Infrastructural and approach changes required for an effective Water Transportation System in India

Author

Nikhil Ambattuparambil Gopi

Affiliation

Third Year Undergraduate Student
Department of Ocean Engineering and Naval Architecture
Indian Institute of Technology, Kharagpur

Abstract

Water Transportation in India only constitutes 0.17% of the inland transport sector while some countries utilize waterways for as high as 45% of its commercial needs. Unequivocally, to make India a contender for the tag of a developed nation, development of infrastructure required for making inland water transport feasible is a step in the right direction.

This paper attempts

(a) To identify the factors that make coastal & inland water transportation feasible in other countries,
(b) To identify the local realities in India & its economic viability,
(c) To propose action steps for a water transportation regime that would optimise commercial transport.

Keywords

Inland Water Transportation, Infrastructure, Ports, Coastal Shipping, Waterways

Main Text

An Introduction – "Water Transportation – Is it for India?"

India, in its hope to become a developed nation looking to utilize all its natural resources sustainably and to its full potential, has a long way ahead of it in order to achieve it. A major bump in the road is the lack of intensive and indigenous manufacturing sector. In fact, while all developed economies drove from an agro-based economy to a services-based economy, they did stop by the manufacturing sector. USA, European Union and China – all of them have this in common. While many in our country do recognize this, what *are* we doing to help it? Do government policies really promote manufacturing industries? Do our transportation and logistics sector *really* cater economically and in-time to every whim of the few manufacturing companies that exist in India? Indeed, that is where the government should concentrate on – a worry-free, economical, environment-friendly infrastructure base

that stops short of a red-carpet-welcome to entrepreneurs looking at the manufacturing industry.

Inland Waterways and Coastal shipping is one transportation mode that is highly underutilized in India and one, which has made a lot of difference in reducing manufacturing costs in other countries. Inland Water Transportation (IWT) has been known for being a cost-effective business-to-business transport mode. It has a very little energy consumption compared to the volume of cargo it carries. According to a 1995 U.S. Government estimate, the energy cost of carrying one ton of freight a distance of one kilometre averages 337 kJ for water, 221 kJ for rail, 2,000 kJ for trucks, and nearly 13,000 kJ for air transport. Also, water transport has always been comparatively, eco-friendly. For the same distance, 1000 tonnes of goods can be transported with 6,600 kg of CO2 release by an inland vessel whereas by trucks (road), such an amount of cargo would release 28,000 kg of CO2. Moreover, there is a much lower probability of accidents and thus higher safety of goods. This is especially because of the lower labour-intensiveness when being compared to other modes of transport. Also, it can handle a large scale of transport (huge shipments) which makes it competitive even when not optimal.

This effectiveness is achieved, however, on the meeting of criteria, which are critical to its functioning. The criteria include availability of relevant infrastructure for satisfactory integration of logistics chains, higher cargo handling capabilities, availability of indigenous inland vessels designed for Indian waterways, and the maintenance & building of waterways. Also, the location of suppliers & consumers play a major role. Development of waterways is a sure-shot way of attracting industries to its banks as it ensures higher passage capacity. Inland ports & terminals development resulting in handling of container traffic is another way of tapping into more markets. Without proper development, IWT can be actually a burden as it is slow, unreliable and has very low accessibility. In fact, the ecological changes due to building of IWT infrastructure might actually cause more damage than good. But at its best, they can transport commodities, which are not time-sensitive and can connect the hinterland to seaports and thus give India the impetus it needs.

Even with the 14,500km of navigable system of rivers, canals, backwaters and creeks, inland water traffic in India only amounts to 0.17% of the total inland traffic. Cargo Transportation in an organized manner is restricted to certain regions of India like Goa, West Bengal, Assam and Kerala, where there is still room for a lot of improvement. Inland Waterway Authority of India (IWAI) has been developing National Waterways and maintaining them. However, there are a lot more that can be done. This technical paper is restricted to providing suggestions regarding developing water transportation after detailed study of success stories in other countries and local realities in India.

Action Steps

Inland Port Development

One of the major action steps required is the development of inland ports. A more & better port facility means better handling and more docks to do so. This in turn, would attract greater amount of inland traffic into the sector. Some port developments that Indian ports can work on are the consolidation of side structures through concrete and the like to prevent erosion and silting up, which can restrict the types of vessels that can dock in the port.

