पत्तन,पोत परिवहन और जलमार्ग मंत्रालय
MINISTRY OF PORTS, SHIPPING AND WATERWAYS
GOVERNMENT OF INDIA

SAGARMALA
PORT-LED PROSPERITY

MARITIME AMRIT KAAL
VISION 2047

सत्यमेव जयते

प्रधान मंत्री
Prime Minister

MESSAGE

I am pleased to learn about the initiative by the Ministry of Ports, Shipping & Waterways to prepare a comprehensive Amrit Kaal Vision 2047 focused on the transformation of India's maritime sector.

India's rich maritime heritage has witnessed many cultural and commercial hubs thriving along our coasts, establishing connections with the world even in ancient times. Inspired by such an illustrious history, our nation is taking confident strides as a significant player in the Blue Economy of the region and the world.

The nation has witnessed our comprehensive endeavours in the maritime sector, particularly in the realm of port-led progress. We have adopted the 'Ports for Prosperity' approach to enhance the connectivity and efficiency of our ports.

India's maritime industry is making comprehensive progress due to a range of policy initiatives and reforms that are furthering 'Ease of Doing Business', creating state-of-the-art infrastructure of global standards, ensuring new age multi-modal connectivity.

The Maritime India Vision 2030 highlighted important themes and initiatives in ports, shipping, and waterways to stimulate the growth of the nation's maritime sector. Building upon this, the Amrit Kaal Vision 2047 underlines efforts to realise the holistic vision for India's maritime sector.

This vision recognizes the vital importance of the Blue Economy as one of the fundamental pillars of economic growth. It also outlines a roadmap for sustainable development related to oceans, rivers and coastal regions, while also focusing on equity, inclusivity and innovation.

The Amrit Kaal Vision 2047 will play a key role in tapping into the potential of India's 7,500-kilometer coastline, its extensive network of inland waterways, and the coastal districts. This vision will serve as a guiding force in shaping India's maritime sector and bolster the nation's endeavours to build a strong, inclusive and self-reliant India.

Working on fulfilling the Amrit Kaal Vision 2047, we will strengthen India's position as a leading global maritime player that boosts peace, progress and prosperity for the whole world.

(Narendra Modi)

New Delhi
आश्विन 22, शक संवत् 1945
14th October, 2023

सर्बानंद सोणोवाल
SARBANANDA SONOWAL

मंत्री
पत्तन, पोत परिवहन और जलमार्ग एवं आयुष
भारत सरकार
Minister
Ports, Shipping & Waterways and AYUSH
Government of India

FOREWORD

The maritime sector plays a crucial role in the growth and development of a country. The Ministry of Ports, Shipping and Waterways, Government of India, has constantly been taking concrete measures which are aimed towards adding pace to capacity building and enhancing the efficiency of the Indian maritime sector. After already having progressed significantly with the implementation of Maritime India Vision 2030 which was launched in 2021, we have formulated AmritKaal Vision 2047 to be a broader, more comprehensive roadmap for maritime transformation in the next 25 years.

To shape India's capability in the maritime sector into a robust engine of the nation's development, the Ministry has given top priority to improving the efficiency of major ports by undertaking policy initiatives and reforms supporting trade and ease of doing business, creation of modern and sustainable infrastructure of global standards, promoting logistics by establishing multimodal terminals along inland waterways, expansion in ship-building & recycling activities and various other measures aimed at harnessing the immense potential of the country's coastline to the fullest.

The impact of these measures can be seen on the overall maritime ecosystem spread across ports, shipping, and waterways sectors. The notable areas include increased efficiency of Major Ports, policy measures and reforms aimed to support trade and Ease of Doing Business, multi-modal connectivity for logistic movement in the country through inland waterways, initiatives to attract flagging of vessels in India, and promoting ship repair, ship recycling and shipbuilding in India in line with Hon'ble PM's vision of Aatmanirbhar Bharat.

The Government of India's vision of 2030 has highlighted Blue Economy as one of the 10 core dimensions of economic growth. To drive growth in the maritime sector and promote the GoI's vision, the Ministry of Ports, Shipping and Waterways has prepared the AmritKaal Vision 2047. For preparation of the roadmap & implementation plan, extensive consultations and brainstorming discussions have been undertaken with both public & private sector stakeholders. Further, multiple international benchmarks have been analyzed for policies, acts, and other regulatory provisions. Based on these consultations and assessments, the AmritKaal Vision 2047 has identified more than 300 actionable points across ports, shipping & waterways sectors which will be crucial for driving the Indian maritime sector's growth and promoting India's Blue Economy.

(Sarbananda Sonowal)

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श्रीपाद नाईक
राज्य मंत्री
पत्तन, पोत परिवहन, जलमार्ग एवं पर्यटन
भारत सरकार

SHRIPAD NAIK
Minister of State for
Ports, Shipping, Waterways & Tourism,
Government of India

Azadi Ka Amrit Mahotsav

Message

The maritime sector plays a crucial role in the growth and development of a country. The Ministry of Ports, Shipping and Waterways, Government of India, has constantly been taking concrete measures since 2014 which are aimed towards adding pace to capacity building and enhancing the efficiency of the Indian maritime sector.

Maritime sector plays a vital role in economic growth and recognizing the potential it presents the Ministry of Ports, Shipping and Waterways has been working continuously to promote the sector towards realizing the numerous opportunities the sector has on offer.

Amrit Kaai Vision 2047, encapsulating multi-dimensional growth initiatives across key themes has been prepared undertaking numerous consultations with stakeholders across industry and the government - bringing together a compilation of 300+ key initiatives identified as part of the development roadmap for India's ports, shipping, waterways while paving way for holistic development of India's costal districts and beyond.

Adding to the Ministry's marquee initiatives such as Sagarmala, Maritime India Vision 2030, the Amrit Kaai Vision 2047 sets a larger vision, targeting developments across areas such as world class port infrastructure, green shipping, promotion of shipbuilding and ship recycling sector while focusing institutional capacity building to promote centres of excellence across specializations in maritime sector aimed at driving growth through innovation.

The Amrit Kaai Vision 2047 with its charted development plan for the coming decades, is India's leap towards becoming a global maritime hub.

Snaik

(Shripad Naik)

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राज्य मंत्री
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय
भारत सरकार

सत्यमेव जयते

Minister of State
For Ports, Shipping and Waterways
Government of India

शांतनु ठाकुर
SHANTANU THAKUR

MESSAGE

Date:- 12-10-2023

Adding another milestone to our continued efforts towards development of India's vast maritime space, after extensive deliberations and consultations with stakeholders spanning across central ministries, state government departments, industry representatives from the private sector and more, the Ministry of Ports, Shipping & Waterways (MoPSW) has prepared the AmritKaal Vision 2047.

The Ministry of Ports, Shipping and Waterways, Government of India, has been focused at measures aimed at adding pace to capacity building and enhancing efficiency of the Indian maritime sector.

The AmritKaal Vision 2047 identifies 300+ initiatives identified across key themes, such as those to promote safe, sustainable & efficient maritime operations and infrastructure, initiatives across ports, shipping and waterways have been identified as part of AmritKaal Vision 2047, aimed at holistic development of India's maritime sector.

India's maritime interest is key to support the nation's economic growth with heavy reliance on the ocean, and with this vision document we foresee a cohesive maritime/ocean governance framework to ensure communication, coordination and clarity between multiple stakeholders and multiple level of administrative authorities and coastal communities, for achieving better outcomes.

I am hopeful that the AmritKaal Vision 2047 will guide the way ahead towards a robust maritime sector contributing to the country's economic and social growth and towards placing India among the leaders in global maritime sector.

(Shantanu Thakur)

टी.के.रामचन्द्रन
T.K.Ramachandran

सत्यमेव जयते

सचिव
SECRETARY
भारत सरकार
GOVERNMENT OF INDIA
पत्तन, पोत परिवहन और
जलमार्ग मंत्रालय
MINISTRY OF PORTS,
SHIPPING AND WATERWAYS

Preface

The **Amrit Kaal Vision 2047,** crafted by the Ministry of Ports, Shipping & Waterways (MoPSW), stems from extensive consultations with stakeholders across central ministries, State Government departments, private sector, financial institutions, and academia. Building upon Maritime India Vision 2030 (MIV 2030), it not only advances existing initiatives but also introduces new ones for the creation of world-class ports, facilitation of inland water transport & coastal shipping, and the advancement of a green and sustainable maritime sector. The report delineates aspirations and initiatives in Logistics, Infrastructure, and Shipping, aligning with key maritime themes for the promotion of the 'Blue Economy' in India.

For preparation of the roadmap & implementation plan, 13 Working Groups (WG) were constituted for deliberations wherein more than 150 consultations with public and private sector stakeholders were held. Further, more than 50 international benchmarks for infrastructure, policies, acts and other regulatory provisions were analyzed apart from reviewing various Vision documents of leading international maritime nations. Based on the above, the **Amrit Kaal Vision 2047** delineates more than 300 initiatives/actionable points for ports, shipping and waterways.

Port sector initiatives focus on developing safe, smart, secure and sustainable ports in India by promoting the use of technology, digitalization and renewable energy. Initiatives have also been proposed for developing world class ports in India by increasing capacity of existing ports, developing new ports, developing maritime clusters and by enhancing efficiency of ports with incorporation of latest technology in operation.

Initiatives identified for **shipping sector** focus on increasing the Indian flagged fleet and reducing dependency on foreign flagged vessels. The prominent theme of promotion of ship building, recycling & repair in India is in line with Hon'ble PM's vision of Aatmanirbhar Bharat. Other areas in focus include strengthening India's global maritime presence and providing world class education, research, and training facilities to the Indian seafarers.

For the **Inland Waterways sector** - promoting ocean, coastal & river cruise sector, promoting multi-modal connectivity at the ports and subsequently improving the modal share of coastal shipping & inland waterways have been the target areas.

Based on extensive stakeholder consultations, best-practice bench-marking, policy assessment and analysis, action items classified into 11 key themes were identified. These

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initiatives under the **Amrit Kaal Vision 2047** are aimed at enhancing overall performance and efficiency of the Indian maritime sector and at unlocking the potential of Blue Economy in India - making it a significant contributor to India's overall economy.

The **Amrit Kaal Vision 2047** took shape because of the vision and conviction of our Hon'ble Prime Minister who has always encouraged the pursuit of excellence in striving towards Aatmanirbharta. I am grateful to NITI Aayog for assigning us the task of preparing Amrit Kaal Vision 2047. I also thankfully acknowledge the support provided by the members of Committee on 'Logistics, Infrastructure & Shipping- Promotion of Blue Economy'- Advisor (Transport) NITI Aayog and representatives from MEA, Dept. of Fisheries, Ministry of Steel, Ministry of Finance, Department of Commerce, Ministry of Defence (Indian Navy), DPIIT, MoEFCC, MSME, HRD apart from representatives from Coastal States & UTs.

I am grateful to the coordinators of the 13 Working Group committees: DG Shipping, Vice Chancellor IMU, Chairman CoPA, Chairman VoCPA, Chairman JNPA, Managing Director IPA, Chairman SMPA, Chairman DPA, CMD KPL, Chairman ChPA & Chairman & Managing Director CSL, and Chairman, MbPA - for their support and insights on various aspects of India's maritime sector (ports, shipping & logistics ecosystem) both at the Central and State levels.

None of this would have materialized without the unflinching support and guidance of our Hon'ble Union Minister of PSW & AYUSH- Shri Sarbananda Sonowal, who inspired us and guided us in our endeavour to prepare the action plan. We are also thankful for the suggestions and inputs received from Hon'ble MoS, Shri Shantanu Thakur and Hon'ble MoS, Shri Shripad Naik, Finally, we express our gratitude to the Blue Economy Team at MoPSW for their remarkable efforts in working relentlessly towards shaping this action plan.

I thank all the members for their support and contribution and hope that this document would pave the way for future successes.

(T. K. Ramachandran)

New Delhi
October 10, 2023

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EXECUTIVE SUMMARY

Amrit Kaal Vision 2047 - Quantum Leap to India's Global Maritime Leadership

The country's maritime sector comprising of 12 Major Ports and more than 200 non-major ports along the 7,500 kms of the coastal line plays a crucial role in the growth of the country's economy. The Government of India's vision of 2030 has highlighted Blue Economy as one of the 10 core dimensions of economic growth. To address challenges & improve coordination, Blue Economy Coordination Committee (BECC) constituted under chairmanship of Vice Chairman, NITI Aayog. BECC identified 6 functional clusters for leveraging Blue economy. Within these clusters, Logistics, Infrastructure and Shipping (including Transshipments) cluster is being driven by Ministry of Ports, Shipping & Waterways.

The Amrit Kaal Vision 2047 for Logistics, Infrastructure and Shipping (including Transshipments) has been prepared through more than 150 consultations with public and private sector stakeholders. These stakeholders comprised of representatives from concerned Central Government Ministries and Departments, Major Port Trusts, representatives from shipping industry, representatives from financial institutions, State Maritime Boards & other state departments, representatives from academia etc.

In addition to the consultation, the preparation of the action plan involved assessment of more than 50 international benchmarks analyzed for policies, acts and other regulatory provisions. Based on the various consultations and assessment, the Amrit Kaal Vision 2047 has identified more than 300 actionable points. These action points will leverage the recent development of the National Logistics Policy (NLP) and the PM Gati Shakti National Master Plan (PMGS-NMP).

Guiding principles

The preparation of the Amrit Kaal Vision 2047 for Logistics, Infrastructure and Shipping (including Transshipments) cluster was driven by the following key principals:

1. Assessment of the current landscape for identification of gaps and find actionable points to fill in the gaps for achieving the respective targets
2. Analysis of international best practices across infrastructure, capacity building, institutional framework and regulatory environment for developing the actionable points
3. Developing framework for improving innovation and financing in the maritime sector
4. Driving the agenda for promoting Atmanirbhar Bharat and sustainability in the maritime sector
5. Defining the timeline for the implementation of the actionable points

Key themes

The Amrit Kaal Vision 2047 Action Points have been defined across 11 key themes which are provided as below. A total of **300+ initiatives** along with their action plan have been identified across these themes.

1. Lead the World in Safe, Sustainable & Green Maritime Sector

Government of India's vision is to reduce emissions from maritime sector in line with IMO GHG reduction strategy and promote the development of zero and low-emission solutions. In addition, as per COP 26 the climate targets have been set with limiting the global warming well below 2 degrees Celsius and efforts will be made to limit temperature increase to 1.5 degree Celsius above pre-industrial levels.

The major ports in the country have taken multiple initiatives such as increasing the adoption of solar and wind energy, providing shore power to port crafts and using electricity powered port equipment. In addition, the ports in the country are introducing safety measures.

Apart from ports, the shipping sector has also witnessed increased adoption of vessels driven by alternate sources of fuels. These vessels are currently in the various stages of development and mainly use sources such as batteries, solar energy, LNG etc.

In order to promote and lead the world in safe sustainable and green maritime sector, initiatives for both ports and shipping have been identified as part of the Amrit Kaal Vision 2047 action plan. There are 22 initiatives identified under the theme, of which the key initiatives identified for 2047 for promoting sustainability in port include developing a strategy to make all the major ports carbon neutral, phased adoption of alternate fuels such as LNG, Hydrogen/Ammonia and biofuels for port vehicles. In addition to ports, key initiatives have also been identified for promoting sustainability in shipping. These initiatives include setting up De-Carbonization Cell at DG Shipping, launch of over 20 pilot projects under India's Green maritime shipping program, providing incentives foster development of low carbon vessels and retrofits in existing vessels, extend PLI scheme to support green maritime technology development in India etc.

2. Promote Ocean, Coastal & River Cruise Sector

India hasn't reached its potential when it comes to Maritime Tourism. While Cruise Industry is growing at steady rate, it is still subdued with various barriers. Ferry market on the other hand is limited to few regions only. An attractive and stable regulatory policy framework in line with international standards is most essential for attracting tourists and cruise lines in India. Further, suitable business modality shall be needed to connect Indian coastal districts through a low-cost water-based transport solution.

There are 25 initiatives identified under the theme, of which the key initiatives for promoting ocean, coastal & river cruise sector in India include infrastructure initiatives such as developing cruise terminals and marinas along the East & West Coast of the country and develop inland waterways for river cruises. Apart from infrastructure, policy initiatives are also proposed which include relaxing cabotage rules, extending e-visa facility to five ports, fiscal incentives in terms of custom duty exemption on consumables, reduction in GST on tickets etc. Other initiatives include updating the Standard Operating Procedures for cruise vessels in line with international standards, establishing a centralized fund under SDCL with capital to be provided by major ports for subsidizing the Ro Ro/Ro-PAX operations, capacity building through establishing training academies etc.

3. Enhance modal share of coastal shipping & Inland Water Transport

The coastal shipping and inland waterways sector in India are still in its nascent stage compared to other countries and other modes of transport. Despite the fact that water transportation is cost-effective, sustainable and environment friendly mode of movement, India is not able to fully utilize its 7,500 km coastline and over 14,000 km of navigable inland waterways.

There are 46 initiatives identified under the theme, of which the key initiatives for enhancing modal share of coastal shipping and inland water transport include creation of port based agglomeration centers, creation of coastal berths near coast based production/demand centers, Road/ Rail/ IWT connectivity/ expansion projects, reduction in port dues and terminal charges, fiscal incentives such as allowing input tax credit on bunker fuel and spares purchased from various states, reduction of GST for multimodal transportation etc., operationalize 50 waterways by 2047, introduction of low draft vessel design with a possible tug-barge combination etc.

4. Promote Maritime Cluster

Maritime clusters as identified for Amrit Kaal Vision 2047 Action Plan include creating industrial clusters along the ports which include DPA, VoCPA, SMPA (Haldia) and also at Andaman & Nicobar Islands. The key initiatives for creating the maritime industrial clusters include identification of models with private sector for developing the industrial clusters, identification of focus commodities for the industrial clusters, adoption of investor friendly policies etc.

In addition to industrial clusters, development of three islands namely Greater Nicobar & Port Blair at Andaman and Nicobar Island can be developed as a bunkering hub and Ship repair respectively. In addition, Kalpeni Island can be developed for Vessel Spares and Stores. There are 30 initiatives identified under the theme, of which the key initiatives for developing these islands would involve infrastructure, institutional and policy/regulatory initiatives.

5. Promote maritime professional services

India holds a strong position as a maritime hub and as the country continues to invest, the maritime industry continues to expand. This would require additional capital for implementation. In addition to the flow of credit, there is a need for fiscal incentives to be provided to the Indian maritime sector. Further, as the sector expands, more services shall be required in the sector due to multiplicity of disputes and expeditious settlement of insurance claims in the sector.

There are 28 initiatives identified under the theme 'Offer maritime professional services'. To promote ease of financing in the maritime sector, as part of initiatives it is proposed to establish a Maritime Development Fund to provide low-cost and long-term capital in the sector. In addition, the initiatives related to establishment of an international level maritime arbitration center, expeditious insurance claim settlement, and provision of fiscal incentives in terms of direct & indirect taxes in the maritime sector shall also be covered.

6. Become a global player in Shipbuilding, repair & recycling

India needs a strong ship building eco-system with adequate infrastructure and policy enablers to become a leader in the Ship building, repair and recycling industry. Policy measures pursued by other key shipbuilding nations suggest that each country has pursued a mix of fiscal & non-fiscal incentives for encouraging development & growth of shipbuilding industry. Similar incentives are to be introduced in Indian industry to keep pace with leading nations.

As part of Amrit Kaal Vision 2047 Action Plan, a total of 17 initiatives have been identified for shipbuilding and repair and ship recycling. The initiatives for shipbuilding and repair include extending the policy for shipbuilding for 5-10 years beyond the end of Financial Year 2025-26, promoting Atmanirbhar Bharat provisions (such as post 2023 only Indian Flagged Vessels to be allowed to serve PSU/ Govt. requirements), grading of shipyards based on technical capacities, simplification of custom procedures for import of vessel spares etc. In addition to shipbuilding and repair, initiatives have been identified for ship recycling which include expansion of Alang Shipyard, leveraging vehicle scrapping policy, developing new ship recycling locations at Andhra Pradesh, Odisha and West Bengal to cater to the markets in South East Asia etc.

7. Develop World Class Education, Research & Training

In the present scenario, the maritime education and research ecosystem in the country operates on standalone basis. There is non-availability of a platform to bring together the elements of maritime education and research, which involve training, faculty, etc. to drive the innovation in the maritime sector. The capabilities in the maritime sector in the country can be enhanced through developing an innovation ecosystem.

There are 39 initiatives identified as part of Amrit Kaal Vision 2047 of which, the key initiatives focus on creating an Innovation Ecosystem in the country to promote world class education, research and training in the maritime

sector. These initiatives mainly include promoting setting up of incubators and accelerators in the country for promoting startups in the maritime sector, setting up of Maritime Knowledge Clusters to promotive collaborative approach for research in maritime sector, establishing a Center of Excellence for Multimodal Logistics at IIM, Ahmedabad and IIFT, Delhi, establish partnerships with leading international maritime training institutes, standardization of port tariff structure across all the ports, reduce the time of professorship for faculties at maritime institute etc.

8. Strengthen India's global maritime presence

Building partnership and enhancing maritime cooperation is one of the important steps for India to grow its global stature as a maritime power. There are 43 initiatives identified as part of Amrit Kaal Vision 2047 Action Plan of which, the key initiatives focus on strengthening our global maritime presence which includes dedicated IMO cell in India, appointment of a permanent representative at IMO headquarters, London, implementation of BIMSTEC Master Plan, creating a robust BIMSTEC institutional structure to ensure implementation of regional projects in a coordinated & timely manner etc.

9. Develop World Class next generation ports

India has 12 major ports and over 200 notified non-major ports along its 7,500+ Km long coastline and sea islands. The ports are critical to Indian economy as they facilitate EXIM and coastal trade. The total cargo handled at Indian Ports (major and non-major) increased to 1319.97 million tonnes in 2019-20 from 1281.78 million tonnes in 2018-19 reflecting an increase of 3.0% during 2019-2020. India's major ports handled around 53.4% of the cargo handled at Indian ports.

There are 42 initiatives identified as part of Amrit Kaal Vision 2047, of which the key initiatives focus on developing world class next generation ports which include developing port clusters involving major and non-major ports with capacities more than 300 MTPA, creation of deeper drafts (18-23 m) at ports, developing transshipment hub, developing two new major ports, reduce vessel related charges, increase private sector participation through implementation of projects under PM Gati Shakti – NMP and Asset Monetization Plan etc.

10. Enhance Efficiency through Technology & Innovation

Maritime sector which carries ~90% of international cargo volume has seen technology advancement, innovation and transformation with the aim to bring in efficiency in operation, cost optimisation and ease of doing business. Covid-19 crisis has further underlined the critical role of digitalisation in functioning and operation of maritime supply chains across the world. It is therefore critical and essential that maritime sectors in India also improve their position in respect of technological innovation, advancement and integration.

As part of Amrit Kaal Vision 2047, a total of 17 initiatives are identified of which, the key initiatives includes implementing technology initiatives such as improving operational efficiency through E-gate 2.0 at all ports based on computer vision & OCR technologies, Drone based inventory management, Just-in-time systems at all ports, Automation of mobile harbor cranes, pilotage, mooring & anchorage etc., port planning & optimization initiatives such as digital twin for port and systems, advanced analytics-based yard management, automated allotment of berths using AI/ ML etc., establish digital center of excellence to do research for implementation of upcoming technologies in the maritime sector etc.

11. Enhance India's Tonnage

The growth of Indian-flag shipping tonnage has not been able to keep up with the pace of Indian trade needs. The number of ships under Indian flag has grown over the years but the share of Indian fleet as a percentage of the world's fleet remains close to 1% whereas leading nations such as China and Singapore have a share of 5% and 6.5% respectively in the world's tonnage. India needs to make certain policy changes and take steps to make the process of registration of vessel and sailing of Indian flagged vessel convenient for all the stakeholders and improve India's ranking and share in world's tonnage.

As part of Amrit Kaal Vision 2047, a total of 9 initiatives are identified of which, the key initiatives to improve India's Tonnage include initiatives providing fiscal incentives such as revisiting the applicability of TDS on wages paid to Indian seafarers, allowing the Input Tax Credit on the fuel, spares etc. procured for vessel, Indian ships should not be required to pay GST on reverse charge for MRO services consumed outside India etc., granting infrastructure status to shipping industry, allowing other sources of financing to vessel owners such as Alternate Investment Funds, removing restriction on ship leasing by insurance Companies etc.

