

# Linking Rivers and Major/Minor Ports in Inland Waterways in India-expanding the Logistics Connectivity

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## Abstract

Inland waterways have been growing rapidly in India. Maritime India Vision 2030 builds on this growth track to increase the multi-modality and stake of inland waterways withstood freight/movement and passenger movement in the country. The national waterways project aims to create large-scale, commercial shipping and navigation systems in 111 waterways. These are proposed to realize the potential of cargo and passenger traffic, including tourism and cruising. The country's development of inland water transport has been slow, though the NW -1 was implemented in 1982. Inland water transport in India has a 0.5% modal share; China 8.7%; USA 8.3%; Europe 7%<sup>i</sup>.

A much-needed integrated policy which binds the procedures and processes in the field of logistics collectively. The National Logistics Policy sets determinate objects in minimizing transportation costs, improving international rankings and incorporating effective implementation. India is the world's fifth-largest economy with GDP growth with the fastest-growing economies. The objective of the policy is to reduce logistics cost as a proportion of GDP to about 10%, optimize the modal mix (25%–30% share of the road, 50%–55% railways, and 20%–25% waterways), increasing last mile connectivity, and enhance the logistics value chain through digitization, standardization, and modernization of warehousing among others<sup>ii</sup>. The 111 national waterways, including the latitude-longitude coordinates of the start and end points<sup>8</sup>, are given in the National Waterways Act 2016. These waterways pass through 24 states and two union territories<sup>iii</sup>, with an approximate total length of 20274 km<sup>iv</sup>. These waterways will pass through nearly 13811 river systems, bays, and related canal systems of India. The authors state that the importance of the Inland waterways and linking rivers with ports can coordinate between inter-state governments is an anticipated section to develop the network of inland water transport systems in India beyond the State restrictions.

**Objectives:** The objectives of this paper are to study the Inland Waterways linking with Ports and to understand the major policies which have debilitated the involvement of the private investors participating in this sector

**Methodology:** The secondary study is on the existing IWC, MMLP and Port connectivity infrastructure to understand the National Logistics Policy recommendation on the River and railway Linking with Ports.

**Keywords:** Inland Water Connectivity (IWC), National Logistics Policy(NLP), Government Policies, New Ports

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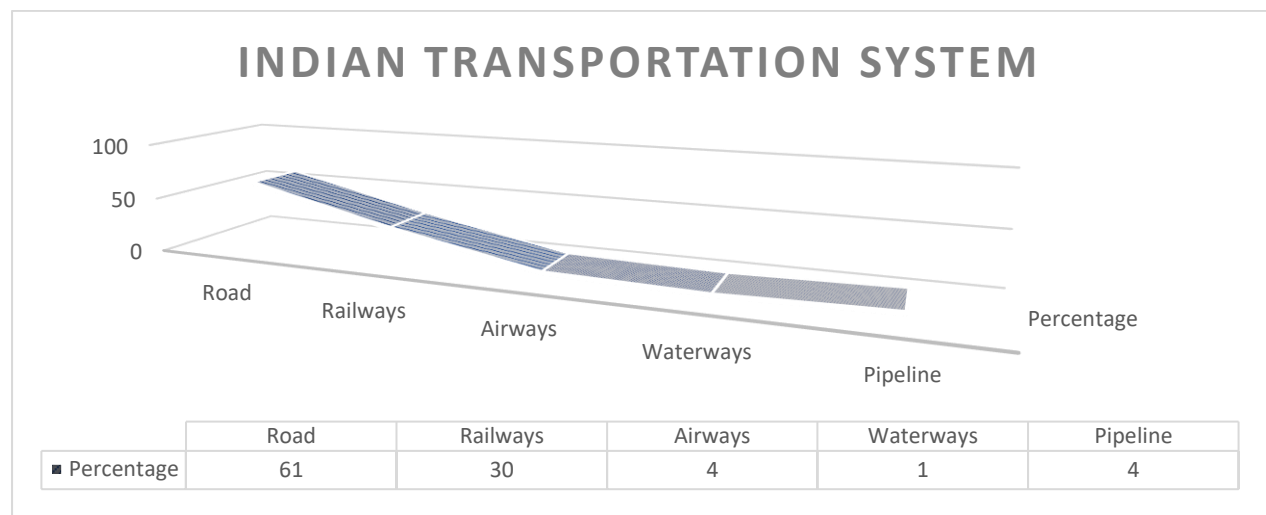
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## Introduction

India is geologically an enormous and varied country, ranked seventh in the world by area. IWT is an important element of the country's National Maritime Development Project (NMDP) overall maritime policy. India is gifted with various navigable waterways comprising river systems, canals, backwater seeks, and tidal inlets. The Inland Water Transport (IWT) is important in regions covered by the Brahmaputra and the Ganges in the North East and Eastern parts of the country, in the deltas of the rivers of Krishna and Godavari, Kerala and Goa, where IWT offers natural advantages. 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.<sup>v</sup>



The transport over waterways is specifically efficient when the source and destination are waterfront locations. Water-based transport is effective as operating costs of fuel are low and environmental pollution is lower than for corresponding volumes of movement by road, rail or air. A major advantage in waterways is often naturally accessible, which must be maintained and upgraded. Many regions of the country are still not well linked by major rail and road systems. The country's northeast regions have various rivers, which can be used to pilot freight vessels.

## IWT in India

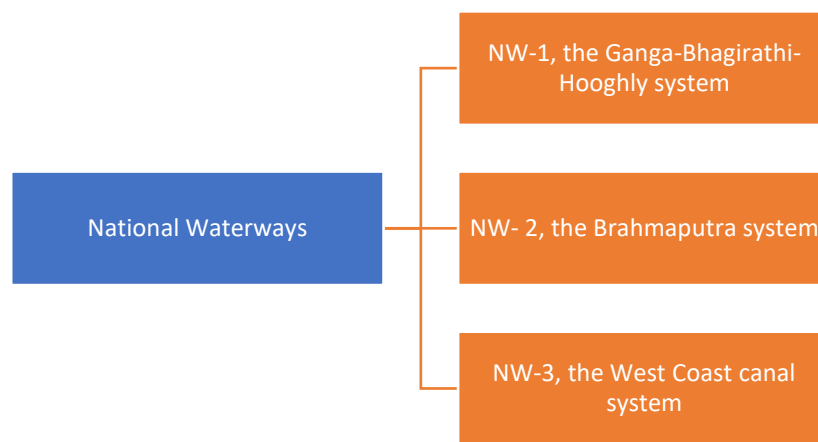
A further possibility can conceivably open up if and when the river interlinking project in the country is found viable. India has a total coastline of 7551 Km with 13 major port trusts and approximately 200 minor ports controlled by the Government and private sector. The country has a vast network of inland waterways in the form of rivers, canals, backwaters and creeks. The total navigable length is 14500 Km, about 5200km of river and 4000 km of canals be used by commercial purposes. Due to the lack of continuous connectivity in Inland waterway network requires a multi-modal network with road and rail connectivity.

