

Inland Waterways of Assam with Special Reference to Brahmaputra River in Post Independence

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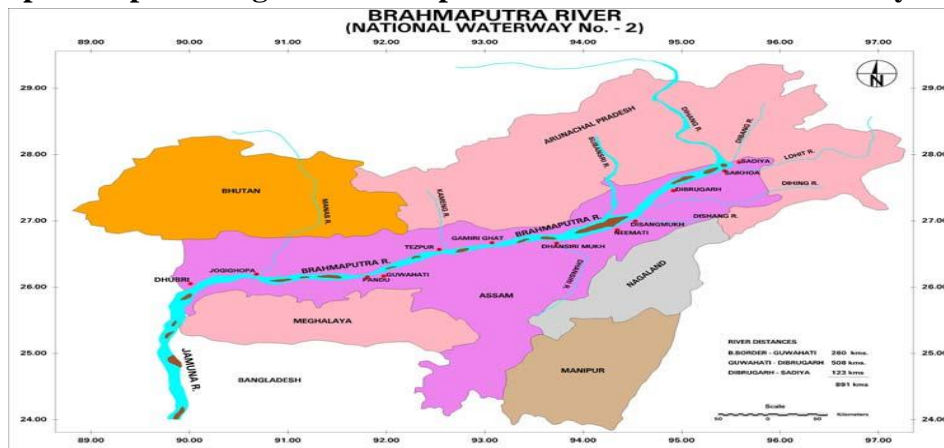
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Abstract

From the Ancient times Inland waterways was used to move products from one location another. The excavations in Indus valley civilization gave the traces about the first port at Gujarat which existed around 2400 BCE. It was continued by the Britishers which was important for trade and commerce. Though the Inland waterways was uses from the ancient times it was neglected after the steam engine came in to existence. Inland water ways has always contributed to countries development, GDP and trade relations with other countries. Its contribution in Education and healthcare had a significant role in certain area. Inland waterways had taken up the development in Tourism sector too. Inland waterways is important due to its cheapest ways of getting around and suitable for transporting of bulky materials. By relocating cargo, waterways help clear traffic on roads, particularly highways. Inland waterways is a multipurpose, providing drainage, water supply, generation of hydroelectric power, irrigation and along with navigation. The development of Rail roads and Land roads resulted the less use of streams in the region. The Inland Waterways was among the crucial means of transportation for livelihood of local people and for the country. Therefore, an attempt is made to write an Article on “Inland Waterways of Assam with special reference to Brahmaputra River in Post Independence”.

KEYWORDS: Inland, Waterways, Assam, Brahmaputra, India, River.

Map: 1 Map showing the Brahmaputra River as National Waterway No. 2



Source: Inland Waterways Authority of India (Ministry of Shipping, Road Transport and Highways), Presentation on Inland waterways Transport in NER, Guwahati, 9th March 2007.

INTRODUCTION

Inland Waterways play a significant role in transportation, Commerce, and ecological sustainability. They are a network of navigable rivers, Canals, Lakes, and water bodies that provide transportation routes within a country's interior. These waterways have been vital throughout human history, serving as crucial trade routes and facilitating the movement of goods, people, and resources. Inland Waterways also provide important links between different regions, promoting economic development and regional integration. They facilitate trade by connecting industries, agricultural areas, and ports, thereby contributing to economic growth and job creation. Moreover, Water transport has the potential to reach landlocked areas that lack direct access to coastal ports, opening up opportunities for trade and development.

