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जलमार्ग • Jalmarg

(त्रैमासिक ई-पत्रिका)

भारतीय अन्तर्देशीय जलमार्ग प्राधिकरण • INLAND WATERWAYS AUTHORITY OF INDIA

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INSIDE THE ISSUE:

: EDITORIAL TEAM:

- Col. Manish Pathak, Secretary
- Sh. U. K. Sahai, Dy. Secretary
- Sh. A. K. Bansal, Director
- Sh. Arvind Kumar, Hindi Officer

संदेश

भारतीय अंतर्देशीय जलमार्ग प्राधिकरण की विकासात्मक गतिविधियों को प्रदर्शित करने वाली त्रैमासिक ई-पत्रिका "जलमार्ग" के छठा अंक हेतु संदेश के रूप में अपने विचार व्यक्त करते हुए मुझे अत्यंत प्रसन्नता हो रही है। ऐसा अनुभव किया गया है कि संगठन के विकास को हितधारकों के साथ साझा करने के लिए ई-पत्रिका संसूचना का एक अच्छा माध्यम है। मैं सचिव, भाअजप्रा के नेतृत्व में संपादकीय टीम के दृढ़ संकल्प की सराहना करता हूं।

साथ ही पत्रिका के जरिये भारतीय अंतर्देशीय जलमार्ग प्राधिकरण द्वारा किए गए विकास कार्य और आशा करता हूं कि तिमाही के दौरान अंतर्देशीय जल परिवहन की उपलब्धियां तीव्रता से अनुगामियों तक पहुंचती हैं।

भारतीय अंतर्देशीय जलमार्ग प्राधिकरण द्वारा निर्धारित लक्ष्य की प्रगति के दृष्टिगत सभी हितधारकों के सामूहिक प्रयासों से भा.अ.ज.प्रा. ने न केवल 75 एमएमटी के लक्ष्य की प्राप्ति की है बल्कि वित्त वर्ष 2020&21 में यह निर्धारित लक्ष्य से अधिक 83-64 एमएमटी हो गया और इस प्रकार वित्त वर्ष 2019&20 में हुई 1-8% की वृद्धि की तुलना में इसमें 13-54 की तेज वृद्धि दर्ज की गई।

इस पुनीत कार्य को जारी रखने के लिए मैं सभी सहयोगियों को हार्दिक शुभकामनाएं देता हूं और ई-पत्रिका को निरंतर व समय पर सफलतापूर्वक प्रकाशित करने के लिए तथा इस हेतु भावी प्रयासों के लिए शुभकामनाएं देता हूं।

MESSAGE

It gives me immense pleasure to pen down the message for the Sixth Quarterly e-Magazine "JALMARG" showcasing the developmental activities of IWAI. It has been experienced that sharing of development in the organization through e-magazine is the best way to communicate with the stakeholders. I appreciate the editorial team lead by Secretary, IWAI, for their focused determination.

The development work carried out by the Inland Waterways Authority of India and the achievements in Inland Water Transport during the quarter reach to the followers in a quickly manner.

IWAI has taken measures to increase movement of cargo through National Waterways. With close monitoring of the progress of target set by IWAI along with concerted efforts of all stakeholders, IWAI has not only achieved the target of 75 MMT, but surpassed it at 83.64 MMT in FY 2020-21 and recorded a steep increase of 13.54% as compared to 1.8% in the FY 2019-20.

I extend my warm wishes to all concerned to continue the good work and make the e-Magazine continuation a timely and successful one and wish the very best in future endeavours.

संजय बंदोपाध्याय, आईएएस

अध्यक्ष

<u>परिचय:</u>

(i) रेलवे, सड़क परिवहन, तटीय नौवहन, अन्तर्देशीय जल परिवहन, पाइपलाइन और वायु परिवहन युक्त परिवहन क्षेत्र किसी भी देश के आर्थिक विकास हेतु अहम अवसंरचना है। एक विकसित परिवहन प्रणाली मल्टीमॉडल नेटवर्क में परिवहन की ईष्टतम लागत को मामला दर मामला आधार पर सभी मॉडलों की शक्तियों का प्रयोग करते हुए संभव बनाती है। ऐसे गलियारों में जहां अन्तर्देशीय जल परिवहन को तुलनात्मक रूप से बड़े आकार के नौचालन चैनल के साथ विकसित कर इन्हें तकनीकी- वाणिज्यिक व्यवहार्य बनाया जा सकता है, वहां ये लागत प्रभावी, पर्यावरण सुलभ और ईंधन दक्ष परिवहन साधन प्रदान कर सकते हैं, विशेषकर इसका प्रयोग भारी मात्रा में सामानों, संकटपूर्ण कार्गो और अति बड़े आकार के कार्गो के लिए किया जा सकता है। कुछ विकसित देशों (जैसे अमेरिका, चीन और अनेक यूरोपीय देशों में) जहां अन्तर्देशीय जल परिवहन (आई डब्लू टी) क्षेत्र के विकास पर विशेष ध्यान दिया जाता है, वे अपनी अर्थव्यवस्थाओं के विकास में इसका काफी उपयोग कर रहे हैं।

(ii) भारत में अनेक नदियां, नहरें, संकरी खाड़ी और बैकवाटर है, जिन्हें लागत प्रभावी और पर्यावरण अनुकूल परिवहन साधन के रूप में उपयोग में लाने की काफी संभावनाएं हैं। 20वीं शताब्दी के प्रारंभ तक आईडब्लूटी को देश के विभिन्न भागों में परिवहन के महत्वपूर्ण साधन के रूप में प्रयोग किया गया था। तथापि, सड़कों और रेलवे के तीव्र विकास, देश में थोड़े औद्योगिक विकास, सहित अनेक कारणों से अन्तर्देशीय जल परिवहन इत्यादि के अनुरक्षण और विकास पर काफी कम ध्यान दिया गया, अनेक जलमार्ग, रेल और सड़क साधनों की तुलना में प्रतिस्पर्धात्मक रूप से पीछे रह गए।

(iii) अपर्याप्त अवसंरचनात्मक सुविधाएं जैसे वर्ष भर प्रचालन हेतु आईडब्लूटी जलयानों की आवाजाही हेतु आवश्यक गहराई और चैड़ाई, कार्गो के लदान और ढुलाई के लिए टर्मिनल और सड़क/रेल के साथ संपर्क, दिन और रात के दौरान सुरक्षित और अबाधित नौवहन हेतु नौवहन सहायता और आईडब्लूटी जलयानों की कमी कुछ ऐसी मुख्य बाधाएं हैं, जिनका सामना अन्तर्देशीय जल परिवहन क्षेत्र द्वारा किया जा रहा है। पर्याप्त आईडब्लूटी आवाजाही के लिए इस बात पर बल दिया जा रहा है कि आवश्यक अवसंरचना (मुख्यतः सरकारी वित्तपोषण) का निर्माण हो और इसके साथ-साथ मुख्यतः निजी क्षेत्र द्वारा आईडब्लूटी बेड़े में वृद्धि की जाए।

(iv) भारतीय अंतर्देशीय जलमार्ग प्राधिकरण को वर्ष 1986 में संसद के अधिनियम द्वारा स्थापित किया गया है। प्राधिकरण के गठन का उद्देश्य नौवहन और नौचालन के लिए और उनसे जुड़े या प्रासंगिक मामलों के लिए अंतर्देशीय जलमार्गों का विनियमन और विकास करना है।

