

# Improvement of Supply Chain Management through Cost Effective Logistics: Utilization of Water Transport in India

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## Introduction

Supply Chain Management (SCM) is defined as:

The management and oversight of a product from its origin until it is consumed. SCM involves the flow of materials, finances and information. This includes product design, planning, execution, monitoring and control. It can be represented in this simple flow chart.



Logistics is defined as:

Planning, execution and control of procurement and stationing of personnel, material and other resources to achieve the objectives of a plan, project or strategy.

It may be simply defined as Management of inventory in motion and rest.

Logistics and SCM are intricately related and improvement of logistics obviously improves SCM.

All great civilizations started on the river banks of some mighty rivers. Transportation of people and goods have been through water right from ancient times. Thousands of years ago goods were traded from India to far off countries by ship. India has long coast line and also some of the greatest rivers on earth. Movement along the river within India is centuries old. However with advent of railways and motorways, waterways have been neglected. Today movement of goods along waterways is very little compared to others. Movement on waterways have a lot of advantages which are not leveraged upon.

## Statement of the Problem

Can water transportation be utilized more for improvement of SCM in India?

## Literature Review

There are a few articles in journals and media regarding water transportation in India. Govt. of India also publishes information on water ways on select websites.

The existing literature can be classified in two categories.

- i) Literature from geographical perspective: They deal with maps and routes of different rivers and canals
- ii) Literature from infrastructure perspective: They deal with existing infrastructure and proposed infrastructure in terms of water ways.

However, there are no reports specifically with the perspective of supply chain management.

## Research Objectives

The research objectives of this research were:

- a) To understand the present scenario of logistics through water ways
- b) To suggest some new ideas

## Research Methodology

The research methodology adopted was exploratory in nature. It was qualitative research and no statistical analysis was warranted. This research is based on secondary data and experts from the industry/academia were consulted. The consultation involved seeking opinions on personal basis from experts.

Academia personnel are from different B Schools including Indian Institute of Management, Bangalore.

Industry personnel included

- a) Ex-employees from Port Trust of India.
- b) Present and ex-employees from a few FMCG companies like Pepsico etc.

## Background of the Study

Our country has many large rivers and an extensive network of inland waterways through small rivers, canals, backwaters and creeks. The total navigable length is 14,500 km. About 5,200 km. of the rivers and 4,000 km of canals can be used by mechanized vessels. However, goods transportation by waterways is highly under-utilized.

Here are few comparison to highlight the importance of waterways:

Ratio of cargo moved in water ways compared to total cargo moved (in tonne/km)

India 0.1 %

USA 21.0 %

Cost of Transport

Waterways 50 paise

Railways	1.0 Rs
Roadways	1.5 Rs.
Logistics cost	
India	18 %
China	8-10 %
European Union	10-12 %

Govt. of India in 1986 established Inland Waterways Authority of India (IWAI) to improve the situation. It undertook projects for development and maintenance of inland water transport (IWT) infrastructure on national waterways through grant received from Ministry of Shipping, Road Transport and Highways. The head office of the Authority was located at Noida with regional offices at Patna, Kolkata, Guwahati and Kochi and sub-offices at Allahabad, Varanasi, Bhagalpur, Farakka and Kollam. Some projects were undertaken but the utilization of waterways was grossly inadequate. Lately the Govt. is taking more interest to improve the situation.

## Results and Discussion

Govt. of India took some initiative to develop inland water transport after independence. It was not very effective for a long period. Recently the Govt. has started putting a major thrust and a lot of new initiatives have been put in place.

## Government Initiative

### Central Inland Water Transport Corporation (CIWTC)

In 1967, Central Inland Water Transport Corporation (CIWTC) with its headquarters at Kolkata was set up as a public undertaking. The CIWTC was mainly engaged in transportation of goods by inland waterways in the Ganga-Bhagirathi-Hooghly, Sunderbans and Brahmaputra rivers. They were operating regular cargo services between Kolkata and Pandu (near Guwahati), between Kolkata and Karimganj (Assam), Kolkata-Bangladesh and between Haldia and Patna. Later the Govt decided to disinvest the corporation and the process for disinvest was initiated.

