

APPENDIX A – TERMS OF REFERENCE

**Terms of Reference
for
"IWT Sector Development Strategy and Business Development Study for Capacity
Augmentation of National Waterway-1 from Haldia to Allahabad"
(Jal Marg Vikas)**

Table of Contents

Introduction.....	4
2. Objective of the Assignment.....	5
3. Scope of Work	6
Part A: Market Development Study (MDS)	6
Market Analysis	6
Market Survey.....	6
Market Development	7
Market Trends.....	8
Waterway & Infrastructure Analysis	9
Capacity Building and Financing.....	10
Socio Economic Environment Assessment	10
B) Institutional Development Study	11
C) Strategy for Development IWT Sector	12
4. Deliverables	13
4.1 Inception Report.....	13
4.2 Part A: Market Development Study.....	13
4.2.1 Market Analysis Report	13
4.2.2 Market Development Plan	14
4.2.3 Market Trends.....	14
4.2.4 Waterway and infrastructure Analysis.....	14
4.2.5 Capacity building & Financing.....	14
4.2.6 Socio-Economic and Environment benefit	15
4.3 Part B: Institutional Development Study	15
4.4 Part C: Strategy for Development of IWT Sector.....	16
4.4.1 Inland Water Transport Policy.....	16
4.4.2 Inland Waterways Integration Policy and Plan.....	16
4.4.3 Organization Structure of IWT Sector	16
4.4.4 Inland Water Transport Market Development Plan.....	16
4.4.5 Projects for International Collaborations	16
4.4.6 IWT Funding Mechanisms	16
4.4.7 Promotion & Incentives Policy.....	16
4.4.8 Integrated Logistics Policy	16
4.4.9 Continuous Monitoring, Review, Improvement and Performance Mechanism	16
4.4.11 Modernization, Harmonization and Green Technology Guidelines	17
4.4.12 Human Resource for IWT and its Development Plan	17
4.4.13 Socio-Economic-Environment Benefits	17
4.4.14 Safety & Security Policy.....	17

4.4.15	Land Policy	17
5.	Miscellaneous provisions.....	17
6.	Timelines.....	18
7.	Minimum Qualification and Experience of Key Experts:	18

Introduction

- 1.1 Inland Waterways Authority of India (IWAI) is a statutory body under Ministry of Shipping, Government of India. IWAI was set up in 1986 and is primarily responsible for development, maintenance and regulation of Inland Water Transport (IWT) in the country and specifically on the National Waterways (NW).
- 1.2 The Ganga-Bhagirathi-Hooghly river system from Haldia to Allahabad has been declared as National Waterway-1 (NW-1). This waterway is of national significance passing through four states of Uttar Pradesh, Bihar, Jharkhand, West Bengal and potentially serving the major cities of Haldia, Howrah, Kolkata, Katwa, Behrampur, Farakka, Sahibganj, Rajmahal, Bhagalpur, Patna, Ballia, Buxer, Ghazipur, Varanasi and Allahabad, their industrial hinterlands, and several industries located along the Ganga basin.
- 1.3 IWT on NW-1 has the potential to form the most economic, reliable, safe and environmentally friendly form of transport. Where developed for use by modern vessels operating on dependable rights of way, it can reduce investment needs in rail and road infrastructure, promote greater complementarities in the economic strategies the riparian states, enhance intra-regional trade and, through increased economies of scale, significantly reduce transport costs for the benefit of the entire economy and India's global trade competitiveness.
- 1.4 There is already evidence of growing demand for transport on NW-1, especially for dry and liquid bulk cargoes. This includes demand from the thermal power plants, cement companies, fertilizer companies, oil companies, the Food Corporation of India and others for coal, fly-ash, cement and clinker, stone chips, edible oils, petroleum products, food grains and over dimensional cargo.
- 1.5 In the early twentieth century, inland waterways were a significant mode of transport for freight (and passengers) in India but, as in many countries, the influence first of railways, and then of road motorization, has led to a neglect of IWT which now carries less than one half of 1 percent of India's freight traffic. On NW-1, the annual freight volumes are approximately 3.2m tons. By contrast, inland waterways in some regions such as China, the USA and the European Union and China have maintained and upgraded their river systems on core routes. These now support large modern vessel fleets of self-propelled vessels, tug and multiple barge units carrying up-to 40,000 tons of cargo on a single voyage. In China alone, over 1.1 billion tons of cargo is carried on some 200,000 IWT vessels annually, in the USA over 615 million tons on over 31,000 vessels and in Europe over 565 million tons on some 11,000 vessels.
- 1.6 One limitation on viable IWT on NW-1 is a weak navigation infrastructure. Currently, IWAI targets a least available depth of: 3.0m between Tribeni and Farakka; 2.5m depth between Farakka and Barh; 2.0m between Barh and Ghazipur; and, 1.5m between Ghazipur and Allahabad. Minimum channel widths are 45m. In order to guarantee these