Note:

- During implementation of initiatives, all stakeholders should ensure sustainable functioning of the coastal and ocean resources following EPA,1986, Water Act., 1974, Air Act., 1981, Noise pollution (Regulation and Control) Rules, 2000; Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008; National Ambient Air Quality Standards, 2009 CRZ, 2019, and EA,2006 and its amendments and guidelines of MoEF&CC shall be followed

- All proposed developmental activities under this action plan may have a comprehensive risk management plan to avoid pollution in coastal and ocean environments

Strategic Aspirations for Amrit Kaal Vision 2047

The following provides the strategic aspirations for Amrit Kaal Vision 2047:

Parameter	Unit	Where we are	Aspiration 2047
Lead the World in Safe, Sustainable & Green Maritime Sector			
Major Ports with LNG bunkering facilities	Number	1	8
No. of hydrogen/ammonia hubs	Number	-	14[1]
Major Ports with shore to ship power facility	Number	2	14[2]
Carbon neutral ports	Number	-	14
Promote Ocean, Coastal & River Cruise Sector			
India's rank of passenger volume in Asia Pacific	Rank	4th	1st
No. of Indian ports amongst top 20 ports for cruise services in Asia Pacific	Number	1	4
Number of cruise terminals	Number	6	25
Enhance modal share of coastal shipping & Inland Waterway Transport			
No. of operational waterways	Number	22	50+
Cargo volume handled by waterways	MMTPA	109	>500
Become a Global player in Shipbuilding, repair & recycling			
Global rank in ship recycling	Rank	2nd	1st
Global rank in ship building	Rank	22nd	Top 5
Develop World class next generation ports			

[1] In line with Draft National Green Hydrogen Mission Document Section 3.2 (f) stating that All Major Ports to have Green Hydrogen/Ammonia storage & bunkering facility.
[2] 14 refers to all major ports by 2047

Parameter	Unit	Where we are	Aspiration 2047
Overall Port handling capacity	MMTPA	2,500+	10,000+
% of cargo handled at PPP berths of Major Ports	Percentage	51%	100%
Number of transhipment hub	Number	1	3
Number of new Major Ports	Number	-	2
Ports with 18-23 m draft	Number	5[3]	13
Enhance efficiency through technology & innovation			
Ports with just-in-time arrival	Percentage	-	100%
Smart Ports	Number	-	5

[3] 5 ports include 1 Major Port (VPA) and 4 Non- Major Ports (Mundra, Krishnapatnam, Gangavaram & Dhamra)

Promoting blue economy in India

India's vast maritime interests have a vital relationship with the nation's economic system. The country is immensely reliant on the ocean. The Government of India's vision of New India by 2030 enunciated in February 2019 highlighted the Blue Economy as one of the 10 core dimensions of economic growth.

In pursuance of the Hon'ble Prime Minister thrust on Blue Economy, there have been 4 major initiatives that included comprehensive deliberation on the issues and challenges in the Maritime sector.

- Maritime India Vision 2030 by Ministry of Ports, Shipping and Waterways
- Draft Maritime Policy by NITI Aayog
- India's Blue Economy- a draft Policy Framework by EAC-PM
- ADB Report on Promotion of Coastal Shipping in India

It was observed that there was no single national agency for coordination and integration of maritime activities that fall under diverse domain - maritime ocean and costal economy, infrastructure, environment, energy, diplomacy, safety and security, ocean technology and resources, shipping, international law, culture and tourism, island development etc. These issues are presently dealt with by several ministries, authorities, agencies and departments individually. Further, reports have suggested for cohesive maritime/ocean governance framework to ensure communication, coordination and clarity between multiple stakeholders and multiple level of administrative authorities and coastal communities, for achieving better outcomes. This will avoid work in silos and duplication of efforts.

On the behest of NITI Aayog, Ministry of Ports, Shipping and Waterways (MoPSW) prepared Amrit Kaal Vision 2047. To devise the above vision and action plan, MoPSW had constituted 13 Working Groups for deliberations & preparing a roadmap with specific implementation plan on the work area designated to each Group. Under this assignment reports and presentations have been prepared in consultation with 13 working groups.

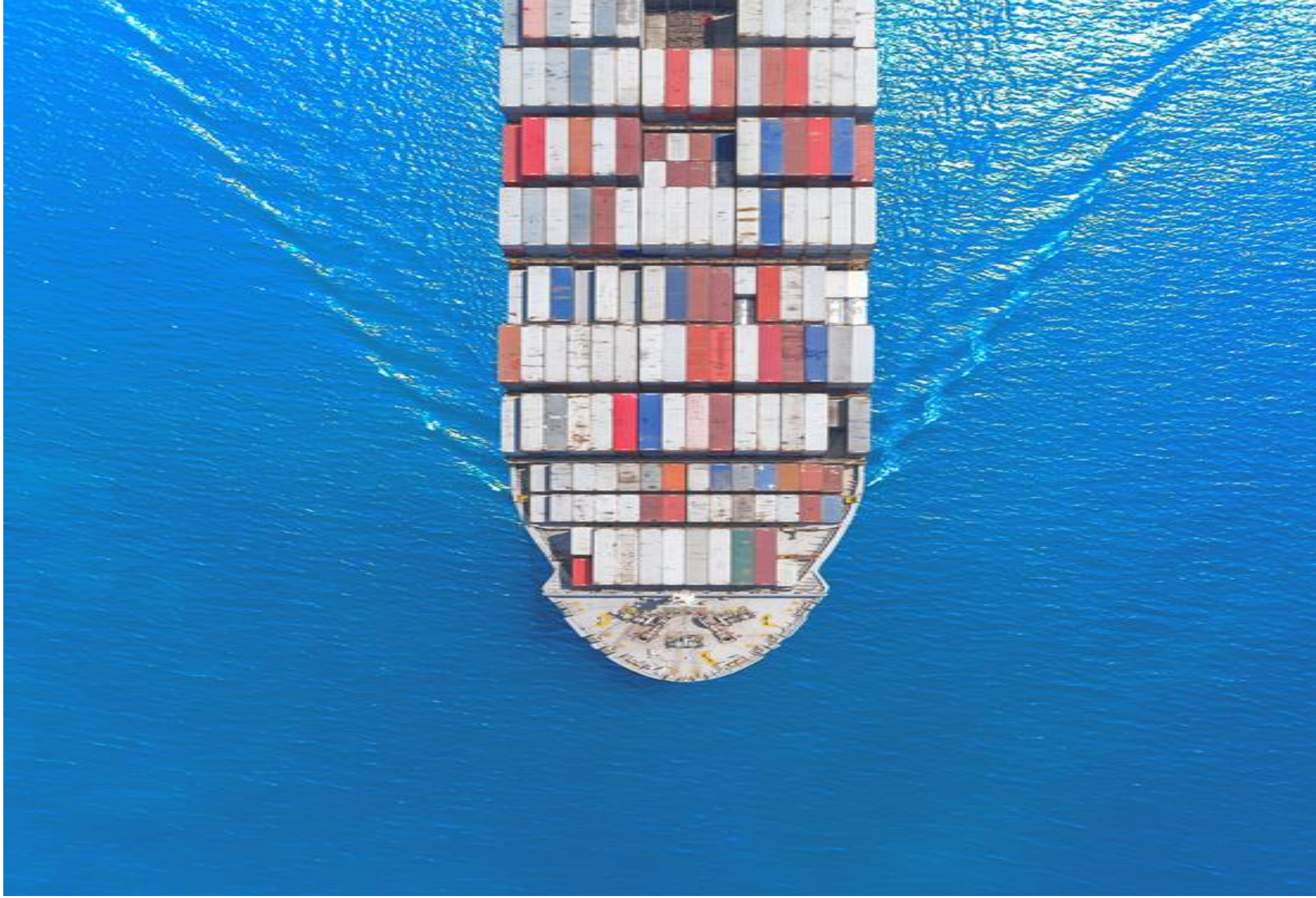
A brief skeleton of the 13 groups is given below with the Working Group Coordinator, who were identified based on the topics covered under each working group:

WG #	Working Groups	Coordinator
WG #1	Bridging the gap between the functioning of Indian Maritime Administration and the priorities of International Maritime Organization (IMO)	DG Shipping
WG #2	Building partnerships and enhancing maritime cooperation with India Ocean Rim Association (IORA) member States and Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)	VC, IMU
WG #3	Strengthening connectivity (ferry, cruise and cargo) with neighboring countries such as Bangladesh, Sri Lanka, Maldives, and Thailand. Developing cruise tourism domestically and circuits across neighboring countries	Chairman, CoPA
WG #4a	Strengthening the India's capabilities in the domain of port logistics	Chairman, VoCPA
WG #4b	Strengthening the India's capabilities in the domain of maritime finance and insurance	Chairman, JNPA
WG #4c	Strengthening the India's capabilities in the domain of maritime law & developing leadership in maritime arbitration	MD, IPA
WG #4d	Strengthening the India's capabilities in the domain of technology in maritime sector	CMD, KPL

WG #	Working Groups	Coordinator
WG #5	Building partnerships, collaborations and international cooperation for promoting maritime domain. Promotion of world class education research and training facilities	VC, IMU
WG #6	Promoting marine clusters taking into consideration the best practices to promote blue economy related industries	Chairman, SMPK
WG #7	To develop policy measures to facilitate Indian shipping tonnage, ship building and marine structures capacities with a thrust on Make in India and Atmanirbhar Bharat	CMD, CSL
WG #8	Addressing UN SDG goals in key environment, safety and health areas for Indian ports and maritime bodies. Formulation of plan to introduce best practices and addressing the marine pollution, and promotion of the green shipping	Chairman, DPA
WG #9	Development of Islands as Maritime Cities	Chairman, ChPA
WG #10	Promote Coastal Shipping and urban water transport	Chairman, MbPA

Theme 1

Lead the World in Safe, Sustainable & Green Maritime Sector



GREEN PORTS

CURRENT LANDSCAPE

Ports, during construction and operation phase, pose environmental impact on land side as well as on waterfront side. They are the major sources of air, water, soil, and noise pollution.

Pollution caused during construction phase

On the land side, construction of a port/ terminal/ berth impacts habitat of animals due to cutting of trees and clearing vegetation. Further, construction activities degrade air quality due to dust suspension, increased vehicular movement. There is also generation of waste material from construction which pollutes land or coastal waters if not properly disposed or reused.

On the waterfront side, dredging results in silt material which is a threat to marine ecology if there is no proper channel for disposal of dredged material. Further, construction of port infrastructure changes the marine ecosystem in the area which harm the marine environment and species existing there.

Pollution caused during operation phase

There are environmental impacts after the start of operations as well. Pollution of air is caused by SO_2, NO_x and PM emissions from engines of ships, tugs, boats running in the port, Diesel Generators, welding, cutting etc. during maintenance activities, and due to vehicles used in various port operations. Use of heavy machinery in port premises cause noise pollution & also contribute to emissions. Spillage of chemicals, oil from bulk handling devices cause soil pollution. Waste generated from port activities also contribute to pollution of soil in the area.

There are negative impacts on water quality due to operations at the shore. Loading/ unloading of cargo may result in spillage of cargo into the surrounding waters when not carefully planned and executed. Pigging lines are used to transports liquid products through the port. Pigging lines are cleaned using water. Discharge of this water into the water body would result in water pollution at a high scale. There is also wastewater generation from other port activities such as cleaning of liquid waste cargo spillages, domestic wastewater generation from residences within port area, discharge of untreated sewage into surrounding water body that lead to great damage to ecosystem. Ships use their ballast water system to balance the vessel while completion of operations at the port. Ballast water is discharged into the water body after completion of the operations. This causes impact on marine biodiversity as invasive species are transferred through ballast water. Oil spills from ships is another major contributor of marine pollution damaging the ecosystem. Metals can contaminate the water during ship maintenance operations. It also poses the risk of entering the food chain through aquatic animals. A United Nations Environment Programme (UNEP) report, 2015 pointed out the following as state of severity of pollution in Indian seas.

- India dumps 0.6 MMT plastics in the oceans every year, the quantities are rising
- India ranked among 12 in top 20 countries responsible for marine pollution
- Plastic debris to sea are contributed by river systems – Three of ten rivers that contribute 90% to plastic debris to oceans are in the India subcontinent – Indus, Ganga, and Brahmaputra (Environmental Science and Technology, 2017)

Safety is a concern in ports as they are prone to natural disasters and accidents

Port safety is one of the main aspects to be looked at in the modern ports. Ports need to be safe in addition to being efficient in their operations. Ports need to provide a safe environment for its workers. Since ports are in coastal area, they are prone to natural disasters such as cyclones, tsunamis, floods, etc. Such disasters can wreak havoc on port operations if effective safety and recovery process are not put in place. Ports also need to have safety and rescue plan for vessels and cargo. Accidents are another deterrent in safety of ports. Vessel

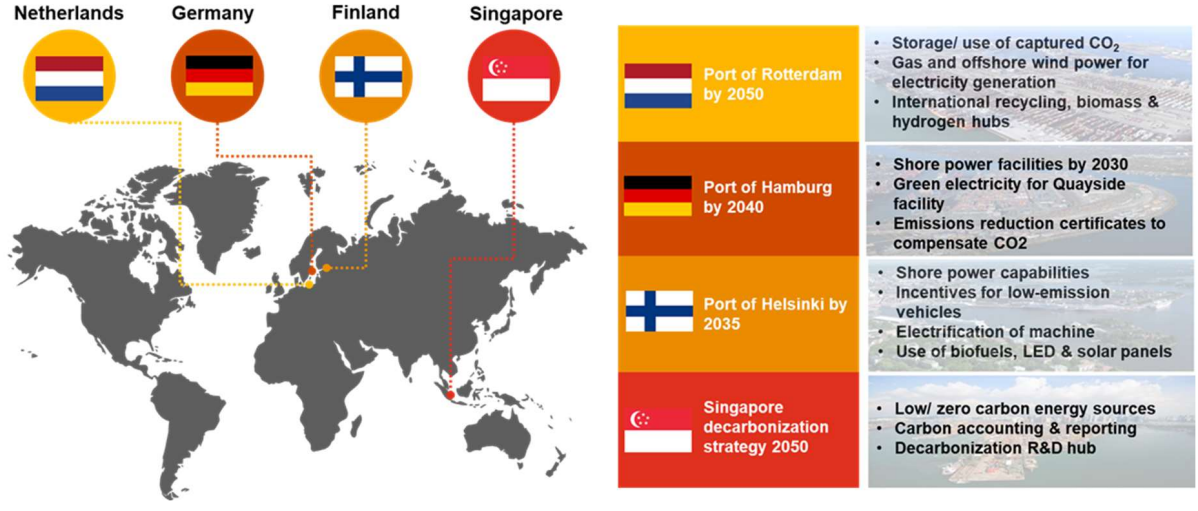
collisions, accidents related to equipment, safety in relation to hazardous materials need to be looked at for safer port operations.

GLOBAL PORTS AIMING TO BECOME CARBON NEUTRAL BY 2050

Restricting the rise of the average temperature of the earth through cutting carbon dioxide emissions is the shared global goal of humanity. Ports and maritime sector would also need to reduce its share of carbon emission and become carbon neutral in the years to come. There are several ports around the globe which are making strategies and targets to become carbon neutral in future. For instance:

- Port of Rotterdam is aiming to be carbon neutral by 2050. In this regard, they have started making steps towards following areas – supply and reuse of surplus energy through steam exchange and heat network, storage/use of captured CO_2 in greenhouses, replacement of coal with gas and offshore wind power for generation of electricity, development of international recycling hub, biomass hub and hydrogen hub
- The Hamburg Port Authority (HPA) is guided by the city of Hamburg's objective to become a carbon neutral port by 2040. The port aims that all the major terminals to be equipped with on shore power facilities by 2030. The Hamburg quayside facility is now primarily powered by green electricity (electricity from renewable sources). Further, the port compensates for CO_2 emissions that are still being generated from port-based activities through emissions reduction certificates supporting projects such as wind farms in India, low-friction anti-fouling paint for ship hulls and reforestation of rainforests in Panama
- Port of Helsinki is set to become carbon neutral by 2035.To achieve the goal, port is taking various initiatives such as shore power capabilities for nine berths, introducing incentives to use low-emission vehicles, enabling the electrification of work machine infrastructure, encouraging the use of biofuels, minimizing the Port's energy consumption by installing LED lighting, and increasing the use of solar panels.
- Maritime Port Authority of Singapore has developed a decarbonization roadmap for transition to low/ zero carbon energy sources by 2050. Further, a dedicated R&D hub is developed for decarbonization technology development.

Figure 1 Global ports aiming to become carbon neutral by 2050



KEY INITIATIVES

As mentioned below, initiatives towards greener ports have been divided into two key areas.

Infrastructure initiatives – It focus on initiatives which are environment friendly and helps in reducing pollution generated from marine operations and conserving marine ecosystem. Following are the initiatives identified under this area:

- Development of carbon neutral ports in India in next 25 years 'Amrit Kaal' and reduce GHG emissions through sustainable solutions such as usage of green fuels, electrified/ renewable energy-based yard equipment, vehicles & vessels, shore to ship power supply arrangement etc.
- Creation of port infrastructure ready for future like Hydrogen hubs

Policy and regulatory initiatives – Any new initiative would require policy push from the government for faster adoption by ports. In this regard, following initiatives have been proposed:

- Implementation framework to adopt green initiatives in terminal operations
- Incentive mechanism for discounts in port dues for vessels with lower emission
- Creation of Disaster management plans for all ports to minimize the losses in terms of human lives, assets and environmental damage and resumes working condition as soon as possible
- Creation of maritime disaster centers (2-3 each on east and west coast)
- Development of dredging
- monitoring toolkit to monitor emissions and resource consumption at ports

INFRASTRUCTURE INITIATIVES

DEVELOP CARBON NEUTRAL PORTS AND REDUCE OTHER GHG EMISSIONS

Carbon dioxide emissions are caused by vessels, work machines, heavy traffic, and the port's own operations. Based on the sources of emission, following strategic areas have been identified and their implementation timeline have been mapped to achieve carbon neutrality at ports.

Figure 2 Strategic areas to achieve carbon neutrality

Strategic Areas	Already implemented	Short term				Medium term	Long term		
	Upto 2021	2022	2023	2024	2025	(2026-2030)	2030-35	2035-40	2040-47
Clean fuel – land based		Battery operated vehicles MHC electrification		Pilot Adoption of alternate fuels such as LNG, blended biofuel-based vehicles		All the port equipments including cranes electrified	Adoption of alternate fuels such as LNG, hydrogen –based fuel cell biofuel by all ports		
Clean fuel – water based	Ports crafts provided with shore electricity at many ports		License for supply of shore power to vessels Truck to ship LNG bunkering		Shore electricity to Coastal vessels	Shore electricity to EXIM vessels Ship to Ship/ Shore to Ship Bunkering	Complete use of shore power for all vessels on ports		
Renewable/ clean energy	20 MW wind energy generation			Converting the port buildings into IGBC Platinum buildings	Hybrid energy Generation	Transfer of hybrid energy to other ports/ industries Develop Hydrogen hubs at port	Complete Hydrogen supply system for port including energy generation	Develop systems to capture Carbon Dioxide	Zero Vehicular Carbon Footprint at ports
Recycling/ Greening	Green belt at many ports	Mechanized truck for fogging & road sweeping Green belt at vacant areas	Decarbonization cell	Solid waste management and Sewage treatment		Use of dredged material for construction activities	Achieve target of 33% green cover on port Implement Circular Port Strategy including for the Coastal Economic Zone		

INCREASE USAGE OF ALTERNATE FUELS (LNG, CNG ETC.) TO REDUCE AIR EMISSION

Ports are the major source of air pollution. It generates pollution from two type of activities – land-based activity and sea-based activity.

Land based activities – On the land side, ports contain a vast array of diesel-powered machinery: straddle carriers, terminal tractors, reach lifters. Diesel powered engines result in elevated emission of various pollutants. They also make a lot of noise, another form of pollution. Further, ports handle large amounts of bulk materials e.g., aggregates, foodstuffs, fertilizer, and wood products. These materials in dry and windy conditions inevitably

result in dust drifting into neighboring areas. Dust, because it can be seen and felt by affected people, can be a major nuisance.

Sea based activities – On the seaside, ship is berthed at the terminal for cargo loading and unloading activity. Shipping vessels run on heavy fuel oil. Heavy fuel oil is much cheaper than the petrol used in land transport, but it also has a high polluting impact. The SO_2 content of Heavy Fuel Oil is 2700 times higher than road fuel. In developed countries SO_2 emissions have been dropping so that now SO_2 pollution is rare in urban environments. The main SO_2 source remaining is from ships coming into port.

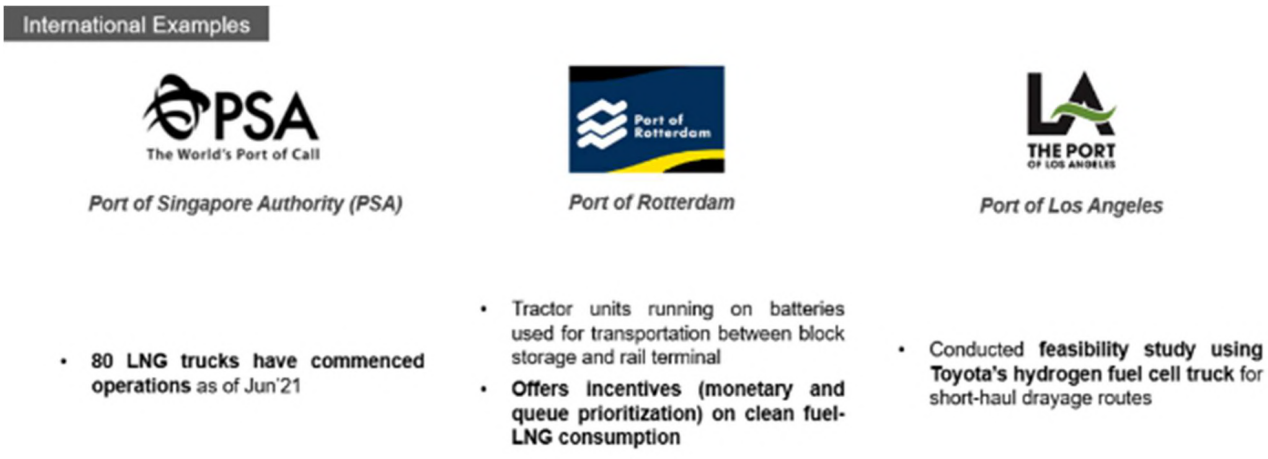
This pollution causing an array of environmental impacts, can seriously affect the health of workers, and contributes significantly to regional air pollution from ships and ports.

Major air pollutants generated by port activities include carbon monoxide (CO), volatile organic compounds (VOCs), nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter (PM). The health effects of prolonged exposure to these compounds include respiratory diseases, cardiovascular disease, lung cancer and premature death.

Clean fuels to reduce emission from land-based activities

In India, currently, diesel alone meets an estimated 72% of transportation fuel demand followed by petrol at 23% and balance by other fuels such as CNG, LPG etc.[4]. for which the demand has been steadily rising. Green fuels have been adopted at many ports across the globe to reduce the consumption of conventional fuels and cut down air pollution emission.

Figure 3 International examples for clean fuel usage at ports



Use of LNG/ CNG as a fuel source for the vehicles - While LNG & CNG fuels sources are attractive commercially, infrastructure availability and short-term incentives will drive full-fledged adoption across ports. Hence, there is a critical need to build suitable infrastructure for driving clean fuels adoption at ports.

In India, Central Govt. has also taken several steps to provide thrust for private participation in clean fuel such as:

- PNGRB declared that any eligible entity can set up LNG station anywhere in the country
- Common guidelines launched to set up dealer operated CNG stations in India (Feb'19)

[4] National Policy on Biofuels, 2018

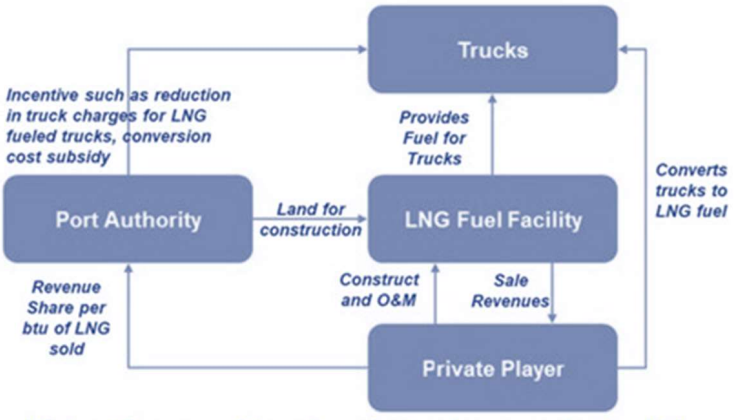
Further, some of the major ports are already on their path to adopt cleaner fuels such as LNG and CNG. For instance, Paradip port Authority is in the process of tendering the construction of LNG fuel depots. It is in discussion with Indian Oil Corporation Limited (IOCL) and Bharat Petroleum Corporation Limited (BPCL) for supply of LNG to the fuel depot.

Intervention – Port Authorities to explore PPP model for conversion of trucks and for development and O&M of LNG fuel station at ports. Pilot adoption of PPP model to be explored at JNPT, Chennai and Paradip port and further, the model to be extended to other ports

Following PPP structure (refer below figure) is proposed for faster adoption of LNG based trucks.

- Private player will provide services to install LNG engines on diesel trucks, set-up LNG station in port premises and sell LNG to truck operators
- Petroleum companies will supply LNG to LNG stations
- Port authority will provide land for setting up LNG facility. Converting diesel trucks to LNG based trucks will come at a cost, therefore, port authority will provide conversion cost subsidy. In return, port authority will receive a revenue share from private player on per btu of LNG sold. Further, in order to make faster and smooth adoption of LNG trucks, port authority will provide a fixed time period (2-3 years) beyond which it will not provide entry to diesel-based trucks

Figure 4 Structure for developing LNG fuel facility for trucks



Highest Revenue Share by private player can be the bid variable

Floating Storage Units for storing LNG fuel

LNG is a viable and environment-friendly renewable fuel. However, the transportation of LNG is a bit difficult. Any slight mishandling could result in loss of precious lives and precious fuel. Any kind of spillage in the ocean can further lead to degradation of the oceanic eco-system. Therefore, it becomes very important to safely store and transfer LNG fuel to the oceanic vessels and other LNG land- based vehicles.

Floating Storage Unit (FSU) is an offshore structure which can store LNG. In other words, any structure can be considered as FSU in any form as far as it is afloat on the sea and is capable of storing LNG. In that sense LNG carrier can be used as a FSU, and a tank lorry can be called a FSU as long as it is mounted on top of barge and released afloat. Main purpose of using FSU is to supply LNG safely to a regasification facility and occasionally to play a role as a temporary terminal in order to redistribute LNG cargo to small scale LNG carrier. Typically, LNG FSU can be used in the several cases shown in the following examples.

