

## INLAND WATER TRANSPORTATION: GROWTH AND CHALLENGES PERSPECTIVE IN INDIA

**Kuldeep Sharma**

*Research Scholar, Department of Accountancy and Business Statistics,*

*University of Rajasthan, Jaipur*

### ABSTRACT

*India has a total coastline of 7551 km with 13 major ports trust, approximately 200 minor ports. The country has extensive network of inland waterways in the form of rivers, canals, backwaters and creeks. Total Navigable length is 14,500 km, of which about 5200 km of rivers and 4000 km of canals can be used by mechanized craft and cargo moved in financial year 2013-14 and 2014-15 are respectively 322.63 and 365.37lakh tonnes in India.*

*The Purpose of this paper is to find out the growth and challenges in Inland Water Transportation in India and also find out the major problems faced by companies involved in this field in India. This paper shows the detailed information about the growth and challenges of Inland Water Transportation in India. The paper reveals that how since past few years the growth of Inland Water Transportation have been taken place in India. As per study done in the some countries Inland Water Transportation has been known as most cost effective and fuel efficient mode of transportation which attracts the attention of scholars to make some efforts relatively to study of growth and challenges of Inland Water Transportation with reference to India since efforts has been made in this paper to highlight present status, growth, opportunities and problem of Inland Water Transportation in India.*

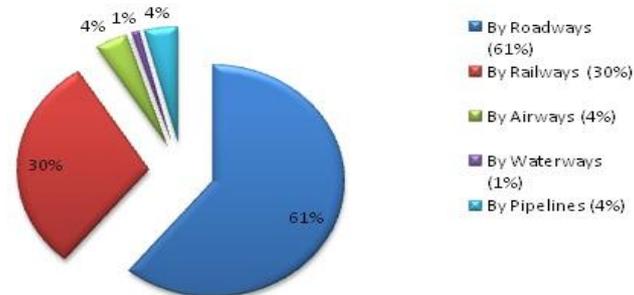
**Keywords:** *Inland Water Transportation, Ports and Transportation.*

### I. INTRODUCTION

India is gifted with a variety of navigable waterways comprising river systems, canals, back waters, creeks, and tidal inlets. However, navigation by industrialized crafts is possible only over a limited length covering about half of the reported navigable waterways.

In India around 61% of the total cargo is carried by road, 30% by rail, 4% by airways, 1% by waterways and 4% by pipeline [Total Transport system study on traffic flows & modal costs, Report for planning commission, RITES]

## Modes of Cargo Transportation in India



India has a total coastline of 7551 Km with 13 major ports trusts, approximately 200 minor ports controlled by the government and privatesector. The country has an extensive network of inland waterways in the form of rivers, canals, backwater and creeksthe total navigable length is 14500 Km of which about 5200km of river and 4000 km of canals can be used by mechanised crafts

In order to regulate inland waterways in India Government of India constitutes a Inland Water Authority of India [IWAI] The organisation got functional in 1986 with a mandate to facilitate the commercial and non-commercial use of channel system . To promote Inland water transport in the country, five waterways have been declared as national waterways by this authority so far are-

NW No	Stretch	Length
1	River Ganga Haldia to Allahabad	1620Km
2	River Brahmaputra From Dhubri to Sadiya	891Km
3	West Coast Canal From Kottapuram to Kollam with Udyogamandal and Champakara canal	205Km
4	Kakkinada-Puducherry stretch of canals with river Godavari and river Krishna	1078 Km
5	East Coast Canal with river Brahmani and river Mahanadi's delta	588Km

## II. REVIEW OF LITERATURE

Water transport is the most cost effective and fuel efficient mode of transport. According to estimates, one litre of fuel can move 24 tonne km of freight by road, 85 by rail and 105 by IWT. Also, government figures establish the fact that a shift of one billion tonne km of freight to IWT will bring down the fuel cost by about INR 250 million and the cost of transportation by about INR 450 million. Data presented in table 1 in annexure makes it easier to understand why IWT is the most fruitful mode of transportation

With the increasing cost of logistics, Inland waterways offer a potential scope of improving the bottom line for the companies. Inland waterways especially make a strong case for transportation of bulky and heavy materials like steel, iron ore, coal, cement, and fertilizers etc. which occupy large volume and are very heavy. These materials are usually transported in large quantities and require high shipment capacity, Fuel consumption per tonne of freight shipped by water is only 15% of that of road and around 54% of that used by railways [Integrated logistics strategy, National Transport development policy committee, and September 2011]

Fixed coast for transportation per tonne can be reduced by 17.1% if handling of goods on one of port is mechanised and by 26.1% if handling of goods on one of the port is mechanised and by 35.3% if both the ports are mechanised for two way navigation [Raguram G, 2004]

### III. OBJECTIVE OF RESEARCH WORK

The research paper is prepared for the purpose of final out growth and challenges of Inland Water Transportation in India. At the end paper will cover each objective comfortably followed by conclusion.