condition IWAI's current maintenance dredging task exceeds 1 million cubic meters/year. Most maintenance dredging work is focused on the heavily braided Ganga River, which is characterized by very high levels of sedimentation and very low sediment through-puts, leading to rapid and changing patterns of shoaling in multithread channels and constant boundary changes. Moreover and while the Bhagirathi-Hugli system (which has been hydro-modified following construction of the Farakka barrage) exhibits a meandering tendency – it originally formed when the Ganga dominated the deposition system through Haldia, before moving eastward through a series of channels over the last 400 years to finally join the course of Brahmaputra River in the 19th Century and which flow is now – it does contain numerous short radius bends. Conditions on both these rivers constrain year-round navigation by larger modern vessels that could deliver competitive advantage over other modes of transport.

- 1.7 To overcome such constraints, IWAI is planning to upgrade the navigation infrastructure. It has already rolled out modern electronic charts for much of NW-1 to improve safety of navigation and is in the process of implementing a river information system that includes vessel tracking and the dissemination of important navigation information to mariners. It is also undertaking studies aimed at increasing the least available depth to 3m on the entire reach between Haldia and Allahabad through various river-engineering schemes that reduce shoaling effects and minimizes maintenance dredging needs. As the irregular flow of the rivers through-out their course forms one of the main difficulties in devising works for increasing the navigable capabilities of the river system, this may include re-directive and resistive works in the lower reaches, together with, in the upper reaches, construction of weirs and locks (that do not prevent regular discharge), to convert this into a succession of fairly level reaches with adequate depth for navigation.
- 1.8 IWAI has applied for World Bank loan assistance to implement its project for Capacity augmentation of navigational infrastructure of National Waterway-1(Jal Marg Vikas). Government of India intends to apply part of the proceeds of this loan towards **“IWT Sector Development Strategy and Market Development Study for capacity augmentation of National Waterway-1 from Haldia to Allahabad”**.
- 1.9 Accordingly, IWAI plans to engage consultants to conduct a market development study and an IWT strategy for NW-1.

2. Objective of the Assignment

The objective of this consultancy assignment is to provide a comprehensive IWT development strategy. The strategy shall be based on an assessment of the existing transport and freight supply/demand situation in NW-1 and an identification of all infrastructure, institutional, regulatory, environmental, safety and commercial challenges hindering IWT competitiveness.

The strategy shall set out a framework that addresses IWT development challenges and shall be sufficiently forward looking and deal proactively with short, medium and long term issues. It

shall guide all IWT investment decisions and build on the competitive strength of IWT to reduce the cost of transport for the wider Indian economy.

3. Scope of Work

The scope of works for this consultancy assignment shall be done in parts. Each part is to run concurrently with each other and shall include:

Part A: Market Development Study (MDS)

The Market Development Study shall comprise of an existing market analysis, market developments and future trends.

Market Analysis

The consultant shall conduct all research and studies to determine the following:

- 3.1 The NW-1 Hinterland;
- 3.2 Existing Transport Demand (Cargo and Passengers) within the NW-1 Hinterland;
- 3.3 Freight Transport Patterns within the NW-1 Hinterland (To cover different transport modes);
- 3.4 The characteristics of the freight supply chain, mono and multi-modal freight flows between major economic centers within the NW-1 Hinterland;
- 3.5 The characteristics of the freight supply chain for cargo originating from or destined to and from the existing gateway ports;
- 3.6 Current freight costs and rates (on a ton/km basis);
- 3.7 Current freight bottlenecks, including time and other bottlenecks by transport mode and route.
- 3.8 Current operational hindrances and bottlenecks in IWT mode

Market Survey

- 3.9 The consultant shall analyze the transport market including cargo and passengers and investigate current and potential customer needs. The consultant shall conduct a survey of customer preferences for specific supply chains based on several key attributes of service especially: (1) price, (2) speed, (3) reliability, (4) security of cargo, and (5) availability of service (6) capacity.
- 3.10 The consultant shall conduct an analysis of the NW1 route compared to customer price and service needs defined in 3.8, identifying the strengths and weaknesses of each.
- 3.11 The IWT mode shall be compared to rail and road modes along NW-1 route with regards to service attributes in 3.8.