To regulate inland waterways in India Government of India constitutes an Inland Water Authority of India [IWAI]. The Government of India established the Inland Water Transport Directorate in the then Ministry of Shipping and Transport in 1965. In March, 1967, the Ganga-Brahmaputra Water Transport Board was merged with the IWT Directorate. Also, Central Inland Water Transport Corporation Ltd.

(CIWTC) was set up at Kolkata in 1967 after taking over the assets and liabilities of the erstwhile River Steam Navigation Company Ltd.

In pursuance of the recommendations of the National Transport Policy Committee (NTPC), the Inland Waterways Authority of India (IWAI) was set up on October 27, 1986 by an Act of Parliament in 1985 for development, maintenance and regulation of National Waterways for shipping and navigation in the country. In India some geographical sectors has been a sustainable mode of freight transport. Primarily, three major waterways, namely<sup>vi</sup>.

1. NW-1, the Ganga-Bhagirathi-Hooghly system, from Allahabad to Haldia,
2. NW- 2, the Brahmaputra system in Assam and
3. NW-3, the West Coast canal system in Kerala.



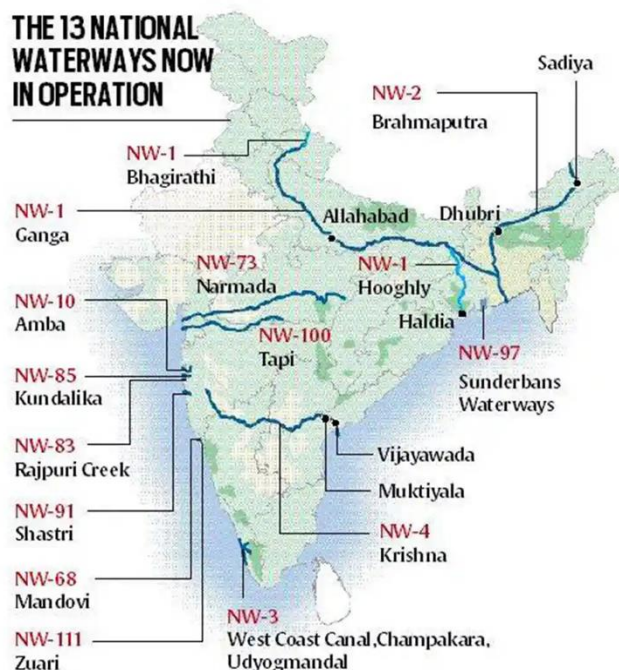
Many possibilities do exist, in terms of in-principle navigable waterways. Still, the ones that offer some potential (a mix of feasibility and some traffic possibilities) are the riverine inlets along the coast, especially the ones near ports and some of the canal systems as part of larger water resource development projects .

### **Operational National Waterways in India**

From the 111 National Waterways (NWs) stated under the National Waterways Act, 2016, 13 NWs are operational for shipping and navigation and cargo/passenger vessels are moving on them. The details of operational NWs are as follows<sup>vii</sup>:

### National waterways

SN.	National Waterway (NW) No.	Length (km)	Location (S)
1	NW-1: Ganga-Bhagirathi-Hooghly River System (Haldia - Allahabad)	1620	Uttar Pradesh, Bihar, Jharkhand, West Bengal
2	NW-2: Brahmaputra River (Dhubri - Sadiya)	891	Assam
3	NW-3: West Coast Canal (Kottapuram - Kollam), Champakara and Udyogmandal Canals	205	Kerala
4	NW-4: Phase-I development of the stretch Muktiyala to Vijyawada of river Krishna	82	Andhra Pradesh
Waterways in Maharashtra			
5	i) NW-10 (Amba River)	45	Maharashtra
6	ii) NW-83 (Rajpuri Creek)	31	
7	iii) NW-85 (Revadanda Creek - Kundalika River System)	31	
8	iv) NW-91 (Shastri river–Jaigad creek system)	52	
National Waterways in Goa			
9	NW-68 – Mandovi – Usgaon Bridge to Arabian Sea (41 km)	41	Goa
10	NW-111 – Zuari– Sanvordem Bridge to Marmugao Port (50 km).	50	
National Waterways in Gujarat			
11	NW-73- Narmada river-	226	Gujarat & Maharashtra
12	NW-100- Tapi river	436	West Bengal(through
13	Sunderbans Waterways (NW-97): Namkhana to AtharaBankiKhal in West Bengal.	172	Indo-Bangladesh Protocol Route)



Source: National Waterways in India<sup>viii</sup>

## **Review of Literature**

India's GDP of 8.35% spends on logistics, permitting to the National Council of Applied Economic Research (NCAER), any savings in cost will benefit all the benefactors in the value chain<sup>ix</sup>.

The Integrated National Waterways Transportation Grid campaigns to link the National Waterways to Multi-modal Transportation like roads, railways and major ports. The investment cost of the Grid is estimated at Rs. 22,763 crores with phase-I (2015-18) and phase- II (2018-23). This development will increase the supportive investment avenues in this and other sub sectoral activity.

The Indo-Bangladesh protocol facilitates trade between Bangladesh and India using NW-1 and NW-2. Several inland and river ports in Bangladesh with cargo handling facilities make the riverine route viable. The protocol now further permits utilization of the Chittagong and Mongla port for transit of Indian cargo and opens up the internal markets in Tripura, which is just a couple of hundred kilometres from Bangladesh.