(v) भारतीय अन्तर्देशीय जलमार्ग प्राधिकरण (भा.अ.ज.प्रा.) अधिनियम, 1985 की धारा 14 के तहत भा.अ.ज.प्रा. ऐसे जलमार्गों के विकास और विनियमन के लिए अधिदिष्ट है जो राष्ट्रीय जलमार्ग के रूप में घोषित हैं। वर्ष 2014 तक निम्नलिखित जलमार्गों को राष्ट्रीय जलमार्ग (रा.ज.) घोषित किया गया था:-

i. **राष्ट्रीय जलमार्ग -1**: उत्तर प्रदेश, बिहार, झारखण्ड और पश्चिम बंगाल राज्यों में गंगा-भागीरथी-हुगली नदी प्रणाली (हल्दिया से इलाहाबाद तक-1620 किमी.) - वर्ष 1986 में घोषित किया गया।

ii. **राष्ट्रीय जलमार्ग -2:** असम राज्य में ब्रह्मपुत्र नदी (धुब्री से सदिया तक - 891 किमी.) - वर्ष 1988 में घोषित किया गया।

iii. **राष्ट्रीय जलमार्ग -3:** केरल राज्य में उद्योगमण्डल और चम्पाकारा कैनाल सहित पश्चिम तट कैनाल (कोट्टापुरम से कोल्लम तक) (205 किमी.) - वर्ष 1993 में घोषित किया।

iv. **राष्ट्रीय जलमार्ग -4:** आंध्रप्रदेश, तमिल नाडु और संघशासित प्रदेश पुडुचेरी राज्यों में गोदावरी और कृष्णा नदियों सहित काकीनाडा से पुडुचेरी कैनाल तक (1078 किमी.) - वर्ष 2008 में घोषित किया गया।

v. **राष्ट्रीय जलमार्ग -5:** पश्चिम बंगाल और उड़िसा राज्यों में ब्राह्मणी नदी और महानदी डेल्टा सहित पूर्व तट कैनाल (588 किमी.) - वर्ष 2008 में घोषित किया गया।

वर्ष 2016 में संसद द्वारा राष्ट्रीय जलमार्ग अधिनियम, 2016 पारित किया गया, जिसके तहत देश के 106 नए जलमार्गों को राष्ट्रीय जलमार्ग के रूप में घोषित किया गया। इस प्रकार, देश में पूर्व के 5 राष्ट्रीय जलमार्गों को मिलाकर अब कुल राष्ट्रीय जलमार्गों की संख्या 111 हो गई है। इन जलमार्गों में व्यवहार्य जलमार्गों के विकास हेतु भा.अ.ज.प्रा. द्वारा कई विकासात्मक कार्य किए जा रहे हैं।

इसके अलावा, भा.अ.ज.प्रा. व्यापार और पारगमन हेतु भारत-बांग्लादेश प्रोटोकॉल मार्ग के तहत कई कार्य कर रहा है, जिससे एक देश का अन्तर्देशीय जलयान दूसरे देश के विनिर्दिष्ट मार्गों से होकर चल सकता है।

Theme: Vessels and activities of Mech. Marine / I.V. Act

Legal & Regulatory Issues of Inland Navigation & Inland water Transport in India

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1. Introduction:

According to the "Arthashastra" of the statesman and economist Chanakya, inland navigation and inland water transport (IWT) regulations in India began in the early 400BC during the Maurya dynasty. Because of the rapid development of IWT mode in the last three centuries, regulation to safeguard the commercial interests, safety and security, and other factors began in the early 18th century in worldwide. The European Commission followed the UK's lead, while the United States became the forerunner in enacting rules and regulations related to the IWT sector, and Admiralty Law (Maritime law & Administration for shipping). Apart from some legislations for the sector during various ruling dynasties in India, including the Mughal, the legal framework and legislations in the formal manner were introduced by the colonial British with the development and operation of IWT as a mode of transport during the middle of the nineteenth century. With a few cosmetic changes, India adopted colonial legislations, rules, and regulations in the post-independence era. With the establishment of the IWAI (Inland Waterways Authority of India) in 1986, India gained a glimpse of an effective legislative framework and legislation with the goal and objective of delivering an effective, cost-effective, and safe inland navigation system. As a result, the article attempts to review the country's legal & regulatory frame on the sector.

2. Evolution of legislation on IWT sector:

The British colonial ruler enacted "the Bengal Ferry Regulation VI of 1819" as the first regulation in the IWT sector to regulate the operation of ferries in Bengal province after consolidating power. Following that, "the Northern India Canal and Drainage Act of 1873" was adopted to regulate ferry services on both the canal and other waterways, such as rivers, estuaries, and so on, introducing inland navigation through the canal system. And, in 1855, a complete statute, "The Bengal Ferries Act," was enacted to replace it for undivided Bengal, Bihar, and

Odisha. The "Inland Steam Vessels Act-1884 (VI of 1884)" was enacted after the introduction of steam engines propulsion in the mid-nineteenth century. It became the "Inland Steam Vessels Act of 1917" after multiple changes and the combination of various sections from earlier statutes. Further, the following statutes were enacted in different provinces of British India to regulate the operation of the ferry, boats & country crafts for cargo & passenger movement, development, and maintenance of the waterways.

- ✓ Northern India Ferries Act of 1878 (for U.P. MP & Punjab provinces)
- ✓ Madras Canals and Public Ferries (II of 1890) Act
- ✓ Andhra Pradesh Canals and Public Ferries Act, 2 of 1868
- ✓ Cochin Public Canal and Public Ferry Act of 1096 (English era 1921)
- ✓ Travancore Public Canal and Public Ferry Act of 1096 (English era 1921)
- ✓ Maharashtra (Bombay section) Ferries and Inland Vessels Act of 1890 Act
- ✓ Gujrat Ferries and Inland Vessels Act, 1868 under Bombay Act No-II of 1868

The provisions of these acts are mainly for ensuring the safety of passengers and goods, as well as for controlling and managing ferry ghats, landing stages, identifying and notifying ferry routes, collecting fares and toll charges, and handling passengers and cargo, among other things. These are still being enforced, with no or minor changes. The following are the rules and regulations that have been adopted and published as a result of these acts:

- ✓ The Madras Canals and Public Ferries Rules -1917 as per the provision of Madras Canals and Public Ferries (II of 1890) Act
- ✓ The Northern India Ferries (Madhya Pradesh) Rules -1962 as per the provision of The Northern India Ferries Act of1878
- ✓ The Bombay Ferries and Inland Vessels Rules -1948 subsequently amended as Maharashtra Inland Vessels Rules as per I.V. Act of 1917.

Except for the Inland Steam Vessels Act of 1917, the central legislation with delegation of power for its execution and administration to the state Government, the colonial legislations and regulations on the IWT sector on adoption have remained largely unchanged in the post-independence era. The bulk of these laws and regulations are outdated, failing to fulfil the needs of modern IWT systems and navigation, including ferry and river cruise services, current trade activities, marine safety, and environmental protection. Many states did not have a department or wing dedicated to administering and enforcing existing laws and regulations until recently. Kerala, Gujarat, Bihar, and Odisha are the states that have adopted the following legislations and rules in the post-independence era:

- ✓ Kerela Inland Vessels Act -2010
- ✓ Gujrat model regulation on Inland Vessels
- ✓ Odisha Boat Rules-2004 as per the Northern Ferry and Bengal Ferry Act
- ✓ Model Bihar Boats Rules-2013 as per the provision of Northern Ferry Act

3. Components of modern Legal

For F.Y. 2021-22 following subjects be taken up:

- July to September - NW-3 & NW-4.
- October to December - Vessels and activities of Mech. Marine / I.V. Act.

On the creation of IWAI, the inland water transport system being an integral of the modern transportation system of the country has undergone up-gradation and modernization processes in the development, maintenance, and management of the national waterways system, ensuring the multi-modal transport system. The expansion of the fleet strength for both cargo and passengers with technological advancements in the design, construction, and operation, equipment, mode of operation, the requirement of safety during navigation, and protection of the environment making the sector economically viable has been the necessity for safeguarding the interests of the public, stakeholders, and the nation as a whole with a modern legal and regulatory framework similar to other surface modes of transport and merchant shipping. The modern legal and regulatory framework for the IWT sector and service provisions is usually aimed at satisfying the national interest in four key areas: economic performance, safety, security, and environmental protection. The different components of such legal framework are as in **Fig-1**.