- 3.12 Supply chain review and transportation cost competitiveness including comparative analysis with road and rail.
- 3.13 Analysis of what service characteristics would need to change for NW-1 to attract more traffic and by how much (opportunities and threats/bottlenecks) shall be performed. The analysis shall also include inputs from existing and potential users.
- 3.14 Identify existing Industrial Zones, SEZ's, Trade Hubs, Depots, Warehouses, Railheads, Sidings, Cold Chains, ICD's, CFS, along the waterway. Study possible interlinking and integrating of same to IWT mode and development of multimodal facilities to enhance modal share of IWT. Identify facilities, infrastructure required at existing SEZ's, industrial zones etc. to enhance modal shift.
- 3.15 Provide the details of capital cost recovery mechanism of railway system as per freight structure of railway system across the various classes of commodities and provide the per ton cost of capex recovery in the identified O-D pairs in order to apply similar mechanism in IWT sector.

Market Development

- 3.16 Develop and apply a model (analysis matrix) for mode choice between IWT, rail and road transport. Using competitive advantages of IWT mode develop marketing plan for fifteen (15) cases of freight traffic favorable to Inland Water Transport, at least one case each w.r.t. commodity, volume, O-D pair, traffic flow (upstream/downstream, backhauls etc.) season/time, intermodal and multimodal.
- 3.17 Identify suitable location for establishment of trans-loading centers, new special economic zones and industrial zones along the NW-1 favorable to IWT.
- 3.18 Identify existing government policies and subsidies offered to a commodity, trade, region, based on mode of transportation. The application of government policies that influence mode choice should be analyzed: - subsidies, negative lists, regulatory controls, etc. Application of the policies developed in EU, US and China in Indian scenario shall also be analyzed.
- 3.19 Develop a case for the possible application of policies and subsidies identified in 3.17 to IWT mode.
- 3.20 Establish unit cost of transportation for the three modes (IWT, Rail, Road) detailing each cost element including externalities (energy saving, pollution, congestion, land use, etc.) between a IWT favorable O-D pair along NW-1. Establish commodity based IWT tariff and compare the same using a benchmark analysis, with the tariffs currently practiced:
 - a. in other transportation modes;
 - b. in competing corridors from the region;
 - c. in IWT mode across EU and Bangladesh;

- 3.21 Based on 3.19 advise at least 10 origin and destination pairs along NW-1 for each of the following scenario where:
- a. IWT mode is most efficient.
 - b. Multimodal with IWT as one of the constituent is most efficient
 - c. Intermodal is most efficient
- 3.22 The Consultant shall, depending on type of commodity and origin-destination pairs, propose an optimal logistical chain that is likely to be adopted by the trading clients and the freight forwarders which would include the type of flux (just in time or extensive use of warehousing) and containerized/packaged vs. bulk transport.
- 3.23 Provide database of prospective stakeholders (shippers, regulators, facilitators, operators, transporters of each mode, freight forwarders, logistic companies etc.) on NW-1 and hold stake holders meeting and workshops (10 locations) for conducting survey and spreading awareness about the sector.
- 3.24 Provide marketing plan (marketing centers, marketing Policies etc.) in order to promote, incentivize and make IWT mode more attractive and develop IWT market.
- 3.25 The consultant shall provide business development plan for all types of cargo, tourism, cruise operators, passenger service including ferry service.
- 3.26 The consultant shall specifically compare cost competitiveness between Rail and IWT sector between two (2) suitable O-D pairs along NW-1 in following terms:
- a. Per Tonne Per Km
 - b. Per Annum per destination of Cargo (To be calculated based on past 3 years actual supply records maintained by the respective Consignor/Consignees)
 - c. Per Annum per last mile bulk stock yard (To be calculated as per supply – stock & sale data available).
 - d. Individual Cost elements, externalities and benefits, subsidies etc, shall be specified.

Market Trends

- 3.27 Based on the market analysis the consultant shall perform waterways transport demand projections with the available infrastructure and demand projections after implementation of the JMV project i.e. after augmentation of the capacity.
- 3.28 Establish IWT market trends and determine freight flows for a 30 year horizon and to include O-D links to neighboring countries.
- 3.29 The study shall produce forecasts of the future demand for freight transport between the 10 main origins and destinations in the region, for key commodities, including raw, intermediate and finished products. In this regard, the study shall produce an origin- destination (O-D) demand matrix per commodity, for the main commodities traded in the region. The matrices shall be produced for the following horizons:

- a. baseline year 2013, or earlier years if data is available;
- b. Baseline year (BY) + 5;
- c. BY + 10;
- d. BY + 20;
- e. BY + 30.