Early signs of success in inland waterways transport, evidenced by an increasing utilization of the waterways for cargo movement in North East, is expected to accelerate with improved facilities in terms of infrastructure and vessels. Meanwhile, in a significant development, the first two sets of containerized cargo have already originated from Kolkata port for Varanasi and Patna<sup>x</sup>.

Western coastline, based on the rich minerals and resources availability the west coast districts are apt for expanding the industry. This lead to huge prospective for the progress of coastal and inland waterways. Maharashtra Maritime Board taking the responsibility of Inland waterways .

The river or waterway development increases the return rate on such development and supports apprehending that moving passengers and cargo. While creating the waterways, the converge depends more on the size and type of cargo than on passengers.

The Mumbai Port Trust is a model for moving cargo and passengers in India. These projects that have been introduced include the Coastal Road Project, the Mumbai Trans Harbour Link, the Roll-on-Roll-off (RoRo) services for Alibaug, the Thane-Borivli creek linking, the Thane coastal road, and the Thane-Navi Mumbai intracity water services.

The Coastal Road Project will ensure the city is "future-ready" "or economic growth. The development of infrastructure projects create for real estate development. The Mumbai Trans Harbour Link, the 22-kilometer bridge between Sewri in Mumbai and Nhava Sheva port in Navi-Mumbai will be a game changer. This interlinking of two twin cities will boost commercial and residential real estate<sup>xi</sup>.

## **Major Policy Reforms:**

Enactment of National Waterways Act, 2016: The National Waterways Act, 2016 came into force w.e.f. 12th April, 2016. 111 (106 new + 5 Existing) National Waterways (NWs) declared increasing the total length of NWs from 4,382 km to 20,262 km.

Inland Vessels Act, 2021 was passed on 11 August 2021, the Act has been published in the gazette on 12th August 2021, which aims to replace over 100 years old Inland Vessels Act, 1917 (1 of 1917) and usher a new era in the inland water transport sector to make the Legislative framework. The Inland

Vessels Act, 2021 has come into force w.e.f. 16th February 2022 (Section 1 and Section 106) and w.e.f. 7th June 2022 (Section 2 to Section 105 and Section 107 to Section 114). Nine Rules under the Inland Vessels Act 2021 (24 of 2021) have been Gazetted till June 2022.

### Navigable Waterways & Infrastructure

The length of waterways, along with its navigable length, is an indicator of the inland water potential of a State. The table below gives the Total and Navigable lengths of Waterways reported across States. It is observed that the maximum length of waterways is in the State of Assam with 7988.37 km followed by West Bengal with 4741 km and Karnataka with 2902.00 km. As per the available data presented in Table 1, it is observed that the ratio of navigable length to the total length is about 100% each for the States of Bihar and Jharkhand; by contrast, in the case of Assam, the ratio of navigable length to total length is 25.34%. Other States with good inland water transport prospects are West Bengal, Maharashtra and Goa, where waterways navigable length is 96.88%, 93.94% and 90.84%, respectively, of the total length of rivers/canals/lakes reported by these states. The total length of rivers in the States, as reported below, is 28085.95 Km, of which 55.17% is navigable length. However, the ratio of the navigable length to the total length of the river/canal better reflects the potential for IWT.

**Details of State-wise navigable waterways in India**

S. No.	State	Length of the Rivers/ Canals/ Lakes in State (Km.)	Navigable Length (Km.)	Percentage of Navigable Length to Total Length
1	Andhra Pradesh	3761.73	1159.73	30.83%
2	Assam	7988.37	2024	25.34%
3	Bihar*	1011	1011	100.00%
4	Goa	273	248	90.84%
5	Jharkhand	95	95	100.00%
6	Karnataka	2902	1215	41.87%
7	Kerala	2881.55	1951.85	67.74%
8	Maharashtra	931.91	875.42	93.94%
9	Mizoram	451.69	216.35	47.90%
10	Nagaland	276	276	100.00%
11	Odisha*	2425	1555	64.12%
12	Tamil Nadu	181.6	133.6	73.57%
13	Uttar Pradesh	166	140	84.34%
14	West Bengal	4741.1	4593.1	96.88%
	<b>Total</b>	28085.95	15494.05	55.17%

Source: State Governments-2021-22

The development of National Waterways in India has led to a transformative step towards enhancing transportation efficiency, fostering economic growth, promoting sustainable tourism, and reducing environmental impact.

### India's Major and Non-Major Ports

According to the Ministry of Shipping, around 95% of India's trading by volume and 70% by value is done through maritime transport.

- India has 13 major ports and over 200 notified minor and intermediate ports.
- The Union Government has permissible Foreign Direct Investment (FDI) of up to 100% under the automatic route for port and harbour construction and maintenance projects.
- Government has also facilitated a 10-year tax holiday to enterprises that develop, maintain and operate ports, inland waterways and inland ports.

### Cargo Traffic in Major & Non-Major ports in India over six-year period

Cargo Traffic (million tons)	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Major Ports	679.47	699.17	704.93	672.68	720.05	784.27
Non-Major Ports	529.09	582.61	615.05	577.19	603.56	650.96

### Cargo Traffic of Coastal (Domestic) and Overseas Cargo:

Years	Major Ports (million tons)		Non-major Ports (million tons)	
	Coastal cargo	Overseas cargo	Coastal cargo	Overseas cargo
2021-22	171.32	548.73	92.35	511.4
2022-23	183.26	601.01	124.89	526.07

The below table indicates the traffic Handled by Non-Major Ports by Maritime States / UTs (million tons)

Location	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Gujarat	370.77	399.20	411.79	387.57	405.39	416.36
Maharashtra	37.91	45.79	43.66	39.84	52.47	71.26
Andhra Pradesh	86.29	103.33	99.91	89.64	87.98	101.45
Goa	0.07	0.02	0.01	0.04	0.03	0.00
Tamil Nadu	1.10	0.96	11.37	7.41	7.84	9.88
Karnataka	0.68	1.04	0.94	0.79	0.79	1.06
A&N	1.42	1.50	1.85	1.43	1.54	1.88
Odisha	22.60	22.19	35.27	43.03	41.54	38.71
Kerala	0.14	0.22	0.16	0.11	0.14	0.24
Puducherry	8.12	8.37	10.10	7.33	5.84	10.12
Lakshadweep	-	-	-	0.12	0.18	-