## Government Policies

### Protocol on Inland Water Transit and Trade

An Inland Water Transit and Trade protocol exists between India and Bangladesh under which inland vessels of one country can transit through the specified routes of the other country. The existing protocol routes are:

- Kolkata-Pandu-Kolkata,
- Kolkata-Karimganj-Kolkata,
- Rajshahi-Dhulian-Rajshahi and

- Pandu-Karimganj-Pandu.

For inter-country trade, four ports of call have been designated in each country namely, Haldia, Kolkata, Pandu and Karimganj in India and Narayanganj, Khulna, Mongla and Sirajganj in Bangladesh.

The Govt had approved an Inland Water Transport Policy which included fiscal concessions, and policy guidelines for rapid development of the mode and to encourage private sector participation in development of infrastructure and ownership and operation of inland vessels.

National Waterways is the responsibility of Central Govt./IWAI, however the respective State Governments should develop other waterways. Unfortunately, due to financial constraint, the States could not allocate adequate funds for IWT development. To encourage the States for IWT development, there was introduced a Centrally Sponsored Scheme (CSS) for IWT sector. Under this scheme, full grant is provided for the projects of North-Eastern States including Sikkim and 90 per cent grant to other States. Subsequently, The Planning Commission discontinued the scheme for areas other than North East Region from the year 2007-08. The scheme was continued for the N-E region and classified as a Central Sector Scheme.

Govt. passed the National Waterways Act, 2016 passed which proposed 106 additional National Waterways. Earlier 5 waterways had been declared as national waterways. The main waterways consist of the Ganges-Bhagirathi-Hooghly rivers, the Brahmaputra, the Barak river, the rivers in Goa, the backwaters in Kerala, inland waters in Mumbai and the deltaic regions of the Godavari-Krishna rivers

The latest development is that the Govt. grouped the 106 national waterways (NWs) into 3 categories based on their viability, coastal area and those in the hilly and inaccessible terrain. Category I consists of 8 waterways that are as of now considered to be most viable and can be taken up for development in phase-I. Accordingly, consultancy assignments for preparing Engineering, Procurement and Construction (EPCNSE -0.93 %) contract and environmental studies for these waterways are being undertaken.

Category II are those NWs that are in coastal regions and have some tidal stretches. The number of such coastal rivers and canals is 60. These have been divided into 8 clusters

Category III consists of all the balance waterways which are in the remote, inaccessible and hilly regions.

### **National Inland Navigation Institute**

In 2004, National Inland Navigation Institute (NINI), Patna, was established. This is the first institute of its kind in the country to develop human resources for inland water transport. It conducts training programmes for IWAI personnel for development of waterways and for repair and maintenance of vessels. The institute offers a range of

job oriented training programmes which are according to syllabi prepared by State Water Transport Department as per Inland Vessel Act 1917.

## Joint Ventures

For exploring possibility of joint ventures and BOT projects in IWT sector, interactions were held with many interested firms and thereafter, some priority projects having potential of Joint Venture projects were short-listed. For some of these projects, bids were invited by IWAI. This initiative of IWAI has succeeded in attracting some private player to IWT sector and four Memorandum of Understanding (MOU)'s have been signed between IWAI and respective successful bidders for setting up and management of jetties at Bandel, Kolaghat and Budge-Budge in West Bengal and for acquisition, operation and management of barges on O-D pairs of Kolkata-Mongla, Kolkata-Dhubri and Kolkata-Pandu. 3 Joint Venture Companies have already been incorporated and the 4th is being incorporated to execute the aforesaid projects.

