, non-compliance with the safe operating procedure which include standard process while refuelling, loading and unloading of cargo, operation and maintenance aspects etc.

This study would also include preparation of Standard Operating Procedures (SOPs) in line with The Inland Vessels Acts, 1917 as amended from time to time.

By considering the activity/ operation in detail, all possible risks and consequences shall be assessed. Considering the severity of the consequences, risk level shall be determined and prevention and emergency response measure requirements shall be delineated. Through preparation of risk matrix, the risk priority levels (low/medium/medium high/high) shall be identified.

**Outputs:**

- I. Identify risk, analyse the consequences of risk on environmental and socio economic aspects and provide a mitigation road map for various stakeholders to avoid the risks associated with the IWT operation.
- II. Formulate plans to enhance disaster preparedness for effective response if and when a disaster happens.
- III. Formulate robust recovery, rehabilitation and reconstruction plans.
- IV. Conduct risk workshops for all the relevant stakeholders to communicate about the risk management and risk mitigation process.

**6.4 Delineation of Best Practices in IWT for NW-1**

The global best practices on the type of vessels, handling of cargo, supportive infrastructure facilities, and traffic management systems shall be identified. Regulatory systems in place for traffic movement through IWT, essential prerequisites (related to regulatory mechanism) for the owner and user of IWT systems shall be reviewed to understand the best practices.

**Output:**

- ✓ Identify & integrate the best practices in IWT aligned to regulatory requirements for traffic movement through NW1 in order to ensure safe and environmental friendly navigation.

**6.5 Integration of IWT related disasters risks in to existing disaster management plan**

As per the National Disaster Management Act, 2005 and updated from time to time the disaster management system has been formulated at various levels

— national, state, district, local levels etc. The study will delineate the stakeholder participation and responsibility allocation in case of any accidental risks during IWT operation. The emergency handling skill enhancement requirement for the owner (IWAI) and user (operator) shall be proposed post analyzing key requirements which include (but not limited to) the vessels, operational crew profile, the type of cargo handled etc. The study shall propose suitable mechanisms for integrating the existing infrastructure and district administration facility (to be utilised during emergency situations) along with specific recommendations on type, size, number and location of minimum hardware/infrastructure and communication requirements to be established in IWAI and district administration facility to mitigate emergency situations. The study shall also include Institutional arrangement for Disaster preparedness along with key role and responsibilities of IWAI nodal representatives, State Disaster Response Force (SDRF) and National Disaster Response Force (NDRF), adopting best practices available already in States. The study shall propose the priority of the various measures to be implemented for avoiding the risk related with IWT operation on NW-1. The study shall also include a proposal for improving the awareness level among the communities along NW-1 on safe cargo movement related risk and their respective abatement measures.

Identification of the Government Departments / Organizations, which have a role to perform in a given disaster situation along with the effective structures for time-bound coordination with one another.

The roles and responsibilities of each department of the government of the State in relation to the preparedness, mitigation and preventive measures and also with regard to responding to any threatening disaster situation or disaster.

***Outputs:***

- I. Formulate a feasible plan for ensuring the integration of prevailing disaster management facilities as per IWT operational requirements.
- II. Formulate institutional and coordination arrangement for Disaster preparedness along with key role and responsibilities of IWAI nodal representatives, State Disaster Response Force (SDRF) and National Disaster Response Force (NDRF).

III. Proposal for risk abatement measures implementation priority and community awareness program along the project influence area.

IV. Build a Capacity Development plan on following theme areas for different stakeholders in the influence area

- Prevention or mitigation for disaster risk
- Effective preparedness and response
- Recover Action Plan

## 7. Timelines & Deliverables

Study period and deliverable details are presented as below:

S. No.	Activity	Content of Deliverable	Deliverable	Time span period
1	<u>Inception Report:</u>	Appreciation of task, detailed work plan and methodology	3 Hard copies with one soft copy within two weeks from date of award of work	(D+2 week)
2	<u>Preliminary Report:</u>	Review of literature, risk assessment and abatement measures	3 Hard copies with one soft copy in CD within 3 months from date of award of work	(D+3 months)
3	<u>Final Report:</u>	Selected best practices for NW-1 and route map for integration of IWT operational risks to existing disaster management system achieved through – <ul style="list-style-type: none"> <li>• Identification of practically possible safeguard options for</li> </ul>	5 Hard copies with one soft copy in CD within 6 months from date of award of work	(D+6 months)

S. No.	Activity	Content of Deliverable	Deliverable	Time span period
		integration to IWT Operational Procedure  • Delineation of methodology for integration of operational risks to existing District Disaster Management Plan		

*D: Date of Award of work*

## 8. Key Experts

- Key experts and their qualifications for the proposed study are given below:

S No	Key Expert	Qualification	Experience
1.	Team Leader	M.A /M.Sc. in Disaster Management/ Master's Degree in Engineering along with diploma in Disaster Management or an relevant officer of Armed/Para military forces/NDRF or equivalent	10 – 12 years of relevant experience  15 years of service experience
2.	Disaster Risk Assessment and Mitigation Expert	Master's Degree along with qualification in Risk and Disaster Management or an officer/JCO/Member of Armed/NDRF/Para military forces or equivalent	8 – 10 years of service experience with exposure of Disaster / Contingency Plans for navigation/ shipping/ port and river terminal
3.	Environmental Expert	Master's Degree in Environmental Science / Engineering / Ecological Science / Botany / Zoology or an officer/JCO/Member of Armed/NDRF/SDRF or equivalent	5 – 10 years of relevant environmental experience in preparation of Risk Assessment, Contingency plan and other oil spill response including NEBA studies
4.	Hazardous Risk	Master's Degree in Engineering /Science along with diploma in Risk	5 – 8 years of relevant experience.

<b>S No</b>	<b>Key Expert</b>	<b>Qualification</b>	<b>Experience</b>
	Assessment Experts	Assessment or an officer/JCO/Member of Armed/SDRF or equivalent	Must have prepared at least 10 to 15 different Risk assessment and Contingency Plans of Port / harbours and Offshore installations.
5.	Navigation Expert	Master Mariner or an Officer/JCO of Navy/Coast Guard. Must have commanded ship navy/ Coast guard ship or equivalent	5 – 8 years of relevant experience in marine oil spill response
6.	Occupational Health and Safety Expert	Master's Degree along with qualification in Occupational Health and Safety or an Officer/JCO/ NDRF of navy/ Coast Guard with qualified supervisor duties onboard certified water crafts as an officer or equivalent	10 – 15 years of experience in relevant field of health and safety.

#### **8.0 Application Submission Format ..**

**Kindly submit & provide the desired information as per attached format - as per Annexure-II attached**

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### Consultants Letter Head

Reference :-		date:-		
To, Project Director IWAI – Jal Marg Vikas (Ministry of Shipping , GOI) A – 13, Sector – 1, Noida -201301				
<b>Subject :- Consultancy for Risk Assessment and Disaster Management Plan for National Waterway-1</b>				
<b>IWAI Reference :-</b>				
<b>Dear Sir,</b>  <b>Refer your Expression of Interest .....</b>  <b>We are pleased to enclose our credentials for the subject cited assignment as per your requirements listed at Para 3 ( a through e).</b>				
SL.NO	Description of Documents	Documents required to be furnished	Yes / no	reference
1	Name of the Organization	<i>Copy of Certificate of Incorporation.</i>		
	Date of Establishment			
	Date of Commencement of Business			
	Type of Organization – Legal Status			
	Nature of Business			
	PAN No			
	Service Tax Registration No			
	TAN No			
	Exact & Complete Address			
	Telephone / Fax numbers.			
	E-mail and cable address.			
	Present a brief profile - narrative description of the firm(s)..	<i>Kindly avoid submission of company brochures for the purpose description of the firm</i>		
	Organizational strength of Consultant			
	Key persons .. 2 principals with contact details to be Contacted by IWAI.			
2.0	EOI Submitted as Sole Applicant or Joint Venture	<i>If yes, details of JV Partner similar to 1 above</i>		
	Details of Joint Venture Partner			
	For Consultant of <b>Foreign registry</b> , indicate if there is any branch	<i>If yes, details similar to 1 above</i>		



	office(s) established in India with details in aforesaid manner			
3a	Consultant should be engaged in conducting similar activities for the past 3 years & certificates of completions to be submitted	<i>Details of relevant Engagement,</i>		
3b	Consultant should have a minimum financial turnover of INR 150 lakhs during any of the last 5 years	2016-17	<i>CA certified declaration for last 5 years.</i>	
		2015-16		
		2014-15		
		2013-14		
		2012-13		
3c	Consultant should be having a minimum of 25 employees on their payroll	<i>Declaration to be made by company HR</i>		
3d	Profile of the Persons likely to be deployed for this Assignment.	<i>Please enclose the details of methodology- the Team Size &amp; CV of the Team leader &amp; others</i>		
3e	Consultant should have completed 4 ( four) such similar / related work during the last 3 years. <b>Similar/related works may Include</b>  Risk assessment and preparation of disaster management plan for inland waterways.	<i>Kindly Provide following details toward completed works.</i> <ul style="list-style-type: none"> <li>• Client's details</li> <li>• Scope of work</li> <li>• Date of commencement,</li> <li>• Date of completion,</li> <li>• Synopsis of the Projects ( relevant certificates of Commencement &amp; completions should be enclosed)</li> </ul>	Task-1	
			Task-2	
			Task-3	
			Task-4	

Hope you will find the same in line with your requirements.

Signature & Name of the Consultant  
Date & Seal

Certificate

This is to confirm & certify that the information furnished with this Expression of Interest (EOI) are true & Correct and are not debarred by the World Bank.

Signature & Name of the Consultant  
Date & Seal

**Enclosure :-**  
**As listed here under:-**