### IV. RESEARCH METHODOLOGY

This paper is based on secondary data and information has been sourced from various books, trade journals, government publications newspapers etc. and research is descriptive in nature.

### V. MAIN TEXT AND FINDING

It is a difficult task to determine the economic efficiency of any process, and inland waterways transportation is no exception. Three factors need to be considered for determining total costs - capital, labour and operating expenses - which, when combined, forms an operating system. The productivity of a system, however, depends on the system used, the extent of mechanization, the use of the latest technology and overall management. In India the analyses carried out by the National Transport development Policy Committee of the Government indicate that the cost of operation of inland waterways transportation, computed for a 500-tonne self-propelled unit working at 75% load factor working for 300 days a year, is significantly lower than rail and road transportation of bulk products like coal and fertilizer.

In order to regulate inland waterways in India Government of India constitutes a Inland Water Authority of India [IWAI] The organisation got functional in 1986 with a mandate to facilitate the commercial and non-commercial use of channel system.

### VI. NAVIGABLE WATERWAYS & INFRASTRUCTURE

Length of waterways along with its navigable length is an indicator of inland water potential of a state. It is observed that the maximum length of waterways is in the State of Assam with 5290 kms followed by West Bengal with 4741 kms. However, the ratio of the navigable length to the total length of the river/canal better reflects the potential for IWT.

India ranks in 9th in the world in terms of potential navigable waterways (source: the world fact book 2008) Length of waterways along with its navigable length is an indicator of inland water potential of a state. It is observed that the maximum length of waterways is in the State of Assam followed by West Bengal. However, the ratio of the navigable length to the total length of the river/canal better reflects the potential for Inland water transport. Fourteen states have reported river length as well as navigable length for 137 rivers. Some of the important source of waterways, rivers and canals in India are as follows:

❖ River Ganga

❖ River Brahmaputra

# 8<sup>th</sup> International Conference on Science, Technology and Management

India International Centre, New Delhi

2<sup>nd</sup> July 2017, [www.conferenceworld.in](http://www.conferenceworld.in)

(ICSTM-17)

ISBN: 978-93-86171-52-8

- ❖ Backwaters of Kerala
- ❖ Goa Waterways
- ❖ Mumbai Waterways
- ❖ River Tapi
- ❖ DVC Canal
- ❖ National Waterways

As per the available data presented in Table 2 in annexure, it is observed that the ratio of navigable length to the total length is about 96.88% in the State of West Bengal; by contrast, in case of Gujrat the ratio of navigable length to total length is a mere 15.62%. Other States with good inland water transport prospects are Goa, Maharashtra and Bihar where waterways navigable length is 90.84, 73.14 and 62.40% respectively of the total length of rivers/lands/lakes reported by these states. Fourteen states have reported river length as well as navigable length for 131 rivers. These 131 rivers have total length of 27962 Km of which 45.57% is navigable length

To promote Inland Water Transport (IWT) in the country, five waterways have been declared as National Waterways. Out of these five NWs, first three waterways have already been developed substantially with fairway of required depth & width, navigational aids & terminal facilities for loading/unloading of cargo & ingress/ egress of the passengers and cargo & passenger vessels are moving on these NWs. A World Bank aided project for capacity augmentation of NW-1 has been sanctioned and it is under implementation.