### Participation of Government Agencies, Public & Private Sector Enterprises in IWT/NW development

Vessels / Terminals	Construction, Operation & Maintenance	Government Agencies	Public Sector Enterprises	Private Sector Enterprises
Waterway	Constructing of waterway	IWAI	CIWTC in <a href="#">Sundarbans</a>	-
Waterway	Maintenance of Waterway	IWAI	Subcontracted Dredging	Subcontracted Dredging
Waterway	Navigational Support	IWAI	Ports, near port areas GPS suppliers (KPT, Port of Panaji)	-
Carriers (Vessels)	Vessel Manufacturing	-	CIWTC, Hooghly Docks, <a href="#">Garden Reach Shipbuilders &amp; Engineers (GRSE)</a>	Several
Carriers (Vessels)	Vessel ownership	IWAI	CIWTC/KSINCL and others	Several
Carriers (Vessels)	Vessel maintenance/repair	-	CIWTC/KSINCL and others	Several

Carriers (Vessels)	Vessel Operation	-	CIWTC/KSINCL and others	Several
Terminals (Jetties)	Terminal construction	IWAI and State Government	Mormugao Port Trust, CIWTC	Several
Terminals (Jetties)	Terminal operation	-	Mormugao Port Trust	Several

## Freight Village

The concept of Freight Village has been widely used in Europe but is a novel concept in Asia. A freight Village is an area where all activities relating to logistics and distribution of goods for national and international destinations are carried out. IWAI is developing first such village in Asia in Varanasi. It will provide connectivity through all modes of transportation; road and rail connectivity through Eastern Dedicated Freight Corridor and water connectivity through NW1. A second village will come up Sahibganj, Jharkhand.

IWAI will develop the basic infrastructure and private sector will be invited to establish their units where they can manufacture, pack and transport their products. Several FMCG companies including Patanjali and many logistics companies and international companies have shown keen interest.

IWAI has hired a German firm to design vessels especially for Indian inland waterways and they 13 designs have been submitted by the firm. These designed vessels can carry up to 2,000 tonnes of cargo, which is equivalent to a full railway rake or 140 trucks. These designs will be in public domain free of cost for private ship owners to manufacture.

Several trials for cargo transportation like cement and automobile, have been conducted and companies are quite happy with the performance. They are keen on using waterways and are waiting for them to be operational soon. Following trials, we have got several other requests from various sectors who would like to transport their products through waterways. AWAI has introduced maintenance dredging by giving full stretches of 100km and above for dredging for 5 to 7 years. The first such project worth Rs150 crore has been awarded to Adani Ports and SEZ. The company will be responsible for maintaining 3 meter depth and 45 meter width of river.

A new initiative by private sector is that a transport container cargo belonging to the food and beverage giant PepsiCo (India) was utilized from Kolkata to Varanasi on river Ganga (National Waterway-1). The company has a plan to move 16 containers from Kolkata to Varanasi by the vessel MV R N Tagore. On return journey the vessel carries fertilizers belonging to IFFCO that will be procured from its Phulpur plant near Allahabad.

Lately there have been criticism of IWT projects from some quarters. National Green Tribunal (NGT) asked the Union ministry of environment, forest and climate change (MoEF&CC) to clarify its position on the need for prior

environment clearances for inland waterway transport (IWT) projects, including the marquee Jal Marg Vikas Project (JMVP) along the river Ganga on National Waterway 1 between Haldia and Allahabad.

The complaints are that these 111 waterways will pass through 24 states and two Union Territories (20,274 km) and involve 138 river systems, creeks, estuaries and canal systems, and also cut through at least 20 wildlife protected areas. The plan does not take into account the monsoonal hydrology of India's rivers when they are either too full or too low. So to execute plans the rivers must be dredged regularly and there may be need to construct dams. This is likely to destroy their morphological integrity, flora and fauna and river-dependent livelihoods. A scientific study by Bangalore-based ATREE said that noise from large ships could adversely affect river dolphins.

The IWT also needs associated infrastructure such as jetties, river ports, terminals and access roads. So there is a huge extra financial burden.

To counter the above criticisms IWAI is ensuring that water traffic does not impact the two aquatic wildlife sanctuaries that fall along this stretch of the river -- the Kashi Turtle Sanctuary at Varanasi and the Vikramshila Dolphin Sanctuary at Bhagalpur.

There As a first step, information about these protected aquatic habitats and other sensitive areas such as wetlands will be fed into the new River Information System being developed under the World Bank-supported Project. This will ensure that vessels plying in these areas comply with the operational framework that has been put into place for minimizing impacts in sensitive zones. This framework includes:

1. A ban on dredging in protected habitat areas
2. In other areas that are known to be the habitat of valued aquatic species, no dredging will be allowed in the breeding and spawning seasons.
3. The speed of barges travelling along the protected areas of the sanctuaries will be restricted to 5km per hour.