Development, maintenance & management of fairways and infrastructures

- Identification, legislation & Declaration of both NWs & State waterways
- Guidelines and Criteria for declaration
- Type of Studies, Survey & Investigation
- Legislation & notification as per VII schedule of constitution
- Legal control over rivers, canals & water body for navigation
- Land acquisition
- Classification of waterways
- Conservancy, river training & protection work & obstruction from waterway
- Safe navigable Channel (Aids to Navigations, marking & signal), pilotage
- Technical study, survey and investigation
- Training of technical manpower

Administration of inland vessels for safe construction, manning & operation, and trade practices

- Registration, survey, survey (fitness) certificate with safe design & construction
- Manning, training & competency
- Safety and security of passengers. crew and goods
- Safe navigation (Rules of road, pilotage and navigation equipment)
- Protection of environment & control of pollution (Water, air, noise & dangerous goods movement and discharge of garbage & sewage)
- Trade Practices
- Liabilities and limitation on liabilities (Protection of Interest of service providers and service users)

- Infrastructures for terminals & facilities for Multi-Modal Transportation, Logistic Park & Freight Villages
- Economic Issues
- Control of waterways/ routes
- Levy of tariff & fees
- Control of entry to ports/terminals
- Removal of encroachment & obstruction of navigation

- Marine Insurances (Third party & Comprehensive)
- Causalities, & Investigation, and wreck and salvage
- Offenses & penalties
- Traditional country crafts (non-mechanically propelled vessels)

Policy for development & Promotion of IWT

- Promotional policies, and Measures
- Fiscal policies and Measures
- Research & Development
- PPT/JV for development, maintenance, management & operation

Ferry & Cruise vessels services, and recreational & sports crafts

- Regulations of the routes, ghats, terminals, routes
- Fixation of terrif
- Collection of tolls & fees
- Safety & Security of the passengers,
- Health & hygienic facilities onboard
- Protection of the right of passengers etc.
- Pleasure & recreational, and sport crafts

Digitization & Automation

- Creation & Maintenance of Database
- Identification of items/ areas to be included in database
- Application of computer
- Automation through AIS (Artificial Intelligence System)

Fig-1: Different components of modern legal framework on IWT

4. Post-Independence Legislation & Regulatory framework

Under the central (union) list, state list, and concurrent list, the VII Schedule of the Indian Constitution divides power and functions between the Union and the States. The union list covers shipping and navigation on inland waterways designated as national waterways, as well as the rule of the road on such waterways for mechanically powered vessels. The state retains control over the development and regulation of navigation channels other than the NWs, the operation and maintenance of ferry services, and traditional country crafts. The center is also in charge of identifying, declaring for development, and regulating NWs. As a result, there are two forms of legislation for regulating the IWT sector: central and state legislation. The I. V. (Inland Vessels) Act and the Ferry Acts, which were inherited from the colonial administration as central legislation, are administered and implemented by the states. Only three pieces of legislation have been passed since then, and IWAI is responsible for their administration and implementation. The states have yet enacted no legislation. A brief description of the central legislations is as below.

4.1 Inland Vessels Act:

The Inland Steam Vessel Act of 1917 enacted during pre-independence era after its adoption in 1950, was renamed as the Inland Mechanically Propelled Vessels Act of 1917 in the year 1977 based on the recommendation of the "Bhagabati committee" due to the switch of the propulsion system from steam to oil-fired combustion engines. With the establishment of IWAI in 1986, the declaration of five NWs (National Waterways), and the opening up of the economy, the sector experienced an increase in the cargo traffic and also the movement of larger vessels, as well as the introduction of modern technology for construction and operation, as well as the need for trained and competent crew. This development demanded the adoption of contemporary and innovative legislation and regulations. The Ministry of Shipping formed a committee in 1992 to recommend the 2nd amendment with revisions to a vast number of existing provisions. However, only a few key points were taken into account, and the act was amended in 2007 under the Inland Vessels Amendment Act 2007 (35 0f 2007).

And meanwhile, increased transportation demand and the construction of modern national transportation infrastructure reinforced the need to integrate inland shipping with coastal shipping, rail, and road modes of transportation, resulting in a multi-modal transportation system. This paved the way for consideration of a sizable revision or rewriting of a new with the repeal of the old and colonial act. During its 13th meeting in Bangalore in 2013, the MSDC (Maritime State Development Committee) of the ministry of shipping & port recommended that the new laws be rewritten. IWAI, accordingly entrusted the task for drafting the new Inland Vessels bill to IRS (Indian Register of Shipping), the national classification society. After a series of consultations, discussions, and deliberation with stakeholders, the state governments, academical institutions, the bill was introduced to both the houses of parliament for enactment and notification in 2020. Finally, the Inland Vessels Act of 2021, which provides the country with progressive, economical, standard, and uniform regulations, was proclaimed on August 12, 2021.

The important features of the Inland Vessels Act of 2021 are: -

- It provides the law for promoting economical and safe transportation and trade through inland waters with the prime objective for the growth of transportation and trade by achieving and protecting the interests and needs of stake holders and technological advancements that the service users and service providers could make use of.

- Ensures for a uniform law, bringing uniformity in application of law relating to inland waterways and navigation within the country.

- Provides for safety of navigation, protection of life and cargo, and prevention of pollution that could be caused by the use or navigation of inland vessels.

- Transparency and accountability of administration, by administrative bodies, to effectively implement the Act to maximize benefits and to regulate trade practices.

- To strengthen investigation and judicial processes to cover casualties, accidents, pollution and any such violations; equality of status, treatment and opportunity to vessels while using or plying in inland waters.

- Replacing and substituting the existing laws and procedures governing the inland vessels, their construction, survey, registration, manning, navigation and such other aspects.

- Act also provides the law to regulate and govern the unregulated sector of non-mechanically propelled inland vessels (country crafts) for protecting the interests of the marginalized sector, having a legislation that can adapt innovations, developments and contributions of the future.

- Also provides for administration and implementation of the provision by adopting the digital and computer application.

- Act empowers IWAI as the competent authority for the purpose of exercising or discharging the powers, authority or duties conferred, by or under this Act. And such important activities are:

  - To make uniform rules and regulations.
  - Creation & maintenance of the database for the details of the vessels, crew etc. besides the measures for E-Administration of the Act.
  - To give direction to the states on the issues of & implementation etc.
  - Removal of the difficulties in the Act.

4.2 Inland Waterways Authority of India Act of 1985 (85 0f 1985)

It is mainly to provide for the constitution of an authority, i.e., Inland Waterways Authority of India (IWAI), as an apex body for the regulation and development of inland waterways declared as National Waterways for shipping and navigation for matters connected therewith or incidental there to. For developing and managing the National Waterways, IWAI also discharges certain statutory and advisory functions and obligations. Only four regulations out of several prospective provisions have been enacted and notified, and these are:

- ✓ The prevention of collision on National Waterways Regulation-2002.
- ✓ The National waterways Safety of Navigation and Shipping Regulation-2002.
- ✓ The Classification of Inland Waterways Regulation-2006.
- ✓ The Levy and collection of Fees and Charges Regulation-2021.

4.3 The National Waterways Act-2016

It is a consolidated act making provision for existing five National Waterways-1, 2, 3, 4 & 5 declared through different acts and the declaration of additional 106 national waterways for regulation and development of shipping and navigation, and matters connected therewith or incidental thereto.

4.4 IWT Policy- 2004

It has been enacted to provide the fiscal benefits for the accelerated IWT growth with the participation of the investors, IWT operators, shippers, etc.

5. Drafting and notification of rules for "Inland Vessels Act 2021"

The Indian Register of Shipping has taken up the task of drafting rules and regulations to implement the act's many aspects on expeditious basis. After the second round of formative feedback and assessment, ten rules as below are ready for further deliberation and finally for placing before the houses of parliament for notification.