A brief History of IWT of India

The first port in Gujarat, which was developed during the Indus valley Civilization around 2400 BCE, and is likely the oldest dock ever discovered in India. This port connects Harrapan towns with Arabian Sea via old Sabarmati river course. In the Eastern side of the subcontinent, the Ganges and its major tributaries have long served as thriving routes for trade and commerce. The ancient Greek historian Megasthenes, in his writings, mentioned that the Ganges and its main tributaries were navigable as early as 4 BC, and navigable thrived during that time. Furthermore, Kautilya, a prominent figure from the 4th century BC, extensively discussed various aspects of navigation, including boat sizes, port charges, ferry regulation laws, expeditions, the responsibilities of the state and the workforce, as well as trade and taxation during the reign of the Mauryan Empire. During the Mughal period, Inland waterway traffic thrived, with historical records indicating active trade between Agra and Satgaon in Bengal. Important ports like Mirzapur, Varanasi, Patna and Munger facilitated the transfer of goods from smaller vessels to larger ones. This trend continued during the British rule, where Brahmaputra and Barak-Surma rivers played a significant role in transportation and trade between Northeast India and port of Calcutta. East India Company (EIC) initiated a water route along the Brahmaputra from Kolkata to Dibrugarh as early in 1844. Prior to commencement of regular steam navigation in 1846 by the East India Company, transportation and communication in Assam, an area abundant in minerals, agricultural products that were in demand in the other parts of India and for export relied primary on country boats, Assam has rich history of river transport that dates return to the beginning of the millennium. A regular steamer service operated fortnightly between Kolkata and Agra on Yamuna River, in 1863, three similar services were in operation between Kolkata and Assam. During 1877, there were many registered country cargo boats in Kolkata, Hoogly and Patna. However, towards end of 19 century and the beginning of 20th century, the British Government began neglecting inland navigation in favour of road and railway transport. This resulted in the consumptive use of river water, leading to reduced flow and silting up river beds.

Due to the arduous nature of overland travel, particularly during the rainy season, Inland waterways became the lifeline connecting Bengal and Northeast India. Even after rail links were established between Calcutta and Assam, the Inland Water Transport remained crucial as the rail lines frequently swept away during the rainy season. Furthermore, the partition and the 1950s earthquake altered the course of the Brahmaputra River, affecting its depth in various locations. This reliance on Inland Waterways Transport continued until around 1967 when the company responsible for it was dissolved. In 1968, Central Inland Water Transport Corporation (CIWTC) was established to ensure the continuity of Inland Transportation. The emergence of sovereign nation of Bangladesh in 1972, India and Bangladesh signed a protocol on Inland water transit and trade on November 1st of the same year. This agreement facilitated the opening

of waterways between Assam and Calcutta, passing through Bangladesh, further enhancing trade and connectivity in the region.

Establishment of Inland Waterways Authority of India (IWAI).

Establishment of the Inland Waterways Authority of India (IWAI) took place on October 27th, 1986. Its primary objective is evolution of regulations of Inland waterways to facilitate navigation and shipping. IWAI is entrusted with obligation of developing and maintaining infrastructure for Inland Waterways on a national scale, encompassing approximately 14,500 km of navigable waterways. To fulfil its mandate, the IWAI receives grants from the Ministry of shipping. Currently, the operational focus IWAI is concentrated on specific stretches of water bodies in the Ganga- Hoogly River, Brahmaputra, Barak River, rivers in goa, the backwaters in Kerala, Inland waters in Mumbai, and the deltaic regions of the Godavari-Krishna Rivers The Inland waterways Authority of India (IWAI) has its headquarters located in Noida. Additionally, the authority has regional offices situated in Guwahati, Patna, Kolkata and Kochi. It also operates sub-offices in Allahabad, Varanasi, Bhagalpur, Farakka, Hemnagar, Dibrugarh (Assam), Chennai, Vijayawada (Andhra Pradesh), Bhubaneswar. These offices and sub-offices serve as important centres for managing and overseeing the activities and operations of IWAI across various region.

Formation of National Waterway 2 (Brahmaputra River)

The Brahmaputra River, spanning a length of 891 km between the Bangladesh border and Sadiya, was designed as national Waterway No.2 on September 1st, 1988. The Brahmaputra River features several small river ports, including Sadiya, Jogighopa, Tezpur, Neamati, Disangmukh, Dibrugarh, Pandu-Guwahati, and Dhubri. In addition to these river terminals, there are ferry-ghats along the Brahmaputra, serving as important transportation points for passengers and materials. Due to its connectivity with National Waterway 1 through a protocol route via Bangladesh, the reach of the Brahmaputra Rivers catchment area extends all the way to state of West Bengal. This extension establishes crucial connectivity between the Brahmaputra River and ports at Haldia and Kolkata.