1. LNG FSU can be used in the environment where LNG storage tank cannot be constructed on land. Also, it can be used in the project whose scale is not profitable when LNG storage tank is installed on land considering the construction cost of the land terminal
2. LNG FSU can be used in case of utilizing an already existing and operating vessel as a replacement for FSU due to a tight construction schedule
3. LNG FSU can be used in case an additional storage facility is needed when operating a FSRU where large capacity regasification facility is mounted

As for an FSU, typically LNG carrier with more than 30 years of age is considered. Hence, to use this kind of old ship as a replacement for FSU, the performance of the main equipment and the condition of LNG cargo tank

must be considered as a priority. Additionally, evacuation sailing plans must be provided (tugboat or self-propulsion) if the area is affected by the typhoon or hurricane.

For small and medium size projects where FSU of adequate capacity cannot be readily available, even a recently constructed LNG carrier can be used as an FSU. In the given charter rate, it is more economical to construct FSU than to construct LNGC.

Internal ferry trucks based on biofuels - Pollution is increasing day by day and one of the major reasons behind this is vehicles pollutants, that come out due to the use of petrol or diesel-based vehicles. Biofuel is an alternative fuel to petrol and diesel. In conventional engines, petrol or diesel is burnt to create power but the process produces harmful carbon dioxide, nitrogen dioxide and other GHG gases. On the other hand, biofuels are made from organic material such as vegetable oil from plants and produce fewer emissions as a result.

The most common type of biofuel are bioethanol and bio diesel. Bioethanol is an alcohol which uses carbohydrates found in the sugars and starch of crops such as corn, sugarcane, or sweet sorghum. Biodiesel on the other hand, is produced by reacting vegetable oil or animal fat-based with alcohol.

Biodiesel can be used as fuel for a diesel engine, either as a direct replacement or blended with regular diesel. In most countries, biodiesel is generally available to drivers in its blended form. This is because few manufacturers have 100% approved diesel engines for biodiesel use. The same goes for bioethanol. While it can be used as fuel in its most pure form, due to compatibility issues pure bioethanol is not widely used. Altogether, most blended biofuels with a low concentration are perfectly safe to use. However, most vehicles aren't compatible with biofuels in their purest form and could therefore be damaging to the vehicle.

Government has come up with the National Policy on Biofuels 2018, which includes harnessing of biodiesel to meet the energy security of India. The goal of the policy is to enable availability of biofuels in the market thereby increasing its blending percentage. Currently, the ethanol blending percentage in petrol is around 2.0% and biodiesel blending percentage in diesel is less than 0.1%. The policy is aimed at taking forward the indicative target of achieving 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel by 2030.

Additionally, on World Biofuel Day, the Food Safety and Standards Authority of India (FSSAI) launched RUCO – Repurpose Used Cooking Oil, an ecosystem that will enable the collection and conversion of used cooking oil to biodiesel. The Policy aims to increase usage of biofuels in the energy and transportation sectors of the country during the coming decade.

Intervention - In the short term, biodiesel/ bioethanol can be blended with diesel/ petrol as per the present Government guidelines (ethanol blending percentage in petrol is around 2.0% and biodiesel blending percentage in diesel is less than 0.1%.) as it does not require any significant alterations in the existing engines. Port Authorities to explore PPP model for conversion of trucks and for development and O&M of Bio-diesel retail outlets at ports. Pilot adoption of PPP model to be explored at JNPT, Chennai and Paradip port and further, the model is to be extended to other ports. The PPP structure can be similar to LNG based vehicles.

In the long run, usage of biodiesel in its purest forms to be promoted as technology and hardware becomes more accessible.

Use of battery-operated equipment - Battery or electric driven trains offer better economics than diesel engines. Hence, many global ports are opting for electrification of all equipment to reduce environmental impact and simultaneously lower operations costs. Today, most container handling cranes in Indian ports are driven by electric drives[5]. In liquid cargo terminals, 90% pumping, conveying, storage & product evacuation systems including all pumps & motors are electric driven. In Aug '21, JNPT commenced operation of 9 electric vehicles for the movement of its employees within the premises and also operationalized a dedicated charging station[6].

[5] Maritime India Vision 2030

[6] https://auto.economictimes.indiatimes.com/news/industry/jnpt-deploys-9-e-vehicles-for-movement-of-employees-in-premises/85098412

V.O. Chidambaranar Port Authority has recently deployed three e-cars for its officers[3] and three more e-cars are to be deployed in near future.

Intervention: Electrification of equipment moving cargo at port area e.g., RTGCs, reach stackers, straddle carriers, forklifts, etc.

Additionally, Ports shall mandate purchase of electrical equipment as a replacement for existing equipment to achieve full electrification over the next 10 years.

Hydrogen, Ammonia based fuel cells to power port-side equipment/ vehicles - A fuel cell uses the chemical energy of hydrogen or other fuels to cleanly and efficiently produce electricity. Fuel cells have lower, or zero emissions compared to combustion engines. Fuel cells work like batteries, but they do not run down or need recharging. They produce electricity and heat as long as fuel is supplied. If hydrogen is the fuel, the only products are electricity, water, and heat. However, on-board hydrogen storage remains a big challenge, which limits the application of hydrogen fuel cells on electric vehicles. Alternatively, hydrogen can be stored in some light chemicals such as ammonia.

Fuel cells using ammonia as the fuel is being developed to recover the energy stored in ammonia to overcome critical technical barriers to fuel cell development. Cost, performance, and durability are still key challenges in the fuel cell industry.

Intervention – MoPSW to work closely with national laboratories, universities, and industry partners to overcome critical technical barriers to fuel cell development and provide requisite support for faster adoption of hydrogen, ammonia-based fuel cells

Clean fuels to reduce emission from waterfront-based activities

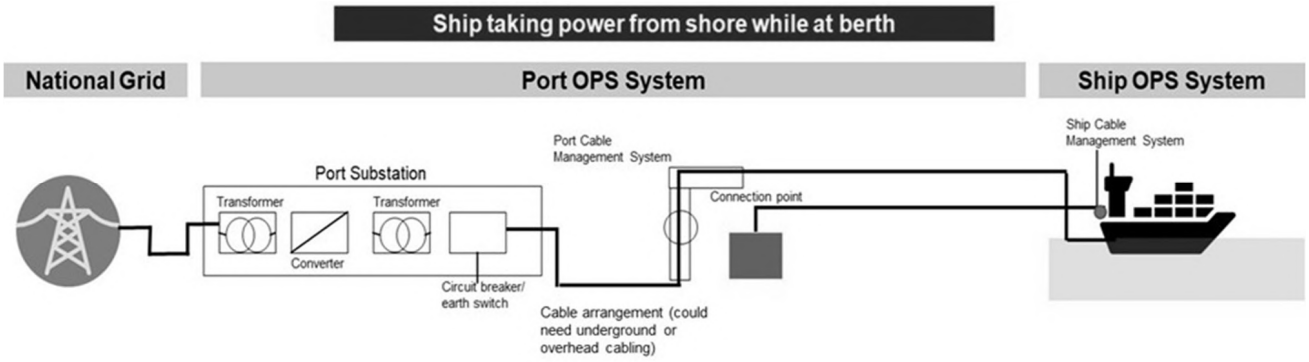
Shore to ship power supply - Ocean-going marine vessels represent one of the largest, most difficult to regulate, source of air pollution in the world and are also an essential component of the international trade and goods movement process. It is estimated that in year 2025 the on-sea trading volume in the world will be tripled compared to year 2008[7]. These vessels are similar to floating power plants in terms of power and would surely be subjected to stricter regulations if their emissions had been generated onshore.

While in port, ships use their diesel auxiliary engines to produce electricity for hoteling, unloading and loading activities. Main engines are usually switched off soon after berthing. The auxiliary engines today are running on cheap and low-quality fuel. It is known that ship's fuel contains 2700 times more Sulphur than the gasoline[8] used in cars, and together with aviation, shipping is one of the biggest emitters of pollution.

One measure to reduce emissions while at berth, is to provide electricity to the ships from the national grid instead of producing electricity by the ships own auxiliary diesel generators. To provide ships with electricity, a shore-side electricity supply arrangement is required.

[7] Batley, Plenys, Solomon, Campbell, Feuer, Masters & Tonkonogy (2004) Harbour pollution, strategy to clean up U.S. Ports. Los Angeles
[8] Schmit, H-E. (2006) SIHARBOR-Shoreside power supply for ships to reduce pollutant emissions

Figure 5 Ship taking power from shore while at berth



Onshore Power Supply (OPS) arrangement consist of two main components – Port Onshore Power Supply and Ship Onshore Power Supply. Details are as follows:

Port OPS System

- **Main Substation Building -** The main substation building represents the heart of the system and makes the centrally placed unity in the establishment. This facility contains coupling equipment such as, breakers, disconnectors, surge arrester and transformers to couple the shore-side connection infrastructure to the national grid**.** It transforms 20-100 kV electricity from national grid down to 6-25 kV.

  Figure 6 Dual-voltage transformer

  It will also have power conversion facility, where necessary. *(Electricity supply in the Community generally has a frequency of 50 Hz. A ship designed for 60 Hz electricity might be able to use 50 Hz electricity for some equipment, such as domestic lighting and heating, but not for motor driven equipment such as pumps, winches, and cranes. Therefore, a ship using 60 Hz electricity would require 50 Hz electricity to be converted to 60 Hz).*
  ***Dual-voltage transformer** is used to step down the voltage from the local power grid to 6.6 kV or 11 kV*

- **Cable arrangement -** The cable arrangement from the main substation building out to all shore-side transformer stations will be underground cables preferably on 24 kV in order to reduce the current in the conductors as much as possible which simultaneously gives lower transfer losses**.**

Figure 7 Shore-connection

- **Shore side transformer station -** Every single berth that will be shore-side power supplied will be equipped with a shoreside transformer station as close to the berth as possible. The transformer station contains the transformer, which is the last link between the electric grid at shore and the electric system on the vessel. The transformer station also includes a smaller switchgear with a secondary circuit-breaker together with disconnection and earth-switch equipment of the outgoing cables. The last part of the shore-side power supply is the connection point where the vessels actual connection is made

The first shore connection in Port of Goteborg, installed in 1989 at the Kiel terminal. Building in picture includes transformer & cable arrangement equipment

- **Shore-side connection arrangement -** The last part of the shore-side power supply infrastructure is the connection point where the vessels actual connection is made**.** It may have cable reel system, to avoid handling of high voltage cables. This might be built on the berth supporting a cable reel, davit, and frame. The davit and frame could be used to raise and lower the cables to the vessel. The cable reel and frame could be electro-mechanically powered and controlled.

  In Fig: Cables are provided by the ship and are lowered to the connection vault

Figure 8 Cables for connection

Ship OPS System

- **Vessel connection requirement -** The vessel will be utilized with equipment to allow connection to the electric grid on shore**.** The connection cable shall in great extend as possible be provided by each vessel and beneficially be arranged with the help of a cable reel system, to avoid handling of high voltage cables. It also contains transformer to transform the high voltage electricity to 400 V.

Below is a case study on shore-side power supply adopted by various ports across the globe.

Figure 9 Case Study – Shore side power supply adopted by various ports across the globe

Case Study – Shore side power supply adopted by various ports across the globe

Shore-side power supply has been used since the 80s for supplying commercial vessels with electricity. Ferries were the first vessels to be shore-side connected. The reason for this was that they always docked in the same position making it easy for connection. Today, other types of commercial ships, such as, cruise, container, and Ro/Ro vessels are connected to the electrical grid in ports around the world.

Currently ~65 ports worldwide that have applied shore-side power supply in their electrical infrastructure, and they have experienced a radical improvement of the environment at their port. This has resulted in that ports worldwide have started to investigate the possibilities with shore-side power supply. Below is the geographical location of 16 key ports.

In order to make a technical design, the onboard electric system on the vessel has to be investigated. Power demand varies depending on what type of vessel. The port must be aware of the vessels power demand, system voltage and system frequency when designing the shore-side power supply facility. Below is the table representing power capacity, system voltage and system frequency for different terminal type across different ports in the world.

Existing shore-side power supplies in the world applied for different terminal type

Terminal Type	Country/Location	Connection voltage (kV)	Frequency	Power Capacity (MW)
Container	Los Angeles, Long Beach, Vancouver	6.6	60	7.5
Cruise	LA, Vancouver, Seattle, Kristiansand, Hamburg	6.6	50-60	12
RoPax	Rotterdam, Ystad, Gothenburg, Stockholm	12.5	50-60	20
Ferries	Gothenburg, Kristiansand	6.6	50-60	0.8
Multipurpose	Zeebrugge, Kemi	11	50	3
Offshore	Kristiansand	0.4	50-60	1
Mega Yatchs	Barcelona	11	50	2.5
River Barge	Haropa	6.6	50	1.25

OPS equipment – As per the study conducted under World Ports Climate Action Program (WPCAP), following are the average number of OPS equipment required by port.

Equipment	Average per port*
Transformers	6
Circuit breakers	9
Connection points	14
Switch gears	8
Frequency convertor	1

Mobile cable reel	1

**Note: Following ports are taken into consideration for calculating average number of equipment required – Port of Rotterdam, Zeebrugge, Ystad, Vancouver, Seattle, New York and New Jersey, Long beach, Kristiansand, Hamburg, Gothenburg, Stockholm, Los Angeles*

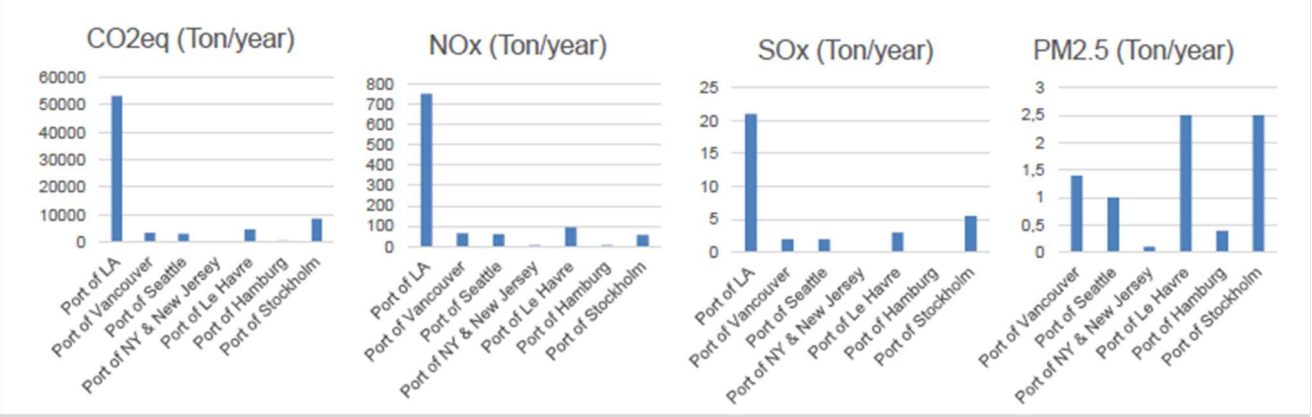
Operations – OPS system are majorly run by port authority followed by terminal operator and shipping company. However, there are also few instances where external operator runs the OPS system.

Main safety and risk preventive measures implemented in ports

- Training of staff
- Proper grounding of faults
- Opening of circuit breakers on both ship and shore when faults occur
- Efficient disconnection during emergencies for weather or excessive vessel movement relative to pier
- Efficient communications between vessel and shore personnel
- Standardized operating safety procedures shared by ship crew and shore side operators
- Indication lights show that the connection is safe to touch

Source of electricity – Majority of the ports are using national grid as a source for electricity. There are ports such as Ystad, Hamburg, Stockholm which have started using renewable energy for generating electricity.

Environment – Due to adoption of OPS system, ports have managed to significantly reduce emissions**.** As shown below, Port of Los Angeles is the front runner amongst other ports in terms of emission reduction in CO_2, NO_x, SO_x, and PM 2.5. This is mainly due to the fact the Port of Los Angeles has high number of berths equipped with OPS system (25+ berths) whereas other ports have less than 10 berths equipped with OPS system.



Discounts, Rebates and Penalties - As per the study conducted under World Ports Climate Action Program (WPCAP), cost and ROI are the key barriers faced by shipowners to adapt their vessels so they can connect to the OPS system. 16 ports namely Port of Rotterdam, Port of Zeebrugge, Port of Ystad, Port of Vancouver, Port of Seattle, Port of New York & New Jersey, Port of Long Beach, Port of Los Angeles, HAROPA Port of Le Havre, Port of Kristiansand, Port of Hamburg, Port of Halifax, Port of Gothenburg, Ports of Stockholm, Port of Barcelona, Port of Kemi were studied to understand the available discounts, rebates offered, and penalties levied by port authorities. As per the study, 60% of the ports are providing discounts, rebates to ship owners for using OPS system in port and 73% of the ports are levying penalty if the ship does not connect to the OPS system available at berth.

Shore to ship power supply could help in reducing GHG emissions at ports and save costs as well. It has various benefits such as reduced fuel consumption, reduced maintenance of vessel, reduced fuel costs, etc. Shore to ship power supply could reduce CO_2 emissions by 60 metric tons during a 10-hour at port which is equivalent to yearly emission by 150 cars travelling 50 kms a day. It would also save fuel cost of ships by Rs. 10-12 per unit.

Thus, supply of shore power will be a major step forward for reduction in carbon footprint for Indian ports.

Intervention – Prioritize port-based vessels in 1st phase to provide shore to ship electricity followed by Indian coastal/ EXIM vessels

Currently, first phase of providing shore to ship electricity to port-based vessels (tugs, port crafts) is already being implemented in some of the ports. For instance, Vishakhapatnam port is giving shore to ship power for tugs. Kamarajar port also has shore power supply for tugs and pilot boats. Chennai port gives shore power to vessels including coast guard vessel. Cochin port has infrastructure for shore power at 11 berths. Mormugao port Authority supplies shore power to cruise, tugs, and Indian coast guard vessel. Shore power supply operations for coast guard and port vessels has stated at Mumbai port Authority. JNPT is currently supplying shore power to tugs. Other ports should also follow suit and expedite the phase-1 implementation of shore to ship electricity.

Once the phase 1 is fully implemented, ports can start phase 2 implementation process wherein they can provide necessary infrastructure to Indian coastal and EXIM vessels for receiving shore to ship electricity.

Figure 10 Phase wise implementation of shore power supply at Indian ports

	Short Term	Long Term
Key model parameters	**Port crafts & ancillary vehicles**	**Indian coastal and EXIM**
Power consumed by vessel *(Power supply readiness of State electricity board a constraint)*	Low: Lesser power consumed due to smaller vessel size	Med for shorter/coastal Navigation High for long haul transport
Residence at Port (*Degree of emissions at ports)*	High: Vessels used for internal port operations	Med for vessels moving from one Indian port to other Low for In-transit at particular Indian ports
Social economic benefit *(Cheaper options first for local Indians owning smaller vessels)*	Benefit flowing to local Indians owning/ operating the vessels	Benefit flowing to local And international trade
Vessel description	Port based tug boats	Indian Vessels carrying cargo on shorter duration and foreign vessels for export/import

Following are the aspects to be considered while implementing shore-to-ship power supply facility at the ports.

Development model - Ports shall look to assign a revenue sharing contract to an external entity which will invest in the Ship-to-Shore facility and operate the same.

Distribution license - As per Electricity Act 2003, commercial power transmission, distribution and trading is not permitted by any entity other than DISCOMs. MoPSW to align with Ministry of Power so as to allow ports for commercial power distribution.

Technical specifications - Technical standardization across ports to be aligned. Power demand varies depending on the type of vessel. The port must be aware of the vessels power demand, system voltage and system frequency while designing the shore-side power supply facility.

Figure 11 Ship to ship LNG bunkering

LNG bunkering - Different types of ships, including cruise and containers ships, are fitted with engines which can burn LNG fuel to reduce harmful emissions from the exhaust of the ship.

LNG fuel is different in properties when compared to conventional heavy fuel oil or LSFO used on ships. Due to its cryogenic temperatures where it can be stored and transferred, the procedure for transferring the fuel into the ships requires a safer approach when compared to other fuel oils.

LNG bunkering can be performed by following three methods:

Figure 12 Truck to Ship LNG bunkering

Truck to Ship - Among the various methods for in-port bunkering of LNG-fueled ships, Truck-to-Ship (TTS) transfer is currently most frequently used. With TTS, the LNG truck is connected to the ship on the quayside, generally using a flexible hose. This is today the most widely used bunkering method, because of the still limited demand in combination with the lack of infrastructure and the relatively low investment costs. For these reasons, truck-to-ship bunkering is a good provisional solution for LNG bunkering. For capacity reasons, truck-to-ship bunkering is most suitable for smaller LNG-fueled vessels with limited bunker volumes, like tugboats, inland vessels, coastguard vessels and smaller passenger vessels.

Ship to Ship - Ship-to-ship bunkering can take place at different locations: along the quayside, at anchor or at sea. The high investment cost for bunker vessels is considered the main barrier. The industry is hesitant to invest in such vessels, in part because they have only limited alternative operations when LNG bunker demand is limited. Given the high flexibility of bunkering vessels, ship-to-ship bunkering is suitable for large vessels such as RoPax/RoRo vessels, bulk carriers, and container vessels.

Shore to Ship - Another bunkering method is shore-ship, whereby LNG is either bunkered directly from an (intermediary) tank or small station, or from an import or export terminal. Pipelines from the terminal to the quay are needed if the LNG terminal is not directly situated at the berth. Shore-ship bunkering is especially suitable shipping services with a high frequency, limited demand, less strict timetables, and limited vessel draft. Examples include bunkering vessels, tugs, inland shipping vessels, utility vessels and fishing boats.

Figure 13 Shore to ship LNG bunkering

IMO has set standards and guidelines which need to be followed while transferring LNG. The International Code of the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC code) needs to be followed by the bunker ships which carry the fuel and transfer it to the cargo or passenger ships. Whereas International Code of Safety for Ship Using Gases or Other Low-flashpoint Fuels (IGF code) needs to be followed by the ships which receive the LNG bunker fuel.

In India, the required infrastructure for providing LNG bunkering services is limited. However, some ports are taking steps to set up the facility. For example, Syama Prasad Mookerjee Port has identified land in Haldia for LNG storage and

bunkering. Further, there is also ongoing work for setting up Floating Storage Regasification Unit (FSRU) at Mumbai port Authority for LNG bunkering.

Figure 14: Leading global ports with LNG bunkering programs

Intervention - Indian ports to increase adoption of LNG by promoting awareness of LNG based vessels & establishing LNG bunkering stations in following manner.

- **Phase 1 - Truck to Ship bunkering** – In the first phase, ports should start providing bunkering services through truck to ship bunkering method due to the following reasons:
    - LNG demand is limited and therefore, limited capacity trucks would be suitable option
    - Relatively low investment cost than other methods
    - Trucks can also be used for LNG distribution for other purposes
- **Phase 2 - LNG bunkering (Ship to Ship Bunkering or Shore to Ship Bunkering)** – As the demand picks **up** and become stable, large capacity would be required. In this case, either of the following two methods can be used:
    - **Shore to ship bunkering** - In this method, LNG is either bunkered directly from an (intermediary) tank or small station, or from an import or export terminal. In this case, ports would need to be equipped with LNG terminal. However, other type of facilities such as FSRU, fixed storage terminal can also be explored for providing bunkering services.
    - **Ship to Ship bunkering** – This method is suitable for all type of vessels due to high flexibility of bunkering vessels. Ports would need to invite private participation for building and operation of LNG bunkering barge to serve ocean carriers. The commercial model in this method would be such that Government will get revenue share for every unit of LNG sold by private player.

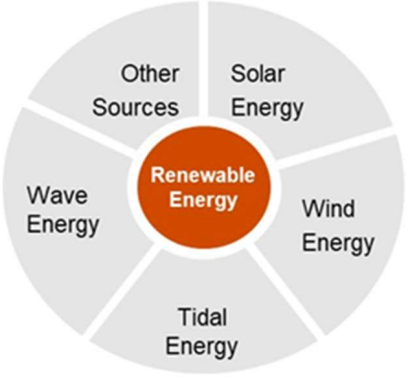
Currently, LNG bunkering services are being provided at Cochin Port. Further, following ports may establish LNG bunkering facility – JNPA, Mumbai, New Mangalore, VOCPA, Ennore, Kolkata and the island city at Andaman and Nicobar Islands.

ACCELERATE ADOPTION OF RENEWABLE ENERGY

Renewable energy is energy that is collected from renewable resources which are naturally replenished. The main sources of renewable energy are solar, wind, tidal, wave, geothermal, hydropower, biomass etc., some of which are commercially viable, and some are still evolving to be economical and competitive.

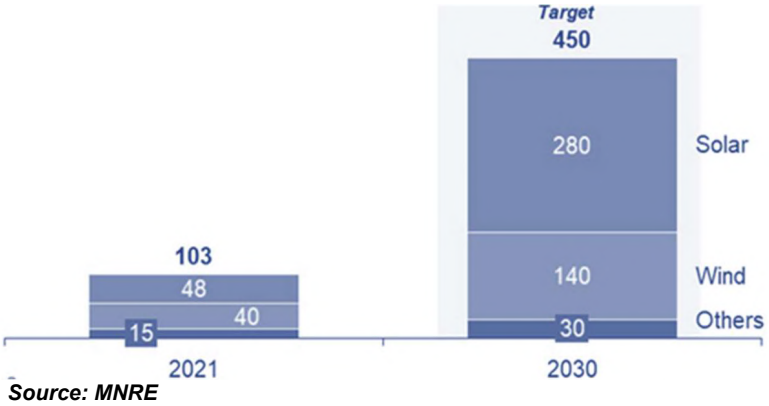
Existing renewable energy capacity of India is ~103 GW as of Oct 2021(~38% of overall installed power capacity India). Solar energy is the major contributor to the renewable energy sector (48 GW). The current consumption of renewable energy at the Indian Major Ports is less than 10% of the total power demand. As per Ministry of Ports, Shipping and Waterways, India intends to increase share of renewable energy to 60% of total power demand of each of its major port.