- ❖ The Inland vessels (Design and Construction) Rules 2021.
- ❖ The Inland vessels (Survey and Certification) Rules 2021.
- ❖ The Inland vessels (Registration and other technical issues) Rules 2021.
- ❖ The Inland vessels (Manning) Rules, 2021.
- ❖ The Inland vessels (Crew and Passenger Accommodation) Rules 2021.
- ❖ The Inland vessels (Safe Navigation, Communication and Signals) Rules 2021.
- ❖ The Inland vessels (Life-Saving Appliances) Rules 2021.
- ❖ The Inland vessels (Fire Fighting Appliances) Rules 2021.
- ❖ The Inland vessels (Prevention and Containment of Pollution) Rules 2021.
- ❖ The Inland Vessels (Insurance, Liability & Limit Procedure, Enquiry in to accidents, Trade Practice, and Wreck & removal) Rules 2021.

The monsoon-fed, tidal, and non-tidal nature of Indian waterways, as well as a large number of limitations and impediments of the channel, and, most notably, the numerous types, sizes, and capacities of inland vessels across the country and their operation in different zones, may necessarily require formulating regulations that are both implementable and cost-effective for the sector. In this regard, eminent maritime administrators and experts advocate that the regulations must be developed to achieve their goals after extensive consultation, discussion, and deliberation with domain professionals and stakeholders directly involved in the sector and impacted by the legislation. Making available the proper guidelines, directions, and explanatory notes on non-trivial issues to assist the state's DA (Designated Authority) to make proper decisions could well be equally significant.

6. Further Scope for legislations

With the recent surge in activity on ferry and river cruises, RO-RO Pax, and tourism vessels, it is essential that the colonial ferry statutes be repealed as soon as possible. Due to the increasing tendency on the operation of the leisure and sport crafts on the inland waters may also require the legislation for their regulation in the near future. Regulation is necessary for the operation, maintenance, and management of terminals and other infrastructures through private participation, as well as the development and regulation of state and local waterways similar to the provisions in the IWAI Act for the national waterways. The inclusion of the information & data in the central database to be developed & maintained by IWAI on the country crafts including the traffic, accidents and causalities of both country crafts & vessels, oil spillage & pollution matters, wreck removal, and so on, could be accomplished through a suitable constitutional provision or ordinance. The other important area for the creation and maintenance of a separate database through IWAI may be the allocation of a unique identification number to each inland vessel crew with the service book, similar to INDOS (Indian National Database of Seafarers) and CDC (Continuous Discharge Certificate) of the mariners respectively administered & managed by the Directorate General of Shipping.

7. Institutional mechanism for implementation & administration

The policy development, regulations, and service provisions may be broadly the main categories of activities for an institution responsible for effective implementation and administration of the statute and framed regulations. Efforts need to be made in each of these categories to achieve the national interest in four major areas of responsibility: economic performance, safety, security, and environmental protection. Hence, the strengthening of the Institution and capacity development with a suitable mechanism is significant. However, in the lack of an IWT Directorate or Maritime Board in the non-maritime (coastal) states, an appropriate agreement with the other departments, or delegation to a competent maritime agency may be the challenge. The number of state waterways, the issues of the development, and the nature of maintenance work, the size of the fleet, governmental policies, and the

importance of the economy may all influence the such institution/department. Therefore, these states may delegate statutory authority to classification societies or marine institutes such as the IINA (Indian Institution of Naval Architects), IMEI (Indian Institute of Marine Engineers), and CMMI (The Company of Master Mariner of India). Alternatively, the services of such institutions' empaneled domain specialists may provide a solution for smoothly carrying out the statutory tasks at least for the Inland Vessels Act of 2021.

For the organizations like IWAI, and the states with multiple obligations, the role of a marine administration could be concentrated with one department or dispersed across several departments. For example, as the country's apex and statutory body, IWAI could restructure its organizational structure into three distinct wings or divisions, such as ***"Safety Directorate/Inspectorate," "Fairway & Infrastructure," and "Policy & Promotion."*** The Safety Inspectorate may be in charge of enforcing the Inland Vessels Act of 2021, and the National Waterways Act of 1985, as well as wreck removal, oil spillage & pollution, search - and - rescue, and the rules of the road on the national waterways, among other things. The second wing could be for the development, maintenance, management, and regulation of the fairways and infrastructures in accordance with the IWAI Act, and the third wing could be for the promotion and profitable use of developed fairways and infrastructures through PPP, JV, and SPV arrangements with promotional policies and fiscal incentives. Other key parameters for institutional strengthening include the availability of sufficient training and education facilities, adequate funds, research & innovation program, regular amendment, and issuance of guidelines.

8. Conclusion

On the eve of the diamond jubilee of the independence, India's inland navigation and IWT system are still in their infancy. As a result, together with proper legislation, policy formation, strategic planning, R & D, promotional, and other measures, developing the potential waterways of both the state and national waterways ensuring economically viable and sustainable navigation is critical. As previously stated, in this initial stage, the statutes & regulations should be more user-friendly, and simple rather than stringent and ambiguous to ensure effective implementation and administration without compromising the fundamental principles and objectives. The sector also urgently needs institutional strengthening and capacity building. Hence, it must get the special attention in order to develop an economically sustainable inland navigation and IWT system, as well as the effective implementation and administration of the enacted and notified statutory provisions.

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Concept of Self-Propelled Inland Cargo Vessels for National Waterways

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Introduction:

The objective is to present a new concept developed for the design of Self- Propelled inland Cargo Vessels especially for the National waterways by which a cargo vessel fully loaded to her max. draft can cross shoals safely by reducing her draft instantly with stability required by means of a **Vertical Lift Mechanism** to be built at vessel's hull bottom as discussed in detail below.

Among our NWs, NW 1 & NW 2 are the most important waterways, but most prone to silting after every flood season.

Presently, the following LADs are committed by IWAI:

NW-1	Haldia – Farakka	**3.0 m**
	Farakka – Barh	**2.5 m**
	Barh – Ghazipur	**2.5 m**
	Ghazipur – Varanasi	**2.2 m**
	Varanasi - Prayagraj	**1.5 m**

NW-2	B'Desh Border - Neamati	**2.5 m**
	Neamati – Dibrugarh	**2.0 m**
	Dibrugarh – Oriam Ghat	**1.5 m**

Despite timely inception of dredging activities with erection & maintenance of adequate bandalling on the shoals on different critical locations along NW 1, NW 2 and other NWs, LAD as low as 0.8 m to 1.2 m could be observed during Feb. & March in the Varanasi – Prayagraj stretch on NW 1 and LAD of 1.2 m could be observed in the upper stretches connecting Dibrgarh & Oriam Ghat on NW 2. This is due to natural problems of siltation of alluvial rivers after every flood season beyond any control.

With this concept in mind even under the above scenario every year during the lean season, a 650-tonne cargo vessel with an empty draft of 1.2 m like MV Rajagopalachari having a max. loaded draft of 1.80 m, for example, can sail safely from Haldia to almost Prayagraj and B'Desh Border to almost Oriam Ghat with stability with a LAD not less than 1.4 m i.e., empty draft of 1.2 m+ 0.2 m keel clearance. Similarly, a 1500 dwt cargo requiring a draft of 2.5 m vessel can sail with her full load up to Varanasi on NW1 and up to almost Dibrugarh with a LAD of 2.1 m i.e., empty daft of 1.9 m + 0.2 m of keel clearance during lean season every year.

In short, every cargo vessel can be lifted by the vessel's own propulsion system to be built additionally as proposed, hereunder, from her fully loaded max. draft up to the minimum draft to sail with stability across shoals safely with a LAD being not less than her empty draft plus a minimum keel clearance of 0.2m.