Northeast India boasts numerous large and small rivers that provide excellent facilities for water transport, particularly in the plain areas and flat river valleys of the hilly regions. In the ancient period and prior to building construction of proper road networks, Brahmaputra and Barak rivers served as major transportation options for goods and passengers. During the British era, these rivers, along with the Barak Surma-Kushiyara-Meghna river systems, played a vital role in facilitating trade and transport between North-east India and the Kolkata port. Growth of the tea industry further amplified their significance as trade carriers. It is estimated that the Northeast region has approximately 1800 km of river routes suitable for steamers and large country boats. Both the state and central Governments Inland water transport (IWT) departments have been making efforts to enhance system of water transport in the region. In the Northeast Region, there are a total of 20 National Waterways, including the Brahmaputra. The declaration of the 19 New Waterways in Northeast Region took place in April 2016 under National Waterways Act of 2016, further emphasizing the commitment to develop and utilize water transport resources in the region.

OBJECTIVE

1. To highlight the importance of inland waterways during Post Independence
2. To study the contribution of Inland Waterways towards livelihood in Brahmaputra valley.

METHODOLOGY

To be able to fulfil the objectives, the work will be using of the Secondary sources to get broader picture

of Inland waterways of Assam with special Reference to Brahmaputra River in Post Independence. The secondary sources will be journals, magazines, books, articles, and websites that have been published. The dissertation will be analytical, Historical and descriptive method.

DISCUSSION:

THE IMPORTANCE OF INLAND WATERWAYS.

Inland Waterways Transport (IWT) refers to the transportation of Cargo over Rivers, Canals, and creeks. It stands out as the most cost-effective mode of transportation in a country due to several reasons:

- a) **Low Capital Cost:** Inland Waterways, being a natural mode, doesn't need to be extensively developed costs like road construction or laying railway tracks. Estimates indicate that developing and building an Inland waterway cost only about 5-10% of a 4-lane highway or railway.
- b) **Fuel Efficiency:** Water transportation is widely recognized as the most fuel-efficient mode of transportation. It is estimated that one litre of fuel can transport 24 tonne/km of freight by road, 85 tonne/ km by rail, and 105 tonne/ km by waterways.
- c) **Minimal Maintenance cost:** The maintenance cost of Inland waterways transport is accessed to be approximately 20% of that of road transportation. This highlights the advantages of lower maintenance expenses associated with inland waterways.
- d) **Tourism:** Tourism particularly the eco-tourism sector, offers numerous benefits through the development of inland water transportation.
- e) **Seamless Integration with Sea Transport:** Inland water transport can be easily integrated with sea transport systems, resulting in reduced costs and time associated with land-sea or air-sea transport interface infrastructure development. This integration facilitates smoother travel experiences for tourists and enhances overall connectivity.
- f) **Enhanced Safety:** Inland water transport is generally considered to be safer compares one mode of transportation to another. The controlled environment of waterways reduces the risk of accidents and provides a sense of security for tourists.

These factors collectively contribute to making inland waterways the most economical mode of transportation, offering significant cost savings compared to additional approaches, including road and rail. Transportation has consistently played crucial function in the comprehensive development of any nation. When consider the literal meaning of transportation, it refers to “movement of humans, animals, or items from one location to another.” This mobility and movement are facilitated through various was of getting around. Railways, airways, roads, waterways, canals, and pipelines are variety of transportation methods that necessitate significant infrastructure installations. Water serves as a crucial mode of transportation, enabling of motion to people, goods, animals, various products via boats ship, and vessels across seas, lakes, canals, and rivers. Due to its natural pathways, bulky commodities can be transported over long distances for a reasonable price using water transportation. Its past is extensive as one of the oldest means of transportation and has played a significant role in connecting different regions of the world, particularly in facilitating foreign trade. However, with the advancements in railways and roadways, the prominence of water transport has declined over time.

India, as a developing country, strives from holistic development across all sectors. Among the various aspects of development, transportation holds great significance in the Indian context. Inland water transportation emerges as a sustainable solution to address existing challenges. By focussing on the development of Inland water transportation, the burden on other modes of transportation like rail and

roadways can be alleviated. Currently, Inland water Transport (IWT) represents less than 1% of all products moved domestically, considering the modes rail, road and water.