Figure 15 Sources of renewable energy



Other sources constitutes Geothermal, Ocean thermal Biomass, Hydrogen, etc.

Figure 16 India renewable energy capacity and target



Source: MNRE

Solar Energy - In India, Solar power generation cost is lower than coal power generation cost. Most of the ports have installed solar PVs to utilize generated power in various operations.

For instance, cochin port Authority has already commissioned 250 MW of rooftop and floating PV. VoCPT has implemented 500KW rooftop solar power plant. 3.17 MW solar energy is being produced at JNPT and upcoming plant will expand this capacity by 2.5 MW in next two years.

Ports can plan long term for solar power generation and use as average lifespan of solar panel is 20-25 years. Solar power ecosystem would be a big part of renewable energy system of tropical country like India by 2030 and beyond.

Intervention - Accelerate adoption of renewable source of energy through usage of Solar PVs which can be extended to other ports for rooftop installation and for mooring and dolphin operation.

Figure 17 Rooftop Solar Panels in Port of Rotterdam

Figure 18 Solar Powered Mooring in Port of Hamburg

Wind Energy- Wind power is also evolving rapidly in India and can be installed at the breakwater and along the periphery of the port premises for energy generation. With national targets determined by the Ministry of Renewable Energy (5,000 megawatts of offshore wind by 2022, and 30,000 megawatts by 2030), ports would be optimum location for this endeavor.

Few major ports (e.g., DPT, V.O. Chidambarnar, Kamarajar Ports) have considerable installations. Deendayal has implemented 20MW wind energy plant.

Figure 19 Wind power

Intervention: It is the need of the hour that the Major Ports have a well-defined strategy to adopt emerging technology and focus on following steps:

1. Identify feasible areas for onshore wind farms across port land, shallow waters, and breakwaters
2. Explore setting up windmill farms through PPP structure
3. Leverage offshore windfarms potential at southern tip of the Indian Peninsula, offshore regions around the Port of Okha, and vast salt fields of Kutch region

INCREASING RECYCLING THROUGH CIRCULAR ECONOMY

The current global economy is a linear system: raw materials are extracted, turned into products and whatever remains is treated as waste.

The Port contains a large variety of waste flows which can be originated from port operations and industrial activity near port area. Following are the category of waste:

- Plastics and rubber: Plastics and rubbers are key materials in the global economy and exist in many types and forms. Plastics are found in almost every consumer product, packaging and industrial component. Although plastics can technically be recycled at a very high quality, many plastics flows are not captured, sorted, and recycled.
- Biomass: Biomass and organic materials flow through the economy in tremendous quantities, from the foods that we consume to the vast range of applications for products derived from wood. The extraction, processing and consumption of bio-based goods and products are also associated with large quantities of wastes that include food waste; paper, pulp, and wood wastes; and a range of organic liquids and sludges, for example, as a result of sewage treatment.
- Metals: ferrous and non-ferrous metals
- Minerals: Enormous quantities of mineral wastes are produced, including construction and demolition waste, soil, sand and gravel, glass waste and a wide range of other mineral wastes from industry near port.
- Chemicals: The Chemical industry near ports produces a wide range of chemical wastes, including diverse acids and bases, solvents and catalysts used in organic and inorganic chemical processes. Additional wastes come from other industries that manufacture paints, adhesives, and chemicals for the photo industry. Next to this, the sector produces significant amounts of chemical sludges, aqueous substances and washing liquids
- Industrial waste: Energy, agri-food and other industries are also important sectors in the port area. These industries produce a wide array of industrial wastes that include industrial oils, solid wastes and industrial sludges and liquids.

- Other waste: In the previous sections, the most prominent heterogeneous flows of waste through the port have been presented. In addition to these, waste such as manufacturing goods, components, electronic equipment etc., which are not attributable to any of the above-mentioned category, are placed here.

Globally, ports such as Port of Rotterdam are moving towards establishing themselves as circular hubs. Port of Rotterdam is strategically well-positioned to develop into a circular hub due to following reasons:

- It has a large ecosystem of companies exchanging outputs (products and waste products) among themselves. This essentially means output of one company can act as a feedstock for the other company and vice versa. Examples are the exchanges of low-temperature steam between Lyondell and Covestro in the port, residual heat of the Shell refinery for district heating in the city of Rotterdam, and CO_2 from Alco and Shell for the greenhouses in the province of Zuid-Holland.

- Further, infrastructure, utilities, and land (co-siting) are shared among companies when possible. This enhances the business and material performance of companies, having the result of limiting waste as much as possible while making the port a more attractive area to conduct business. Port of Rotterdam is currently working on collective waste treatment installations for wastewater and organic waste flows, which will deliver technical advantages, cost reductions and environmental benefits for the companies involved.

- The local industry, logistics sector and surrounding region generates a wide variety of waste flows. Valorizing and recycling these residual flows offers Rotterdam new economic opportunities and societal benefits through efficiently utilizing available resources and reducing carbon footprint. In this regard, the port is acting as a breeding ground for start-ups which work on innovative technologies to convert waste to value.

The Port Authority is actively advancing four circular pathways in collaboration with a range of partners to make the port and port-based supply chains more circular. The pathways are: Innovation Ecosystem, Sorting and Recycling, Industrial Symbiosis and Carbon Capture Utilization & Storage (CCUS). The details are presented below:

Figure 20 Case study - Port of Rotterdam transition towards circular port

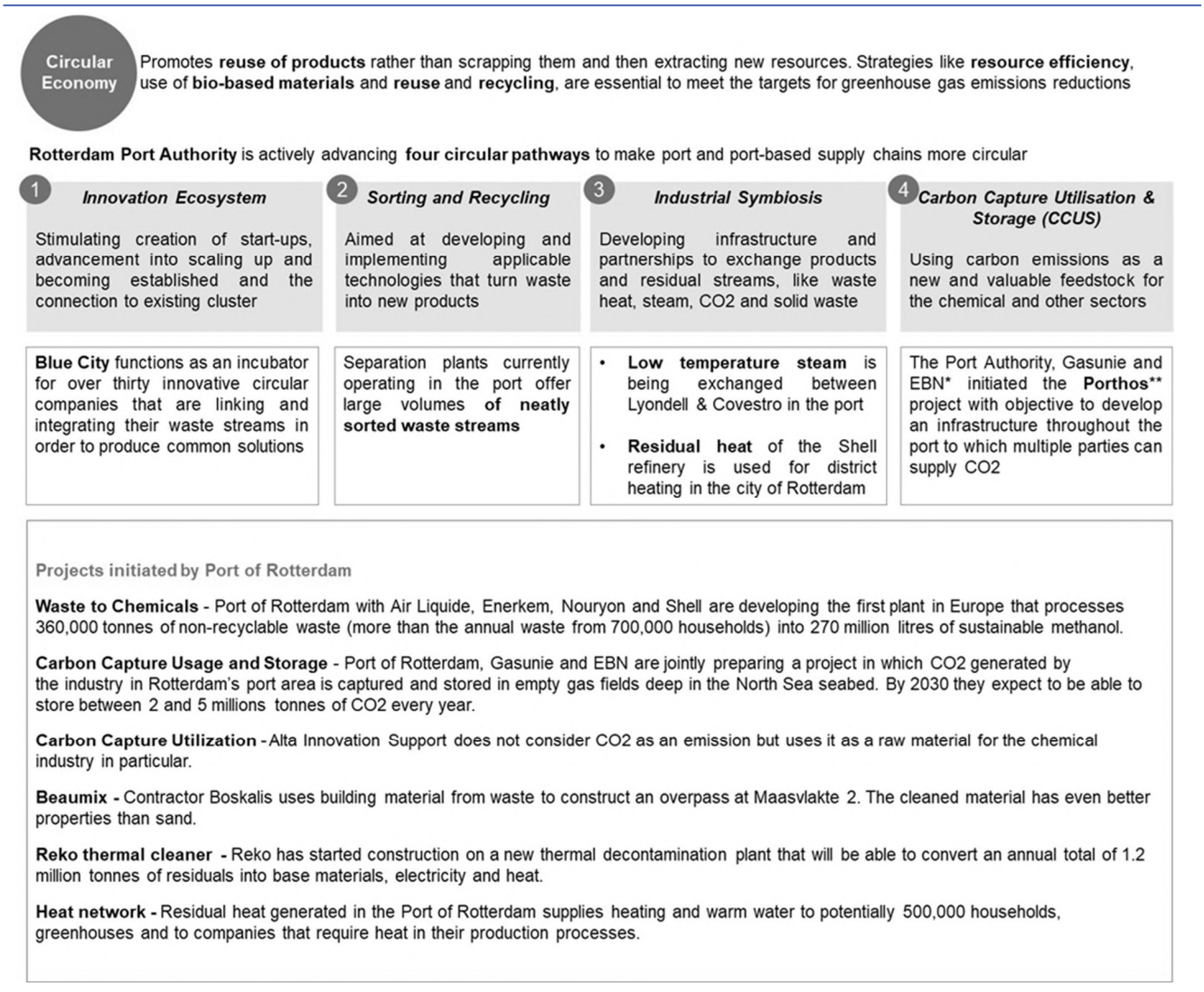
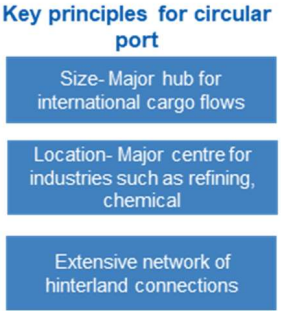


Figure 21 Key principles for circular ports



Intervention

The circular economy provides unique opportunities for the port to future-proof its activities for a decarbonized world. In India, key ports to be identified where material flows from all over the world and all stages of value chains come together, especially of industries that are huge consumers of raw materials. This essentially means that the port should be a global hub for industrial and logistics activities. This is one of the important factors if a port aims to become circular port. In case of Port of Rotterdam, the sheer size of the industrial and logistics activities in the Rotterdam region makes the concept of industrial symbiosis achievable. Further, extensive network of hinterland connections offers an excellent opportunity to aggregate circular activities.

JNPT in the west and Chennai in east can be the potential options for establishment of circular ports. Following are four circular pathways to make port and port-based industries more circular:

Figure 22 Four circular pathways

Innovative solutions from industry/ start-ups – The port authority has to focus on encouraging innovation. This mainly involves supporting industries/ start-ups that are working on innovative technologies for recycling.

Sorting and recycling – This aim at developing and implementing applicable technologies that turn waste into new product

Industrial symbiosis – The concentration of industrial and logistical activities makes it relatively easy for companies to exchange products and residual flows, and also to use shared facilities. Port authorities would need to identify and support industries that would complete the circular links. For instance, dredged spoils can be explored to be reused/ recycled as sand in construction activities, therefore, it would make sense if construction companies utilize the waste generated from dredging in construction activities and complete the circular link.

Carbon capture utilization and storage – Port is a considerable source of greenhouse gases, produced by several large point sources. In the short term, port authority should focus on the re-use of CO_2 in greenhouses as well as sub-surface storage in order to realize a reduction in CO_2 emissions to the atmosphere. On the longer term, CO_2 will be used as a feedstock for a variety of value-added products, such as chemical building blocks, synthetic fuels, or mineral building materials.

REDUCE MARINE POLLUTION

There are several sources of marine pollution. Some of key sources which are originated from ports and maritime activities are as follows:

Figure 23 Sources of marine pollution

Sewage from port operations – Sewage generated from ports and maritime activities are now treated to tertiary level which is the final stage of the multi-stage wastewater cleaning process. The tertiary level of water treatment removes inorganic compounds, bacteria, viruses, and parasites. Removing these harmful substances makes the treated water safe to reuse, recycle, or release into the environment. Majority of the ports re-uses the treated water for horticulture and dust suppression.

Some ports have established sewage treatment facility for treatment of wastewater produced in and around the port. Vishakhapatnam port has setup a 25 KLD tertiary level sewage treatment plant, which treats drains & sewage. Sewage treatment plant of 1.5 MLD has been operationalized at Deendayal port as well.

Oil spills – The Indian Coast Guard, part of the Ministry of Defense, is the designated national authority for oil spill response in Indian waters under the National Oil Spill-Disaster Contingency Plan (NOS-DCP). As per NOSDCP, ports are required to be capable of handling tier-1 level of oil spill within their jurisdiction. Tier-1[9] spills are generally small in size and response is overseen by ports itself. Some ports have developed their own Oil Spill Disaster Contingency Plan (e.g., New Mangalore port, Cochin port have their OSDCP in place) which is applied in conjunction with NOS-DCP and other applicable regional, state, district OSDCP for cleaning operation of oil spills.

[9] Spills are operational in nature occurring at or near an operator's own facilities i.e., site specific as a consequence of its own activities and includes most shore-side oil facilities with oil transfer sites, oil storage installations, offshore installations, and all related vessels, which are required to plan for and be able to provide a clearly identifiable and effective firsthand response to pollution incidents

However, in case of major oil spill of tier-2[10] and tier-3[11] nature, response for clean operation is done through regional/ national/ international coordination. The response is guided by national/ regional/ state/ district level OSDP with assistance from Indian coast guard.

Present system is adequate to handle small to large spills.

Bilge and ballast water from the vessels - India is not yet a signatory of The International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BMW convention), however DG Shipping has issued guidelines in relation to bilge and ballast water management to Indian vessels making calls to Ports where the convention is in force. These guidelines are issued to establish accountability with respect to disposal/ reuse of bilge and ballast water.

Intervention - All ports must establish guidelines for bilge and ballast water management which Indian ships and calling vessels from non-signatory countries must follow in order to berth at Indian ports.

GREEN BELT

Green belt development helps in capturing emissions and reducing noise pollution. It supports in maintenance of biological diversity and climate of the surrounding areas. The roots of trees hold the soil together and prevent erosion due to wind or water. It also contributes to maintaining water table, maintain soil moisture. Green belt near material handling area can reduce effect of dust, noise on environment and reduce pollution levels in port area. Hence all ports should aim to develop adequate green cover near material handling area.

MoEF&CC mandates greenbelt development in ports through guidance manual for Environment Management Plan (EMP) to control air and noise pollution. Currently recommendation from MoEF&CC is for greening of 33% of the port area. Green belt in Indian ports varies from 3% to 36%.

Indian ports except ports with vast land area are facing challenge to meet the recommended greening area due to inadequate land.

Intervention- Ports shall enter into discussion with MoEF&CC to allow mangrove plantation in alternative land and develop mangrove under 33% greenbelt cover.

DEVELOP KEY INDIAN PORTS AS INTERNATIONAL HUBS FOR HYDROGEN PRODUCTION, APPLICATION, AND EXIM TRADE

Hydrogen is being seen as an alternate fuel to power vehicles, equipment, and heat buildings. Hydrogen is a clean fuel which when burn in the presence of oxygen produces water and energy. There are three main types of hydrogen based on their production process.

Green hydrogen - Green hydrogen is made by using clean electricity from surplus renewable energy sources, such as solar or wind power, to electrolyze water. Electrolysers use an electrochemical reaction to split water into its components of hydrogen and oxygen, emitting zero-carbon dioxide in the process. Green hydrogen currently makes up a small percentage of the overall hydrogen because production is expensive.

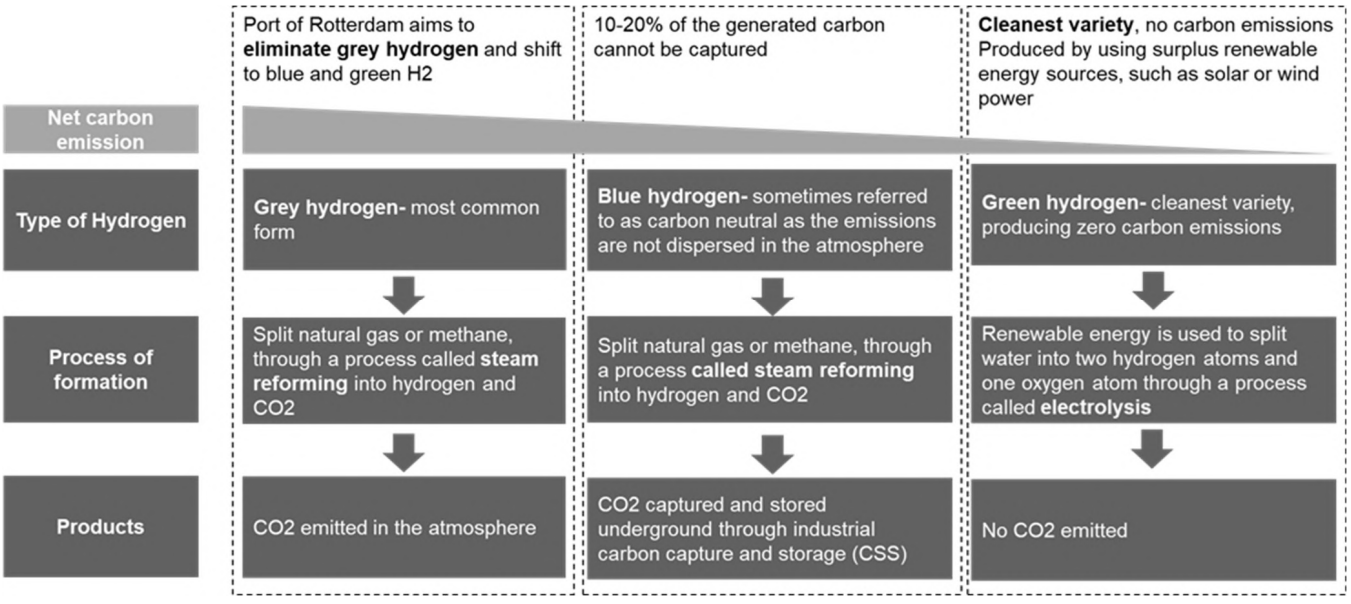
Grey hydrogen – This the most common form of hydrogen. Grey hydrogen is created from natural gas, or methane, using steam methane reformation but without capturing the greenhouse gases made in the process.

[10] Spills are most likely to extend outside the remit of the Tier 1 response area and possibly be larger in size, where additional resources are needed from a variety of potential sources and a broader range of stakeholders may be involved in the response. State Governments are expected to plan for and respond to such oil spills within the Territorial Sea (up to 12 nautical miles), along with the Indian Coast Guard (Western Region) where the spills exceed the clean-up capability of Tier 1, or for which no responsible party can be identified

[11] Spills are those that, due to their scale and likelihood to cause major impacts, call for substantial further resources from a range of national and international sources. The Indian Coast Guard, which manages the National Oil Spill Disaster Contingency Plan (NOS-DCP), is responsible for, spills within a region which are beyond the resources of the region, or which occur within the EEZ or outside regional boundaries likely to impact the Indian coastline

Blue hydrogen - Blue hydrogen uses the same process as grey, except this time the carbon is captured and stored. This makes it much more environmentally friendly but comes with added technical challenges and a big increase in cost.

Figure 24 Types of Hydrogen



However, there are certain constraints in adopting green hydrogen as an alternate source of energy.

Technology – Huge quantity of green hydrogen is needed to replace conventional fuels such as natural gas, oil, and coal. To generated green hydrogen in huge quantity, it would need electrolysers to be built on a large scale

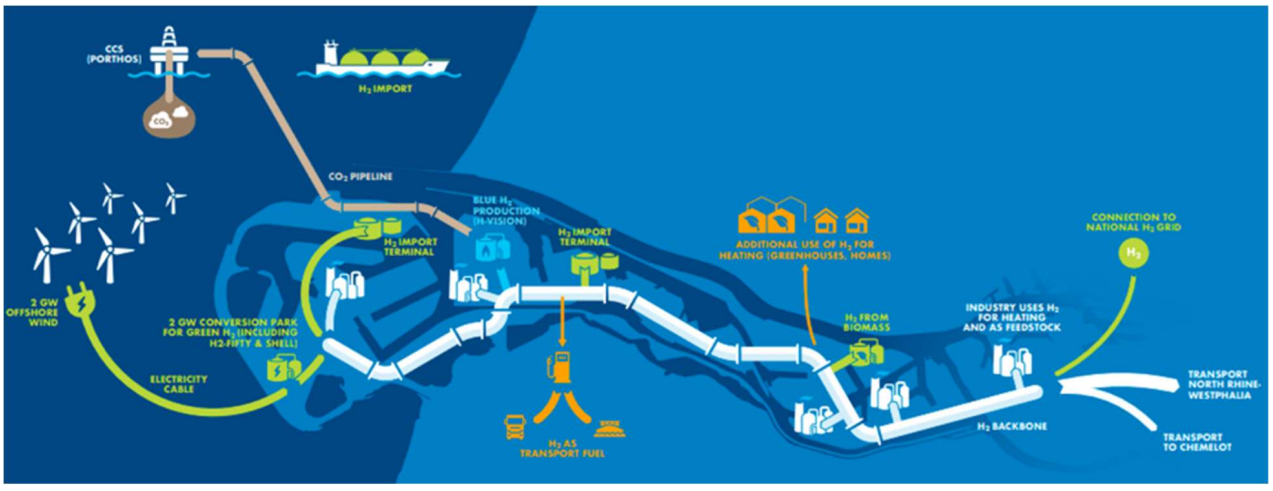
Electricity - Creating green hydrogen needs a huge amount of electricity, which means a considerable increase in the amount of wind and solar power is required.

Transportation and Storage – Transportation of hydrogen is expensive. Unlike, for example, oil that is liquid at 'normal' temperatures, hydrogen has to be cooled down considerably (to -253 degrees Celsius) to make it liquid. An alternative is to 'pack' (and unpack) hydrogen into another molecule, such as ammonia (NH3), methanol or a Liquid Organic Hydrogen Carrier (LOHC) which requires energy.

Globally, countries have realized the potential of hydrogen as a clean fuel and have started using hydrogen for powering vehicles, equipment, and heating buildings. Ports around the world are playing catalytic role in harnessing hydrogen and catering to the demand of nearby regions. Ports like Rotterdam in Netherland, Antwerp, Zeebrugge in Belgium, and Newcastle in Australia developing hydrogen hubs to speed up green hydrogen development. Following is a case study of Port of Rotterdam which has started building infrastructure.

Figure 25 Case Study | Port of Rotterdam is aiming to become an international hub for hydrogen production, import, application, and transport to countries

- Port of Rotterdam aims to eliminate grey hydrogen and shift to blue and green hydrogen
- Port of Rotterdam will have a hydrogen system that combines production and use, particularly in industry, but also imports and transit flows of hydrogen to other parts of the Netherlands and Northwest Europe
- Port Authority and Gasunie, natural gas infrastructure and transportation company, are working on an initiative to have a backbone for hydrogen running through the port as early as 2023
- Main transport pipeline will supply companies with hydrogen produced at conversion parks in the port
- Backbone will be connected to Gasunie's national infrastructure throughout the Netherlands and to corridors leading to industrial areas in Chemelot in Limburg, and North Rhine-Westphalia.
- In time, there are also plans for a terminal to facilitate imports of hydrogen



Port of Rotterdam has several proposed projects to make it a hydrogen hub

Project	Description	Timeline
Backbone	The backbone connects production and import (tankers) with clients in the port area	2023
Conversion Park	2GW conversion park (industrial estate) for the production of green hydrogen	2023
Electrolyser upscaling	Shell is planning a 150-200 MW electrolyser for the conversion park Nouryan, BP and port of Rotterdam authority have teamed up in H2-fifty on development of 250 MW electrolyser	2023 2025
Transport	A consortium is being developed with the aim of operating 500 trucks on hydrogen. Eventually hydrogen can also be used to heat greenhouses and buildings	2025
Blue Hydrogen	H-vision for blue hydrogen production. The released CO2 is stored in depleted gas fields under the North Sea	2026
Import Terminals	Large scale import of hydrogen compounds at import terminals to cater to northwestern Europe demand for sustainable energy	2030

Further, ports like **Antwerp, Zeebrugge** in Belgium and **Newcastle** in Australia developing hydrogen hubs to speed up green hydrogen development

India has already started taking steps towards reducing their dependence on importing fossil fuels and developing an ecosystem to cater to hydrogen. India has announced a National Hydrogen Energy Mission (NHM) that will draw up a road map for using hydrogen as an energy source. India's ambitious goal of 175 GW by 2022 got an impetus in the 2021-22 budget which allocated Rs. 1500 crore for renewable energy development and NHM realizing hydrogen as future source of energy. Further, Reliance Industries intends to invest $10 billion over the coming three years in a 20km^2 green energy giga-complex at Jamnagar. The complex would be dedicated to electrolysis to produce green hydrogen and fuel cells for converting hydrogen into mobile and stationary power. Another project is ongoing at Indian Oil's Gujarat refinery, wherein the focus is on creation of blue hydrogen with carbon capture technology.

Intervention:

Indian ports can play a major role in meeting the targets set under NHM and catering to the future need of hydrogen by various industries. Kandla, JNPA, New Mangalore, Cochin, Visakhapatnam port as well as island city of Andaman and Nicobar Islands can be set up as international hubs for hydrogen production, storage, bunkering and EXIM trade.

Following are the key strategic areas which need to be covered by the ports identified ass international hubs for hydrogen production, application, and EXIM trade.