Basic Working Principle:

The basic concept is to lift the vessel up as she finds less depth to sail ahead with her maximum draft. With the system proposed, the vessel will lift herself up with a vertical up thrust produced by a few horizontal propellers to be built at the hull bottom at bow & stern immersed in the minimum available water required to maintain her stability i.e., at her minimum draft level. It also enables the vessel to sail ahead with her normal propellers after being lifted up, of course, with much reduced speed for precaution over the shoal as elaborated in details in subsequent paras.

The up thrust is produced in such a way as just to replenish the buoyant force lost by the vessel at any instant of time due to the lifting of the upper part of the hull above water surface. The bottom hull propellers are to be built symmetrically fixed with hull bottom and positioned at bow & stern as close to the extreme Port & Starboard side corners as possible for stability.

As long as the vessel is lifted up vertically up to the designed minimum draft, its metacentric stability will not alter much except only by external forces like severe wind and waves.

With a small transverse healing of the vessel, suppose, clockwise, looking forward toward the bow of the vessel i.e., the S/B side going down and the Port side coming up, the centre of buoyancy rotates through a small angle anticlockwise towards the SB side, but the resultant Up thrust acts through the CG of the vessel and rotates clockwise with the vessel towards the Port side by the same angle of heeling and remains normal to the vessel's hull bottom. It acts through the CG of the vessel so that it generates a Sine function of the angle of heeling that develops a horizontal thrust by both the SB as well as Port side bottom pair of propellers. Both the S/B side as well as the Port side propellers develop an equal and opposite horizontal thrust component that cancels each other. In case, the angle of heeling tends to exceed the danger limit for any reason whatsoever, the S/B side two propellers at the stern & bow are to be controlled to generate more up thrust compared to the Port side bottom propellers to reduce the angle of heeling to bring the vessel to a stable position. As the vessel is lifted up, the resultant Up thrust is to be increased just to replenish the loss of buoyant force of water due to lifting and this righting arm component too is strengthened more and more to increase the vessel's stability. The procedure will be reversed in case of an anticlockwise heeling of the vessel.

It is to be noted here that as discussed in the subsequent paras, out of four bottom propellers, a pair will be positioned at the stern bottom while the other pair will be positioned at bow bottom each yielding equal magnitude of up thrust for a normal uniform lifting. The bottom propellers are therefore to be positioned at the four corners of the hull bottom for stability all along.

In case the angle of heeling or trimming tends to exceed the danger limit due to any reason during lifting, the magnitude of up thrust generated by each pair of Bow or Stern may be adjusted accordingly by increasing/decreasing the propeller RPM as required to increase/decrease the righting moment to restore the stability of the vessel as and when required. The Master of the vessel, above all, is, of course, the best judge to decide such actions as needed.

If the bottom propellers are rudder propulsion type like SCHOTTEL or HRP of Europe, the required propellers P or S/B side may just be rotated clock or anticlockwise to generate the required thrust to strengthen the righting arm for stability.

But it is true only for calm weather conditions without any significant wind pressure and waves to apply lateral thrust to the superstructure of the vessel. In a rough weather with strong wind and waves, the wind pressure from an angle may weaken the righting moment endangering thereby the stability of the vessel sailing with full load at its minimum draft, of course with much reduced speed over the shoals only. **Duration of such a sailing at a stretch on a shoal will, of course, be for a few minutes only for our National Waterways.**

Even with a negative metacentric height i.e., in a metastable condition, vessels with certain forms can still find a position of stable equilibrium at an angle of heel called 'angle of loll' which may be corrected only by lowering the gravity centre.

Evaluation of Up thrust & hp of the lifting bottom Propellers:

It is not necessary to go into the detailed intricacies of mathematical expressions related to hp, force, rpm, torque or hp losses by the propulsion mechanism of a normal inland vessel. Simply with the basic mathematical relationship of various propulsion components, the subject may be discussed.

Following this, we understand the basic relationship between ship power, shaft torque and fuel consumption.

Power: Power is simply force (F) times velocity (v), where 1 HP (horsepower, English units) is equal to 0.7457 kW (kilowatt, metric) and 1kW = 1000 Newtons *meters/second.

$$P = F * V$$

The above refers to the normal horizontal movement of a vessel along a fairway with her normal stren propellers. For personal convenience, all calculations are based on FPS Practical Units only.

Now let us imagine this phenomenon during the lifting process in a vertical direction too when the vessel is moving vertically upwards very

slowly, of course, reducing her maximum draft slowly by means of a gradually increasing up thrust produced by her own system of a few horizontal propellers located at the hull bottom (keel level) symmetrically as proposed. Number of pairs and thrust generated by these bottom hull propellers will depend on the size of the vessel. During this vertical lift, the forward propulsion is to be stopped.

Generation of vertical up thrust for lifting vessel:

The vertical up thrust produced by the horizontal bottom propellers will just compensate for the gradual loss of buoyant force (linear to the height of lift) at any instant of time during lifting process so as to keep the vessel always floating with stability.

In order to make the vessel sail with her own normal stern propellers being immersed in water to produce the required horizontal thrust, the vessel will have to reach her minimum draft with the full load being carried i.e., Max. Lift possible = Difference between the Maximum and the minimum draft. In fact, with the system proposed, a vessel can lift herself up to any depth from her maximum draft to her minimum draft only as required depending on the LAD on the shoal.

❖ Evaluation of vertical lift thrust & hp of the bottom hull propellers: (Vessels like MV Rajagopalachari):

Max. draft is 1.8 m and the minimum draft is 1.2 m for the vessel similar to M V Rajagopalachari. Max. lift possible with stability=1.8 m – 1.2 m= 0.6 m.

At the instant the vessel reaches a shoal with a LAD less than 2 m as recorded by the Echo sounder, forward velocity is made 0. Master instantly starts operating the hull bottom propellers located symmetrically at the bow and stern at the keel level in order to start lifting the vessel up vertically to attain a clear depth of 1.4 m (empty draft of 1.20 m + keel clearance of 0.2 m) above the shoal so as to sail safely further over the entire shoal length with stability, of course, with a slower speed. The maximum lift possible, therefore, to attain over a shoal of 1.4 m LAD = 0.6 m i.e. from a channel LAD of 2 m to a LAD of 1.4 m. The Master is to get all information of the shoals ahead from the Echo-Sounder.
Let us assume that the vessel takes just 1 minute to lift her up by 0.6 m at the point where she has to stop i.e., at a lifting speed @ 0.0328 ft. Per sec.

As the vessel lifts her up leaving the water surface, the upward buoyant thrust of water decreases inversely with lift height attained.
Now this reduction of buoyant pressure of water has to be exactly compensated for at every instant of time by the increasing vertical up thrust to be generated by the bottom propellers so as to keep the vessel floating with stability.

At the instant at t = 60 seconds when the vessel attains a clear lift of 0.6 m over the shoal existing ahead, the vessel attains an upward velocity v @ 0.6 m / 60 seconds' i.e., 0.0328 ft. / sec.

The vertical up thrust at that instant produced by the bottom propellers is equivalent to the weight of the volume of water reduced by the vessel while rising up leaving the water surface. This volume of water works out to 0.784 (Block Co-eff) X 62.80 m (LoA) x 10.6 m (breadth) x 0.6 m (Lift attained in m) = 313.14 m^3 = **11, 058.29 cubic ft.**

The required up thrust to keep the vessel floating = Equivalent weight of water = 11,058.29 x 62.4 = **6, 90,037.23 lbs.**

Therefore, total installed hp of propellers will be Up thrust in lbs. x velocity of lift in ft. per sec / 550 hp i.e. 6, 90,037.23 x 0.0.0328/ 550 = **41.15 hp**.

4 nos. of bottom propellers may be used @ 2 on the P side and 2 on the S/B side both at bow and stern of the vessel so that each propeller generates a thrust of 6, 90,037.23 /4 = **1,72,509.30 ft. lbs**.

