

## **Section 7. Terms of Reference**

### **1 Introduction & Background**

- 1.1 Assam has approximately 1980 km of navigable waterways of which the most important for transport purposes are the Brahmaputra and Barak Rivers. The Brahmaputra River with a length of 891 Km between the Bangladesh Border and Sadiya, was declared National Waterway no. 2 by the Government of India in 1988, the development of its navigation infrastructure thereafter being the responsibility of the Inland Waterways Authority of India (AIWTDS). AIWTDS is currently aiming to maintain a navigable depth of 2.5m from Bangladesh Border to Neamati (629 Km), 2.0 m from Neamati – Dibrugarh (139 Km) and 1.5m from Dibrugarh – Sadiya. However, while AIWTDS is responsible for the navigation ‘fairway’ it does not own the water resources or have responsibility for operating water transport services. Landside activities such as riparian land-use development are regulated by State or local governments.
- 1.2 The Brahmaputra, running through the heart of the state of Assam, provides a vital link for both urban and rural ferry services which are the single most important transport mode for many sections of the population, especially rural households in Assam. These ferry services are provided by the Directorate of Inland Waterway Transport Assam, and by country boat operators – typically small independent and informal private businesses. In addition to the 97 ferry service routes designated by the Directorate of IWT, there are numerous routes licensed by the local (village) and district councils. Other users of the river include the Central Inland Water Corporation Limited (a Government of India Undertaking transporting cargo and operating some terminals on the rivers in the Eastern India & North-Eastern India and on the Indo-Bangladesh protocol routes), border security forces, tourist organizations and private operators. Navigation on the Barak River (152 km) is minimal at present, but the river is designated to become National Waterway 16 under the National Waterways Bill (2015).
- 1.3 The Directorate of Inland Waterway Transport Assam, established in 1958 and part of the Assam Transport Department, is responsible for developing, maintaining and regulating IWT services in the state. It also operates and maintains many of the passenger transport services, ferry terminals and navigation aids on both Brahmaputra

and Barak Rivers. Headquartered in Guwahati, it has three divisional offices in Guwahati, Dibrugarh and Silchar; five sub-divisional offices in Guwahati, Goalpara, Jorhat, Dibrugarh and Hailakandi; and three commercial offices at Guwahati, Goalpara and Dibrugarh. It also has a Crew training centre at Guwahati. DIWTA currently has a total of about 4,330 regular staff.

- 1.4 The ferry industry as a whole is characterised by an aging and poorly equipped fleet. Most demand is now met by the informal sector operating traditional country boats without supporting infrastructure. Terminal facilities and navigational aids are insufficient. Most ferry terminals consist of no more than improvised moorings on the bank of the river, which require relocation with changing river conditions, often over substantial distances. In the absence of bank protection, the main ferry terminals in or close to the urban centres (provided with floating, movable steel pontoons and temporary access roads) also typically require frequent relocation as river conditions change across seasons. The cargo sector is small partly because of market circumstances, partly because of connectivity problems and partly because the navigation standards provided do not permit reliable year round use by large modern vessels that can deliver competitive advantage over other transport modes.
- 1.5 In order to leverage the benefits of inland water transport, the Government of Assam wishes to transform the quality of inland water transport services and integrate high quality passenger and vehicle ferry services, and inland water freight transport into Assam's wider transport network system. The Government of Assam has applied for World Bank loan assistance to implement its project for (i) Developing Long Term Strategic Plan for IWT in Assam and Institutional and Capacity Development and (ii) Improvement in Ferry Services.
- 1.6 Accordingly, AIWTDS plans to engage consultants to investigate the strategic planning and design, as well as the technical, economic and financial feasibility of ferry services at Guwahati and Dibrugarh situated on the bank of Brahmaputra River (NW-2). The Work shall include selection of best locations within the specific regulatory, planning, and investment framework of above mentioned cities, design development, preparation of DPR and procurement strategy.

