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India's Emerging Quest to Develop Inland Waterways

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India is the seventh-largest economy in the world as measured by nominal GDP and third-largest economy as measured by purchasing power parity (PPP). The industrial sector registered a growth of 5.9 per cent in 2014-15, and India aims to grow further in this sector. Revitalizing Project 'Sagarmala' in 2014 is a major step towards India's infrastructural growth. It constitutes a series of sub-projects aimed to boost India's port infrastructure development along the coastline.

The vision of Sagarmala is port-led development and reduced logistics cost for both domestic and international cargo with improved infrastructure.[1] The mammoth project has 150 initiatives with a total outlay of US$ 5.9 billion, spread across four broad areas/pillars[2] – port modernization, port connectivity, port-led industrialization, and coastal community development. The project will help India save US$ 600 million annually by 2025.[3]

Developing inland waterways is one of the 150 initiatives under this project. The development of these waterways is crucial for the Indian economy. It brings enormous benefits to the country's economy and can prove advantageous for the people. This issue brief aims to highlight the significance of inland waterways in the overall infrastructure development plans.

Inland Waterways

Inland Waterways Transport (IWT) is an economical, fuel-efficient and environment-friendly mode of transport. In the past, the IWT was extensively used by the Mughals and later by the East India Company, but post-independence the development of waterways was neglected. In 1986, Inland Waterways Authority of India (IWAI) was set up for the development and regulation of inland waterways, and was mandated to develop shipping and navigation. However, insignificant focus was given to IWT.

India has 14,500 km navigable rivers, of which 5,200 km (36 per cent) major rivers and 485 km (3 per cent) canals can be used by mechanised vessels.[4] The logistics costs incurred by the waterways is minimal. For instance, the transportation cost is about 25 paise per km in comparison to ₹ 1.50 per km and ₹ 2.50 per km by rail and road respectively. Despite this, they carry only 0.4 per cent of the total cargo. Waterways transportation, other than saving logistics costs, also benefits the nearby communities through development of the area.

During the last two years, there has been a spurt in the development of waterways through various changes in the government policies – Jal Marg Vikas project for development of National Waterway 1; US$12 million has been allocated for waterways in the Budget 2016; enactment of National Waterways Act 2016; no service tax; and the rewriting of the Indian Vessel Act 1970 to facilitate trade. The National Waterways Act, 2016, merges five existing National Waterways (NW) and 106 additional National Waterways. Ganga waterway (NW1), Brahmaputra waterway (NW2), West Coast Canal in Kerala (NW3), Mandovi river in Goa (NW68), Zurari river in Goa (NW111) and Sundarbans waterway in West Bengal (NW97) are presently operational. Six more waterways are likely to be commissioned during financial year 2016-17.[5]

National Waterway 1

NW1 began operations in 1986 after the formation of IWAI. It is the longest waterway (1,620 km), stretching from Allahabad in Uttar Pradesh to Haldia in West Bengal (see Fig.1). The river has two barrages at Farakka and Jangipur to control water discharge, which enables maintenance of a navigable depth of two metres throughout the year. The Feeder Canal and navigation lock at Farakka connect rivers Hooghly and Ganga.

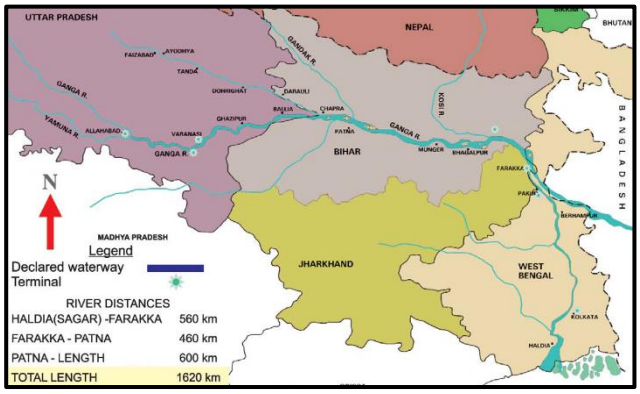

Fig.1 National Waterway 1 (Ganga-Bhagirathi-Hooghly)[6]

Further development of the NW1 has been covered under the Jal Marg Vikas project, which includes development of a fairway; construction of new multi-modal terminals at Varanasi, Haldia, and Sahibganj; modern river information system (RIS); digital global positioning system (DGPS); night navigation facilities and construction of a state-of-the-art navigational lock at Farakka.[7]