Each of the 4 bottom propellers will be required to generate **10.30 hp.**

❖ **Bigger vessel**:

(i) For a similar max. lift of 0.6 m. the corresponding up thrust & hp of the vertical lift propellers shall be **8,37,046.42 lbs. & 50 hp** respectively for a bigger 1,350 dwt vessel with LoA 85 m, breadth 9.5 m, max. draft 2.5 m, minimum draft 1.90 m following the above same estimation procedure.

(ii) 4 nos. of bottom propellers may be deployed @ 2 (1 on the P side and 1 on the SB side) on the stern hull bottom and at the bow hull bottom on the Port side as well as SB side so that each propeller generates a thrust of 8, 37,046.42/4 = 2, 09,261.61 ft. lbs. and corresponding hp is 12.47 hp.

❖ **Evaluation of forward propulsive thrust for sailing after attaining the reduced 'empty draft' level:**

✓ **Example with vessels like IWAI cargo vessel 'M V Rajagopalachari' of IWAI**

The max. loaded draft = 1.80 m and the minimum draft = 1.2 m.

The vessel requires a minimum depth of 2 m with a minimum safe keel clearance of 0.2 m in order to sail safely with stability at the maximum dwt of 650 tonnes. As such, the vessel can be lifted maximum by 0.6 m so as to sail on the minimum depth of 1.4 m (minimum draft 1.2m + 0.2m) with a keel clearance of 0.20 m.

We can evaluate the required forward thrust and hp of normal propellers after being lifted up by 0.6 m as below:

Here F, the buoyant force of water that the vessel has to overcome by her propulsive forward thrust equals to C_B x 10.60 m (Breadth) x 1.2 m (empty draft) m. x the buoyant pressure of water ahead where C_B is the block co-efficient of the vessel taken as 0.784.

(i) The resultant buoyant pressure by water varying proportionately with water depth all along down her draft as the vessel sails ahead works out to= Density of water x 1.2 m / 2.

In FPS Practical Units, it will work out as:

62.4 (lbs/cubic feet) x 3.936 (ft.) / 2 = 122.80 lbs per sq. feet.
Therefore, total forward thrust (F) produced by 2 propellers equals, = 122.80 x 0.784(C_B) x 34.768 (ft.) x 3.936 (ft.) = 13,174.96 lbs force.
This works out to a Horse Power equalling **F x v/ 550**, where v is velocity of the vessel in ft. per sec which is a reduced speed @ 8 km/hr. i.e. 7.28 ft./sec to sail with caution over the shoals.

Therefore, total hp = 13,174.96 x 7.28/550 = 174.39 hp.

According to this calculation, the maximum propeller power of M V Rajagopalchari will be **859.14** hp against the installed hp of 2 x 380 hp as per the Builder's manual for a max. speed of 17.5 km/hr. i.e., 15.94 ft./sec. at max. draft.

(ii) **Squat**: Vessel's speed will be very slow during this sailing forward over the critical shoals. A speed of 8 km/hr has been assumed. This is equal to 4.32 knots.
Roughly, the squat in meter is expressed by the following:
Squat (m) = 1 x C_B x v^2 / 100, v is in knots.
As such, squat = 0.784 x $(4.32)^2$ / 100 = 0.146 m. So, as long as the vessel is maintaining a safe keel clearance of 0.2 m, there is no problem with the squat.

✓ **Bigger vessels:**

(i) Similarly, for a cargo vessel of dwt 1,350 tonnes, 85 m (LoA), 9.5 m, (Breadth), 2.50 (Max. draft), 3.0 m (water depth required), max. Speed 15 km/hr. minimum draft of 1.9 m, the following is corresponding values for forward sailing hp by the normal propellers. The cruising speed, of course, during crossing the shoal with LAD down up to 2.1 m (empty draft 1.9 m + 0.2 m safe keel clearance) is reduced to 7 km/hour i.e., 6.38 ft./sec. for caution.

Forward thrust works out according to the same calculation as above = 29,602.133 lbs. and sailing **hp** at minimum draft of 1.9 m works out to = **343. 38**.

(ii) **Squat:** Vessel's speed will be very slow during this sailing forward over the critical shoals. A speed of 7 km/hr has been assumed. This is equal to 3.78 knots.

Roughly the squat in meter is expressed by the following:
Squat (m) = 1 x C_B x v^2 / 100, v is in knots.
As such, squat = 0.784 x $(3.78)^2$ / 100 = 0.112 m
So, as long as the vessel is maintaining a safe keel clearance of 0.2 m, there is no problem with the squat.

Observations and recommendations:

It is observed that for a manoeuvring system for such an extremely low draft operating conditions at the minimum draft, the Pump-Jet Propulsion System is the best solution. In The Netherlands, many inland Tankers 2500-3000 dwt sail with the help of 2 x 500 hp Pump- Jet propulsion units each. The Pump-Jet propellers are built on the hull flushing with the bottom requiring a minimum immersion of 150 mm to 750 mm. These thrusters can provide full thrust in all directions. A minimum of 4 or more bottom pump jet propulsions may be built at the hull bottom symmetrically at the corners of the bow & stern depending on the max. capacity of the vessel and the max. lift required for lifting up to the vessels' empty daft while crossing the shallow stretches as discussed above. This refers to vessels without requiring any normal propeller at the stern.

During normal plying of the vessel at her max. draft without requiring any lift to clear any shoal, the bottom pump jet propellers will be kept inoperative except the pair at the stern may be operated being rotated in such a way as to generate only a horizontal propelling thrust to the vessel for sailing with her design speed.

At the time when the vessel cannot sail ahead further due to inadequate LAD, all pump jets are to be made operational so as to provide the full vertical up thrust required to lift the vessel vertically up to the reduced required draft limited up to the minimum draft keeping in view the safe stability of the vessel. Once reduced draft up to the minimum draft to clear the shoal ahead is reached, the stern jet propulsion pair only may be given a slight tilt by rotating the pump-jet by a small degree anticlockwise from the horizontal position to produce a small horizontal component to generate a forward thrust to propel the vessel very slowly so as to cross the shallow stretch ahead with caution while the remaining pump jets will provide the required vertical up thrust to keep the vessel lifted as required. The duration of such crossing the shoals will be very short like several minutes at a stretch only on the NWs. This is, of course, for vessels built with only bottom propellers or bottom Pump Jet propellers without any conventional stern propellers.

In Europe and other countries, this jet propulsion system instead of normal stern propeller system is in use since long for various types of ferry,

passenger and cargo/container/tanker inland vessels. Thrust as high as 600 hp may be produced by a single jet propulsion unit. Building new inland vessels with this type of Bottom Propellers or jet propulsion system as described above or installing the system additionally in our existing vessels will not attract any major additional cost.

Once the above facilities are installed in the existing and the future inland cargo vessels to sail on NWs as proposed above in details, a minimum LAD of 1.4 m only will be required for the safe movement of a 650-dwt vessel from Haldia to Prayagraj throughout the lean season. This will save a huge amount of expenditure by the Govt. towards bandalling and dredging as the LAD committed will reduce to only 1.4 m instead of 2 m for 650 dwt vessels and likewise to a LAD of 2 m to 2.40 m only for bigger vessels of 1,500 - 2,500 dwt capacity to sail on almost the entire length of the NW 1 & NW 2 and other NWs throughout the year instead of a LAD of 3.0 m now being maintained presently.
This will, undoubtedly, enhance the credibility of IWT on NWs compared to other modes.