Figure 26 Key strategic areas to become hydrogen hubs

Power generation from renewable/ clean energy – Production of green hydrogen is generated from electrolysis process which breaks water into hydrogen and oxygen through power generated from renewable sources. With growing need of hydrogen as a source of energy by different industries which are currently using conventional source of energy, huge capacity of renewable energy plants would be required. Port authority would need to accordingly conduct the study to estimate the future demand of hydrogen which can be catered by the port and accordingly plan installation of renewable energy plants.

Steam Methane Reforming (SMR) for blue hydrogen and Carbon Capture and Storage (CCS)–SMR mixes natural gas with very hot steam, in the presence of a catalyst, where a chemical reaction creates hydrogen and carbon monoxide. Additional water is added to the mixture converting the carbon monoxide to carbon dioxide and creating more hydrogen. The CO2 generated from the process is removed, transported, and permanently stored through CCS technology. Port authority would need to partner with entities working on this technology for setting up SMR process and CCS technology.

Electrolysers – As indicated above, green hydrogen production will require electrolysers upscaling if the future requirement of industries is to be met. Port authority would need to partner with entities working on this technology.

Transport network – The transportation of hydrogen will be a crucial step for ports. Similar to LNG, Hydrogen requires cryogenic set-up for transportation. Ports which are planning to set up LNG terminal or have existing LNG terminal can be used for conducting EXIM trade of hydrogen. For transporting hydrogen on land, port authority would require pipeline set up (if hydrogen is to be transferred in gaseous form) or trucks with cryogenic facility (if hydrogen are to be transferred in liquid form). The former option is the cheaper mode of transportation; however, it would involve considerable capital expenditure for developing new pipelines.

POLICY AND REGULATORY INITIATIVES

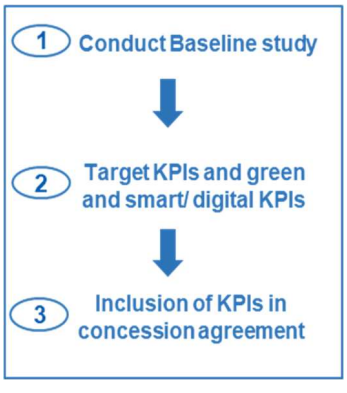
IMPLEMENTATION FRAMEWORK TO ADOPT GREEN INITIATIVES IN TERMINAL OPERATIONS

Implementation framework for green initiatives have been tailor-made according to the type of terminal (new or existing).

Figure 27 Implementation framework for new terminals

New Terminals – There are three key steps to be followed for implementing green initiatives in new terminals which are as follows:

Initially, project authorities would need to conduct baseline study on select operational terminals across parameters such as usage of clean fuel in various port operations, area under green belt, share of renewable energy, vessel turnaround time on the basis of last 3-year performance of the terminals.



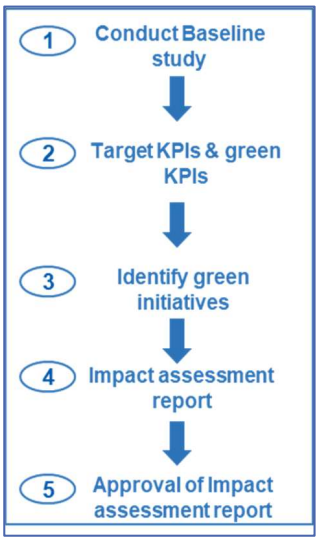
- Post base line study, project authorities would need to define/ revise target KPIs (existing/ new) and introduce green KPIs across all the parameters
- Finally, the identified KPIs and green KPIs would need to be accordingly included in concession agreement

Bidders would include the cost incurred in adopting green initiatives in the quotation. Further, port authority would provide incentives to operators for going beyond 15% on green KPI in any year.

Existing terminals – There are five key steps to be followed for implementing green initiatives in existing terminals which are as follows

- Step 1 - Project Authorities would need to conduct baseline study basis last 3-year performance of the terminal and minimum standards in concession agreement across the key parameters. If Base lining study is prepared by PPP project operator, then it shall be vetted and approved by an independent third party

Figure 28 Implementation framework for existing terminals



- Step 2 - Based on base lining study, project authority would need to define/ revise target KPIs (existing/ new) and introduce green KPIs across all the parameters
- Step 3 - PPP Port Operators/ Project Authority would need to submit an action plan proposing multiple green projects/intervention to the MoPSW/ State Maritime Boards for approval
- Step 4 - PPP Port operators/ Project Authorities would need to prepare an impact assessment report, estimating upfront capital cost, technical changes, improvement in efficiency, increase in operating cost for terminal, impact on environment and efficiency in port operations.
- Step 5 - MOPSW/ State Maritime Boards may employ independent agencies to vet and approve the funding requirement, targeted outcomes of the proposed projects/interventions

Port/ terminal operators to calculate additional capital expenditure and operating and maintenance cost required to implement green initiatives/ projects and define the total amount required to attain cost neutrality to project authority. Post defining the amount, port authority/ MoPSW may cover 50% of the said amount in the form of discount on revenue share. The remaining 50% would need to be borne by port/ terminal operator. However, on achievement of target green KPIs, remaining 50% of the amount will be reimbursed to port/ terminal operators. Further, port authority would provide incentives to operators for going beyond 15% on green KPI in any year.

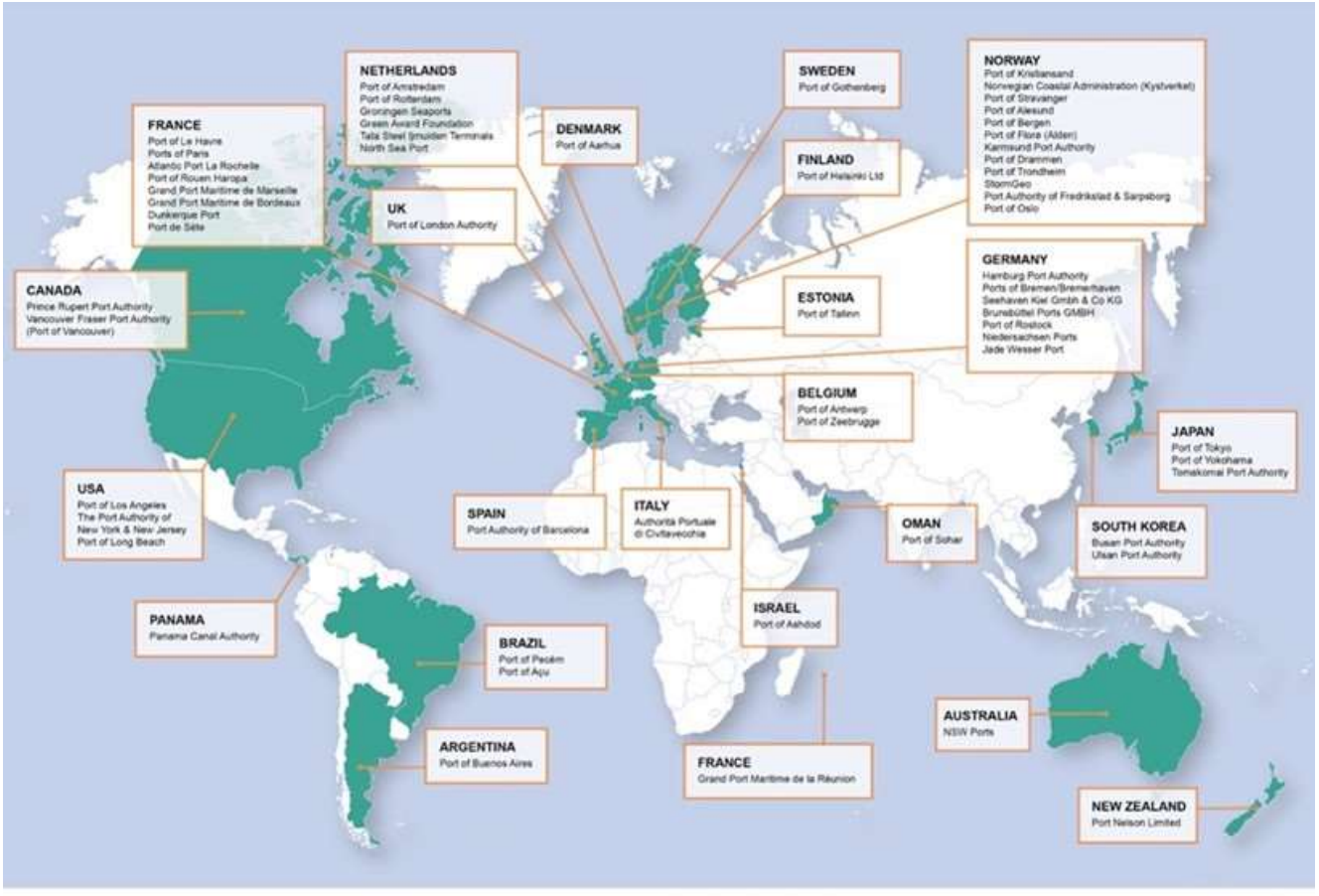
INCENTIVE MECHANISM FOR FASTER ADOPTION OF CLEAN FUEL AND CLEAN/ EFFICIENT TECHNOLOGY IN VESSEL OPERATIONS

To increase the number of vessels eligible for discounts and therewith encourage uptake of cleaner fuels and clean/efficient technologies, some ports offer incentives to ships that perform as per the set standards under different ratings/ index programs. Following are the key widely recognized rating/ index programs in the world.

RightShip GHG Emissions Rating - RightShip's GHG Emissions Rating provides a transparent method to assess the relative efficiency of vessels and compare a ship's theoretical CO_2 emissions relative to peer vessels of a similar size and type using the easy to interpret A – G scale. In this scale, A is the most efficient rating and G is the least efficient rating. Pioneering ports such as Canada's Port of Vancouver and Prince Rupert Port Authority now use RightShip's GHG Rating to offer incentives for more efficient ships, reducing CO_2 emissions and other criteria pollutants in port.

Environment Shipping Index – The ESI indicate the relative emission levels of air pollutants (NO_x, SO_x, and CO_2), taking into account all engines onboard and all fuel types. The emission level of a sea ship is set against the IMO regulations that apply to current ship operation. The baselines will be lowered in the future, following IMO regulations. The overall ESI score varies between 0 (meeting IMO regulations) and 100 (no emissions). Additionally, it also rewards ships that can use onshore power supply while at berth. Following are the countries which are utilizing ESI to provide incentives to shippers who uses clean energy and/ or are efficient in its operations.

Figure 29 Participating incentives provider countries



Green Award - A Green Award certificate, which can be obtained by ships that go above and beyond the industry standards in terms of safety, quality and environmental performance, acts as a quality mark and brings benefits to its holders. The following countries recognize this certificate program to offer incentives to shippers -Argentina, Belgium, Canada, Germany, Gibraltar, Japan, Latvia, Lithuania, New Zealand, Oman, Portugal, South Africa & the Netherlands.

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Clean Shipping Index - The basis of the Clean Shipping Index is a digital questionnaire covering vessels' environmental performance. The questions cover general information about the shipping company as well as vessel-specific information. Vessels are scored on the following parameters – SO_x, CO_x, NO_x, chemicals, water and waste and particular matter. Final scores for vessels are based on the outcome of the questionnaire. A total of 150 points can be obtained, 30 points for each of the 5 different parameters. The final score results in CSI Class 1-5 according to the below scheme:

- CSI Class 5: 125-150 points
- CSI Class 4: 100-124 points
- CSI Class 3: 75-99 points
- CSI Class 2: 38-74 points
- CSI Class 1: 0-37 points

Green Marine - Green Marine is an environmental certification program for the North American marine industry. It is a voluntary, transparent, and inclusive initiative that addresses key environmental issues through its 14 performance indicators - Aquatic invasive species, Cargo residues, Community impacts, Community relations,

Dry bulk handling and storage, Environmental leadership, Greenhouse gas emissions, Oily discharge, Pollutant air emissions NOx, Pollutant air emissions SOx & PM Spill prevention and stormwater management, Ship recycling, Underwater noise, Waste management

Energy Efficiency Design Index (EEDI) - EEDI is the measure of the amount of CO2 emitted by the ship (in grams) per tonne-mile of work. IMO sets the Required EEDI which is the maximum value of EEDI required for the ship. Over the period of time, IMO wants to reduce the required EEDI value for the ships so that in future the ship's engines are even more energy efficient. The actual value of EEDI attained by the ship would be different from required EEDI. The actual value would depend on factors such as specific fuel consumption of engines, type of fuel used, the speed of the ship, deadweight of ship, efficient technology used. If the above-mentioned factors are leading to efficiency in engine working and reduction of CO2 emission, then actual EEDI may be less than required EEDI. Incentive provider countries look at the actual EEDI of ships as against the required EEDI set by IMO and provide incentives to ships which perform better than required EEDI.

Figure 30 Case study – Incentive schemes adopted by Port of Vancouver

Case study – Incentive schemes adopted by Port of Vancouver

Port of Vancouver's EcoAction program recognizes a variety of cleaner fuels and technologies, as well as different incentive/rating schemes for reducing ambient air and carbon emissions, providing vessels with 3 different levels of discounts on port dues. Ships may qualify for gold, silver or bronze levels, which qualify them for a 23%, 35% or a minimum 47% discount. The EcoAction program provides discounts through one of the following five qualifying incentive schemes

INITIATIVE	CRITERIA FOR SHIPS TO QUALIFY FOR DIFFERENT LEVELS OF DISCOUNT ON PEORT DUES		
	Bronze (23% discount)	**Silver (35% discount)**	**Gold (47% discount)**
RightShip GHG Emissions Rating and Quality index (Qi) Rating	**GHG C & Environmental 3+ stars**	**GHG B & Environmental 3+ stars**	**GHG A & Environmental 3+ stars**
Environment Shipping Index (ESI)	**20 ≤ Score < 31**	**31 ≤ Score < 40**	**Score ≥ 40**
Green Award Certified vessels	**Award certificate**		
Clean Shipping Index (CSI)	**Score of 3**	**Score of 4**	**Score of 5**
Green Marine-environnemental performance certification	**Level 3 GHG & min. Level 2 others**	**Level 4 GHG & min. Level 2 others**	**Level 5 GHG & min. Level 2 others**
Energy Efficiency Design Index (EEDI)	**Attained EEDI 5% better than required EEDI**	**Attained EEDI 10% better than required EEDI**	**Attained EEDI 15% better than required EEDI**

Intervention – Indian port authority should also recognize any of the above-mentioned rating/ certification programs to offer discounts on port dues or any other form of incentives to promote operations of clean fuelled vessels at ports. This will boost usage of clean marine fuel in the country and promote sustainability at ports.

CREATION OF DISASTER MANAGEMENT PLAN

Of India's 7,516 km coastline almost 5,700 kilometers are highly vulnerable to the impacts of tropical cyclones and related hydro-meteorological hazards. This results in recurrent loss of life and properties. Natural disaster losses equate to up to 2% of India's Gross Domestic Product (GDP) and up to 12% of Central government revenue. Indian subcontinent is the worst affected region of the world which is exposed to nearly 10% of the world's tropical Cyclones.

An effective Disaster Management Plan (DMP) helps to minimize the losses in terms of human lives, assets and environmental damage and resumes working condition as soon as possible.

Ports are mandated to maintain DMP in order to comply with different rules and regulations and to receive EC and CRZ Clearances.

Figure 31 Disaster impact

National Disaster Management Plan (NDMP) are already formulated which provide guidelines covering all phases of disaster management: **mitigation, prevention, response, and recovery**.

Figure 32 MRCC Areas

- **Mitigation** involves steps to reduce vulnerability to disaster impacts such as injuries and loss of life and property. This involves proactive measures taken before a disaster occurs. For e.g., strengthening of infrastructure.
- Disaster **prevention** refers to measures taken to eliminate the root- causes that make people vulnerable to disaster. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high-risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake
- **Response** addresses immediate threats presented by the disaster, including saving lives, meeting humanitarian needs (food, shelter, clothing, public health, and safety), cleanup, damage assessment, and the start of resource distribution
- **Recovery** is the fourth phase of disaster and is the restoration of all aspects of the disaster's impact on a community and the return of the local economy to some sense of normalcy

Ports and other maritime entities have formulated their activities and location specific DMPs which has led to quick response and better coordination in the last decade to extreme coastal climatic events. Ports like Cochin port have developed a very robust DMP. For other ports, there is a scope of improvement in DMP.

Aspects of DMPs towards extreme coastal climatic events and general areas of strengthening are discussed below:

- **Standard Operating Procedure-** Fill gap(s) in the DMPs by cross port audits and adopting best practices of other ports. Further, ports can standardize their DMP format for better implementation and quick familiarization.
- **Early warning systems-** Establish early warning system for Tsunami preparedness. Additionally, put in place hotline between ports to India Meteorological Department (IMD) and District DM for pre-event and post event coordination. Further, usage of harmonized system codes should be encouraged for emergency communication and coordination through walkie talkies.

- **Post event immediate relief-** Recovery activities to be conducted within a week post disaster like debris removal**,** corpse management, medical facilities, medical relief, food (community kitchens), supply of clean water, etc. Delegation of Authority should be put in place for spending of CSR funds for post event relief activities.
- **Mock Drills-** Disaster specific mock drill should be conducted to check the effectiveness and to identify gaps in existing DMP
- **Climate change response and adaptation-** Ingrain resilience to extreme climatic events in port operations and maintenance activity. Rebuilding of damaged infrastructure should be taken up based on "Build Back Better" principle which aims at reducing the risk to the people of nations and communities in the wake of future disasters and shocks.

DEVELOP SUSTAINABILITY MONITORING TOOLKIT TO MONITOR EMISSIONS AND RESOURCE CONSUMPTION AT PORTS

Integrating sustainability into core business practices is considered essential to futureproof the port industry. A sustainability tool kit may be developed to monitor performance of ports across following 13 areas.

Figure 33 13 areas for sustainable strategy

Land use planning – Developing sound land and water area use is the first step towards becoming a Green Port. This is both for new port developments (Greenfield) and upgrading existing developments. Port authority to determine if the chosen location allows for a viable long-term operability of the port when considering the overall social (workforce, hinterland), ecological (nature areas) and environmental (sedimentation/erosion, wave/flooding, river discharges, etc.) situation. Further, it to make a long-term plan in which land and water areas are assigned to the different functions in the port in such a way that the port operations work effectively, (hinterland) transport modes are enhanced, the natural environment can flourish and the people enjoy the area

Modalities and connectivity – An increase in world trade would lead to increase in sea transport. To be able to cope with increase in marine trade, quality and capacity of hinterland connectivity should be adequate. Development of hinterland connectivity should keep sustainability into consideration such that modal shift to more environment friendly mode of transport is promoted.

Air quality – Under this area, port authority should ensure that further development of port operations does not impact the air quality in the area while continuing measures to meet emissions reduction targets.

Surface water and sediment quality – Port authority should prevent port operations from degrading the surrounding water quality or even take measures to improve the water quality in the port which is suited for the ecosystem and has potential for ecological habitats to be developed in the port area. Additionally, there should be a system that monitors the water and sediment quality in and around the port area.

Soil and groundwater quality – Port authorities to ensure to facilitate further economic developments by managing historic legacies of soil and groundwater pollution in such a way that environmental, health and safety risks are controlled

Dredging impact – Monitor dredging activities to test and demonstrate best management practices (BMP) effectiveness aimed to prevent/minimize impacts from dredging. Additionally, search for opportunities for beneficial re-use of dredged material by identifying and appointing areas for development of port infrastructure and natural ecosystems

Sound/Noise Impacts - Port activities and related transport produce sound that can be perceived as a serious environmental nuisance. This can be above or underwater sound. Sound may not only reduce the quality of life but may also provide a health hazard and may have ecological impacts. In order to mitigate noise pollution, port authority should develop acceptable sound contours in and around the port based on measurements taken during different seasons/meteorological conditions. Subsequently, port authority should do zoning of the port with different permitted noise levels for the various zones. Noisy industry can be moved to areas with a higher permitted noise level.

Energy and Climate Change Mitigation - Greenhouse gas (GHG) pollutants such as carbon dioxide (CO2) are linked to global warming. Marine industry is a significant contributor of GHG pollutants. Port authority should ensure that further development of port operations does not impact the air quality in the area while continuing measures to meet emissions reduction targets. Port authority should focus on reducing energy consumption and energy costs through increase of efficiency and modernizing (industrial) processes.

Climate adaptation - Ports must prepare for sea level rise, including increased storm surges, due to climate change. Sea level rise has already impacted port operations in some areas of the world. Port authorities need to ensure that port infrastructure and land transport corridors to the port are developed taking into account climate change impacts.

Habitat and Species Management Health - Ports and their (maritime) accesses are often located in or near valuable natural habitats, in certain cases designated as protected areas. Port authority needs to incorporate eco-structures in new developments that allow for development of ecological systems, e.g., aquaculture. Further, port authority should ensure it integrate habitat creation in port master and development plans. Port authority should also support monitoring and research in development of habitats in port areas.

Landscape Management and Quality of Life - Landscape is an area whose character is the result of the action and interaction of natural and/or human factors and it is a key issue in an individual's social well-being and people's quality of life. Port authority should conduct a visual impact assessment for existing and new facilities. Visual impact results from the combination of visual modification (contrast between the development and the existing visual environment) and visual sensitivity (a measure of how critically a change to the existing landscape will be viewed from various use areas). Once visual impact assessment is completed, port should propose a mitigation plan. Mitigation actions fall under one of the following strategies: avoidance, reduction, remediation, and compensation. Examples of mitigation measures are: Sensitive location and siting, Site layout, Choice of site level, Appropriate form, materials and design of built structures, Lighting, Ground modelling, Planting, Use of color schemes, camouflage, or disguise.

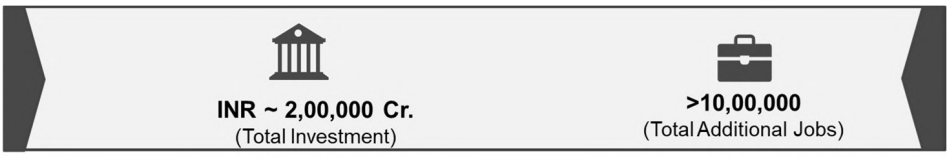
Ship related waste management – The protection of the marine environment can be enhanced by eliminating discharges into the sea of ship-generated waste and cargo residues. This can be achieved by improving the availability and use of reception facilities. Port authority should srxfcnsure maximum delivery of ship-generated waste and cargo residues through availability of adequate port reception facilities and the establishment of (financial) incentive schemes in order to avoid waste being discharged at sea.

Sustainable Resource Management - Within ports, significant material flows are generated, by economic activities or by infrastructural developments on land or in water. By closing material loops, significant waste flows can be avoided. Closing material loops requires cooperation between companies to detect (waste) material

streams they can exchange. Therefore, companies must have some kind of forum to exchange information, experiences, and good practice examples.

The above areas to be regularly monitored by a Program Management Unit Cell. The monitoring exercise to be repeated at regular intervals (6-12 months) or after every significant intervention to assess the impact.

Total investment required and potential job opportunities



GREEN SHIPPING

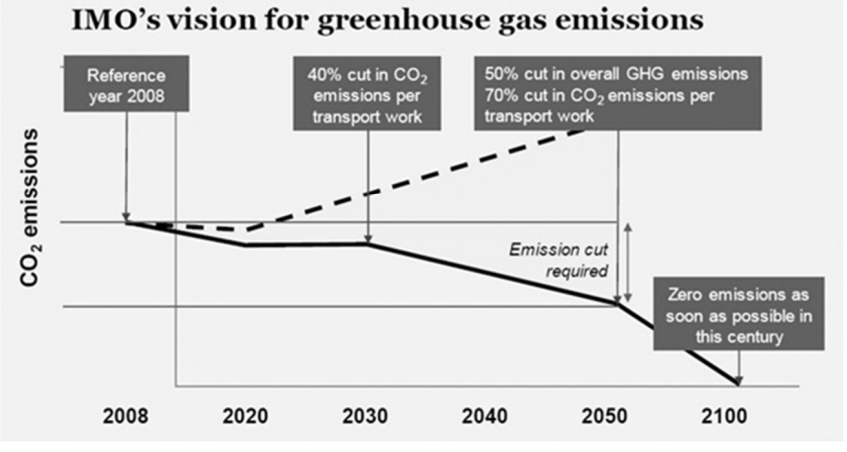
CURRENT LANDSCAPE

Urgent action is necessary to accelerate the pace of the energy transformation and decarbonization of the economy, including the shipping sector, a strategic sector of the global economy. At present, about 99% of the energy demand from coastal shipping sector is met by fossil fuels, with fuel oil and marine gas oil (MGO). If no actions are taken, IMO has flagged that GHG emissions associated with the shipping sector could grow between 50% and 250% by 2050 in comparison to 2008 emission levels. Clearly this broad range of projected GHG emissions flags a level of uncertainty in terms of how the sector will evolve over the next 30 years. Nonetheless, even the lower-level band of GHG emissions increase is an area of great concern in terms of global warming.

To address these concerns, there is a need to map out a path to a decarbonized maritime shipping sector. Its primary focus is the analysis of a pathway to a mitigation structure that will limit global temperature rise to 1.5 degrees Celsius (°C) and bring CO2 emissions closer to net zero by mid-century.

In April 2018, IMO adopted a strategy for reducing greenhouse gas emissions from international shipping, which sets the level of ambition of reducing emissions by at least 50 % by 2050 compared with the level in 2008. The overall vision is to phase out greenhouse gas emissions from the industry as soon as possible in this century. In addition, the IMO strategy includes ambitions to improve the energy efficiency of each ship and to reduce the carbon intensity of the whole sector by reducing emissions per unit of transport work done by at least 40 % by 2030 and further towards 70 % by 2050.