Development of Inland waterways during Pre- Colonial Era

During the reign of the Mauryans and the Gupta Empire, significant advancements were made in Inland water transportation. These empires held sway over substantial portions of the subcontinent, creating a stable economic environment conducive to development. However, with the decline of these great empires, power became fragmented, leading to the division of river basins among multiple regional powers. It was during the late 15th century, under the Mughal rule the trade and communication flourished being a big expanse of river basins came under the unified control of a single empire. This consolidation of power facilitated increases in trade networks and transportation systems.

Colonial Era

With the establishment and East India company's expansion in India, there was notable improvements in law and order. This favourable environment encouraged the expansion of the inland water transportation system. During this, period the pattern of trade underwent a significant transformation. India, previously a supplier of finished products, now became a provider of raw materials. The need to transport these bulky goods towards the ports influenced the growth water transportation of Inland. In the 18th century, as the industrial revolution gained momentum in Europe, the British introduced railways, machines and vehicles in their colonies, including India. With the emergence of alternative means of transportation, the significance of inland water transportation gradually declined. Despite this, the British maintained control over the governance of major navigable routes.

Post Independence

After India gained independence in 1947, the government, in collaboration with the Central Board of transport, formed several committees to assess and evaluate the potential and requirements of the existing and potential navigable waterways. These committees conducted surveys to determine the viability and demand for inland water transportation routes. The Government of India established the Inland Waterways Authority of India (IWAI) on 27th October 1986, its main objectives include:

- a. Development and regulation of building on National waterways (NWs)
- b. Conducting techno-economic feasibility studies for various projects
- c. Formulating proposals for the declaration of new National Waterways
- d. Providing advisory services to Central Government on matters related to Inland Water Transport (IWT)
- e. Assisting states in the development of inland water transport infrastructure
- f. Classification of waterways considering their navigational parameters and suitability for different types of vessels.

The IWAI has its headquarters in Noida and operates regional offices in Guwahati, Patna, Kolkata and Kochi to ensure effective coordination and management of Inland waterways across different parts of the country.

Formation of National Waterway 1

The first National Waterway was officially declared in October 1986, marking a significant milestone in the government's commitment to the development of Inland Water Transport (IWT) as a viable mode of transportation. This declaration showcased the governments intent to prioritize IWT by allocating funds, identifying and executing specific projects, and ensuring a navigable pathway throughout the year.

Formation of National Waterway 2

National Waterway 2, located on the Brahmaputra River, was declared in September 1988. This formation aimed to address a specific challenge faced by the Indian North Eastern region, which is its limited connectivity to the mainland through a narrow corridor known as the “Chicken Neck” By declaring NW2, the government sought to establish an alternate method of connecting the North Eastern region with rest of India. This decision aimed to enhance connectivity, promote economic development, and facilitate the movement of goods and passengers between the North East and the mainland.

After India gained independence in 1947, there was a significant boost in the development of transportation modes. As part of this development, 111 Inland National Waterways (NWs) were officially notified in India for the purpose of inland water transport. These NWs were identified and established under the National Waterways Act of 2016. Out of the total 111 NWs, 106 were created in 2016, reflecting the government’s commitment to expanding the inland transport network. The extensive network of NWs spans approximately 20,275.5 kilometres across the country. Notably, NW-1, NW-2, and NW-3 are already operational, facilitating the movement of cargo as well as passenger and cruise vessels. These waterways have turned into crucial conduits for transportation, supporting both commercial and recreational activities.

In water-based transport, fuel costs are typically lower compared to transportation modes such as rail, road or air. Additionally, water-based transport has the advantage of lower environmental pollution. The Waterway infrastructure is naturally available, although it requires training, maintenance and upgrading to ensure optimal usability. Inland Waterways, including rivers, canals, and lakes, play a vital role in facilitating transport through the mode known as inland water transport (IWT).

Movement of Cargo

The transportation of commodities like tea, jute, and spices in the eastern region, connected to the river port in Kolkata, played a crucial role in driving commercial activities during pre-independence India. River transport offered logistical convenience and was a determining factor in the location of industrial activities, notwithstanding the fact that its importance diminished in recent times. Nevertheless, access to water for processing and, in some cases, effluent treatment remains a consideration when choosing a location. Since gaining independence, the growth of cargo transportation via inland waterways in India has been relatively slow. This can be attributed to various factors such as the lack of policy incentives and inadequate infrastructure, including the availability of jetties, proper width of channels, an insufficient number of boats, and challenges related to right of way. However, there is a renewed focus on promoting and enhancing waterway transportation in recent times. Recognizing the potential and advantages of inland waterways, efforts are being made to address these challenges and stimulate the movement of commodities across rivers. This includes the implementation of supportive policies, infrastructure development, and the allocation of resources to improve the overall efficiency and accessibility of waterway transportation. The viability of cargo movement through IWT depends on various factors, including technological and physical feasibility, commercial potential, and the operating policies of carriers and associated agencies.