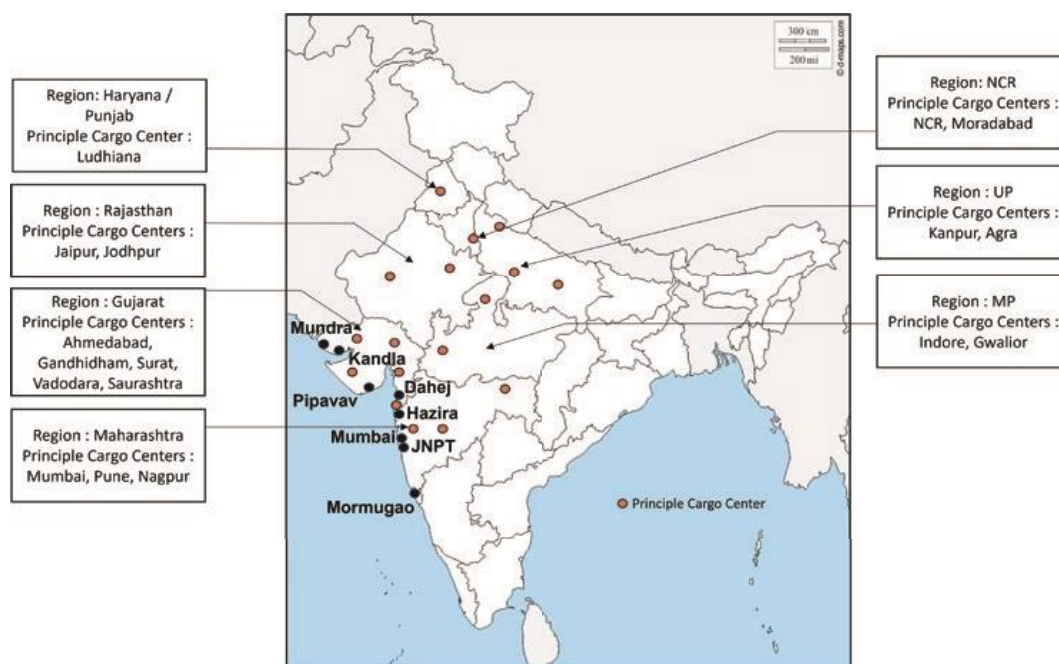
The below table indicates the traffic Handled by Major Ports (million tons)

Ports	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Chennai	51.881	53.012	46.758	43.553	48.564	48.949
V.O. Chidambaranar	36.583	34.342	36.076	31.79	34.119	38.041
Cochin	29.143	32.021	34.038	31.503	34.551	35.256

New Mangalore	42.059	42.508	39.145	36.5	39.296	41.417
Mormugao	26.897	17.683	16.017	21.988	18.456	17.334
Mumbai	62.902	60.634	60.696	53.324	59.891	63.606
JNPT	66.004	70.706	68.449	64.809	75.996	83.861
Deendayal	110.099	115.401	122.606	117.566	127.1	137.561

The contribution and share of Overseas Cargo Traffic at Major Ports – 2022-23 (million tons)<sup>xii</sup>

Location	Ports	Traffic	Share
Kandla, Gujarat	Deendayal Port	123.88	20.60%
Navha Seva, Maharashtra	JNPT	78.78	13.10%
Jagatsinghpur, Odisha	Paradip Port	76.97	12.80%
Visakhapatnam, Andhra Pradesh	Vishakhapatnam Port	54.72	9.10%
Haldia, West Bengal	SMP Haldia Dock	43.90	7.30%
Chennai, Tamil Nadu	Chennai Port	43.30	7.20%
Mumbai, Maharashtra	Mumbai Port	40.89	6.80%
Mangaluru, Karnataka	New Mangalore Port	32.47	5.40%
Chennai, Tamil Nadu	Kamarajar Port	25.86	4.30%
Muttayyapuram, Tamil Nadu	V.O. Chidambaranar Port	25.26	4.20%
Kochi, Kerala	Cochin Port	23.45	3.90%
Kolkata, West Bengal	Kolkata Dock	16.84	2.80%
Mormugao, Goa	Mormugao Port	15.64	2.60%



Outreach of Major ports from principal Cargo Centres

### Upcoming Ports in India as of 2023:

Vadhavan Container Port which is located about 10 km from National Railway grid and about 35-40 km from NH8.;Status: Construction in progress : Capacity:254 million tonnes of cargo.

### Trans-shipment Port in India 2023

Port	State	Capacity	Status
Vizhinjam International Seaport	Kerala	1 million TEU	Operational by 2024
International container transshipment port (ICTP)	Galathea Bay in the Great Nicobar Island	4 million containers	DPR in progress
Vallarpadam International Container Transshipment Terminal (ICTT)	Cochin	1 million TEU - Operational	Operational