3.30 The study shall then, for each horizon assign such demand between the various transport corridors and modes available, namely, waterway, road and rail. The assignment shall be on the basis of transport generalized costs, including monetary and non-monetary costs (e.g. time saving, reliability, safety, emissions etc.). Other considerations such as logistical (e.g. availability of storage facilities, cold store chains, etc.) and non-logistical (special requirement of some commodities, e.g. perishable products), will have to be taken into account when identifying alternative routes and modes for the assignment.

3.31 The demand growth between the above horizons will need to take into consideration background economic growth, induced growth due to development of IWT infrastructure, its inherent advantages, policies etc, modal shift and through traffic due inert linkages. In this regard, the study shall also explore potential for future economic developments not only along the waterway corridor, but also other corridors and waterways that could benefit from the waterway or impact the growth of the said waterway (e.g. Eastern Dedicated freight Corridor, NH-1, Coastal Shipping)

3.32 The forecasts shall be presented year on year, be detailed for both existing and augmented waterway.

Waterway & Infrastructure Analysis

3.33 Analyze current and potential transport supply including waterway characteristic navigation aids and infrastructure suitable to handle the traffic including terminal facilities including cargo handling, warehousing/storage needs, intermodal & multimodal equipment required for trans-loading.

3.34 According to the demand analysis when applicable suggest locations, for new terminal to be developed along the waterway, considering: capacity, type of commodities to be handled, connections to other modes, vicinity of industrial zones, etc.

3.35 Determine the need and location for multimodal logistic hub, Inland Container Depot, cold storages, rail siding, freight depot etc. and connectivity with road, rail and pipeline network of proposed and existing hubs.

3.36 Connectivity of waterway Terminal with existing or proposed road and rail freight corridors and networks.

- 3.37 Determine the type of vessels, size of vessels, the fleet size and operational performance requirement to meet the potential demand also considering solutions for greening the fleet,
- 3.38 Analyze current and possible new location and size of shipyards and repair facility required for proposed fleet development, its maintenance and repair.
- 3.39 Volume of the existing and proposed freight that waterway can handle and identify the infrastructure requirements to provide for handling, storage and evacuation of the type, size and quantity of cargo and traffic.

Capacity Building and Financing

The study shall:

- 3.40 Identify institutional, financial, regulatory, taxation, procedural bottlenecks including concerns (safety, security) that hinders growth of the IWT sector and propose solutions required for development of the sector as safe, secure, efficient and clean mode of transport.
- 3.41 Identify the financing mechanism applicable/available to the rail and road sector that may be made applicable to IWT Mode. Propose financing plan to promote IWT Sector.
- 3.42 Clarify and formulate the expected role of the private sector in the development of NW1 with regards to dredging, terminal construction & management, shipping, shipyard and repair facility etc.
- 3.43 Develop at least 5 detailed project proposals for barge acquisition, terminal construction & management for cargo and passenger movement to meet the financing requirements of banks and ensuring the financial viability of the projects.
- 3.44 The consultant shall hold consultations with different stake holders, including industrial associations etc. for development of policies, frameworks and marketing of the sector.

Socio Economic Environment Assessment

- 3.45 Assess the potential economic development and increase in employment opportunities in the region/hinterlands of NW-1 and expected shift from primarily agrarian economy to industrial service sector economy due to development of IWT Sector. The economic potential of the region along the NW-1 shall be assessed. Economic Performance Index (EPI) of the districts along the National Waterway-1 shall be assessed and provided along with effect of IWT growth on EPI.
- 3.46 The socio-economic assessment and formulation of a road map for legal/regulatory reform of the sector.
- 3.47 Assess the potential social effect including consideration of health, demographic, employment and generated wealth on account of the potential traffic.
- 3.48 Deleted

B) Institutional Development Study

The consultant shall advise on the following activities for institutional strengthening & capacity building:

- 3.49 Review and suggest the roles of State Government and Central Government and other institutions for market development, financing, insurance, freight forwarding, logistics, documentations, survey and certifications, safety, security etc., with regards to rules and regulations pertaining to development of waterways, environment management, registration and operations of vessels.
- 3.50 For capacity building, institutional strengthening, knowledge enhancement and adequately equipping the IWAI / PMU (JMV) personnel for effective and efficient project management, implementation the consultant shall organize and facilitate 4 visits of 6 officials to developed countries (EU, USA etc.) and developing countries (China, Vietnam etc.). The study visits shall cover the following:
 - 3.51 Exchange of ideas, identification of the needs of navigation in NW-1, witnessing understanding the planning, development and implementation of similar waterway projects.
 - 3.52 Understanding the concept of smart rivers, ports, terminals and use of modern technology
 - 3.53 Economic and business aspects of terminal planning, policy making, and construction of navigation channels, locks etc.
 - 3.54 Understanding innovative design solutions and models in freight transport optimization
 - 3.55 Vessel innovations focusing at better operational performance, along with an improved environmental performance.
 - 3.56 Modelling and simulating successful traffic flow of international waterways in Europe, China etc.
 - 3.57 Asset risk management strategies
 - 3.58 Recommend safety and security guidelines, institutional and organization management system for safe, secure and clean transportation on the waterway.
 - 3.59 Review and recommend best systems, practices and procedures for operation, maintenance and management of fairways, terminals, terminal facilities, vessels and navigation aids.
 - 3.60 Review and recommend Human Resource Development for complete Inland waterways Transport Sector
 - 3.61 Review and recommend development/enhancement and establishment of Training Institutes for IWT sector
 - 3.62 River Information service and vessel traffic management service for the sector.
 - 3.63 Advise on search, rescue and emergency arrangements for the sector.

C) Strategy for Development IWT Sector

- 3.64 The consultant shall prepare an IWT sector development strategy and a strategic business development plan to increase the modal share of inland waterway transport. The business development plan shall be synergized with project master plan for infrastructure development i.e. waterway parameters, number, location of terminals and facilities there on. The IWT Sector Development strategy shall cover the following broad aspects:
- a. Create Brand Image of IWT Sector
 - b. Marketing Demand for IWT Sector
 - c. Infrastructure and Institutional requirement for marketing of the IWT Sector
 - d. Material and Methods for information dissemination
 - e. Harmonized Tariff structure for IWT and multimodal transportation where IWT as one of the mode including rationalization of tariff
- 3.65 Develop strategies to enhance the competitiveness of IWT based on detail analysis of :
- a. different competitive modes and comparative advantage of inland waterways is a preferable choice and
 - b. Multimodal transportation and IWT can provide complementary intermodal services.
 - c. Transportation need where IWT is expensive but railway cannot meet the demand and IWT can provide supplementary services.
- 3.66 The strategy shall cover the wider region along National Waterway -1 from integrated waterways (National & State) and multi modal network (Rail, Road, Pipeline) perspective.
- 3.67 The strategy is intended to be a document for Capacity Augmentation of Navigational Infrastructure of National Waterway-1 and Inland Water Transport in the region and shall cover waterway systems inventory analysis, cargo traffic & market analysis, and economic analysis for at least next 30 years.
- 3.68 The study shall provide documents for proposed policy framework with regard to development of IWT sector covering institutional strengthening, capacity building and improving investment climate.
- 3.69 The study shall identify gaps and needs for waterway infrastructure development, fleet development, financing, human resource development, and environment protection.
- 3.70 The study shall provide policy document on carbon emissions credit and other successful models/methods to promote IWT sector.

- 3.71 The Study shall advise on appropriate and viable economic/industrial development zones along the waterway. These zones should primarily be inter-dependent on waterways transportation.
- 3.72 Potential impact, threats due to development of Eastern Dedicated Freight Corridor, Expressways, Pipeline network etc. on the IWT market shall also be submitted.
- 3.73 Work out a potential scenario of mutual synergy and market sharing modalities between rail and road freight corridor projects such as EDFC etc.
- 3.74 Possible MOU's and synergy of IWT Sector with PSU's (e.g. EDFC, CONCOR, CRWC, SCI etc.) and companies (TCI, Great Eastern Shipping etc.) serving logistics needs shall be provided.
- 3.75 Possible MOU's and Synergy between IWT Sector and PSU's (NTPC, Coal India, NHPC, IFFCO, SAIL etc.), and Companies (Ultratech, Maruti Udyog etc.) users of IWT shall be provided.