For IWT based cargo movement to be successful, there must be a favourable combination of technological and physical feasibility, commercial potential, and supportive operating policies. Additionally, the availability of well-maintained waterways, appropriate navigational vessels, efficient terminal facilities, and a reliable managerial and supporting infrastructure network are key factors in ensuring operational success in the IWT sector.

Passenger movement

Inland water transport (IWT) based passenger movement primarily occurs through ferry services across rivers, especially on short stretches along the rivers. Tourism based passenger traffic is prominent in regions such as Goa, Kerala, Assam, etc. areas. Statistical summaries produced by organizations like IWAI, the ministry of shipping, the planning commission working group on IWT, and state-level authorities such as West Bengal and Kerala provide further details on passenger movement in IWT.

Factors influence passenger movement in IWT, including the following

1. **Travel Time:** The contribution of bridges has reduced travel time by land. To remain competitive, IWT focus on faster ferries and launches that can provide efficient and timely transportation.
2. **Cost:** It is crucial to consider the total cost, including the ferry fare and subsequent modes of transport that passengers may require to reach their final destinations.

By, addressing these factors and ensuring that IWT services offer competitive travel times and cost-effective options, the sector can attract more passengers and enhance the overall passenger experience.

Transportation of vehicles, preferably in a roll-on-roll-off mode, is an important aspect of inland water transport. West Bengal, Kerala, Assam and Goa have a significant number of ferry services catering to this need. However, for further development, there is yet unrealized potential in this area. To unlock this potential, it is essential to enhance the infrastructure with faster boats, proper landing facilities, and seamless interchange with other mode of transport.

Water-based tourism, including stays and entertainment, is thriving in certain regions, like Alapuzha and Kozhikode, are known centres for activities such as house boat stays. Places like, Mumbai, Goa, and Kochi have witnessed the flourishing of boats that offer music and dining experience. River cruises both scheduled and chartered, are also available in various location.

Another area with potential is water sports, which can be explored in the rivers of northern and eastern India. Activities like white-water rafting and trekking on iced mountain stretches of rivers offer exciting possibilities for adventure enthusiasts.

By concentrating on the improvement of infrastructure, expanding water-based tourism offerings, and promoting water sports, the inland water transport sector can tap into new opportunities and contribute to overall growth and diversification of tourism industry.

CONTRIBUTION OF INLAND WATERWAYS TOWARDS LIVELIHOOD IN BRAHMAPUTRA VALLEY

Assam, frequently referred as the gateway to the North-East India, holds the distinction of being a sizeable state in region, share its borders with seven states Arunachal Pradesh, Manipur, Meghalaya, Nagaland, West Bengal, Tripura, and Mizoram. Additionally, it shares borders with two countries, Bangladesh and Bhutan. A notable characteristic of Assam its extensive network of navigable inland waterways, which play a vital role in the social and economic development of the population. In rural areas, the livelihoods of the people are heavily reliant on locally available and natural resources. However, to access new products and services, it is crucial to have connectivity with the mainland and ensure year-round accessibility. Solely relying on road communication proves to be inadequate in meeting the growing demands of the rural population. This limitation hinders improvements in their standard of living and restricts their livelihood options. Numerous factors contribute to the challenges faced by the rural population in accessing livelihood opportunities, including inadequate infrastructure, limited public transport provisions, and high tariffs imposed by private operators. To address these challenges and

enhance the livelihoods of the rural population, countries need to invest in the process of rural transport infrastructure. This include creating job opportunities near their place of residence and focusing on their existing skills or providing skill development programs tailored to the needs of small-scale or indigenous industries. Water has traditionally served as a vital source of livelihood for communities living near inland waterways. It provides sustenance through fishing, transportation service operated by ferry operators, irrigation for agriculture, and accessibility to clean water for various household activities. Investing during the creation and utilization of inland water transport can significantly benefit rural communities by improving their access to essential services and economic opportunities. By recognizing and harnessing the potential of inland water transport, countries can empower their rural population, create sustainable livelihoods, and contribute to overall rural development and economic growth. Assam, with its extensive network of inland waterways, having the capacity to serve as a model for leveraging water transport to enhance the lives of its rural population and drive economic prosperity in the region.