The Ministry of Shipping plans to start Roll-on Roll-off (Ro-Ro) service on this waterway for which a Memorandum of Understanding (MoU) has been signed between the IWAI and M/s Maruti Suzuki India Ltd., for transportation of cars between Kolkata and Varanasi.[8] The first trial run was carried out in August 2016, wherein 200 newly assembled Maruti cars and 1,000 tonnes building material were transported from Varanasi to Kolkata.[9] This exercise was undertaken during the monsoon season when the water level in the river is usually between 7 metres and 15 metres. However, once the monsoon recedes, water levels drop below two metres in certain areas, making navigation difficult for the vessels.

National Waterway 2

NW2 was declared open in 1988 and is an 891 km long stretch on the Brahmaputra river, connecting Dhubri on the Bangladesh border to Sadiya in Assam. This historical route connects the ports of Kolkata and Haldia through Bangladesh. Facilitated by an agreement with Bangladesh, Indian vessels ply on this route to transport goods to Kolkata using IWT transit facilities.[10] The stretch from Guwahati terminal to Dhubri is the busiest segment of the waterway. In February 2016, IWAI initiated development of a ship repair facility (Slipway project) at Guwahati and a Roll on-Roll off Ferry service on NW2. Th stretch also has night navigation facilities from Dhubri up to Dibrugarh.[11]

Fig.2 National Waterway 2(Brahmaputra)[12]

At present, the waterway is being used by Government of Assam, Central Inland Water Corporation Limited (CIWTC), Indian Army, Border Security Force, tourism vessels, and other private operators. Tourist cruise vessels also operate between Sivsagar near Dibrugarh and Manas wild life sanctuary near Jogighopa. Since this waterway has been in operation for tourism purpose, it can be further developed for trade and community development.

National Waterway 3

The West Coast Canal from Kottapuram to Kollam in Kerala, was declared as National Waterway No.3 in 1993. Part of the famous Kerala Backwaters, it is a chain of salt water lagoons, lakes, rivers and man-made canal sections lying parallel to the Arabian Sea coast. The stretch, along with the Champakara and Udyogmandal canals have a navigable length of 205 km, linking industrial centers of Ambalamugal and Udyogmandal with the Kochi port (Fig.3).

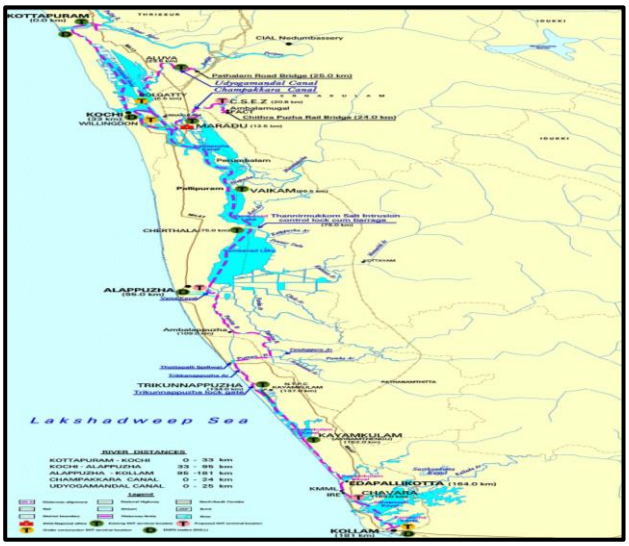

Fig.3 National Waterway 3 (West Coast Canal)[13]

NW3 was opened for cargo movement in 1994. Since then, it has been the most developed waterway in the country. Capital dredging is being practiced since 1998 and it is the first waterway to have a 24-hour navigation facility along the entire stretch. IWAI and Cochi Port Trust have created two new Roll on-Roll off (Ro-Ro) cum Lift on-Lift off (Lo-Lo) IWT terminals at Willingdon island and Bolgatty in Cochin port area to facilitate inland waterway connectivity.[14] This entire stretch has been in use for both cargo and passengers, and is one of the most navigable waterways in India, which has immense potential for tourism as well.