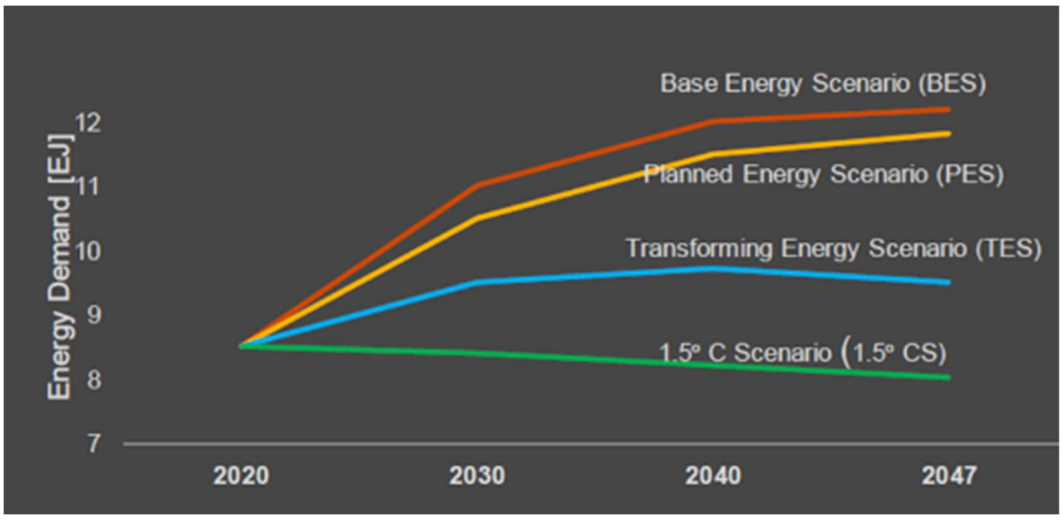
Figure 34: IMO & CoP 26 Green emission targets



The dotted black line shows the projected emission trend under a business- as-usual scenario
The solid black line shows an emission trajectory in line with IMO's strategy

To achieve the above target, four scenarios have been analyzed - Base Energy Scenario (BES), Planned Energy Scenario (PES), Transforming Energy Scenario (TES) and 1.5-degree Celsius Scenario (1.5 CS)

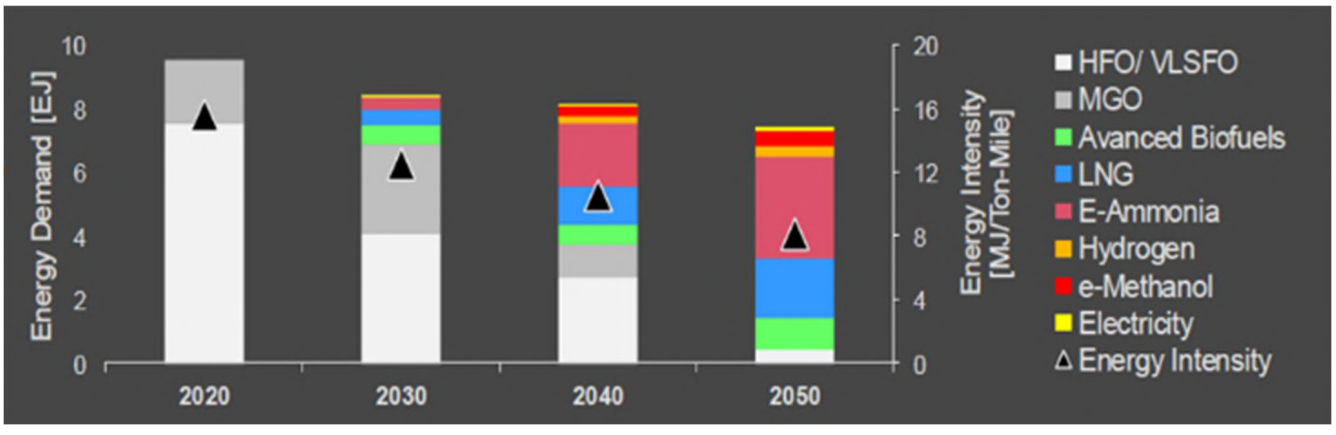
Figure 35: Energy demand in different scenarios (Source: IMO/ IRENA)



Business-as-usual behavior represented under the BES would imply an overall growth of 30% in energy demand by 2050. Similarly, for the PES, final energy demand would increase by 24%. In contrast, for the TES and 1.5°C Scenario, final energy demand could decrease by 3% and 17%, respectively.

While the BES scenario implies that the inclusion of renewable fuels by 2050 is practically null with fuel oil and MGO being dominant, the PES scenario explores a pathway in which LNG becomes the fuel of choice by 2050. In parallel, TES considers a more balanced picture where the inclusion of renewable fuels represents about 40% of the share by 2050. In contrast, the 1.5°C Scenario pathway presents a total renewable fuel share of 70% and limited participation of LNG. In the latter scenario, green H2-based fuel is expected to play a major role, particularly green ammonia. The overall transition from 2018 to 2050 from a carbon-intensive sector, currently predominantly based on the use of fuel oil and MGO, to a decarbonized sector in 2050 with a high inclusion of renewable fuels is illustrated below:

Figure 36: Fuel mix to achieve 1.5-degree Celsius scenario (Source IMO/ IRENA)



KEY INITIATIVES

POLICY AND REGULATORY INITIATIVES

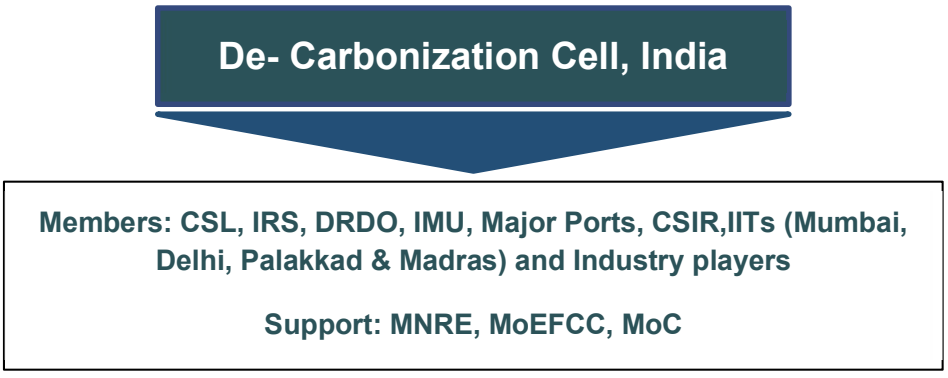
IMPLEMENT GREEN MARITIME SHIPPING PROGRAMME

The Green Shipping and move to Net Zero Shipping is now getting lot of national and international attention with GOI setting up National Hydrogen Mission and a committee under Cochin Shipyard for taking advantage of such changes under Atmanirbhar Bharat. This may require coordination at various levels for determining our position at IMO and one coordinator at IMO cell or the shadow committee may alone be not sufficient to do that work, analysis, etc. It also involves initiating greening of ports and shipping, development of regulatory framework for alternate fuel bunkering facilities and thus coordination with various stakeholders such as port, MoEF, Ministry of Commerce, DRDO, Ministry of New and Renewal Energy, etc. Further, the cell may have officers from Cochin Shipyard, Major Ports, IMU, IRS, Ministry of New and Renewable Energy and Ministry of Environment and Ministry of Commerce for issues related to Market Based Measures.

The decarbonization cell will develop India's decarbonization roadmap outlining the need for specific policies and initiatives being/ to be taken by major ports and shipping industry.

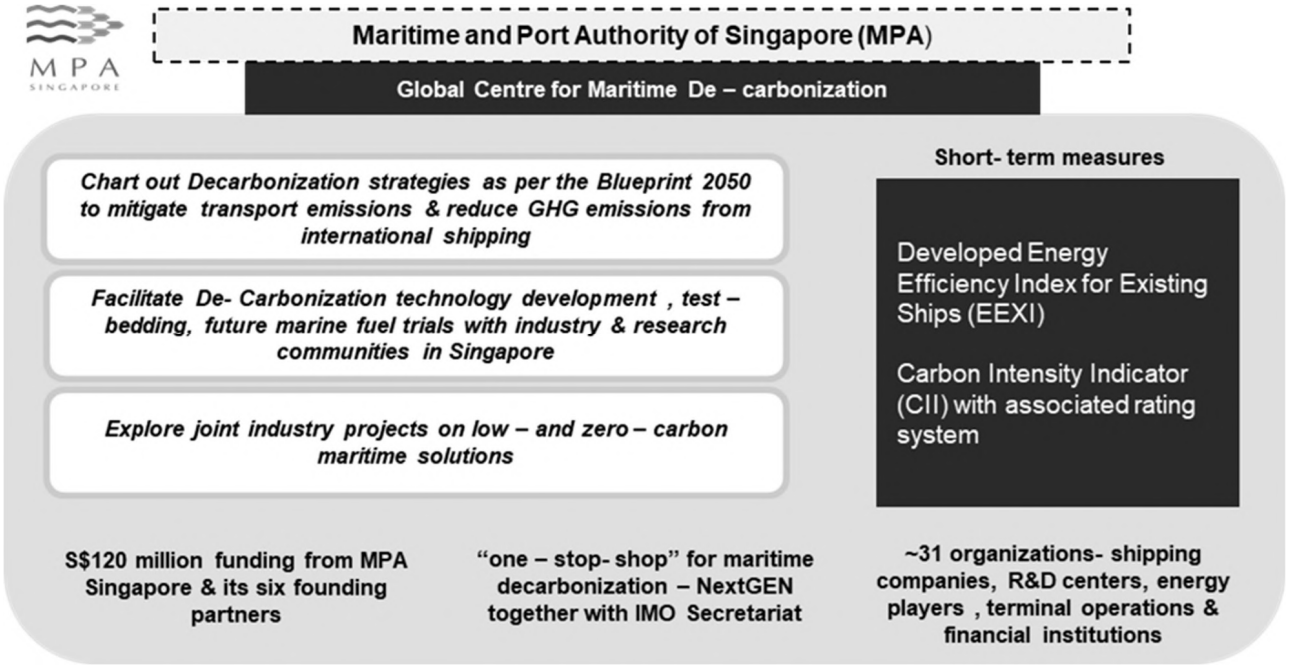
Basis above, the cell will help in preparing policies, regulatory frameworks that will support carbon reduction; propose initiatives for greening of ports and shipping sector; propose green technology enablement; conduct R&D, etc., which will be approved by a high-level committee to be posed to MoPSW for implementation. The cell will also coordinate with ports and other agencies to align with India's decarbonization roadmap.

Figure 37: Structure of proposed Decarbonisation Cell, India



Maritime and Port Authority of Singapore (MPA) has also developed a Global Centre for Maritime De-carbonization. Similar learnings can be implemented in the proposed de-carbonization cell in India.

Figure 38 Case Study: Global Centre for Decarbonization, Maritime Port Authority of Singapore



- To conduct all the actions under the proposed cell, an initial corpus based Green Shipping fund will have to be established (could be explored as part of MDF) across
    - Building strategic regulatory frameworks/ propose policies
    - Pilot vessel development and other green initiatives
    - Collaborative research & partnerships with leading nations
    - Green technology enablement

LAUNCH OVER 20 PILOT PROJECTS UNDER INDIA'S GREEN MARITIME SHIPPING PROGRAMME

- Over the next decade, the Decarbonization cell will develop cutting edge technology vessel development for pilot runs across the following categories:
    - 1 Hydrogen fuel ferry
    - 5 Electric water taxies
    - 2 Hybrid electric Ro-Ro ferry
    - 2 Hybrid LNG electric cargo carriers
    - 1 Hybrid tug at JNPT
    - 3 Dual-fuel container Ro-Ro ferry
    - Green Hydrogen/ Ammonia tugs each at select 4 major ports
    - 1 Green Hydrogen/ Ammonia propelled Coastal cargo bulk carrier & 1 Green Hydrogen/ Ammonia propelled offshore vessel

- For pilot runs of ferries/ Ro-Ro various locations on NW1, NW2 & Kochi shall be considered. On successful pilot runs, bunkering Infrastructure (LNG stations & shore charging points) at deployed locations shall be developed and shipyards shall be enabled to develop Green-home grown technology for LNG/ Electric/ hybrid vessels.

Electric/ Hybrid – Electric

- Ferries & Ro-Ro carriers
- Tugs

LNG - Diesel/ LNG - Electric/ LNG –Battery - Solar

- Ro-Ro carriers

INCENTIVES TO FOSTER DEVELOPMENT OF LOW CARBON VESSELS AND RETROFITS IN EXISTING VESSELS

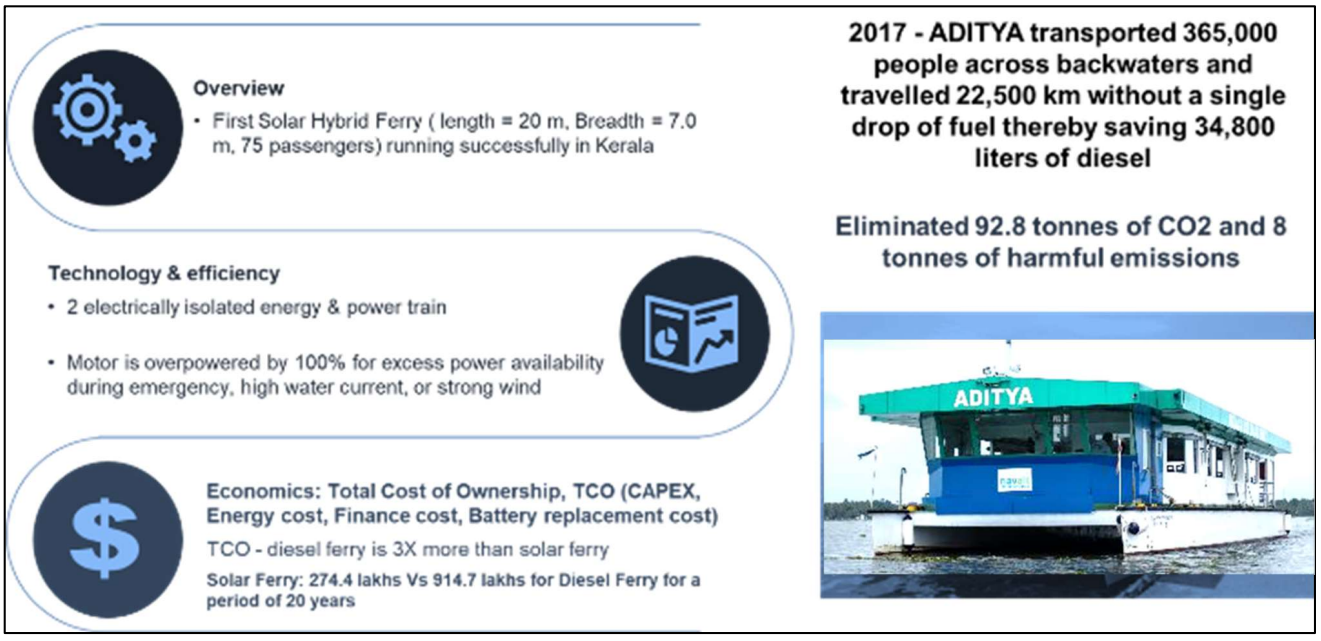
- Extension of Ship building financial assistance policy for Green vessels for another 10 years with ~30-40% assistance (including retrofitting)

It is well known fact that cleaner fuels generate less emission, however the capex cost of development of such vessels is 20-30% higher than traditional fuel vessels.

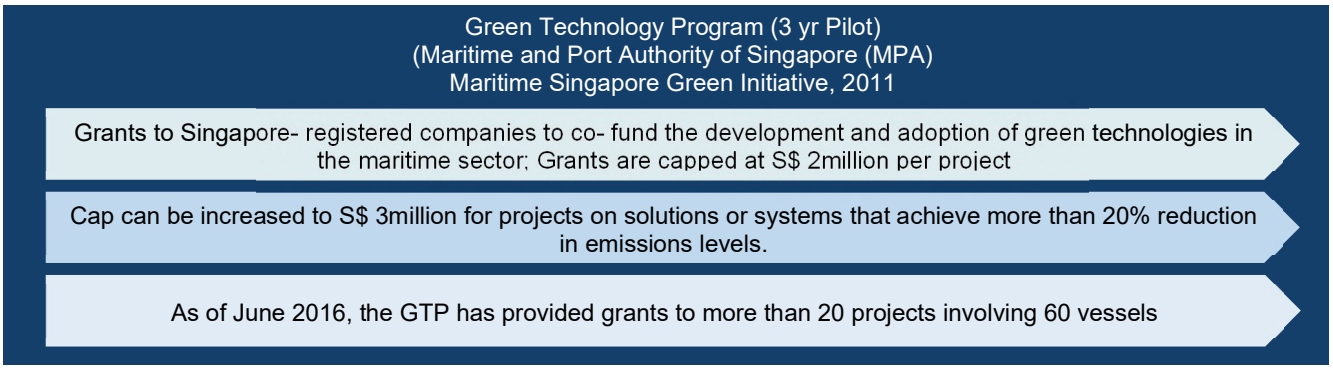
Table 1: Cost comparison of clean vs traditional fuel

	LNG	**SOLAR / ELECTRIC VESSEL**
BENEFITS	Marginally high capital cost for LNG operated barge mainly due to engine & LNG tank	Marginally high capital cost for solar/ electric ferries
	Competitive energy cost with LNG providing lower consumption than HFO by 24%	Savings in operational cost for solar/ electric ferries
	Lower maintenance cost with greater engine life	Lower maintenance cost with greater engine life
CAPEX COST	For 2000 DWT, IWT vessel Traditional vessel: INR 10 cr Duel-fueled LNG: INR 12 cr	For 75 Pax ferry Traditional vessel: INR 1.5 cr Solar/ EV: INR 1.95 cr
OPEX COST	At par with traditional vessel. Cost to decrease with decrease in LNG import cost	OPEX of Solar/ EV is over 90% less than diesel operated ferry

Figure 39: Case Study| ADITYA, India's First Solar Ferry



It is proposed that under the existing Ship building financial assistance scheme, green fueled vessels to be given a financial assistance in the range of 20-30%.



- Implement Green incentive program with rebate in port dues, tonnage tax and vessel registration fees for vessels demonstrating better EEDI

Apart from financial assistance, shippers to be provided various operational incentives for demonstrating emission reductions in line with international practices.

Table 2: Various ports (particularly EU) have introduced incentive programs to encourage ships calling at their ports to use cleaner marine fuels

Discount on Port Dues	**Tier 1 (10%)**	**Tier 2 (20%)**	**Tier 3 (50%)**
RightShip GHG Emissions Rating and Qi Rating (Rating and benchmarking of CO2 performance on the vessel basis)	Env 4 * & GHG D; or GHG C & Env 3 * or GHG B	GHG B and Environmental 3*	GHG A
Environment Shipping Index (ESI) for ships that perform better in reducing air emissions than required by current emission standards of IMO	20<= Score <=30	30<Score <=50	Score >=50

Discount on Port Dues	Tier 1 (10%)	Tier 2 (20%)	Tier 3 (50%)
Green Award - Certifying vessels that are clean and safe based on certain parameters	Certificate	Certificate	Certificate
Clean Shipping Index (CSI) online tool that provides rating to each registered ship based on a range of environmental criteria	Score of 3	Score of 4	Score of 5
Green Marine - environmental performance certification scheme for the North-American marine industry (U.S. and Canada)	Level 3 GHG & min level 2 overall	Level 4 GHG & min level 2 overall	Level 5 GHG & min level 2 overall
Energy Efficiency Design Index estimates grams of CO2 per tonne-mile	EEDI - 15% better than reqd EEDI	EEDI - 25% better than reqd EEDI	

Figure 41:Rebate in First time registration fee of vessels and annual tonnage tax

Singapore Green Ship Program

For ship designs exceeding IMO's EEDI
- ✓ 50% reduction of Initial Registration Fees
- ✓ 20% rebate on Annual Tonnage Tax

For ships that use SOx scrubbers
- ✓ 25% reduction of Initial Registration Fees
- ✓ 20% rebate on Annual Tonnage Tax

For ships adopting both of technologies
- ✓ 75% reduction of Initial Registration Fees
- ✓ 50% rebate on Annual Tonnage Tax

Figure 40: Green Tax

Norway – Business Sector NOX Fund

- ✓ Fixed NOX **tax rate of NOK 21.17 for every kg of NOX emitted**

Sweden – Fairway Dues

- ✓ Charging polluting ships (=>6g/kWh of NOX) more & discounts to cleaner ships

RATIFY CONVENTIONS AND IMPLEMENT RULES THAT REDUCE MARITIME ENVIRONMENTAL IMPACT

- Ballast Water Management Convention 2004
- International Convention relating to Intervention on the High Seas in cases of Oil Pollution Casualties 1969 (Intervention 1969)
- Protocol relating to Intervention on High Seas in cases of pollution by substances other than oil 1973
- London convention & London Protocol

EXTEND PLI SCHEME TO SUPPORT GREEN MARITIME TECHNOLOGY DEVELOPMENT IN INDIA

The Production Linked Incentive Scheme (PLI) offered a production linked incentive to boost domestic manufacturing and attract large investments through incentive of 4% - 6% on incremental sales. The scheme supported Photo voltaic cells and thus supported the solar energy production. Similar scheme may be launched to support Marine (Hydrogen) fuel cells and Ammonia marine engines development.

PUBLIC PROCUREMENT POLICY FOR VESSELS TO INCLUDE REQUIREMENTS FOR LOW EMISSION SOLUTIONS

Inclusion of environmental requisites (energy efficient designs) in public procurement processes for domestic/ short sea shipping ferries, OSVs, PSVs, Port vessels, cruise and cargo vessels

DEVELOPMENT OF ENVIRONMENT REGULATIONS FOR ALL VESSELS

Development policy and guidelines for fuel obligation for domestic and international vessels plying on Indian waters (post development of land side green fuel infrastructure development)

OTHER INITIATIVES

- Decarbonize non-major and private port vessels - All non-major port vessels including tugs, crafts and dredgers to be replaced with clean fuel systems
- Advanced ship-shore communication technologies - Develop and implement cost-efficient high-speed wireless communications for shipping in port waters and usage of global navigation satellite systems for smart communication and energy savings
- Development of autonomous fleets - Implement Maritime Autonomous Surface Ships (MASS) technology at select major ports/ Inland waterway with capabilities like remote and autonomous waypoint navigation through collision avoidance and detection algorithms, situational awareness with sensor fusion and intelligent route planning
- Enhance capabilities in detection and monitoring of marine operations - Enhance operational capabilities to combat and mitigate oil spills, monitor and contain chemical leakages and toxicity, and retrieve and disposal flotsam and marine plastic litter from ships
- Export home-grown green technology to the world - Enable Indian Shipyards to develop Green-Home grown technology for Hydrogen/ Ammonia fueled vessels. Development of low-cost green technologies. Participating in global tenders with international collaborations

KEY PERFORMANCE INDICATORS

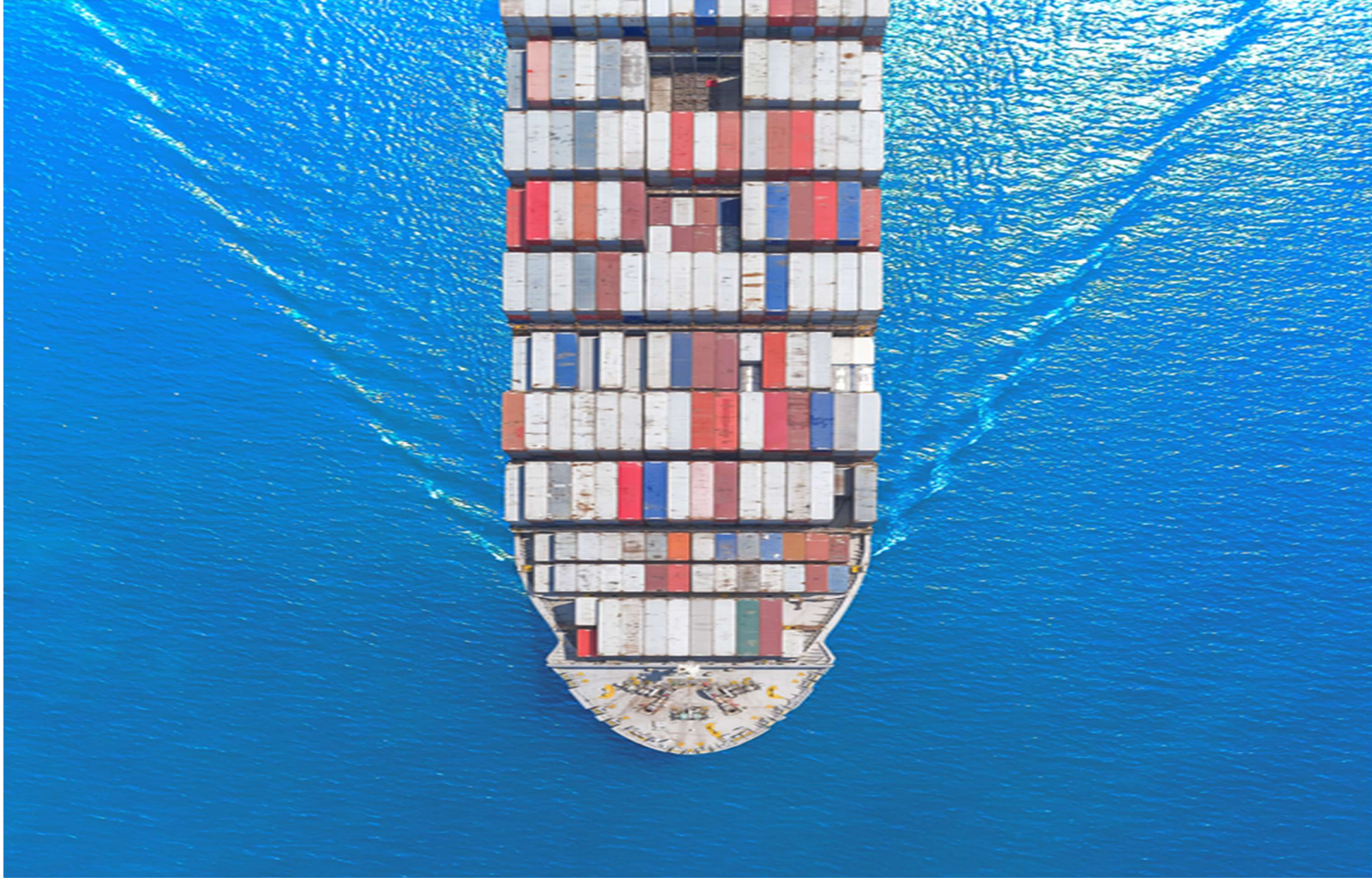
As part of Action plan, globally benchmarked targets have been defined as mentioned below to help India reduce pollutions from shipping sector.