## Conclusion

The potential of navigable waterways and shore side and river services needs to be widened as a complementary and environmentally sustainable mode of transport, tourism and recreation. The issues must be critically examined and the concerned authorities should do away with all the anomalies that have obstructed the evolution and expansion of the sector.

To conclude, as the economy getting increasingly integrated and globalized, and infrastructure development being a key area, inland waterways will become critical to trade and growth.

Finally it is estimated that 1.8 lakh persons would be provided employment in the IWT sector in the near future. New employment opportunities will come up for operation and management of fairway, terminals, aids to



navigation, barges, training and other areas.

### Recommendations

1. Govt. of India should streamline certain policies.
2. More companies, Indian and international should utilize water ways for transportation of their cargoes.
3. Logistics operation needs a lot of improvement in terms of transportation and warehousing. This of course is not so easy, particularly in far flung areas.
4. Public-Private Participation models to be adopted for setting up warehouses, jetties and other necessary infrastructure at strategic points.

### Limitation

The main limitation of this research was the time and resources available at hand.

### Scope for Further Research

There is a great scope for further research. This research can be extended in terms of studying

- a) Different geographical regions
- b) Different companies involved in the infrastructure development
- c) Different companies utilizing the water ways

### References

[https://en.wikipedia.org/wiki/Water\\_transport\\_in\\_India](https://en.wikipedia.org/wiki/Water_transport_in_India)<https://archive.india.gov.in/sectors/transport/index.php?id=23>

[https://en.wikipedia.org/wiki/Inland\\_waterways\\_of\\_India](https://en.wikipedia.org/wiki/Inland_waterways_of_India)

<https://www.adb.org/sites/default/files/publication/30113/inrm13.pdf><https://www.worldbank.org/en/country/india/brief/developing-india-first-modern-inland-waterway>

<http://www.economicdiscussion.net/articles/advantages-and-disadvantages-of-water-transport/2185>  
[//economictimes.indiatimes.com/articleshow/52190923.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/52190923.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)

Rangaraj, N. and G. Raghuram (2005b), Systems Perspectives on Inland Water Transport for Freight Movement, presented at the 37th annual meeting of the Operational Research Society of India, Ahmedabad, January 8–11.

SRFDCL (1998), Sabarmati Riverfront Development, Sabarmati Riverfront Development Corporation, Ahmedabad, May. TRW (2001), Statistics of Inland Water Transport 1999-2000, Transport Research Wing, Ministry of Shipping, Government of India, New Delhi.



TRW (2002), Statistics of Inland Water Transport 2000-01, Transport Research Wing, Ministry of Shipping, Government of India, New Delhi.

WB (2005), China Inland Waterways Project, The World Bank, [http://www.worldbank.org/transport/ports/iwt\\_dev.htm](http://www.worldbank.org/transport/ports/iwt_dev.htm) [www.travelchinaguide.com](http://www.travelchinaguide.com),  
<http://www.travelchinaguide.com/faq/cruise/three-gorges-project.htm> 12 Policy Brief No. 13 Viability of Inland Water Transport in India 13

<https://economictimes.indiatimes.com/industry/transportation/shipping/-/transport/indias-first-container-movement-on-inland-waterways-with-pepsico-on-board/articleshow>

"Maruti Suzuki planning to transport vehicles via inland waterways". news. Economic Times. 25 July 2016. Retrieved on 28 Aug 2019

PTI (12 August 2016). "Government to spend Rs 50,000 crore on river front development: Nitin Gadkari". news. The Economic Times. Retrieved 21 August 2019

"Gazette Notification" (PDF). Gazette of India. Retrieved 16 April 2016.

"Maruti Suzuki planning to transport vehicles via inland waterways". news. Economic Times. 25 July 2016.

"Government to spend Rs 50,000 crore on river front development: Nitin Gadkari". news. The Economic Times

<https://www.livemint.com/Politics/JEkzuoKmNUsc9tq499tJkL/Freight-villages-will-change-the-logistic-narrative-of-India.html>. Retrieved on 4 Sep 2019