## **2. Objective of the Assignment**

- 2.1 The ferry services being operated on Brahmaputra River, transports passengers, two wheelers and four wheelers from one side of river bank to the other. The ferry service operate in day time between North Guwahati and South Guwahati at a total of five terminal locations, and between Neamati – Kamalabari and Neamati – Aphalamukh stretches at a total of five terminal locations.
- 2.2 The ferry services get only few hours to operate in day time, as the factors like fog hampers navigation and dusk sets in early in this region. The last ferry that operates is at 3.00 PM, after which no navigation is possible due to darkness and absence of any sort of night navigation facilities. Even in the day time there are a few bamboo marks other than which there is even no day navigation aid.
- 2.3 The initiation of services for navigation in night as well as in fog hours in the stretches mentioned above is critical due to multiple reasons - Guwahati is expanding in North which will lead to growth in traffic and will require operational ferry services beyond dusk to accommodate the traffic., IWT transportation is a critical means of connectivity of the population in Neamati – Kamalabari – Aphalamukh stretch with the mainland. Lack of proper navigation arrangements limits the possibility of socio-economic growth in the region.
- 2.4 While night navigation arrangement is a necessity for the aforementioned, the feasibility of such arrangements get considerably hindered due to various factors. The channel to cross the river is not fixed and based on the movement of shoals / sand chairs it keeps on changing. The route meanders depending on the location of such shoals / sand chairs which keeps on silting and increasing their influence in the channel. In every flood season the location of these shoals / sand chairs changes resulting in the change of route of ferry travel across Brahmaputra river.
- 2.5 The objective of the assignment is to establish the feasibility of the night navigation equipment in the designated areas.

### **3. Detailed Scope of Technical Support Service**

3.1 The broad scope of works are as follows:

3.1.1 The Consultant shall be responsible for effectively leading and taking initiative to establish the requirement for night navigation to start and sustain in these stretches.

3.1.2 The Consultant shall study, in depth, the morphology of the river, the working conditions for ferry services in various stretches and all other such factors to advice for the effective planning, design and implementation of night navigation facilities including but not limited to night navigation aids.

3.1.3 The consultant and his team shall be responsible for studying the entire stretch of ferry movement on River Brahmaputra including but not limited to the components like hydrography and water level variations, siltation patterns and formation of shoals / sand chairs, advise on most suitable channel of navigation, aids to navigation required including night navigation on this stretch, possible procurement specifications of all such aids and maintenance requirements.

3.1.4 The consultant shall independently carry out collection and assessment of data for analysis of the river stretch for shoal shifting pattern, understanding of river morphology and siltation to clearly identify night navigation needs

3.1.5 Prepare a feasibility report to provide solutions to issues affecting night navigation and enumerating the requirements of night navigation facilities in the designated areas.

3.2 Overall the scope of the consultant's services shall be as indicated herein but not limited to:

#### **3.2.1 Collection of data on various stretches including ferry terminals (i.e. Nemati – Kamalabari – Aphalamukh and North to South Guwahati)**

(i) Mobilize necessary equipment on site to collect bathymetry current, water quality, siltation, wind, bank to bank survey along the length of the river and other data necessary to assess the requirement of night navigation in the stretch where the ferry services are operational currently in day time.

- (ii) Acquaint with and carry out analysis of all the existing data, reports / documents prepared in past i.e. Review existing reports / documents prepared for this project prior to appointment of the consultant.
- (iii) Collection and analysis of data of current, wind, siltation, sliding and formation of shoals, discharge, water quality parameters, shoal movement, channel behavior and all necessary data, i.e. factors required to consider while suggesting night navigation requirements.
- (iv) Identify specific routes for ferry movement based on LAD, river water current and deepest channel available, keeping in mind the movement of shoals / sand chairs, meanders due to shoals or river meanders and total travel time of the ferry.
- (v) Collect data by conducting hydrographic / topography surveys, collect all the necessary data as mentioned herein above but not limited to the list, analyse and advise to conclude the requirement of night navigation activities.

### **3.2.2 Analysis of data and Requirement for night navigation including navigation aids**

- (i) Set requirements, specifications, details, estimated cost, standards to be adhered to and terms of reference for procurement / installation mechanism of all such night navigation requirements.
- (ii) Based on the river study and review of the data available, the consultant will conclude assessment for requirement and submit a detailed feasibility report clearly identifying requirements of aids to navigation for night navigation, any other intervention necessary for night navigation, cost and time schedule to procure / install / maintain night navigational aids in the said stretches.
- (iii) The feasibility report should clearly suggest the requirements of night navigation facilities (temporary / permanent) to be developed for short term / long term solutions to the issues affecting night navigation, including specifications and terms of reference of the night navigational aids to be procured and implemented.

### 3.2.3 Other activities related to the Project

- (i) Efficient Documentation both on paper media and soft media
- (ii) Assist in procurement, including preparation of bid document as per World Bank procurement guidelines for Night Navigation in Assam including necessary technical inputs for the installation of proposed navigational requirements.
- (iii) Assist in arranging and conducting presentation(s) to the stakeholders, coordination meetings with vendors for procurement and formulating terms of reference.

## 4. Milestones

Activities	Time period from contract signing (in Days)
Draft Feasibility Report as per the TOR	30
Final feasibility report and Final Tender Documents and Workshop/Meeting	45

## 5. Workshop/Meeting

Team leader along with relevant team members should be present for meeting/workshop at AIWTDS office.