Metric	Status (as of 2021)	Target (2030)	Target (2047)
Carbon neutral ports	-	1	14[12]
Developing Hydrogen/ ammonia Hubs at major ports	-	3	14
Develop circular ports	-	-	14
LNG Bunkering in major ports	1	4	8
Port equipment electrification (%)	-	50%	>90%
Area under green belt[13] (%)	<10%	20%	33%
Share of renewable energy at ports (%)	<10%	>60%	>90%
GHG emission reduction in domestic/ short sea shipping ferries, port vessels (tugs/ crafts/ dredgers) & OSVs/ PSVs	-	30%	70%
GHG emission reduction in all coastal/ EXIM vessels	-	10%	50%

[12] 14 represents number of total Major Ports in India

[13] *Note - National level target, since port level target can vary basis land availability, soil fertility etc. Including mangrove plantation

Theme 2
Promote Ocean, Coastal & River Cruise Sector



CRUISE TOURISM

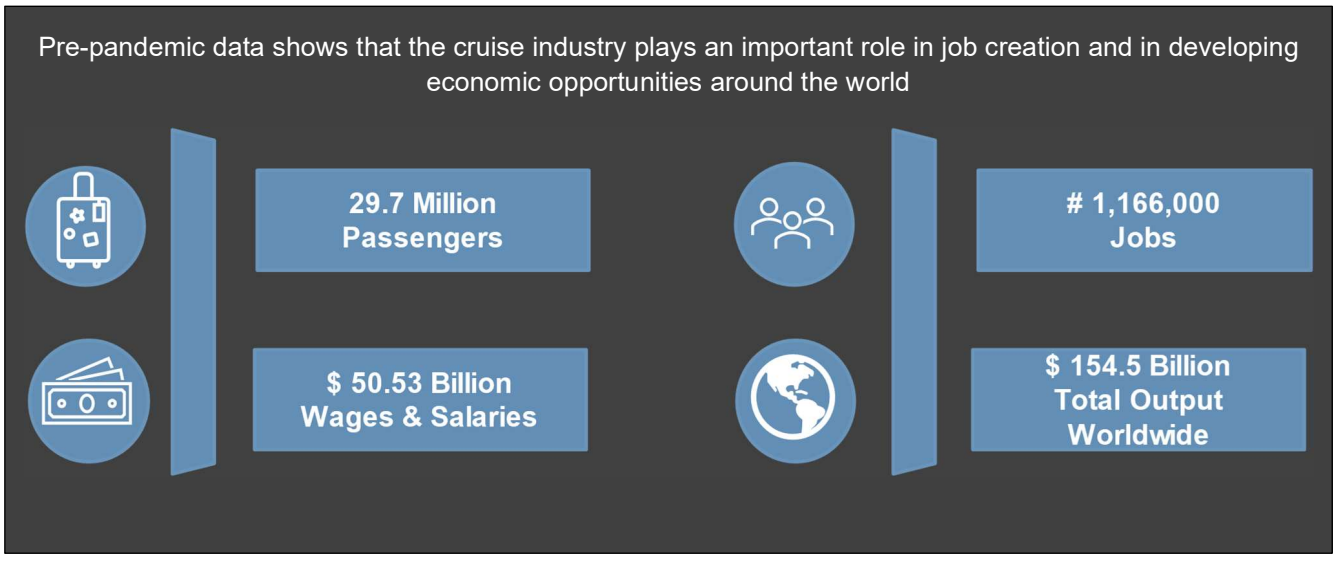
CURRENT LANDSCAPE

Tourism is currently one of the largest global industries and a significant engine for economic growth and employment generation. Globally, strong economic growth has led to the emergence of millions of new travelers looking for exceptional travel experiences, whether business or leisure, domestic, regional or international. This trend is expected to continue with sustained momentum, outpacing global economic growth.

India represents a largely unexplored realm with vast potential for exponential growth due to its population capacity, increasing wealth, a propensity for travel and continued investments overall in India. Cruise tourism is a niche sector in India representing only 1% of the overall global cruise industry numbers. However, cruise tourism numbers in India have had a steady growth in the last few years and present a strong opportunity today. India has enhanced its focus on the cruise sector with the Ministry of Tourism and Ministry of Ports, Shipping and Waterways actively promoting cruise tourism for its vast economic positive impact, the potential for job creation, for earning foreign exchange, amongst many other benefits.

Figure 42: 2019 Global Economic Impact of Cruise Industry

Source: CLIA (Cruise Lines International Association)



WHERE DOES INDIA STAND?

India has a substantial population base with a high GDP, growing middle class and a continually growing allowance for spending. Today, there is a limited Indian cruise market that focused on cruise regions outside of India. The market factors are in place to allow cruise tourism to flourish. However, allowing the Indian market to expand based upon natural growth, with no pivotal moment of change, means that growth will be extremely low and likely flourish over a long period.

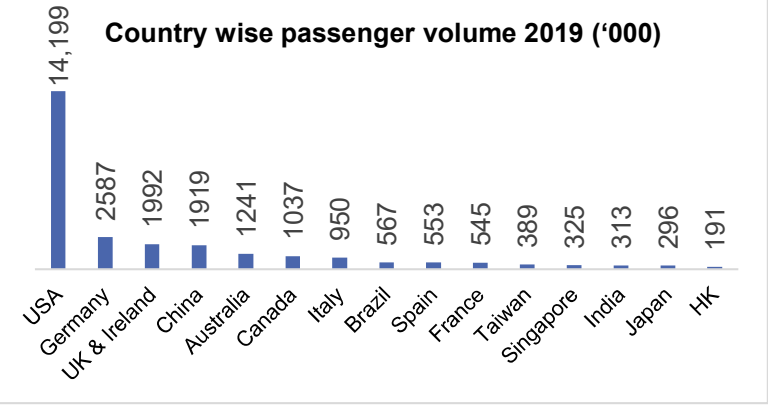
Presently, India has a very small share of the world cruise tourism market with more than 23-million cruise passengers in 2016. As per Indian General Sales Agents (GSAs) estimate, approximately 120,000 Indians book a cruise each year.

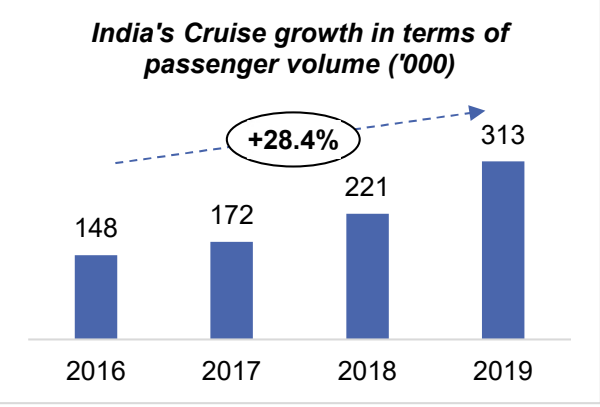
Table 3 Present cruise tourism market

Country	Coastline (Km)	Pax annually ('000)	Port calls
China	32,000	1,919	809
Taiwan	1,566	391	284
Singapore	193	373	400
Japan	29,751	266	888
India	7,500	313	284

The pre-pandemic data for 2019 shows India at **13th position** in terms of passenger volume with USA, Germany and UK being the front runners. In Asia pacific region India stood at **4th place** behind China, Taiwan, and Singapore.

Figure 43: Passenger volume: India vis-a-vis global maritime nations

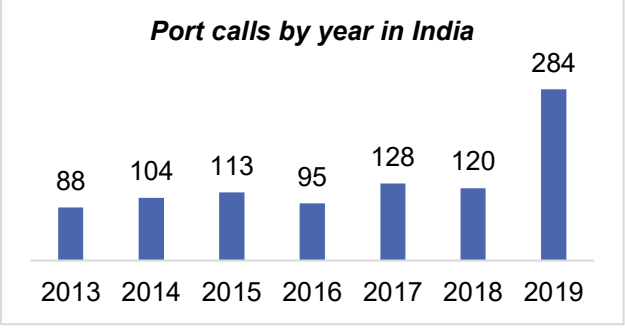


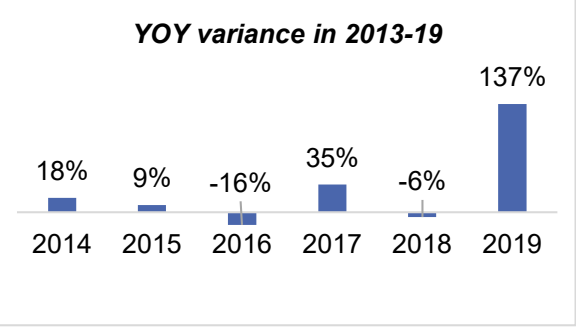


The passenger volume in India has been growing steadily with a CAGR of ~28% over the period of 2016-19 (pre-pandemic). In 2019, the passenger volume grew to 3,13,000 from 2,21,000 in 2018 with ~40% growth.

The overall port calls made in 2019 at India ports stood at 284, during the year the PDD (Passenger Destination Days) were 412. The past data for port calls shows that there has been a significant growth in port calls, 136% higher than 120 port calls made in 2018.

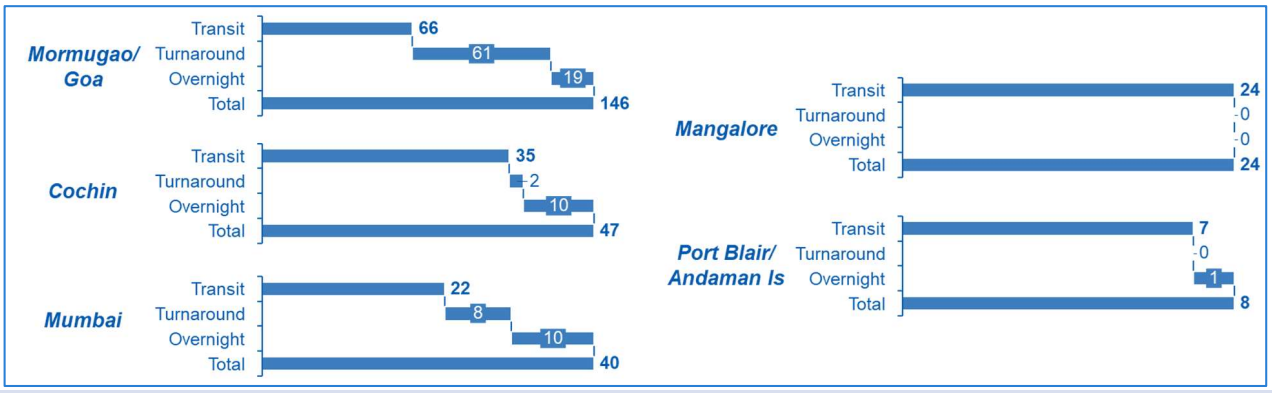
Figure 44:Overall port calls 2013-2019, India





These port calls in India are made from Mormugao/ Goa, Cochin, Mumbai, Mangalore and Port Blair/ Andaman, the split of these port calls is provided below:

Figure 45 Port calls made in India, demography



CHALLENGES

World's second largest country in terms of population, seventh largest by area and one of the most endowed regions of the world in terms of its tourism attractiveness, India doesn't figure in the top ten in her continent – Asia.

A sea change for India is required to establish a platform by which the cruise industry can be successful in the development of international as well as domestic cruise industry that focuses on the expansion of the International/ Indian consumer market and provides for a level playing field whereby the industry can be successful.

To achieve this, there is a need to focus on both domestic as well as international passengers.

Table 4 Challenges faced in Indian cruise tourism

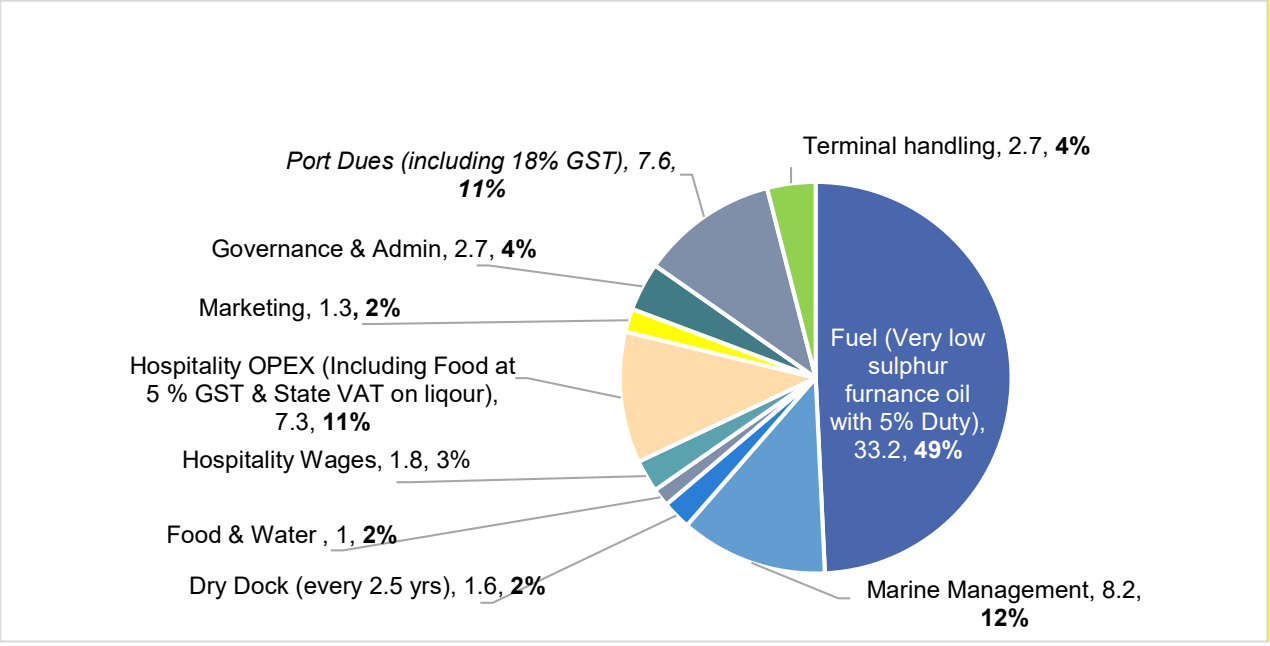
The vast majority of cruisers to India are foreign tourists (99%) that are moving through the region on World or repositioning sailings that move between Asia and the Mediterranean.	India has a substantial population base with a high GDP, growing middle class and a continually growing allowance for spending. Today, cruising is not meant for elite segment, and the sector is shifting to middle class while the elite class are moving to yachts & high-end private ships. By 2026 the population of India will be >1.4-billion with a growing middle class looking for travel experiences. However, the current taxes and duties are limiting the middle class from taking cruise ships.
With the global ocean cruise industry highly concentrated (80%+ share with top three to four players i.e., Carnival Corporation, Royal Caribbean Cruises Group, Norwegian Cruise Lines, MSC Cruises), unfortunately none of them are present in India. An attractive and stable regularity policy framework in line with international standards is most essential for attracting existing international players to set up their base in India.	There is also a need to establish a new Indian cruise tourism market that has little dependency on the development of the international tourism base and is separate from the expansion of the Indian Ocean / Arabian sector will provide for national cruise tourism growth in a shorter period.

Stakeholder interaction with one of the leading Indian cruise operators has revealed that certain following factors are one of the major reasons for market unattractiveness.

HIGH OPERATIONAL COST

Following is the operational cost breakup for one of the O-Ds in India provided by a leading cruise liner.

Figure 46 Indian Cruise line operating cost breakup on annua basis (INR Cr, % share)



Following are the average annual operating expense and annual revenue as revealed by the cruise liner

Average Annual operating expense	Average Annual revenue
INR 68 Cr	INR 52-69 Cr (350 pax @INR 6K-8K/ unit)

From the above, it is clear that annual revenue for the player in consultation is either lower or at par with annual operating expense. If CAPEX is also considered into the equation, then it leads to negative net revenues for them. Hence there is a need to reduce certain cost elements to make this market segment attractive and profitable for all the players in the industry.

The major contributors to high operational cost are **Fuel cost** which comprises of ~50% of overall operational cost, followed by **Marine management**, **Hospitality OPEX** and **Port dues** (~12% each). Remaining components contribute to less than or equal to 4% each. Owing to their higher contribution to operational cost the above highlighted factors are the possible areas for cost reduction.

- **Fuel cost** is the largest contributor to operational cost, reduction in which will lead to significant lowering of total operational cost. Government has already reduced GST on from **18% to 5%** recently (**October 2017**)[14] on bunker fuel for both coastal vessels and foreign going vessels. Further reduction might be difficult but once done, will certainly have a major impact on reduction of overall operational cost.

- The other major contributors such as Marine management which includes the crew cost have limited scope for cost reduction as these are the minimum requirements to take care of the essential task at the ship and cannot be reduced.

- **Port dues** is another potential component where the government[15] has already taken steps and provided rebate basis the calls made at the port. Further, reduction in Port dues may not be viable for Ports.

[14] https://gstcouncil.gov.in/sites/default/files/Press-Dynamic/11oct-no-10.pdf
[15] https://pib.gov.in/PressReleasePage.aspx?PRID=1645774

- **Hospitality OPEX** component contributes to about **~ 11%** of the total operational cost and various areas under this component may be looked into to make cruise industry viable.
- As per CBIC notification[16] dated 4th October 2018, Domestic passengers sailing on domestic sector are not entitled to buy duty free products on the cruise ships and in case where passengers make any on-board transaction, they will have to pay appropriate customs duty when they disembark at the next port. This is making cruises unattractive for domestic players.
- Further, as per the same notification, cruise ships will have legal obligation to pay customs duty on consumption of products including alcohol.

Case of Carnival Cruise Lines USA

Duty-Free Allowance for U.S Residents:

- *Itineraries that include any of U.S Virgin Islands (St Thomas, St Croix and St John)* - $1600 (retail) of duty-free purchases per person may be spent.
- *All other domestic itineraries* - $800 (retail) of duty-free purchases per person may be spent

Case of *Carnival Cruise Lines* Australia

- Provision of duty-free shopping onboard- from jewelry, merchandise to liquor

COMPUTATION OF CUSTOM DUTIES

Computation of custom duties presently levied for consumption within 12 nautical miles from Indian shores involves cumbersome paperwork and manpower. Customs will go by the self-assessment and declaration of cruise vessels regarding consumption of products including alcohol and on payment of appropriate duty thereon.

HIGH GST ON PASSENGER TICKETS & COMMISSION OF GENERAL SALES AGENT / PREFERRED SALES

India imposes **18% GST** on cruise passengers' tickets compared to airlines where only **5% GST** is imposed for Economy class and **12%** for Business class. Further, India also imposes 18% GST on commission of General Sales Agent / Preferred Sales

Singapore case
0% GST on passenger ticket and sales agent commission
Sale of air ticket, ferry ticket, coach transport to overseas is zero rated (**0% GST**)

CUMBERSOME PROCESS

Computation of custom duties presently levied for consumption within 12 nautical miles from Indian shores involves cumbersome paperwork and manpower. Customs have issued a Circular No.450/214/2015-Cus-IV dated 04.10.2018 clarifying that Cruise ships have the legal obligations to pay Custom Duty regarding consumption of products including alcohol on payment of appropriate duty thereon. However, the interpretation of the jurisdiction of its applicability and the process of its evaluation and payment has been one of the major irritants for the Cruise lines

*Port Miami charges a flat rate **head tax** of $12.74 per guest*

[16] https://www.cbic.gov.in/resources//htdocs-cbec/customs/cs-instructions/cs-instructions-2018/cs-ins-15-2018.pdf;jsessionid=678122C1A55BDBD7ECCDC3A392B02878

LIGHT HOUSE CHARGES

In accordance with the Gazette Notification dated 08.09.2000, Charge of INR 8/Ton[17] on Net weight on international cruises or Indian cruises entering Indian waters from another region.

Ships engaged in International Trade arriving at or departing from any Indian *Port are required to pay light-dues @ Rs. 8/- per ton. Section 13 of the Light House Act, 1927 empowers the Proper Officer of Customs to recover the light-dues*

KEY INITIATIVES

In order to overcome the above stated challenges following recommendations have been suggested:

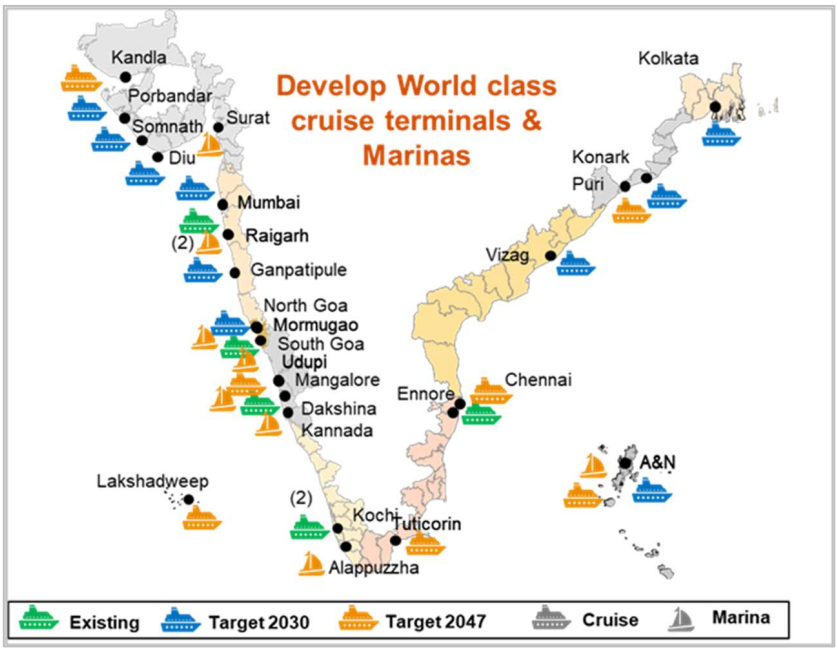
INFRASTRUCTURE INITIATIVES

IMPROVEMENT OF INFRASTRUCTURE OF THE CURRENT AND POTENTIAL NEW PORTS

Cruise tourism in India has remained limited to four major ports - Mumbai, Mormugao (Goa), New Mangalore & Cochin. Vishakhapatnam and Chennai do have port infrastructure but have not been explored by cruise liners. These 6 ports must be upgraded with good facilities.

Apart from augmenting existing infrastructure, new facilities shall be required to accommodate the cruise demand in next 25 years. Following are the potential locations for development of cruise terminals/marinas

Figure 47: Potential locations for cruise development



RIVER & INLAND CRUISES

One of the key differences between an Ocean cruise liner versus a River cruise liner is that the latter has much smaller vessel sizes/ passengers onboard, generally navigating shallow rivers and locks, and requires lesser infrastructure. This segment has a strong revenue earning opportunity for the country, as river cruising will be essentially only India centric, and both the homeporting and the cruising will cater mainly to the domestic market.

[17] http://kandlacustoms.gov.in/old/menu/publicnotice/PN-06-08.htm

The manufacturing of river cruise vessels also happens in India, as India has the relevant expertise for the same and about 12 river cruise ships have already been made in India.

River cruising should be done on rivers with a minimum of at least 150 kms cruise distance where longer duration programs can be created. For the shorter distances house boating and day cruising models can be utilised. The river cruise industry is at a nascent stage in India, with an initial focus on River cruise in India has significant untapped potential. Currently, only NW 1 (Ganga) & NW 2 (Brahmaputra) are offering river cruises. NW 68 (Mandovi), NW3 (West Coast Canal) and NW5 (East Coast Canal), have tourist attractions, however, are yet to be used.

IWAI is planning to develop NW 97, NW 8, NW 73 and NW 100 for cruises. IWAI shall provide demand-based support by conducting hydrographic surveys, supply and installation of floating and concrete jetties, steel walkways and marking buoys subject to demand/ proposals received from State Government/ Tourism Department.

POLICY/ REGULATORY INITIATIVES

HOSPITALITY OPEX

There should be Zero taxation for on-board transactions for a period of 10 years

CUSTOM DUTY EXEMPTION

Customs duty payment for consumables and fuel may be exempted for a period of 10 years for establishment of international cruise market in India. If exemption is not possible, a flat rate per passenger should be charged with no paperwork. In case, flat rate is also not acceptable, then a simple declaration of consumption from the Master of the ship should be referred for custom duties

REDUCTION IN GST

Reduce GST to **5%** on agent commission from current 18% GST. Further, the **18% GST** from passenger tickets to be reduced to a lower rate in the range of **5-12%** as in case of airlines.