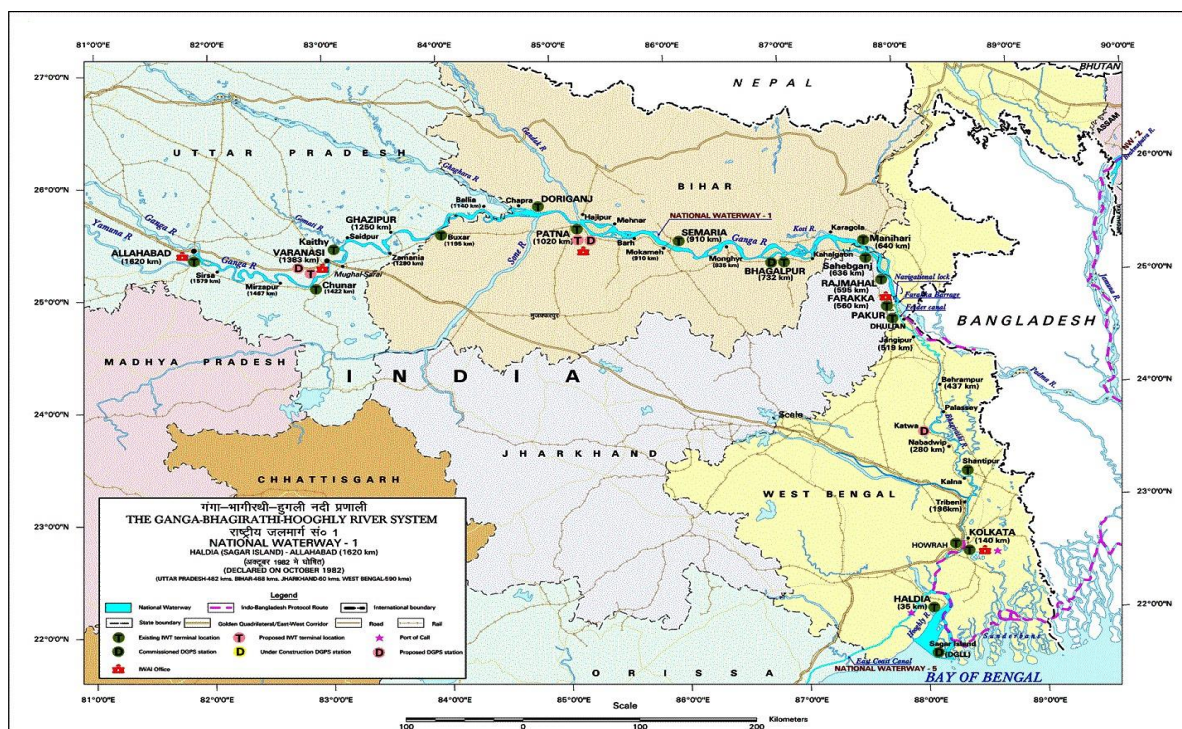
The development of Vizhinjam International Seaport is ,

Capacity	
Phase 1	1 million TEUs (by 2023)
Phase 2	2.5 million TEUs
Phase 3	3.3 million TEUs
Terminal Area (Phase 1)	80 hectares
Quay Length (Phase 1)	800 meters
Connectivity	
Road	4 lane NH-66
Rail	Proposed dedicated freight corridor
Air	16 kms from Trivandrum International Airport

Source: <https://vizhinjamport.in>

## Viability of Traffic on National Waterway 1 (Allahabad to Haldia)

The majority of the traffic on NW-1 is centred around the inland water port of Kolkata. The traditional base of commercial operations, the barge owners, the CIWTC and the major shipyards and repair facilities are all based in Kolkata. There is some potential for project- based movement of construction material on stretches of the Ganga upstream.



Source: (IWAI 2016)

## Details of Terminals in Haldia - Rajmahal stretch of NW-1-Floating Terminals

No	Name of terminal with chainage (In km)	Land area (in Sq. m)	Size of berth, water front (In mtr.)
1	Haldia (Ch. 35.0)	10930	70 m berth & 200 m WF
2	Botanical Garden Jetty (Ch. 134.5)	996	35 m berth & 50 m WF
3	BISN Jetty & G.R. Jetty-1 (Ch. 135.0)	30409.64	70 m berth & 100 WF
4	Tribeni (Ch. 196.0)	-	35 m berth
5	Shantipur (Ch. 241.0)	8000	35 m berth & 100 WF
6	Swaroopganj (Ch. 280)	2337	35 m berth
7	<b>Katwa (Ch. 334.50)</b>	-	35 m berth

## Fixed RCC Jetties

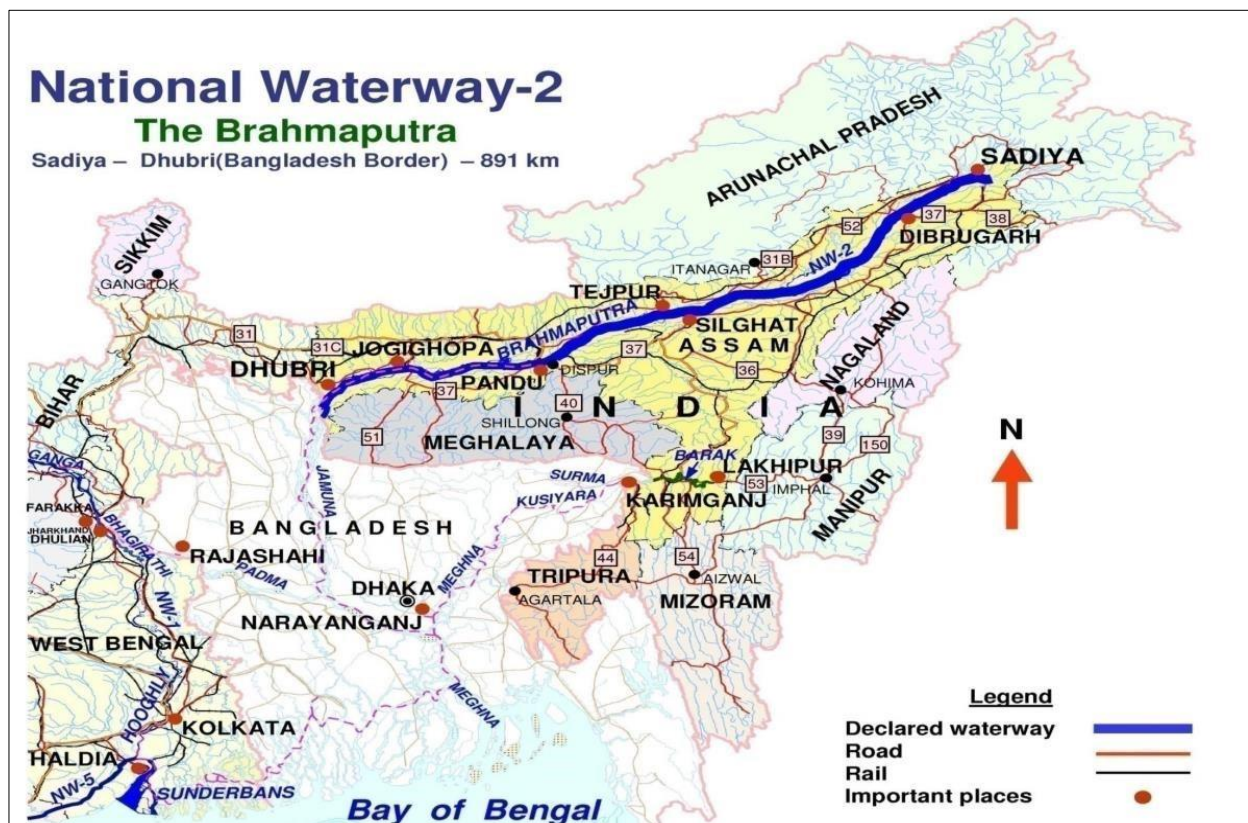
No	Name of terminal with chainage (In km)	Land area (in Sq. m)	Size of berth, water front (In mtr.)
1	G.R.Jetty-2 (Ch. 134.5)	14,557	70 m berth
2	Farakka RCC Jetty (Ch. 542 km)	-	115 m berth
3	Pakur RCC Jetty (Ch. 522 km)	-	60 m berth