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Vessels and activities of Mech. Marine / I.V. Act

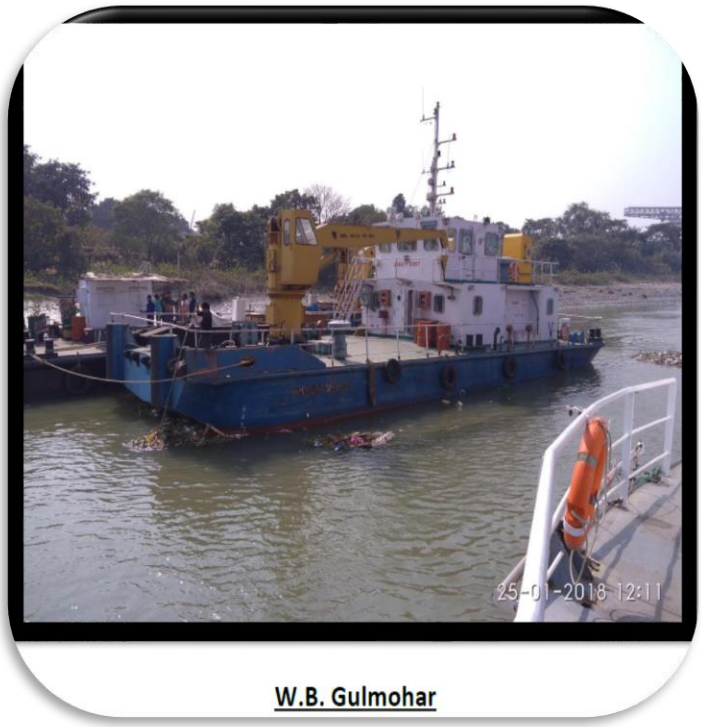
Inland Waterways Authority of India (IWAI) (Authority) was constituted by an Act of Parliament i.e., THE INLAND WATERWAYS AUTHORITY OF INDIA ACT, 1985 (No. 82 of 1985). This Act provided for the constitution of an Authority for regulation and development of Inland Waterways for purposes of shipping and navigation and for matter connected therewith or incidental thereto. Amongst the various functions and powers of the Authority are to carry out surveys and investigations for the development, maintenance and better utilisation of the national waterways; provide or permit setting up of infrastructural facilities of national waterways; carry out conservancy measures and training works and do all other acts necessary for the safety and convenience or shipping and navigation and improvement of the national waterways. Besides these other functions and powers are provided in the IWAI Act. For giving impetus to shipping and navigation, **111 waterways (106 new)** were declared by THE NATIONAL WATERWAYS ACT, 2016 (No. 17 of 2016). For the overall development of IWT sector throughout the country various works carried out are survey and investigations, river conservancy measures to provide certain minimum least available depth (LAD) and also to provide the required dimensions for the fairway to facilitate navigation of inland vessels in National Waterways.

In order to undertake these works/ activities in the inland waters, the key requirement is of different kind of **inland vessels** such as survey launches for carrying out thalweg survey, detail survey, bank to bank survey. Cutter suction dredgers, hydraulic surface dredgers and amphibian dredgers supported by tugs / workboats and accommodation boats to provide and maintain the fairway. Tugs / workboats are also required for towing of vessels and also assist vessels which are grounded or in distress etc. Floating jetties (terminal pontoons) for providing terminal facilities, crane pontoons fitted with suitable crane for handling of cargo at the terminals. All the above works are carried out to facilitate cargo vessels for transportation of cargo; Ro-Ro vessels for transportation of vehicles from one shore to another; Ro-Pax vessels to facilitate transportation of vehicles and passengers.
IWAI has procured vessels, over the years and the fleet of IWAI vessels is given below:

Cutter Suction Dredgers

There are 13 numbers of cutter suction dredger units deployed for dredging and maintaining the LAD.7 number of dredging units are at Patna (RO) having jurisdiction from Shaibganj to Allahabad. A typical cutter suction dredger unit comprise of one workboat, one accommodation boat and one anchor pontoon.

9 numbers of CSD units are deployed in Allahabad to Haldia stretch of NW-1; 2 numbers at Kolkata RO from Sahebganj to Haldia; 3 numbers at Guwahati RO and 1 number at Kochi RO.



W.B. Gulmohar

Workboats/ Tugs

There are 24 number of Work boats and tugs deployed in NW-1,2 & 3 of which 11 numbers are attached with Cutter Suction Dredgers for various purposes such as assisting anchor pontoons, towing house boats and cutter suction dredgers to the desired location whereas, 13 numbers are deployed for other purposes such as assisting other vessels passing by the waterway, towing, pushing and salvage operations in national waterways.

Accommodation boats

IWAI has 14 numbers of accommodation boats of which 12 numbers are attached with CSD in NW-1 & 2, for accommodating the working crew of CSD.

Anchor Pontoon

IWAI has 12 numbers of Anchor Pontoons of which 4 numbers are placed at RO Patna, 3 at RO Kolkata and RO Guwahati each and 2 at RO Kochi. These are used for positioning dredger swing winch anchors during dredging works.

Hydraulic Surface Dredgers

There are 3 numbers of Hydraulic Surface dredger of which 1 deployed at RO Patna and 2 at RO Guwahati

Amphibian Dredgers

IWAI Procured 3 numbers Amphibian dredger of which 2 numbers are deployed at RO Kolkata and 1 at RO Kochi.

Survey Launches

There are 19 numbers of Survey Launches for conducting the thalweg survey, detailed survey, bank to bank survey etc.

Floating Jetties

There are 34 numbers of Floating Jetties deployed at various terminals of National Waterways for assisting terminal operations such as berthing of vessel, passenger movement, cargo and logistics transfer.

Crane Pontoons

IWAI has 10 numbers of crane pontoons deployed at NW-1 & 2. These are steel pontoons with cranes mounted on deck for various lifting and hoisting purposes required during loading/unloading operations of materials.

RO-RO Vessels

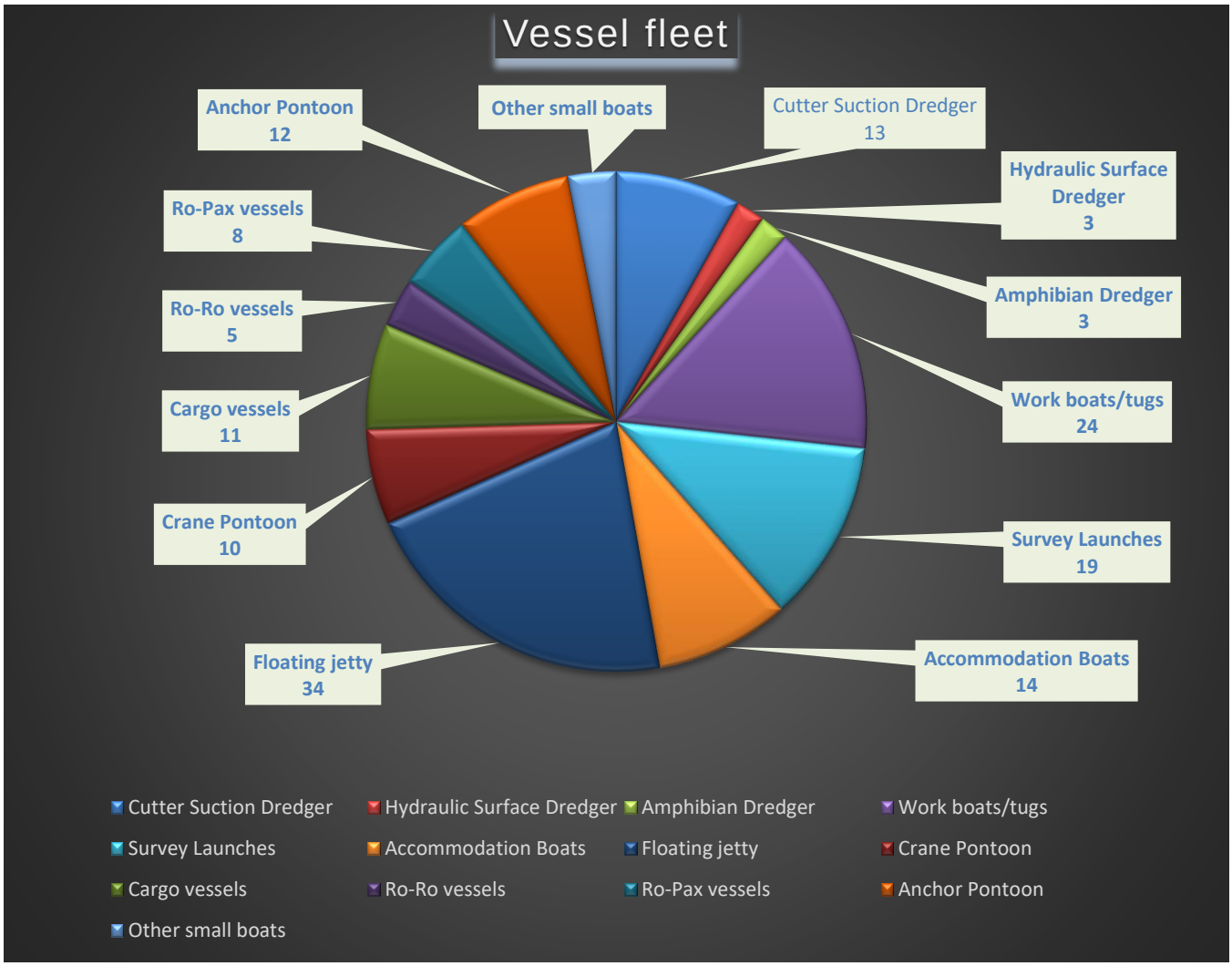
IWAI vessel has 2 numbers RO-RO Vessels which are designed for 15 TEU container & are being utilized between Bolgatty Jetty and Willington Island.