Waterway Development

Waterway Development includes servicing and increasing capacity and draft of existing waterways. Such measures would allow higher passage capacity, which in turn, promotes greater trade. This is especially required in some cases because of the waterway being natural (rivers) and thus leading to possibilities of reduction in water levels according to season and climate change. However, these changes can also cause ecological ones that may permanently alter the hydro-morphological features in the land. Studies should be taken to ensure that this doesn't affect nature much. There is always a way of developing green infrastructure.
Waterway Development also involves construction of newer waterways, to improve inter-connectivity, thus increasing accessibility of waterways. An increase in accessibility can do wonders to the development of industries in the area and would thereby help in increasing traffic.

Maintenance of river/waterway

IWT is different from other modes of transport in the way that a greater maintenance is required of the waterway in comparison to roads. IWAI is doing a great job of maintaining our National Waterways. However, there are varied options like usage of modern facilities like locks, consolidating the river waterways with side structures, and decreasing chances of lowering of water level according to season by geo-membranes. Also, another interest area should be the treatment and management of ship wastes that tend to be released in waterways.

Promotion of inland navigation

Many a time, new modes of transport are not explored because of lack of knowledge about the presence of such a mode. Promoting inland navigation as a cost-effective, energy-efficient and environment-friendly alternative could go a long way in gaining competitive advantage against other modes of transport.

Waterway Information Services

A Waterway Information Service should be publicly available online with updated data about relevant developments. All specifications about waterways and typical vessels that can pass through them should be provided in order to function as a reference database. It can act as a means to provide information about the logistical services provided and connect those services to the providers. This can also function as a free online educational tool for a network of schools and training institutes.

Establishment of vocational training institutes for direct and ancillary jobs

Increase in inland water transport will generate a plethora of jobs and job types that didn't exist previously. The government initiative to employ Army, Navy and Coast Guard employees in the initial stages of IWT through an amendment in the Inland Vessels Act of 1917 is an encouraging star. However, the demand for trained professionals, like captains of vessels and crane handlers, should be met via vocational training institutes modelled just for the purpose. This can be part of the curriculum or a course offered in the already established

ITIs. Whatever the case, an IWT labour force coming out of these institutes will ensure the promotion of inland navigation and provide a great impetus to the industry.

National IWT Conference

A National IWT Conference is a need of the hour at present. The Indian IWT sector is in its infancy and it will only grow with the support and encouragement of all stakeholders. Companies should be encouraged into working as operators. People should be inspired to become entrepreneurs in the field.

Such a conference would try to:

- Highlight the developments that are happening in the industry
- Increase awareness about the cost-effective and environment-friendly nature of IWT
- Bring together all kinds of industry experts and ensure their networking
- Study innovations through invitation for technical papers
- Healthy & stimulation debate between stakeholders, Government, operators, and labour

Ideally, a conference like this should be held bi-annually. However, it can start with an annual version and further increase its frequency according to needs.

Separate terminals for Inland traffic at major ports

Inland/coastal vessels have been known to wait for hours at a port to be serviced because sea-going vessels were docked. Separate terminals for Inland vessels with lower cargo handling capacity will ensure that this doesn't happen.

Increasing fleet size

One of the major reasons of low usage of IWT is the lack of adequate vessels or vessels that are large enough to make the transport economical (larger the vessel, lower the cost per container/cost per tonne of cargo). Developing/promoting indigenous shipyards that can cater to inland vessel needs and specifications will also retain value-addition in India thus, making it more economical by reducing vessel costs.

Research centres

Research centres are very essential to any industry looking to gain an advantage. In fact, if IWT is seeking to become the next big thing after Railway, it needs a *lot* of research. Research should mainly focus on two areas:

- Optimizing design of Indian IWT vessels to make it most effective for Indian waters
- Study of hydro-morphological alterations that may occur in the event of building infrastructure required for IWT. In fact, many countries have refrained from developing their waterways to their full potential due to the enormous ecological changes it could bring in.
- Detailed study of Demand of IWT in India and tailoring logistics for each industry accordingly. This allows for tailor-made solutions to every industry's need. Different industry would have different needs.