### Challenges in interlinking NW-1:

The region has a long history of barge building and maintenance. Still, the existing facilities, including the CIWTC operated Rajabagan dockyard are not modern and productive as per the standards that the sector requires. There are some improvements in the sector, including the performance of Rajabagan Dockyard (reported by CIWTC) and introduction of fixed schedule operations to gain the confidence of shippers and customers and some new potential traffic, including international trade with Bangladesh.

### National waterway 2

National waterway 2 is the Brahmaputra system from Dibrugarh in Assam to Dhubri on the Bangladesh border and also in Assam. The waterway is entirely in Assam. There are a large number of tributaries of the Brahmaputra, which are also potentially navigable. There is sufficient evidence to show that the Brahmaputra was in fact provided the major mode of conveyance for freight and passenger transport in the region well into the 1900s. NW-2 is that the through connection with the Ganga system and mainland India has been lost because of the creation of Bangladesh and the Farakka barrage. An unfortunate consequence of this in the 1970s was that barge operators could not operate through services and had to effectively abandon some of their vessels in the Brahmaputra as there was insufficient traffic.



Source: (IWAI 2016)

## Details of Terminals in stretch of NW-2

Terminals at 12 locations are being sustained on NW-2 for handling cargo vessels and passenger ferries as per the details given below:

No	Location	Type of terminal (Fixed/Floating)	Purpose
1	<b>Hatsingimari</b>	Temporary Ro- Ro terminal with a steel crane pontoon is provided.	For providing Ro-Ro service between Dhubri and Hatsingimari
2	<b>Dhubri</b>	RCC Ro- Ro terminal with a crane pontoon is provided.	For completion of customs and immigration both for incoming and outgoing vessels on Protocol route and handling of Ro -Ro vessel, cargo vessels and passenger ferries.
3	<b>Jogighopa</b>	Floating terminal with a crane pontoon.	For transportation of Meghalaya coal/import of coal for NTPC power plant at Bongaigaon.
4	<b>Pandu</b>	Fixed/permanent terminal with two godowns and RCC jetties	Pandu is the major location on NW-2 as an entry point to NE States.
5	<b>Tejpur</b>	Floating terminal with a steel pontoon.	For handling of cargo vessels, local ferry service.
6	<b>Biswnath Ghat</b>	Floating Terminal	Projected for handling of PDs cargo by FCI and ODC movement.
7	<b>Silghat</b>	Floating terminal with a steel pontoon.	For handling of cargo vessels, local ferry service.
8	<b>Neamati</b>	Floating terminal with a steel pontoon	For handling of cargo vessels, local ferry service.
9	<b>Bogibil</b>	Floating terminal with steel pontoon.	For handling of FCI cargo.
10	<b>Dibrugarh</b>	Floating terminal with a steel pontoon	For handling of cargo vessels, local ferry service. ODC cargo is also expected at this terminal because of upcoming hydro power project.
11	<b>Sengajan/ Panbari</b>	Floating terminal with a crane pontoon	Considered because of regular movement of Indian army IWT fleet.
12	<b>Oriumghat</b>	Floating steel pontoon	To facilitate passengers connected to Arunachal /Assam, BSF / Army, and link to southern bank like Dibrugarh. ODC and project cargo.

## Challenges in interlinking NW-2

Even today, the movement of Indian vessels in Bangladesh (and vice versa) is governed by a protocol negotiated between the two governments and renewed every so often. This type of business risk retarded the development of IWT in the region. Only now are signs of Bangladesh opening up its waters for more commerce and barge operators from other regions are considering investments in the area.

The problem of water availability in NW-2 is of a different nature than in NW-1. The Brahmaputra is subject to severe flooding and changing of course at many points. Although the river is sufficiently wide in its entire course from Dibrugarh to Dhubri, it has eroded the banks at many places and does not form a channel of sufficient depth in many places.

The north-east region (the states of Assam, Meghalaya, Arunachal Pradesh, Tripura, Manipur, Mizoram and Nagaland) has severe constraints in transport infrastructure, as far as rail and road are concerned. This is largely because both those modes have to pass through a narrow stretch of land on a circuitous route as far as the main route from Kolkata is concerned.

Two single lines up to Guwahati now serve rail. Road infrastructure is qualitatively better in recent years but is still insufficient to meet the region's needs. The area is comparatively non-industrialized and therefore relies on imports and shipments from other parts of India for most industrial goods (cement, iron and steel, machinery etc.) The major shipments out of the region are coal from Mizoram, tea, jute and some other Agri products.

### **National Waterway 3**

National Waterway 3 in Kerala is the smallest of the three national waterways. It is made up largely of coastal backwaters of the Arabian Sea.. A system of gates from both the north (Thanneermukkom) and the south (Trikkunapuzha) controls the extent of salt water that is maintained in the Vembanad lake (of which a large channel is designated as the national waterway) and the waters are used both for prawn cultivation and fishing as well as for rice growing.