Due to the dominant presence of the mighty Brahmaputra river in Assam, most towns in the state are situated in the southern part, while the northern part has comparatively limited development due to poor connectivity. The northern region lacks essential facilities such as schools and medical services, with only Majuli having its own administrative district. The population of Assam is closely connected to Brahmaputra river, and the government defines that char area as sandy land areas within or surrounded by the river, where people live and cultivate. Traditionally, the residents of the riverbank areas in Assam have been primarily engaged in agriculture and fishing. However, the nature of Brahmaputra, including the recurring problems of floods and soil erosion, has led to major alterations in their occupation patterns over the years.

The Inland water transport (IWT) sector plays a crucial role in generating employment and sustaining the lifestyles of residents. This includes ferry and Bhut Bhuti operators, farmers, small vendors, transport operators, boat making industry workers, and other community members. Water transportation not only serves as means of survival but also contributes to the overall development of these individuals. The char areas of Assam, it's possible to see not just the existence of Bhut Bhuti operators but also agricultural activities carried out by locals. The districts located along the banks of the Brahmaputra and its tributaries heavily rely in these rivers for various livelihood related activities, including cattle wading and irrigation. For ferry and Bhut Bhuti operators, Water transportation id their primary source of income. The ghats (riverbanks) and their surrounding areas serve as places of interaction, presenting opportunities for small vendors and transport operators to cater the needs of the local population. Additional, farmers and business owners rely on ferries and Bhut Bhutis to transport their products and visit their business premises. In the Char areas, owning a boat or having access to one Vital as it often the only mode of connectivity and survival, particularly during flood seasons. The impact of Inland Water Transport extends beyond individual livelihoods and benefits the overall well-being of the local communities. According to the IWT departments data from 2019, the sector employed 3,987 individuals, with a significant portion filled by the local inhabitants, holding positions such as Khalasi, Field Assistant and Laskar.

The service of inland water transportation in Guwahati city.

Based on the analysis and observation, the following inferences can be made regarding the service of inland waterway transportation in Guwahati.

1. The department records indicate the existence of three routes, and the timings for weekdays and Sundays are available for these routes.
2. Within the inland waterway transport system in Guwahati city, different times may apply for depart-

mental and private ferry/boats.

3. Official records do not provide timings for other routes of the inland waterway transport system in Guwahati city. These routes operate based on the fluctuating demand for transport within the city.
 4. The frequency of trips in a day varies across different routes and is driven by the demand of commuters, particularly those needing to connect with the central business district of Guwahati city and North Guwahati.
 5. Sundays generally have a lower trip frequency compared to the other working days of the week.
- Specific timings and schedule may vary and its advisable to refer to the official records or contact the relevant authorities for the most accurate and up to date information on ferry/boat timings in Guwahati City. The Brahmaputra River has always been a lifeline for the sake of the people of Assam, providing numerous livelihood opportunities. The fertile paddy fields along the riverbanks, particularly in Dibrugarh and Dhemaji, have yielded record quantities of rice, thanks to the rivers waters and the monsoon rains. Fishing activities associated with the river have not only sustained for the local employment to a significant number of people. Boat makers and boatmen have found their livelihoods in ferrying people across these waters. Majuli, one of the worlds largest riverine islands, continues to attract tourists from around the globe. Modern mechanized boats transport visitors to Majuli, while smaller temporary islands called chaporis that emerge during winters offer unique opportunities for tourism activities such as picnics, bonfire dinners and star gazing. Towards Guwahati, the chaporis become exciting destination for various celebrations and gatherings. Sporting events and literary activities have often taken place on the pristine sandy shores of these chaporis, creating a memorable ambience for the occasion. Tour operators had not only survived but thrived due the majestic presence of river in Guwahati, private ship and cruise operators have offered visitors once-in-a lifetime experiences on luxurious river ships, showcasing the opulence of Assam along the river. Looking towards the future, the potential for livelihood activities related to the river is immense. With the right government policies in place, there is a plethora of opportunities to be explored. Activities such as rafting, houseboat facilities, jet skiing, yachting and even the option of living on the river can be envisioned. The key is to capitalize on the incredible possibilities that the Brahmaputra River offers and ensure its optimal utilization to foster decent livelihoods for the people of Assam. By embracing these opportunities and implementing suitable policies, Assam can unlock the full potential of the river and create a thriving and sustainable future for its residents.