National Waterway 4

NW4, declared in 2008, is a 1,095-km long stretch, comprising a network of irrigation cum navigation canals. It links Chennai, Puducherry and Ennore Ports in Tamil Nadu with the Kakinada and Machlipatnam Ports in Andhra Pradesh through the Buckingham Canal. This stretch is intersected by the Godavari River at Rajmundry and Krishna River at Vijayawada (Fig 4)

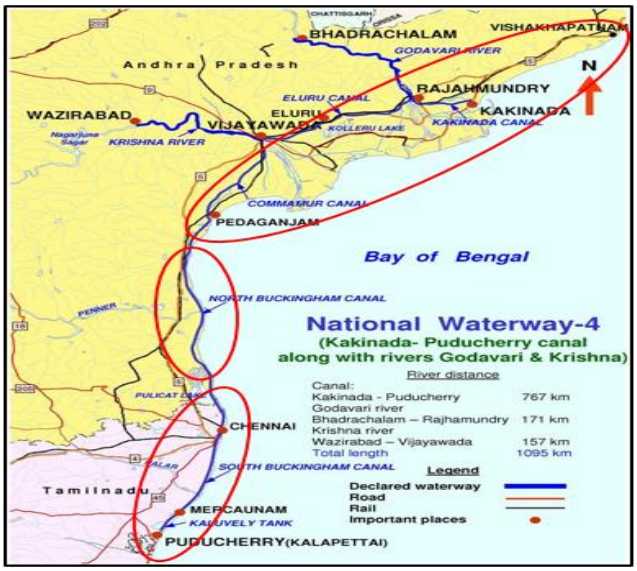

Fig.4 National Waterway 4 and CEZs[15]

The developmental plan for NW4 includes widening of canals, dredging, excavation, bank protection, construction and repair of locks, navigational aids, and setting up of IWT terminals. The maximum potential of this waterway on the Krishna River, between Amaravati, the new capital of Andhra Pradesh, and the ports on the East coast. Container transportation is also possible using a multimodal hub along the riverfront near Amaravati.

The government has established a Vizag-Chennai Industrial Corridor (VCIC) along this stretch and three upcoming Coastal Economic Zones (CEZ) in the region would complement each other. These CEZs would have industries like petrochemicals, electronics, shipbuilding, iron and steel and textiles. In the past, major commodities transported through this waterway were coal, rice, food grains, cement, salt, sand, forest products, paddy, pulse, building materials and other bulk cargo. With the new industries, this waterway would be of great potential by reducing the logistics costs.

National Waterway 5

The NW5, declared in 2008, stretches along the Brahmani and Mahanadi delta system connecting the ports of Goenkhali in West Bengal with Paradip in Odisha, through the Hijli Tidal Canal and Odisha Tidal canal (Fig.5). To maintain a navigable depth of two metre, five barrages with navigation locks have been proposed to allow passage of two 500 tonne vessels simultaneously.

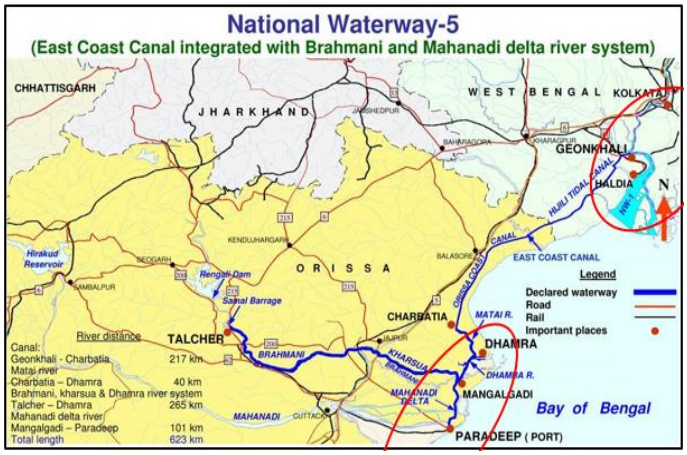

Fig.5 National Waterway 5 and CEZs[16]

The adjoining areas are rich in resources like coal and iron ore and will also host upcoming leather and marine processing industries proposed in CEZs. Therefore, this waterway will be vital for transporting coal, finished goods, manufactured products and agricultural products.