#### **Details of Terminal Facilities in NW – 3 as of June 2018**

No	Terminal Location	Area acquired (in Hectare)	Length & Type of Jetty
1	Kottapuram	0.5823	30 m Long :Berth (RCC Jetty)
2	Aluva	1.331	31 m Long :Berth (RCC Jetty)
3	CEPZ (Kakkanadu)	1.2234	10 m wide RCC temporary Jetty
4	Maradu	2.0268	30 m Long :Berth (RCC Jetty)
5	Vaikkom	0.5184	30 m Long :Berth (RCC Jetty)
6	Thanner mukkom	0.917	30 m Long :Berth (RCC Jetty)
7	Alappuzha	2.255	30 m Long :Berth (RCC Jetty)
8	Thrikunnappuzha	0.5057	31 m Long :Berth (RCC Jetty)
9	Kayamkulam (Ayiramthengu)	1.6304	32 m Long :Berth (RCC Jetty)
10	Chavara	0.8061	Land only
11	Kollam	0.6208	30 m Long :Berth (RCC Jetty)
12	Bolgatty Island (CoPT land-on lease)	-	Container terminal
13	Willingdon Island (CoPT land-on lease)	-	Container terminal



Today, there is some movement by water, but with a huge increase in road connectivity and bridges, the primacy of water movement is a thing of the past. In the Cochin area, with the three part Goshree bridges, Bolghatty, Vypeen and Vallarpadam islands are connected to the mainland by road, which has already had a big impact on passenger ferry services to those islands.

Apart from commuter movements and local trade through water-based transport, two other aspects of water-based transport need to be discussed: freight movements and tourism-related activities. The major cargo of freight movement in Kerala is to and from Cochin port to a few industries in the vicinity.

### Challenges in interlinking NW-3

There is not much private participation in NW-3. There is less or no private participation in the sector which could be less government policy reforms and the private investors do not see any profitable perspectives in this sector<sup>xiii</sup>.

As far as construction and maintenance of infrastructure at the NW-3 is concerned, all the activities from the construction of terminals to dredging to other infrastructure is carried out solely by the government statutory body IWAI.

Though the activities been undertaken by Government, it has neglected to maintain the mandatory Least Available Depth (LAD) of 2m in certain parts. There is less infrastructure supportive system due to this reason there will not be any optimum utilization of the infrastructure that has been created.

Similarly, tanker barges were carrying petroleum products from Cochin port to Kollam. Still, for reasons of labour management and also problems of the waterway on the southern side, this movement has stopped.

### Commercial transshipments via Inland Waterways

The stark difference between trade and transit on NW-1 and NW-2 is the quantum and type of trade. Overall, cargo movement on NW-1 and NW-2 is limited to the state of West Bengal and for limited products.

Some major products transported through NW-1 are fly ash, iron ore, coal, steel, building material, tyres, rock and stones, oil, sand, food items, timber and aluminium. Interestingly, the major products transported through NW-2 are food grains, electrical and transmission equipment's, fertilizer, building material and bamboo (IWAI 2017).

It has been estimated that coal and fertilizer movement on bulk scale will support large-scale cargo transportation on NW-1. The coal transported along NW-1 primarily caters to the need of power plants located on the river banks of Ganga. This is mainly because there is a huge demand of coal for ten existing thermal power plants and eleven new power stations which are under construction or being constructed in Bihar and Uttar Pradesh in the next eight years on the banks of NW-1. Around 20 per cent of coal requirement of these power plants will be completed by imported coal through Haldia route. Hence, this will give a significant potential to NW-1.

Moreover, there is a plan to link many of the national waterways to each other, to roads and railways and to major ports. This scheme is being called the Integrated National Waterways Transportation Grid. According to the National Waterway Transportation Grid Study<sup>xiv</sup> by Inland Waterway Authority of India: "Integrated National Waterways Transportation Grid study is undertaken with an aim to link all National Waterways .....to National/ State Highways, Railways and Sea Ports so that all these waterways become an integral part of the total transportation grid."

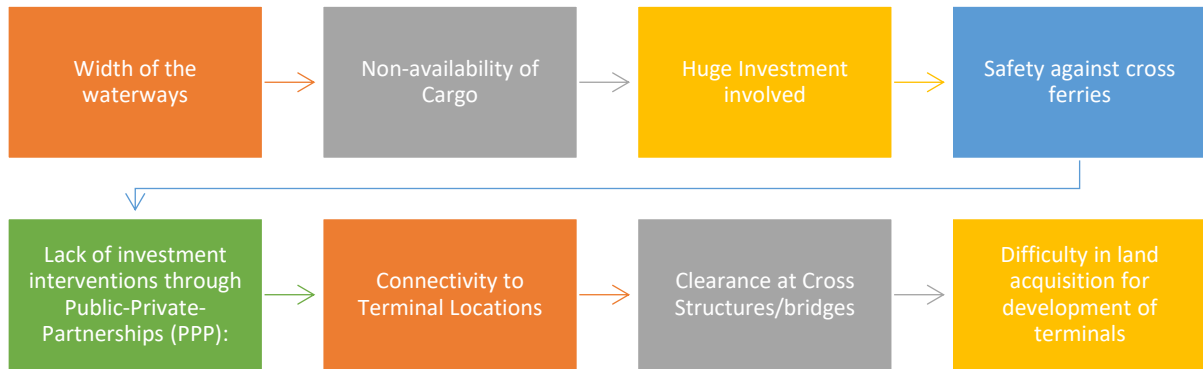
Another aim is to connect the waterways to the planned economic corridors like Eastern Freight corridor, Western Freight Corridor, and projects like the Sagarmala Project, which aims to promote port-led direct and indirect development. According to the Vision for Coastal Shipping Tourism and regional Development of the Shipping Ministry<sup>xv</sup>, "The Sagar Mala project at hand envisages seamless connectivity of sea-borne cargo with inland waterways for hinterland movement."

### **Potential possibilities of effective port and inland waterways connectivity**

The development of National Waterways in India has provided us with an eco-friendlier alternative mode of transportation. It has reduced the burden of relying on and travelling on roads and railways. It enables the cost-effective movement of goods, including heavy cargo, over long distances, contributing to lower logistics costs and faster delivery. These waterways have enhanced India's connectivity to various industrial hubs, ports, and inland markets, which has boosted economic activities, trade, and regional development.