4. Deliverables

4.1 Inception Report

The Consultant shall submit an Inception Report that gives details of the methodology the Consultant intends to use to fulfil the Terms of Reference. The Report shall include detailed performance schedules and personnel deployment. The methodology, reports required, performance schedules and personnel deployment may be modified by the client. The inception report shall at least cover:

- a. Detailed methodology for the work including general forms of the models to be developed and applied
- b. Data requirements and availability
- c. Stakeholders to be consulted and questionnaires
- d. Proposed benchmarks for comparison and reasons for their selection

4.2 Part A: Market Development Study

The consultant shall provide documents and reports required as per the objectives and TOR outlined above and shall include but be not limited to the following:

4.2.1 Market Analysis Report

1. Market survey including of stakeholders and users, traffic flows and modal split analysis
2. Sensitivity analysis of the main drivers of modal preferences
3. Traffic Characteristic and Flow
4. Intermodal Comparison including SWOT analysis of each
5. Cost Benefit Analysis of IWT mode

6. Supply chain review
7. Infrastructure, institutional and financing bottlenecks for IWT
8. Location analysis of terminals, multimodal, logistic hubs etc.

4.2.2 Market Development Plan

1. Marketing plan for fifteen (15) cases of freight traffic
2. Report on location of SEZ and Industrial Zones
3. Analysis of government policies and subsidies for transport sector
4. Unit cost analysis of the three modes
5. Origin - Destination pairs favorable to IWT
6. Market Development Plan for IWT Sector
7. Detailed comparative Analysis of Rail and IWT sector
8. Database of Stake holders & recommendations of IWT workshops
9. Marketing development centers

4.2.3 Market Trends

The consultant shall provide documents and reports for Market Trends as per the objectives & TOR outlined above and shall include but be not limited to the following:

1. Total Transportation Market and Modal Share report
2. Market trends and traffic forecast for thirty year horizon for existing and augmented waterway
3. Impact of Dedicated Rail and Road Freight Corridors and pipeline network on IWT Modal share in NW-1

4.2.4 Waterway and infrastructure Analysis

The Consultant shall provide documents and reports for development of infrastructure in order to meet the current and potential market demand including number, size, type, capacity and location etc. where relevant with regards to the following but be not limited to:

1. Fairway, terminals/ Jetties, integrated terminals etc. with cargo handling and other facilities
2. Vessel fleet
3. Shipyards and repair yards
4. Navigational Aids, River Information Service & VTMS
5. Special Economic Zones, warehouses, cold chains and CFS etc.

4.2.5 Capacity building & Financing

The Consultant shall provide documents and reports for capacity building and financing in order to promote IWT sector:

1. Institutional & financing bottlenecks & proposed solutions
2. Financing mechanism and financing plan for the IWT sector

3. Bankable DPR's for IWT sector
4. Industry associations and consultations groups of stake holders

4.2.6 Socio-Economic and Environment benefit

The Consultant shall provide documents and reports for Socio-Economic and Environment benefit report as per the objectives outlined above and shall include but be not limited to the following:

1. Socio-Economic benefits to the society in terms of employment, uplifting of living standards, better water management, cheaper, efficient and economic transportation of cargo and passengers, etc. especially advantages to the agrarian and fishing society living along the NW-1 corridor.
2. Absolute and Comparative benefits to Environment due to the modal shift and transportation of cargo using IWT sector.

4.3 Part B: Institutional Development Study

The Consultant shall provide documents and reports for Institutional Strengthening as per the objectives outlined above and shall include but be not limited to the following:

1. Institutional and Organization Analysis report
2. Institutional Capacity Development report for strategic and business development & planning, IWT traffic control, financing, communications and safety, security, marketing, cargo handling, terminal management, environmental monitoring, and infrastructure maintenance etc.
3. Management systems and structures in IWT sector for the safe, efficient and viable operation and maintenance of inland waterways and equipment.
4. Organization Structure at central and state levels for development of management structures and systems/tools to increase IWT capacity to meet the challenges of IWT market demand using new market oriented management concepts.
5. Report on improvement of federal and state regulatory, legal frame work for IWT sector.
6. Report on areas of contribution and harmonization of state policies with the central government.
7. Report for building of institution for Financing, Insurance and facilities required for operation of IWT sector
8. Proposal for setting up training institute for IWT sector
9. Plan for study tours and training
10. Total Human resource required for the IWT sector
11. Training institutes and infrastructure required for development of HRD for the IWT Sector
12. Organization structure, manning and certifications required for the IWT sector

4.4 Part C: Strategy for Development of IWT Sector

The Strategy shall be drawn considering advantages of IWT sector and objective of optimal usage of the existing and augmented capacity of IWT mode. It shall consider overall requirements and how the government intends to achieve them. The plans should include development policies, regulatory mechanisms, action plans etc. and shall include but be not limited to the following.

4.4.1 Inland Water Transport Policy

Provide comprehensive policy for IWT Sector covering fairway & terminal development, navigation facility development, ship building and repair, fleet development, market development, capacity building, institutional and human resource development, policy and procedures and funding mechanisms. The policy shall also cover state and central government aspects. The policy shall cover development of new economic zones, location of integrated terminals, tariff policies, design of physical network.