Terminals at National waterway 2 (Brahmaputra River)

Terminals are established at 12 locations along NW-2 to facilitate the handling of cargo vessel and passenger ferries. The details are of each terminal are given below:

1. **Hatsingimari:** A temporary Ro-Ro terminal with a steel crane pontoon has been set up in Hatsingimari. The purpose of this terminal is to provide Ro-Ro service between Dhubri and Hatsingimari. The Ro-Ro service is currently operational.
2. **Dhubri:** An RCC Ro- Ro terminal with a crane pontoon has been established in Dhubri. This terminal service the purpose of completing customs and immigration procedures for incoming and outgoing vessels on the protocol route. It also handles Ro-Ro vessels, cargo vessels and passenger ferries. The Ro-Ro terminal is fully operational.
3. **Jogighopa:** A floating terminal with a crane pontoom has been set up in Jogighopa. The primary purpose of this terminal is to transport Meghalaya coal and handle the import of coal for the NTPC power plant in Bongaigaon. There are plans to develop this terminal into a multi-model logistic hub, Additionally, a DGPS station has been established at this terminal.

4. **Pandu:** Pandu is a major location on NW-2 and serve as an empty point to the Northeast states. It has a fixed/permanent terminal with two godowns and RCC jetties. The terminal includes a low-level jetty and a high-level jetty. There are two shore cranes with a capacity of 20 tons, one container crane with a capacity of 75 tons, and one floating crane for handling cargo.
5. **Tezpur:** Tezpur has a floating terminal with a steel portoon. This terminal is primarily used for handling cargo vessels and local ferry services. A steel portoon has been placed at this terminal.
6. **Biswanath Ghat:** A floating terminal has been projected for Biswanath Ghat. The purpose of this terminal is to handle PDs cargo by FCI and ODC movement. A DGPS station has also been established at this location.
7. **Silghat:** Silghat has a floating terminal with a steel portoon. This terminal is used for handling cargo vessels and local ferry services. It is also a port of call in the Indo- Bangladesh Protocol Route.
8. **Neamati:** Neamati has a floating terminal with a steel pontoon. Similar to other terminals, it is used for handling cargo vessels and local ferry services. There are plans to develop a Ro-Ro terminal at this location.
9. **Bogibil:** Bogibil has a floating terminal with steel pontoon. This terminal is primarily used for handling FCI cargo. Food grain transportation effective execution has already occurred at this terminal.
10. **Dibrugarh:** Dibrugarh has a floating terminal with a steel portoon. This terminal handles cargo vessels and local ferry services. It is also expected to handle ODC cargo due to an upcoming hydro power project.
11. **Sengajan/Panbari:** Sengajan/Panbari has a floating terminal with a crane pontoon. This terminal is considered important since the regular movement of Indian Army IWT fleet. A floating terminal is being maintained at this location to facilitate the movement of Indian Army vessels between Arunachal and Assam.
12. **Oriumghat:** Oriumghat has a floating steel pontoon. The purpose of this terminal is to facilitate passengers traveling Arunachal/Assam, BSF/Army personnel, and provide a link to southern bank, such as Dibrugarh. The terminal also handles ODC and project cargo. Land acquisition for this terminal has been completed, and further development activities are planned

Old Ro-Ro Vessel rolling off vehicle at Hatsingimari



Source: Inland waterways Authority of India Ministry of ports, shipping and waterways, Government of India.

Inland water transport in Education and Health

Transportation plays a crucial role in enabling better education opportunities and facilitating the distribution of health and education facilities in Assam. In 2019, the Assam industries and commerce Department signed a Memorandum of Understanding (MoU) with the Malaysia India business council (MIBC) for enhance two way trade in education, tourism, primary industries and other sectors. This collaboration has significantly boosted the Inland water transport sector in Assam.