## VII. CARGO MOVEMENT

As per Table 3 in annexure provides a snap view of cargo moved on the three national waterways, waterways of Goa and Maharashtra which carry most of the cargo traffic on India's Inland Waterways. The total cargo movement on India's waterways comprising the three national waterways and waterways in the State of Goa and Maharashtra was 365.37 lakhs tonnes in 2014-15 as against 322.63 lakhs tonnes in 2013-14, reflecting an increase of 13.3 %. In terms of tonnage, Goa and Maharashtra accounted for 2.2 % and 74.9 % respectively of the total cargo volume in 2014-15 with balance 22.9 % being accounted by the 3 National Waterways. In terms of tonne km (movement of one tonne of cargo over a distance of one km) there was an increase of 17 % in 2014-15 over 2013-14. Maharashtra waterways accounted around 75% of the total cargo movement on inland waterways across India. In case of Goa and Maharashtra, high volume of cargo movement was carried over relatively short average distances of about 42.82 Kms and 17.88 Kms respectively leading to their intensive use. However, in the three National Waterways the volume of cargo traffic was relatively much small. In case of National Waterway II (The Brahmaputra) and National Waterway III (Champakara canal, Udyogmandal canal and West Coast canal) the distance traversed by cargo was on an average around 20.38 Kms and 10.90 Kms respectively in 2014-15. In case of National Waterway I (Ganga- Bhagirathi-Hooghly) the average distance over which cargo moved was relatively much longer at around 444.73 Kms.

As per Table 4 in annexure Cargo transportation by inland water transport in India has been steadily increasing. Movement of National waterways I, II and III has increased from 3MMT in 2005-06 to 7.1MMT in 2015-16, an overall growth around 137 percent.



## VIII. CHALLENGES OF INLAND WATER TRANSPORTATION IN INDIA

1. Water Flow:- The basic need for the Inland transportation is sufficient water flow. Due to Industrial, Agriculture and habitation the water flows has been decreased over the years this also may have decreased due to impact of dams of on the rivers.
2. Inadequate water channel Depth:-Large vessels cannot traverse without adequate waters in the rivers. This along with the seasonal dependency of rivers makes operation of many ports difficult.
3. Storage Infrastructure:-Other than certain governmentrun warehouses whose main objective is grain storage, most of the warehouse are small in size and lesser in number. There is inadequate security measure, poor racking system and most important of all these is lack of cold storage facilities in majority of the ports.
4. Inadequate Air Draft:-Multiple bridges with low vertical clearance obstruct the passage of bigger inland water transport vessels on waterways No.3. There several navigable canal in the states of Uttar Pradesh, Bihar, West Bangal, Tamil Nadu and Andhra Pradesh: Sarda Canal, Ganga Canal, Yamuna Canal, The Delta canal system of the Krishna, Godavari, Mahanadi and Brahamani. But these cannot be utilised for cargo movement due to air draft restriction.
5. Shortage of IWT Vessels:-Vessels buildings is highly capital intensive and faces difficulties in obtaining project finance from banks and financial institutions. The private sector is relevant to invest in barges unless long term commitments for onward/ return trips are made for onward/return trips are made from users industries.
6. Excessive Siltation:-Deforestation and erosion activity of the river leads of siltation.
7. Poor Skills and low technology adaption:-Lake of automation in processes and low multi operation skills affects efficient utilisation of ports.

## IX. CONCLUSION

The Inland water Transportation has experienced high growth over the last decade with the visible shift towards development of navigable waterways. The cargo movement has been reached at 8.38 MMT in the year 2014-15, with a growth of 181.20 % has been seen over the decade which is good sign for the IWT in India but there are

# 8<sup>th</sup> International Conference on Science, Technology and Management

India International Centre, New Delhi

2<sup>nd</sup> July 2017, [www.conferenceworld.in](http://www.conferenceworld.in)

(ICSTM-17)

ISBN: 978-93-86171-52-8

some challenges also associated these are lack the water flow, adequate depth and shortage of vessels etc. which needs the government to pay attention and invest resources as well as increase the navigable length.

## REFERENCES

### JOURNAL PAPERS

- [1] Statistics of Inland water Transportation 2014-15, Transport Research Wing Ministry of Road Transport and Highways, Government of India, New Delhi.
- [2] Statistics of Inland water Transportation 2011-12, Transport Research Wing Ministry of Road Transport and Highways, Government of India, New Delhi.
- [3] Praveen S and Jegan J [2010], “Key Issues & Challenges for India Water Transportation Network in India” International Journal for Scientific Research & Development Vol. 3, Issue 10, 2015
- [5] Rangaraj, N. and G. Raghuram (2007) “Viability of Inland Water Transport in India”. ADB- India Resident Mission: INRM Policy Brief No-13:
- [6] Sriram S, 1998. Inland water Transport in India: Issues and prospects, Asian Transport Journal, Asian Institute of Transport Development, New Delhi, June 1998
- [7] Inland Waterways Authority of India (2008) “Annual Report [2008-2009]”-Published by department of Shipping-Ministry of Shipping, Road Transport and Highways. Noida-India, pp.