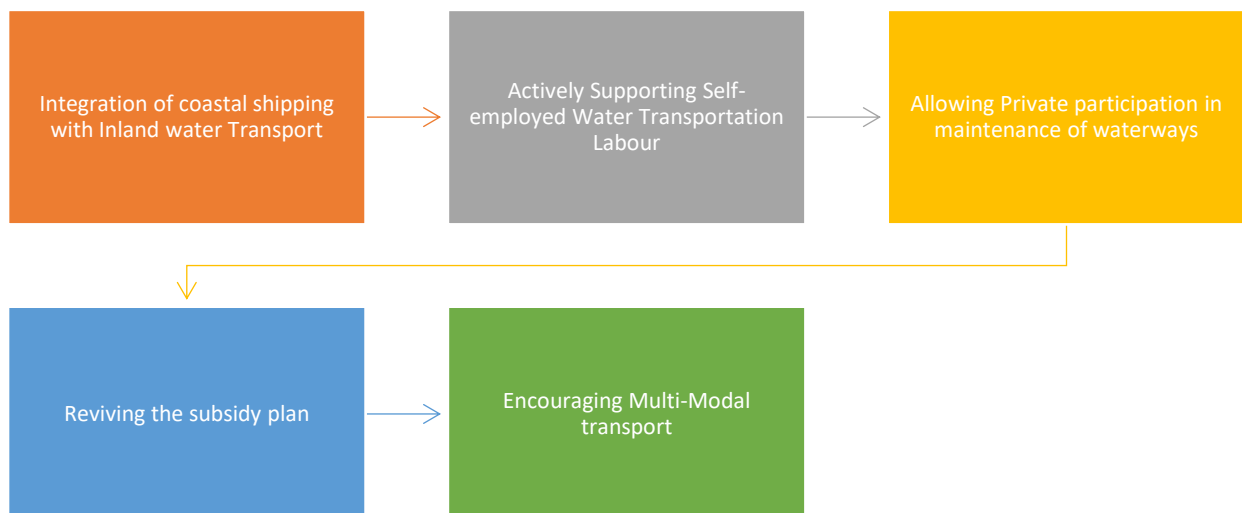
### **Key concerns with Private Investment in India**

The key issues here are investments in national waterways and associated infrastructure. The proportion of traffic carried by IWT is very small. One of the reasons is the development of road and rail traffic, which have become very viable modes of transport. Globally it experiences that long term investments in different modes of transport can improve shares of movement significantly and impact overall costs and competitiveness. The general principle of investment by the Government in such sectors is that it concerns those facilities and operations like river training, including dredging, mapping of the river and providing navigational support are some tasks in this domain.



## Suggestions

Based on this study research, it has been shown that Inland Waterways and its connectivity is actively capable of servicing transport needs in many interlinked river and sea ports. It is an exclusively attractive branch of transportation in such areas as: transportation of construction materials and energy resources for the needs of cities, tourist transport and bulk cargo transshipments.



Integration of coastal shipping with Inland water Transport ,thereby to enhance its share in the total transport system of the country. The seamless integration of coastal shipping and inland water transport can be effective only when the vessels can operate economically in both sectors.

Actively supporting self-employed water transportation labour in all ports, wharves, and loading and unloading, repairing, lock, winching and communication facilities be opened to self-employed water transportation labour.

Allowing Private participation in maintenance of waterways the Government should allow private players to invest even in the maintenance of waterways and construction of terminals. At present only the IWAI undertakes such projects. If it gives out certain projects to potential private investors it will insure a better infrastructure and maintenance.

Reviving the subsidy plan, the government policy to provide 30% subsidy to private investors to construct barges which now been scrapped. This policy should be revived to attract more and more private investors.

Multi-modal transport is a very interesting approach that solves a large part of cargo mobility problems. Combining private and state transport in a multi-modal transport system offers the opportunity to capitalize the best rates and transit time as possible. Multi-modal transport could remove the barrier of last mile connectivity state like in Kerala.

In summary, it can be concluded that inland waterway transport can play an essential role in the development of sustainable transport in cities. Thus far, these possibilities are used only on a small scale and mainly in passenger transport. However, innovative ship constructions, allowing for the expansion of this mode of transport, create a possibility that with the increase of population in cities located near waterways and resulting transport problems, the use of this mode of transit will gradually increase.

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<sup>i</sup> Jal Marg Vikas Project -Frequently Asked Questions And Their Answers, Inland Waterways Authority Of India.  
<http://www.iwai.nic.in/showfile.php?lid=864>

<sup>ii</sup> <https://www.drishtiias.com/daily-updates/daily-news-analysis/multimodal-logistics-park-in-assam>

<sup>iii</sup> Information compiled from various sources such as the Act and PIB releases by Ministry of Shipping.

<sup>iv</sup>Compiled from Press information Bureau, Ministry of Shipping, dated 21<sup>st</sup> July 2016  
<http://pib.nic.in/newsite/PrintRelease.aspx?relid=147477>

<sup>v</sup> Total Transport system study on traffic flows & modal costs, Report for planning commission, RITES.

<sup>vi</sup> <https://www.adb.org/sites/default/files/publication/30113/inrm13.pdf>

<sup>vii</sup> Press Information Bureau Government of India Ministry of Ports, Shipping and Waterways, 27 DEC 2018 3:37PM by PIB Delhi

<sup>viii</sup> <https://www.clicbrics.com/blog/national-waterways-in-india>

<sup>ix</sup> <https://www.cogoport.com/en-IN/blogs/indias-inland-waterways-have-huge-economic-potential-but-also-challenges>

<sup>x</sup> <https://www.orfonline.org/expert-speak/inland-waterways-positive-impact-on-economy-60449>

<sup>xi</sup> <https://www.sasec.asia/index.php?page=news&nid=1272&url=waterways-new-highways-future>

<sup>xii</sup> <https://www.rsm.global/india/sites/default/files/media/N%20L%20P%202024.pdf>

<sup>xiii</sup> <https://logistics.gov.in>, <https://ieefa.org>, <https://pib.gov.in>, <https://niti.gov.in>, <https://loksabhadocs.nic.in>, <https://cag.gov.in>, <https://www.business-standard.com>

<sup>xiv</sup> Integrated National Waterways Transportation Grid Study (Stage 1 Of Phase II) RITES,

<sup>xv</sup> <http://shipmin.nic.in/writereaddata/1892s/183389537coastalvision.pdf>