Education in the char areas heavily relies on inland water transportation, many char areas lack access to primary level schools and according to survey, only 67% out of 100 respondents mentioned the availability of primary level school in the area. Moreover, for higher studies, students often need to travel to the nearest town or city, incurring additional costs. The unavailability of proper transportation facilities has led to some children dropping out of school. IWT can serve as a vital link, connecting teachers, students and staff with educational institutions are among prime motivator of ferry services, highlighting significance of IWT in providing education services to rural and char areas. The lack of minimum educational qualifications has hindered their consideration of the IWT sector as an employment opportunity. The IWT department of Assam offers 92 different job positions divided into various grades, emphasizing the employment potential within the sector. Various jobs in the Inland water transport sector in Assam have different education and certification requirements. Positions such as Boat Khalasi, Ghat Helper, Field Khalasi, sweeper, painter helper etc, typically require only a minimum schooling level and jobs like welder helper, Boatman, Arikatha, Mechanic helper, Driver Grade 2, etc, may require specialized certification or vocational training courses.

The utilization of medical facilities has emerged as the third most important justification the utilizing ferry services. This includes the fact that considerable scope for the inland water transport sect to adapt their operational model and cater to the healthcare needs of the local population. One of the key motivations for people residing near the ghat areas to use ferry services to access healthcare facilities. In certain ghat areas, the state government has implemented emergency ambulance services. In the centre of North East studies & policy Research (CNES) has taken initiatives to provide essential healthcare services to the population residing in flood prone areas along the Brahmaputra islands.

CONCLUSION

In conclusion, Inland water transportation (IWT) provide a number of benefits that make it cost-effective and sustainable mode of transportation. Development of inland waterways has a rich historical background, dating back to ancient empires and continuing through the colonial era. After independence, significant action had taken by the government to promote and develop IWT, including the establishment of the Inland waterways Authority of India (IWAI) and declaration of national waterways. The growth of cargo transportation through IWT has been reasonably slow as a result of challenges such as infrastructure limitations and policy incentives, there is a renewed focus on promoting and improving waterway transportation in recent times. Efforts are being made in order to deal with the challenges and stimulate the movement of commodities across rivers through supportive policies, infrastructure development, and resource allocation. Passenger movement in IWT primarily occurs through ferry services, particularly in tourist destination. Factors such as travel time and cost influence passenger preferences, and it is important to other competitive travel options to attract more passengers and enhance their experience. The cargo

movement had untapped potential in areas such as vehicle transportation and water-based tourism. Developing in infrastructure, faster boats, proper landing facilities, and promoting activities like household stays, river cruises, and water sport can unlock these opportunities and contribute to the growth and diversification of the tourism industry. India can leverage its extensive network of rivers and waterways to enhance connectivity, promote trade and create livelihood opportunities.

Assam extensive network of navigable inland waterways has played a vital role in the country's social and economic development. The states rural population heavily relies on the natural resources provided by Brahmaputra River for their livelihoods. Inland water transport (IWT) sector, including ferry and Bhut Bhuti operators, farmers, small vendors and boat makers, provides employment and sustains the local population. The IWT sector also contributes to overall well being of the communities by facilitating access vital service, including schooling and healthcare. To further enhance the livelihoods of the rural population and promote economic growth, investments in rural transport infrastructure are necessary. Creating job opportunities near their place of residence and providing skill development programs can empower those in the area and support small scale and indigenous industries. Assam's extensive inland waterways, particularly the Brahmaputra River, offer a lot of room for growth and exploration of livelihood opportunities such as tourism, water sports and cargo movement. The establishment of terminals along National Waterway (Brahmaputra River) facilitates cargo handling and passenger ferry services. These terminals play a crucial role in connecting different regions and promoting trade and tourism. Inland water ways has potential to improve education accessibility and healthcare services addressing requirements of rural population. By capitalizing on the opportunities offered by Brahmaputra River and implementing suitable policies, Assam can unlock the full potential of its inland waterways. Not only this help but the economic growth of the region but also create sustainable livelihoods and improve the overall being of its residents.

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