Harnessing Inland Waterways

Inland waterways have not been utilized to their full potential despite the fact that there are benefits over traditional road and rail transport network in terms of infrastructure overloading, congestion and noise and air pollution. To maintain higher profit margins, traders and freight-forwarders look for the 'cheapest', and not the 'shortest' routes for transportation. As transportation through waterways is the cheapest, it is attractive for bulk transportation.

Various initiatives are being pursued in different parts of the country, that seek to promote use of waterways for transporting passengers. For example, in December 2015, the Maharashtra Maritime Board (MMB), announced a project aimed at linking Ferry Wharf-Mandwa (10 nautical miles) and Ferry Wharf-Nerul (11 nautical miles) on Mumbai's East coast. It invited private players for operating passenger ferries and Ro-Ro vessels.[17] While

development of waterways is important as a means of passenger transportation, it will also boost eco-tourism along rivers.

Inland waterways can be further developed through 'dry ports'. These are inland intermodal terminals directly connected by road or rail to seaports and operate as a center for the transshipment of sea cargo to inland destinations. This network helps in reducing transportation costs of the cargo. There are around 170 functional dry ports and 180 more are either proposed or under-construction. Proposed dry ports would consist of Connected Inland Depots (ICDs) along with agri parks, cold storage chains, bulk handling facilities, collateral warehousing and liquid logistic facilities. These projects will also benefit local communities along rivers by generating employment, and developing infrastructure and connectivity.

Shortcomings and Recommendations

The development of Inland waterways has faced a series of challenges over the years. The Indian government accorded lower priority to inland waterways, as transportation through waterways is inherently time-consuming and inconvenient. This led to negligible investments in the sector. In order to develop river infrastructure, the Ministry of Shipping is seeking budgetary allocation to the tune of five per cent of the central road fund.[18] Domestic and foreign companies can be involved through Foreign Direct Investments (FDIs) and by using the Public-Private Partnership (PPP) models. There are various concerns being raised with regard to the National Waterways Act 2016 due to distribution of executive powers under the entries enumerated in Union, State and Concurrent List of the Indian Constitution. This is potentially a discord between Central and State governments, which can be resolved by setting up a Waterways Disputes Council similar to Inter-State Disputes Council. It would enhance synergy between the Central and the State governments.

Siltation caused by the Himalayan rivers is another challenge as it impedes free movement of ships, especially in deltaic areas and estuaries. Due to this, rivers require regular dredging, which adds to overall costs on free movement of shipping. There are various scientific methods for silt disposal, which reduce the need for repeated dredging. Disposal techniques such as using de-watering bags, permeable membranes, bunding and utilization of flat land are some techniques adopted by foreign countries. Such techniques help in reducing costs and mitigating the need for repeated dredging. The Indian Government has also issued new guidelines for dredging to further reduce costs. Ports can now opt for long-term contracts of up to five years, where frequent dredging is required. In

locations where minor dredging effort is required, day-hire charges of dredgers may be adopted. Price adjustment is allowed without altering contracts to cater for frequent variation in petrol prices. MoUs between IWAI, Dredging Corporation, and ports have also been operationalized in some locations.

Another major challenge pertains to the water level of rivers. The rivers require a minimum depth of at least three metre, but most Indian rivers are about two-metre-deep; making carriage of heavy loads difficult due to risks of damage to vessels passing through shallow stretches despite having water locks. Rivers require effective lock mechanisms such as, single locks for simple navigation, broad locks for wider ships, double locks for two boats at a time, and staircase locks and flights for steep gradients.

Different rivers have different navigable depths; hence, they need specialized vessels capable of navigating in the peculiar environment. This requires design and construction of suitable ships that can operate in rivers based on their depth and width. A robust shipbuilding industry is necessary to provide such ships and vessels.

Inland waterways are used for passenger transportation and are quite common in small towns along the coast; but these have not been developed along major rivers. Many parts of the waterways have been utilized for tourism, like NW1 in Kolkata, NW68 and NW111 in Goa, and NW3 in Kerala. Inland waterways can also be used for the daily requirement of passengers to travel across small towns. A majority of the Indian population prefer economical modes of transportation and inland waterways has the national potential to be one.

Development of inland waterways has gained prominence with infrastructure development strategy. It is a practical, economical, efficient and eco-friendly mode of transportation. Various studies and projected economic benefits portray a positive picture of the infrastructural development. As the projects involved in the development process are of complementary nature, proper coordination, management and control at all levels is necessary to make it a success.

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