Ro-Pax Vessels

IWAI has 11 numbers of Ro-Pax vessels which are used for carrying bikes, cars and trucks along with passengers through waterways. Three Ro-Pax vessels were procured during the period 2016 to 2018 and earlier same were operated in NW-2. Two Ro-Pax vessels designed for 8 trucks and 100 passengers. One Ro-Pax vessels designed for 12 trucks and 200 passengers. 8 no. Ro-Pax vessels (4 for NW-1 and 4 for NW-2) were constructed and delivered in March 2020.

Cargo Vessels

IWAI has 11 numbers of Cargo vessels consisting of Oil tanker 300T, MPV 600T, 4 general cargo vessels (300T) of which 2 has forward ramps for quick loading/unloading.
IWAI has procured 2 nos. tug barge flotilla in 2018 consisting of 2 dumb barges of 1000 tons each with high powered tug. Also, IWAI has procured 2 nos. self-propelled cargo vessels of 2000 tones capacity each in 2018.



Other Activities of Mech-Marine are Given Below:

1) Annual and dry-dock repairs:

Existing vessel fleet of IWAI consisting of 162 nos. of vessels in NW-1, 2 & 3 including different types of vessels. In order to maintain these vessels in operational condition, projects for repair of vessels including drydock & afloat repair of vessels are considered annually.

2) Operation and Maintenance of vessels:

IWAI is operating the vessels in National Waterway-1 from Allahabad to Haldia stretch, NW-2 from Bangladesh Border (Dhubri) to Orium and NW-3 for a stretch of 205 kms for which RO wise project for Annual operation and maintenance of IWAI vessels is sanctioned every year.

3) Manning:

The Mech-Marine department is currently working with a regular staff of 18 nos. officials Directors 2nos, Deputy Director 3 nos., Assistant Director 5 nos. and Technical Assistant 8 nos. in Head office and regional offices. There are vessel staff also on regular basis including contingent staff for operating the IWAI vessel fleet. Moreover, IWAI recruits' technical manpower on need basis through outsourcing.

4) Procurement of vessels/ dredgers:

Mech-Marine department not only maintains and regulate the existing vessel fleet but also procure new vessels on need basis for different waterways. IWAI is maintaining LAD, which was maintained for various stretches of NW-1 during 2019-20 as given below:

Haldia – Farakka stretch	(560 km)	2.6 m to 3.0 m
Farakka – Barh stretch	(400 km)	2.1 m to 3.0 m
Barh – Ghazipur stretch	(290 km)	1.5m to 2.5 m
Ghazipur – Varanasi	(140* km)	1.0 m to 2.20 m

The LAD ranging of 0.8 -1.5 m was naturally available in Varanasi-Allahabad / Prayagraj (230 km) stretch of NW-1.

The above-mentioned LAD is being maintained departmentally as well as on contract basis, for conducting dredging works departmentally Cutter suction dredgers along with supporting ancillary vessels are procured from time to time.

The latest procurement of vessel in IWAI is 8 nos. Ro-Pax vessels for NW-1 & 2 built by CSL, Kochi and 2 nos. Ro-Ro vessels for NW-3.

5) Regulations Inland Vessels Act, 2021, Inland Vessels Rules, 2022:

Based on the recommendation of Maritime State Development Council in its 15th meeting. IWAI has undertaken the exercise of rewriting of the Inland Vessel Act, 1917. The work was assigned to Inland Register of Shipping in 2015 and after two rounds of the preparation of draft cabinet notes the Inland Vessels bill, 2021 was finalised. Stakeholders meeting were also held in New Delhi, Mumbai, Kolkata and Noida during 2015 to 2016. Later, this exercise was carried out in the year 2016 to 2021 and the revised draft cabinet note was made and inter-ministerial consultation were done. The Draft Act were sent to all State Governments and Union Territory. Out of which 13 states responded with their suggestions/comments, replies were made accordingly. The Draft Bill was subsequently submitted to Prime Minister Office (PMO) and their comments were also suitably addressed. Draft Cabinet note was approved for the Inland Vessels Act, 2021 was approved on …… and sent to both houses of the parliament. The Draft Inland Vessel Bill was introduced by Hon'ble Minister of POS&W on 22-07-2021 in Lok Sabha and 02-08-2021 in Rajya Sabha.

❖ Inland Vessel Rules, 2022

On Enactment of Rules, 2021 the same was published in E-gazette on ……. date for information. 10 nos. Draft Inland Vessel Rules, 2022 were prepared through Indian Register of Shipping. These rules were sent to all State Governments and Union Territories and other stake holders. The first Stake holders meet was held on 13th & 14th Sep. 2021 and the suggestions given by various stakeholders were suitably addressed. The 2nd stakeholder meeting was held on 07-12-2021. The Draft Inland Vessels Rules, 2022 were finalised and sent to the MoPS&W on 10.01.2022 further process for enactment of the rules, appointment of dates is ongoing.

❖ There are 10 rules covered under Inland vessels rules 2021:

- ✓ Rules for Design and Construction of Inland Vessels Rules 2021.
- ✓ Rules for Survey and Certification of Inland Vessels Rules, 2021.
- ✓ Rules for Registration and other technical details of Inland Vessels Rules, 2021.
- ✓ Rules for Manning of Inland Vessels Rules, 2021.
- ✓ Rules for Crew and Accommodation of Inland Vessels Rules, 2021.
- ✓ Rules for Safe Navigation, Communication and Signals of Inland Vessels Rules, 2021.
- ✓ Rules for Life Saving Appliances of Inland Vessels Rules, 2021.
- ✓ Rules for Fire Fighting Appliances of Inland Vessels Rules, 2021.
- ✓ Prevention and Containment of Pollution of Inland Vessels Rules, 2021.
- ✓ Rules for Insurance etc of Inland Vessels Rules, 2021.

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Employee's Corner

- Sh. Sanjay Bandopadhyaya, IAS assumed the charge of Chairman, IWAI on 06-December-2021.
- Sh. Uday Kumar, Accounts Assistant has joined IWAI, Noida on 13-October -2021.
- Sh. Guruvilli Prasad Rao, J.H.S transferred from Vijayawada to Shilchar on 30-October-2021.
- Sh. Saraswati K., S.O. transferred from Noida to Kochi on 15-December-2021.
- Sh. Anand Kumar, Technical Assistant transferred from Noida to Patna on 10-December-2021.
- Sh. Gautam Haldar, J.H.S. transferred from Kolkata to Guwahati on 29-Nivember-2021.

For F.Y. 2021-22 following subjects be taken up:

- January to March - Project Management and NW.