Industry	Supplier	Consumer
Agriculture	Farms	Food Industry
Food Stuffs	Food Industry	Individuals/Cities
Solid Mineral Fuels (coal)	Mining	Power plants
Crude Oil	Mining/Offshore	Oil Refineries
Ores	Mining	Metal product manufacturers
Building materials (sand & gravel)	Mining	Construction industry
Fertilisers	Chemical industry	Farms
Machinery	Manufacturing industry	Individuals/factories

Source: Author's own work

Encouraging entrepreneurship (attracting new markets)

Through various forums and incentives/perks, the Government should try and encourage entrepreneurship in IWT. There is a very lucrative and intellectually challenging future waiting for anyone looking into this sector. After all, such an opportunity will not present itself everyday and the Government should make it known to the public by making it policy.

Container transport

Container transport is the thing of the future. The multitude of options it provides through multi-modal transport makes any country that supports container shipping, modern. Inland ports that have container capability allow hinterland industries to get access to their containers faster. However, care should be taken to ensure easy connectivity with road transport and presence of quay cranes. Also, one travel document for all modes of transport of a container would allow fast and easy modal shiftability.

Conclusion

For India to grow as a developed nation, this is one sector that needs attention. There are a lot of options available to the Government and IWAI to execute and implement in the coming years that can consolidate water as a mode of transport that is a major player as a cheap yet safe, slow yet eco-friendly bulk carrier of commodities.

In conclusion, Coastal Shipping & Inland Water Transportation should be & will be a vital sector in years to come. Investments by the Government and private parties towards its research and development will yield great results. I foresee IWT as a sector that could compare in its scale with the Railway Industry in India. It has a potential of generating thousands of jobs during its operation and maintenance. True, there would be quite a few financial constraints towards its execution, but those investments would be worth it in the long run and would be a small price to pay for the huge profits that can be reaped out of it. In the end, IWT infrastructure investments are helping you:

- Take cargo off roads
- Green your transport modes
- Provide supply chain with a sustainable and reliable transport mode

- Construction of a sustainable infrastructure network in India that will cater to future demands

There are innumerable problems too that need to be solved in order to reach there. The Indian Railway did not reach its potential overnight. Laying of rails must have been a headache. Building IWT infrastructure would be too. Many questions would be raised about its relevance. IWT has hardly any potential of handling door-to-door services but is a great tool for transport of commodities that are not time-sensitive. With a more sustainable and interdisciplinary approach towards IWT – rather than judging it on its vulnerabilities as drawbacks on IWT's future – can convert those vulnerabilities into elements that work in IWT's favour.

Acknowledgements

There was a lot of work that went into the making of this technical paper and it would be incomplete without acknowledging the people who made it possible for me to write this paper. I'm thankful to:

- **IIT Kharagpur** for providing me with a great library, Wi-Fi, accommodation and a great set of professors
- **Apurva Kamble** for continuously supporting me from the start to the end of this paper
- **Prof. N. Datta** for presenting this opportunity to me and helping me with my abstract
- **Cdr S Navaneetha Krishnan,** who was generous enough to share his ideas on the topic of Coastal shipping
- **Anand V Sharma** for sharing the sources of information he uses for analysis and advisory services at Mantrana

References

1. Navigation and Inland Waterway Action & Development in Europe. http://www.naiades.info
2. Inland Waterway Authority of India. http://iwai.nic.in
3. Indian Ports Association. http://ipa.nic.in
4. United Nations Economic Commission for Europe. http://www.unece.org
5. United Nations Economic & Social Commission for Asia and the Pacific. http://www.unescap.org
6. Climate Tech Wiki. http://climatetechwiki.org
7. Inland Transport in the BSR Transport System, *Dariusz Milewski, TransBaltic. 2011*
8. Inventory of available knowledge on strategic inland waterway projects, *PLATINA. 2011*
9. European Good Practices Report for Inland Water Transport, *PLATINA. 2011*
10. UNECE White Paper on efficient and sustainable Inland Water Transport in Europe. http://www.unece.org/fileadmin/DAM/trans/doc/2011/sc3wp3/ECE-TRANS-SC3-189e.pdf