4.4.2 Inland Waterways Integration Policy and Plan

Provide National Inland Waterways Integration Policy and Plan to develop an integrated waterway network interlinked to provide intermodal and multimodal transport system. It shall cover developing of existing canals as IWT fairways and rules for developing other fairways.

4.4.3 Organization Structure of IWT Sector

Provide organization structures of IWT sector including roles and responsibility of local, state & central government and structure in the different components of the IWT sector. It shall be based on analysis of IWT structures worldwide.

4.4.4 Inland Water Transport Market Development Plan

Provide time based action plans with specific deliverables for development of the IWT sector from immediate, short, medium and long term prospective using different market development and market penetration approaches covering all aspects of the IWT Cluster i.e. cargo, fairway, terminals, intermodal connectivity, facilities, shipyards, fleet, manpower, regulatory mechanisms, taxes, financing, market & environment etc..

4.4.5 Projects for International Collaborations

Provide report on Inland Water Transport Sector specific projects for technical collaboration and technical assistance with the countries having developed IWT system.

4.4.6 IWT Funding Mechanisms

Provide Guidelines for Private (national and international) sector participation and government financing, funding and tax rationalization mechanism for development of the IWT Sector. Different participation models of private sector in IWT sector shall be provided.

4.4.7 Promotion & Incentives Policy

Provide guidelines for promotion of Inland Water Transport Sector with specific incentives and schemes including successful models implemented in other countries.

4.4.8 Integrated Logistics Policy

Provide guidelines for promotion of Inland Water Transport Sector in harmony with National Integrated Logistics policy.

4.4.9 Continuous Monitoring, Review, Improvement and Performance Mechanism

Provide structure and guidelines for continuous monitoring, review, improvement and performance mechanism for the execution IWT Policy, Plans, Guidelines and recommendations etc. for the sector

4.4.10 Information Technology and IWT Sector Report

Provide report identifying areas of IWT sector where IT can improve the performance of the sector and suggesting e-governance, e-marketing models for the sector.

4.4.11 Modernization, Harmonization and Green Technology Guidelines

Provide guidelines and incentive mechanisms for introduction of technology, systems and procedures that are innovative, modern, smart and involve green technology ensuring same is sustainable and is in harmony with the natural environment of the waterway system.

4.4.12 Human Resource for IWT and its Development Plan

Provide organization structure for the IWT sector at central government and state government level including in other allied authorities, maritime boards and facilitation organization and departments. Provide Human resource development policy including selection, training, placement and up-gradation for the complete IWT sector.

4.4.13 Socio-Economic-Environment Benefits

Provide report on Socio–Economic-Environment benefits of the IWT sector and provide action plan for actualization of the said benefits.

4.4.14 Safety & Security Policy

Provide a comprehensive policy on safety & security covering general security on the waterway for armed robbery, theft and pilferage, security of personnel, security of vessels and terminals shall also be covered.

4.4.15 Land Policy

A policy on land Acquisition and land use policy for Terminals, jetties, logistics parks, river front areas, tourism, repair yards, etc. A comparison with land policy of railways and road shall be provided. The policy shall include resettlement and compensation mechanism.

5. Miscellaneous provisions

- 5.1 Master Plan and detailed study timeline shall be submitted.
- 5.2 The progress report shall be submitted every month.
- 5.3 Cost benefit analysis (CBA), Financial Internal Rate of Return (FIRR) and Economic Internal Rate of Return (EIRR) of the different transportation options based on current Indian / International norms including SWOT analysis with detailed back up calculations, basis, assumption, justification etc. along with their source of information where appropriate shall be provided.
- 5.4 Suitable method of implementing the project including phasing, time frame and source of funds for implementation of the plan and policy shall be submitted.
- 5.5 Stakeholder meetings on monthly basis or as required by IWAI at Allahabad / Varanasi / Kolkata / Noida / Delhi for progress report whenever asked by IWAI and to seek views of stakeholders, incorporate views of stakeholders and make suitable modifications shall be conducted by the consultant.

5.6 Subsequent to Reports/documents submitted consultant shall submit the details, clarifications reports, survey, research methodology, models, software etc. as required by IWAI.

5.7 Appropriate methodology, concepts and scientific & research tools/models including modern methods of GIS mapping of locations, traffic flows etc. shall be used for study.