### WESITES

- [8] [.http://shipping.gov.in/showfile.php?lid=2210](http://shipping.gov.in/showfile.php?lid=2210)
- [9]. [www.iwai.nic.in](http://www.iwai.nic.in)

## ANNEXTURES

<b>Table 1: Comparison of Waterways, Railways and Roadways on some parameters</b>			
Parameters	Waterways	Railways	Roadways
Energy Efficiency 1 HP Can move what weight of Cargo in (Kg)	4000	500	150
Fuel Efficiency 1 Litre of Fuel can move how much freight (ton-km)	105	85	24
Equivalent Single unit carrying capacity	1 Barge	15 Rail Wagons	60 Trucks
Air Pollution	Low	Medium	High
Land Acquisition	Low	High	High
Capital Required	Low	High	High

**Source:-**Statistics of Inland water Transportation 2014-15, Transport Research Wing Ministry of Road Transport and Highways, Government of India, New Delhi

<b>Table 2: Total and Navigable Length of Waterways in different States 2014-15 (In kms)</b>			
State	Total Length of Rivers / Canals / Lakes (Kms)	Navigable Length (Kms)	Percentage of Navigable length to the total length
Andhra Pradesh	3579	804	22.46%
Assam	5290	1682	31.80%
Bihar	2229	1391	62.40%
Goa	273	248	90.84%
Gujarat	653	102	15.62%
Karnataka	2862	1215	42.45%
Kerala	2779	845.2	30.41%
Maharashtra	631	461.5	73.14%
Orrissa	1378	508	36.87%
Nagaland	937	375	40.02%
Mizoram	238	81	34.03%
Tamil Nadu	27	12	44.44%
Uttam Pradesh	2345	425	18.12%
West Bengal	4741	4593	96.88%
Total	27962	12742.7	45.57%

**Source:-**Statistics of Inland water Transportation 2014-15, Transport Research Wing Ministry of Road Transport and Highways, Government of India, New Delhi

# 8<sup>th</sup> International Conference on Science, Technology and Management

India International Centre, New Delhi

2<sup>nd</sup> July 2017, [www.conferenceworld.in](http://www.conferenceworld.in)

(ICSTM-17)

ISBN: 978-93-86171-52-8

**Table 3: Cargo Movement on Waterways**

Source: (i) Inland Waterways Authority of India for National Waterways (ii) Data for Goa Waterways include the data received from Ports department, Govt of Goa and the data received from the Mormugao Port Trust (MPT). (iii) Maharashtra Maritime Board for Maharashtra Waterways

Details of Waterway	Cargo Moved ( lakh tonnes)		Tonne Kms (in lakh )	
	2013-14	2014-15	2013-14	2014-15
National Waterway No 1	33.49 (10.4)	50.50 (13.8)	18512 (76.5)	22459 (79.4)
National Waterway No 2	24.75 (7.7)	24.92 (6.8)	594 (2.5)	508 (1.8)
National Waterway No 3	10.66 (3.3)	8.44 (2.3)	116 (0.5)	92 (0.3)
Goa Waterways	5.99 (1.8)	7.94 (2.2)	270 (1.1)	340 (1.2)
Maharashtra Waterways	247.74 (76.8)	273.57 (74.9)	469 (19.4)	4892 (17.3)
Grand Total	322.63 (100.0)	365.37 (100.0)	24183 (100.0)	28291 (100.0)

Note : Figure within brackets indicates percentage to the total

**Source:-**Statistics of Inland water Transportation 2014-15, Transport Research Wing Ministry of Road Transport and Highways, Government of India, New Delhi

**Table 4: Cargo Movement on National Waterways**

Year	Cargo Movement (In MMT)
2005-06	2.98
2006-07	4.36
2007-08	4.31
2008-09	4.29
2009-10	4.59
2010-11	4.92
2011-12	7.1
2012-13	6.38
2013-14	6.89
2014-15	8.39
2015-16	7.1

**Source:-**Statistics of Inland water Transportation 2014-15 and 2010-11, Transport Research Wing Ministry of Road Transport and Highways, Government of India, New Delhi