6. Timelines

The study shall be conducted concurrently however the reports and documents shall be submitted as per the following guidelines;

6.1 Inception Report shall be submitted as and when completed but not later than 1 month from award of work.

6.2 Survey, reports, documents, recommendations and studies conducted for assessment and analysis of the Current Scenario shall be submitted as and when completed but not later than **four months** of award of work.

6.3 Survey, reports, assessments, documents, recommendations and studies for Market Development (Part A) and Institutional Development (Part B) shall be submitted as and when completed but not later than **six months** of award of work.

6.4 Survey, reports, assessments, documents, recommendations and studies for the Strategy for Development of IWT Sector (Part C) shall be submitted as and when completed but not later than **twelve months** of award of work.

7. Minimum Qualification and Experience of Key Experts:

Note that civil servants and other staff of the public administration of the partner country, or of international / regional organizations based in the country, shall only be approved to work as experts if well justified.

Key experts must submit CVs and signed Statements of Exclusivity and Availability. All experts who have a crucial role in implementing the contract are referred to as key experts. All experts must be independent and free from conflicts of interest in the responsibilities they take on.

The Consultants / Key Experts to be assigned for successful completion of the study must have outstanding track record and extensive professional and educational background on the various fields of studies including Economics, Transport Engineering, shipping, logistics, Naval Architecture, port and terminal management and inland waterways. They must have **at least two years of experience in IWT or shipping sector** and need to fulfill the following:-

S.No.	Key Expert	Minimum Qualification	Experience
1	Team Leader	Master's Degree in Transport Engineering /	20 years' experience in the field relevant to the assignment.

		MBA in Logistics or its equivalent.	He/she shall be experienced in market research and business development for river transport projects in developing countries.
2	Navigation Specialist	University Degree in Nautical Science, Maritime Studies, or be a Master mariner or equivalent	15 years of experience in the field relevant to the assignment and possess sector specific experience.
3	Naval Architect	MSc / M Tech in Naval Architecture or equivalent	15 years of experience in the field relevant to the assignment and experience in design and construction supervision of commercial cargo vessels for the navigation in coastal waters and for river transport. The expert shall have particular experience in the planning of shallow draft vessel systems optimized for commercial river navigation
4	Sociologist	University Degree in Sociology or related studies	10 years of working experience. He/she shall have wide experience working in Indian Subcontinent environment, with particular reference to resettlement and other social impacts of large transportation infrastructure projects.
5	Economist	Masters of Arts (Economics) or Master of Science (Economics) or equivalent	15 years of experience. He/she should demonstrate a detailed understanding of regional economics especially with reference to transport and logistics.
6	Transport Modelling and forecasting expert	Master's degree in Transport Modelling and Engineering or equivalent	10 years of experience in modelling and forecasting, involving maritime and multimodal transport
7	Legal Expert	Master's degree in International Law or Hydro-Politics	10 years of relevant experience in handling trans-boundary water related projects
8	Logistics Expert	Master's degree in Transport Economics or Engineering or Logistics	10 years of relevant experience in transport, logistic projects and operations, involving river and or maritime transport
9	Railway Traffic Expert	Master's degree in Transport Economics or Engineering	10 years of relevant experience in transport logistic projects and

		or Logistics or equivalent	operations, involving railway transportation and railway network
10	Public Private Partnerships (PPP) Expert	Master's degree in Business Administration or a related discipline	10 years of experience in structuring PPP options for transport related investments
11	Hydrographer	Master's degree in Hydrography and Oceanography or be holder of IHO CAT "B" certificate or be charge hydrographer	15 years relevant experience
12	Business and Financial Analyst	Chartered Accountant or hold an MBA degree in Finance Management or Masters in Finance and Accounting or equivalent	15 years of relevant experience
13	Market Surveyor	MBA degree in Marketing or operations	10 years of relevant experience
14	Statistician	Master's degree in Statistics or Mathematics	10 years of relevant experience
15	Human Resource Development	MBA degree with specialization in Human Resource Management	10 years of experience in shipping or IWT sector
16	Institutional Expert	Master's degree in Economics / Legal / Management	10 years' experience of institutional restructuring / organisational turnaround

7.1 Other experts & support staff

CVs for experts other than the key experts should not be submitted in the tender but the tenderer will have to demonstrate in their offer that they have access to experts with the required profiles. The Consultant shall select and hire other experts as required according to the needs. The selection procedures used by the Consultant to select these other experts shall be transparent, and shall be based on pre-defined criteria, including professional qualifications, language skills and work experience. The costs for support staff and additional experts as needed, are however considered to be included in the tenderer's financial offer.