LIGHT HOUSE CHARGES

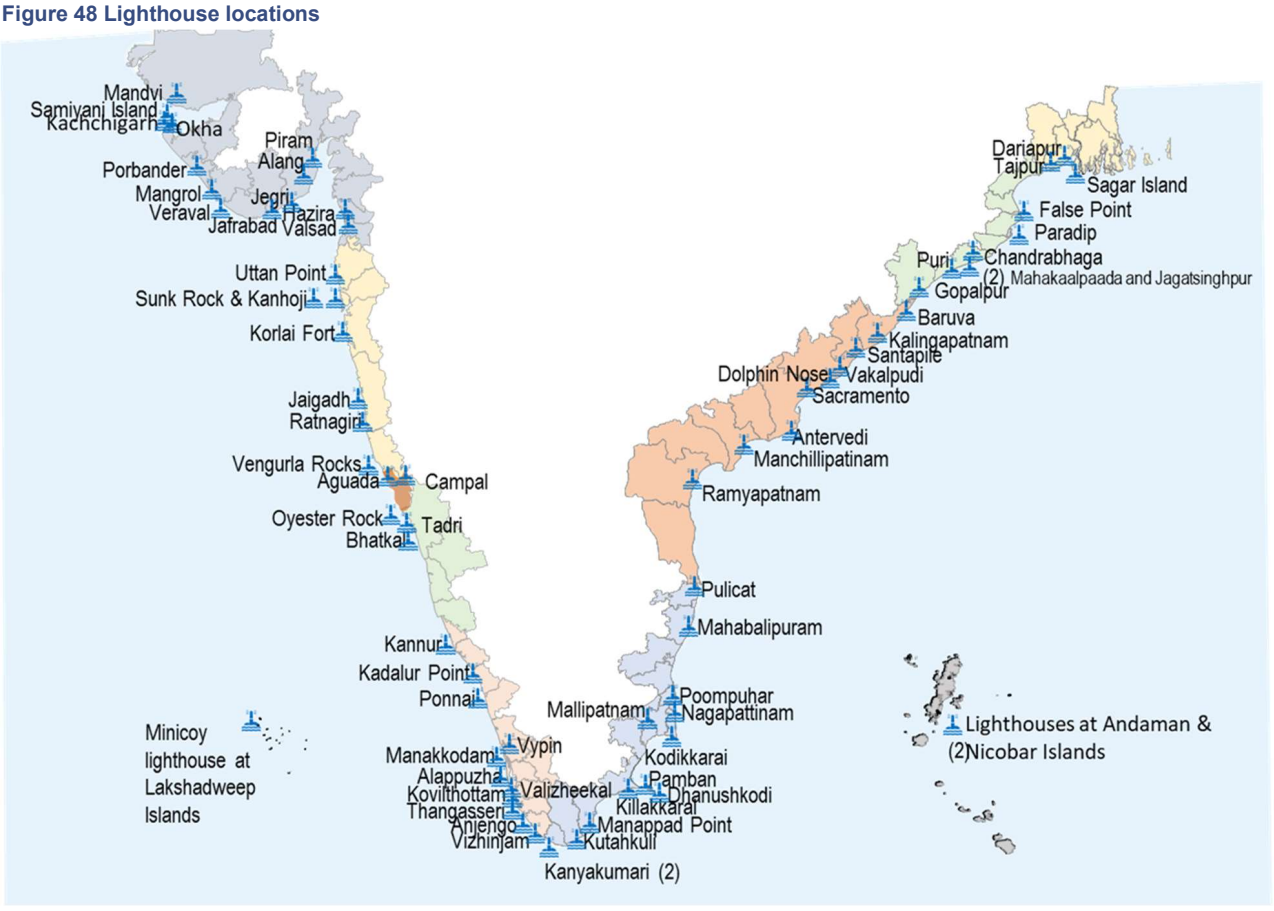
With modern navigational and digital instruments, ships arriving at Indian ports are no longer guided by the Light Houses and are unnecessarily charged for the same. The Ministries of Tourism and Shipping have recognised the impracticality of light houses and have suggested that all the light houses be transformed to tourist areas where recreational facilities are created for the benefit of visiting tourists. As this proposal to develop light houses for tourist spots is created, the Ministry of Finance will earn through these tourists and hence it is essential to cease charging Light House Dues to cruise vessels.

Directorate General of Lighthouses and Lightships (DGLL) and MoPSW have undertaken an ambitious project for the development of 13 light houses as day excursion destinations for attracting coastal and ocean cruise passengers. The development of these lighthouses is happening through 2 models i.e., Inhouse development and PPP development.

There are a total of around 68 light houses which may be developed from tourism purposes in phased manner. A detailed study may be conducted to take up development of these light houses.

The cruise action team, with the guidance of Ministry of Tourism should monitor the progress of lighthouse and island development plan and due marketing/ visibility of the same must be done, under the marketing initiatives mentioned in ocean liner cruising.

Figure 48 Lighthouse locations



CABOTAGE RELAXATION

Cabotage relaxation, which is valid till **February 2025**, needs to be extended until at least **February 2030** or cabotage law should be permanently abolished to enable foreign flag vessels to carry passengers to call on Indian ports without obtaining a license from the Director General of Shipping. This extension is required as international cruise companies make deployment plans 2-3 years going forward.

E-VISA FACILITY

E-visa facility has been extended to **five seaports**, namely Mumbai, Mormugao (Goa), New Mangalore, Cochin and Chennai but same needs to be extended to other Indian ports i.e., Andaman Nicobar Islands, Lakshadweep, Porbandar, Dui, Kolkata and upcoming facilities.

TAX HOLIDAYS

A tax holiday is an incentive program run by the government. It helps to stimulate foreign investment by reducing taxes on businesses. The objective is to encourage economic activity and foster growth. Software and ITeS industry, which is among the most visible sections in India today, had benefitted significantly from the fiscal support provided by the government in the form of income-tax holiday.

The STPI (Software Technology Park of India) scheme for IT companies offered 100% tax deduction on profits. The exemption was discontinued after March 2011[18].

[18] https://www.financialexpress.com/archive/sun-set-of-tax-holiday-for-it-ites-industry/541973/

A similar incentive in the form of "**tax holiday**" may be provided for cruise tourism industry for a period of **5 years**. This will help the industry achieve its full potential by facilitating expansion, employment generation, etc.

As per **Nasscom reports**, the contribution of the IT/ ITeS sector to the national GDP grew from **1.2%** in 1998 to around **5.8%** in 2009 and the sector's share of total Indian exports increased from less than **4%** in 1998 to almost **16%** in 2008 before the scheme was discontinued in March 2011

INSTITUTIONAL INITIATIVES

STANDARDIZED OPERATING PROCEDURES (SOPS) IMPLEMENTATION

Standardized Operating Procedures (SOPs) for cruise vessels have been revised and operationalized w.e.f. November 2017 at all major ports, but same needs to be updated in line with international standards. SOPs across the value chain (arrival process, terminal facility operations, and departure process) are necessary to ensure uniform and coordinated implementation across all cruise terminals. To ensure adherence to SOPs by all stakeholders, the following steps are needed to be taken:

- Personnel Sensitization and Training: Continuous training to officials across all segments - ports, security, immigration and, customs to ensure uniform practices across all terminals and departments.
- Implementation and Monitoring: SOP implementation committee to monitor implementation of SOP in all ports by all agencies uniformly.
- Process streamlining:
    - A credit card size e-LC with a barcode to be issued for use at multiple ports.
    - Collective clearance and the biometric exemption have been granted for three years (w.e.f Jan 2019). To enable quick immigration and this must be extended for a further period of 5 years.
    - Face to face check to be carried out only with e-LCs.
    - E- Landing Card (e-LC) for the crew to reduce paperwork for ships.
    - E-visa for crew should be available for extended durations.
    - Simple and dedicated process for completing the Immigration process en-route from previous foreign ports.

DEDICATED CRUISE ACTION TEAM

Establishing a dedicated Cruise action team, governed by Executive committee of "Indian Maritime Centre" or the "Tourism Ministry of India" has been proposed to manage the sector growth. This action team will act as a single point of contact for all public and private stakeholders for cruise industry in India. Representatives from concerned ministries will be part of the action team and expected to work jointly on the promotion of the cruise sector.

Singapore tourism board has a Cruise Development Fund through which it supports cruise industry players such as cruise lines, travel agents, charterers and trainers in activities that will build strong consumer demand for cruises from Singapore

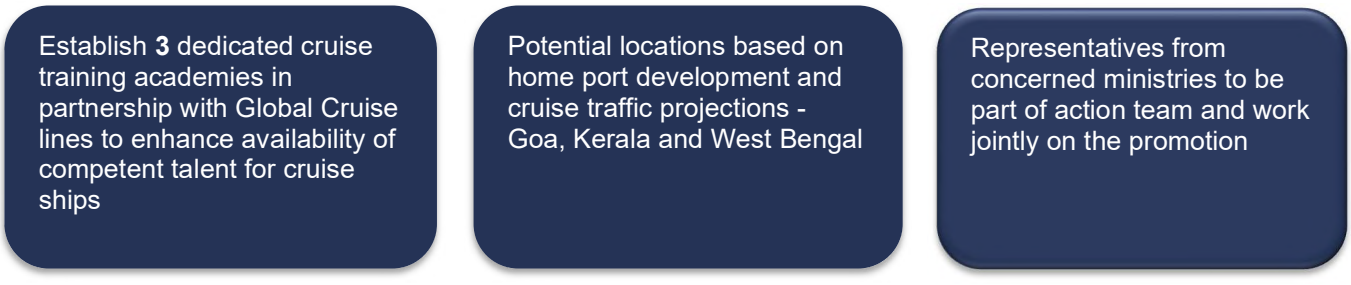
The global cruise industry is likely to spread out from the current cruising sectors of Caribbean, Mediterranean, China, etc., and find new destinations. India can be a promising alternative, given a long coastline and multiple tourist attractions encompassing Wellness, Culture, Ayurvedic, Beaches and Pilgrimage. Therefore, it is important that India builds its brand as a viable cruising destination and a unique cruise opportunity. India would need to launch sustained promotional and marketing campaigns, particularly targeting cruise liners and terminal operators as they play an important role in bringing cruise business to a destination. Support and grants from the Tourism ministry should also be given to cruise liners. This is the standard practise in developing/ developed cruising markets, whereby the Tourism ministry works alongside the various stakeholders of the cruise industry to promote cruising. Some of the marketing steps that can be undertaken by the tourism ministry in India are given below:

- Organize FAM tours for key decision makers of cruise line executives; engaging with them on a one-to-one basis to understand and align the ecosystem.
- India would also need to take its promotion and campaigns to international trade shows and relevant conferences.
- Participate in international cruise conferences held in various parts of the world like Miami, Dubai, China, Singapore.
- Organize National and International workshops with industry participants to showcase sector improvements and capabilities.
- Marketing campaign the cruise segment should be included in the current Incredible India campaign and the same should be shown in both the International and domestic market.
- Marketing plan to be prepared for building home ports and attracting global cruise lines.
- Centre has permitted employees to avail concession through rail and air travel under Leave Travel Concession (LTC) scheme. The scheme is proposed to be extended to the cruise sector.
- Have a Cruise Development Fund, through which it supports cruise industry players such as cruise lines, travel agents, charterers and trainers in activities that will build strong consumer demand for cruises from India

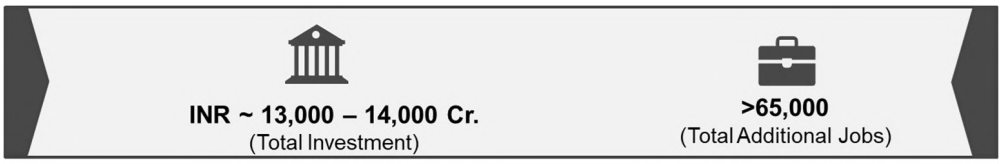
CAPACITY BUILDING INITIATIVE

For further growth and efficient operation of the cruise industry, it is proposed to establish three dedicated cruise training academies in partnership with Global Cruise lines to enhance availability of competent talent for cruise ships. The growing Indian cruise industry offer significant opportunities for cruise crew jobs with attractive benefits such as tax-free dollar earnings, on-board perks like food, lodging, medical expenses, etc. Moreover, there is flexibility of assignment with short contracts lasting up to 10 months across multiple designations and posts with different specializations. Despite the presence of Maritime Training Institutes (MTIs) and hospitality institutes, the training required for the scale of operations on cruise ships, merits the establishment of a world-class training facility in India. Three potential locations have been identified on the basis of home port development and cruise traffic projections, where cruise crew training facilities to be setup in partnership with global cruise lines in India: Goa, Kerala, West Bengal.

Figure 49 Areas of capacity building on cruise industry



Total investment required and potential job opportunities



FERRY MOVEMENT

CURRENT LANDSCAPE

Nation's 7,516 km-long coastline is interspersed with over 1300 islands and islets which were is home to 77 districts with 18% of India's population. Indian coastline touches nine states viz. Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, West Bengal and two union territories viz. Daman and Diu and Puducherry.

In India approximately 34% of the total population lives in cities. Urbanization has grown by 4% in the last decade. Almost 7-12% of work daytime is spent on travelling and workforce looks for low-cost transit.

Water transport is an untapped source of transport for city dwellers. Eight out of the ten largest cities in the world are coastal and a majority of large, non-coastal cities are riverside and ferry services are being encouraged there through various Govt. led initiatives.

Figure 50: Share of water-based transport in global maritime economy

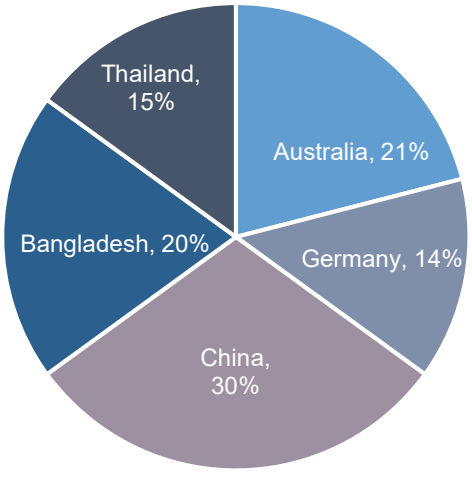
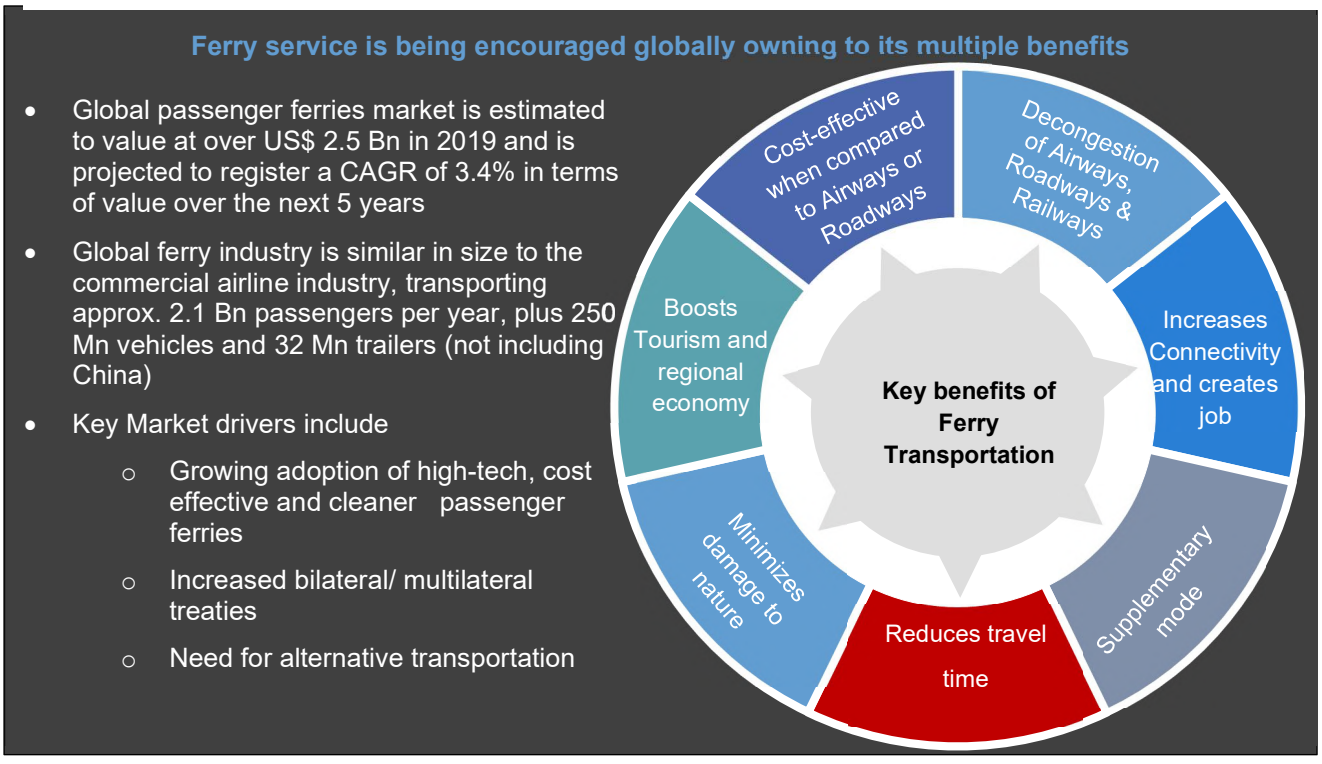


Figure 51 Key features: Ferry Transportation



India's water transport sector is relatively underdeveloped compared to other large economies due to matrix of natural reasons, infrastructural and policy lacunae

CHALLENGES

INFRASTRUCTURE RELATED CHALLENGES

Currently there is very limited land side infrastructure available for passenger water transport. Further, unlike cargo shippers, ferry operators are small parties with limited capital availability and investment from private operators for development of capital infrastructure is not viable.

LIMITED AVAILABILITY OF VESSELS

Vessel building is highly capital intensive and faces difficulties in obtaining project finance from banks and financial institutions. Investments from the private sector are very miniscule given the apprehension on long term profitability, longevity, and sustainable business in the water passenger transport sector.

LIMITED GOVERNMENT INVESTMENTS

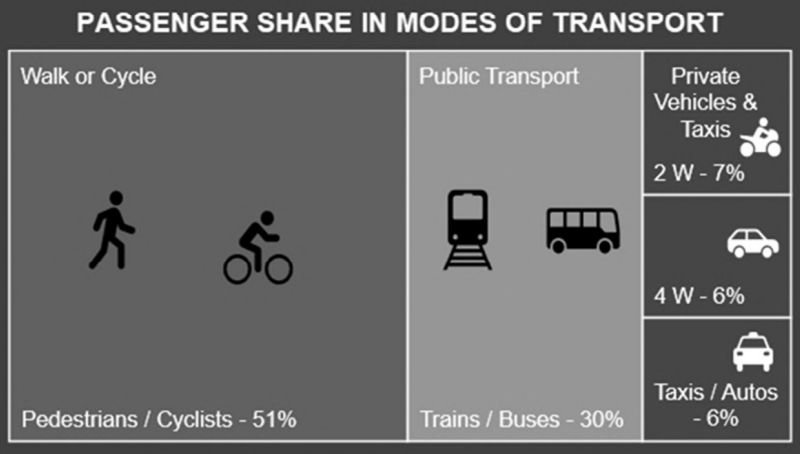
While considerable emphasis has been laid on development of other modes of transport, the importance of water transport has been realized lately. Consequently, public investments in water transport mode have been far below the levels attained by other modes. The operation and maintenance of ferries vessels and related infrastructure needs private participation to achieve accelerated development, however, without Government initial push, private sector would not be willing to investment in this sector.

Figure 52 Case Study: Challenges with land-based Commute, Mumbai

Case Study: Challenges with land-based Commute, the case of Mumbai

Mumbai is the largest commercial and industrial center of India. It is marked and highly developed with large office and business complexes, commercial centers. The city is developed vertically to accommodate the large population. Vehicular traffic in the Mumbai Metropolitan Region (MMR) has been increasing at an alarming pace.

A study by The Institute for Transportation and Development Policy – India (ITDP) reports that ~51% of Mumbaikars travel by foot or cycle, ~30% travel through public transport and ~19% travel by private vehicles and taxis. It is also observed that the number of vehicles grew threefold in the span of 15 years from 0.8 mn in 2001 to 2.27 mn in 2016 of which 0.86 mn are cars alone. The report also finds that while just ~19% of the people travel by private vehicles and taxis, they consume 82% of road space and 55% of traffic in peak hours crawls at less than 20 kmph.



The heavy congestion on these roads leads to indefinite delay in travel time. Also, there is no land available for expansion. There is a need to develop and adopt a new environmentally sustainable and responsive transportation system. In selecting this system, consideration should be given to the mode that does not contribute to unnecessary increase in fuel consumption, exhaust emissions and congestions. With the natural environment facilitating, the development of water-based transport would be an alternative in Mumbai to ease commuting and save on time and fuel consumption.

CURRENT LICENSING SYSTEM

While licensing for vessels involve in coastal shipping is done through DG Shipping, there are various bodies to provide license for inland vessels. There are many bodies including state maritime boards, zilla parishads, municipalities, gram panchayats, irrigation departments, ports, etc. that have the authority to issue a vessel license. Some of acts that empower these bodies are mentioned here:

1. Indian Ports Act 1908
2. Bengal Ferries Act, 1885
3. Northern India Ferries Act (I), 1878
4. The Bihar Ferries Manual of 1956
5. Control and Management of Ferries, Rules of 1968
6. Travancore Public Canals & Public Ferries Act 1096
7. The Cochin Public Canals and Backwaters Navigation Act, 1092
8. Assam control and management of ferries rules 1968
9. Maharashtra Minor Ports (Passenger Vessels) rules - 1963
10. Odisha Boat rules 2004,
11. The Maharashtra Zilla Parishads and Panchayat Samitis Act, 1961
12. Tamil Nadu Canals and Public Ferries Act, 1890
13. The West Bengal municipal act, 1993

With so many acts, there are so many differing definitions for ferries, boats, vessels that one fails to define a ferry properly. There is no clarity of definition of a ferry, a passenger vessel and a harbor craft with regard to legal matters. The rules have become vague and arbitrary due to lack of clarity.

Indian rules are plenty, discrete and obscure. There is no clear demarcation in many areas and is open to conflicts. There could be overlapping jurisdictions for areas such as Hooghly, where West Bengal transport department, a municipality, Kolkata Port Trust and MMD can have powers for registering a ferry or a vessel. When there are many bodies that are authorized to award licenses, the business competition creates an unhealthy environment with regard to safety and environmental performance. Nobody can make profit and the public may lose confidence and are less likely to accept water transport.

When it comes to blue economy, we fail to quantify the number of registered marine / inland vessels, contribution to economy, employment, emissions etc. which are vital statistics on the basis which future decisions can be taken. Due to this, Central government may not be able to quantify the benefit to society in funding projects that aim to enhance or improve water transport and may be reluctant to offer subsidies.

Figure 53 Ferry licensing, Maritime Ports Authority of Singapore

Maritime Ports Authority of Singapore

The procedure for ferry licensing is studied among leading developed maritime countries. It is found that Singapore adopted the most business-friendly approach. In Singapore, all vessels licensing authority is MPA Singapore only. There are separate provisions for licensing different types of vessels with clear definition, as shown below:

- Licensing a Harbour Craft - [Harbour Craft Licensing]. “Harbour craft” means any vessel which is used in the port for any purpose
- Pleasure Craft Licensing - [Pleasure Craft Licensing]. “Pleasure craft” means any craft which is intended for use within the port exclusively for sport or pleasure purposes but does not include any craft which is used to carry passengers on sightseeing tours within the port for which each such passenger is charged a separate and distinct fare. All pleasure craft to be used in Singapore port waters must be licensed. Further distinction can be made between a personal use pleasure craft and commercial use pleasure craft (less than 12 passengers’ capacity)
- Passenger Ferry - *defined as additional provisions for carrying more than 12 persons* - [Ferry Licensing]
- Temporary Harbour Craft Permit - [Temporary permits]. Any harbour craft which is not licensed but intended for temporary use for intra-port transportation of cargo or passengers, or other intra-port activities may apply for a daily Temporary Harbour Craft Permit. These are limited to a maximum of 5 calendar days (need not be continuous) in any calendar month and 15 days in a calendar year.

One of the reasons for their good, organized framework is a uniform set of rules all over the country’s

PRIORITY INITIATIVES

INFRASTRUCTURE INITIATIVES

LAND SIDE INFRASTRUCTURE DEVELOPMENT

To develop any mode of transport, the Government has to take initiative to establish the service. Similarly, to push the water transport, steps like constructing berths and providing navigation channel for Passenger/ Ro-Ro/ RoPax vessels for operations need to be taken by the Government. In other words, **“Build the infrastructure and they will come”**, i.e., once the market is established private sector will step in. Govt may invite the interested Private sector participants and support them with essential Infrastructure and other incentives to make operations viable, so that they can establish a service. Consequentially, the **Private sector can handle Marketing and Operations in a more economical manner**.

An example below is citing several countries that have adopted public-private partnership in order to meet multiple requirements of the transport,

Table 5: International benchmarking on PPP models

Component	Seattle	Sydney	London	Lake Victoria	Antwerp	San Francisco
Fairway	Public	Public	Public	Public	Public	Public
Connectivity	Public	Public	Public	Public	Public	Public
Terminal	Public	Public	Public	Private	Private	Private
Operations	Public	Private	Private	Private	Private	Private

Kochi Water Metro project

The Kochi Water Metro project has a total value of Rupees 819 crores and major part of which is financed under Indo-German Financial Cooperation with a long-term loan agreement of 85 million Euros (Indian Rupees 579 Crore) with German funding agency, KfW (Kreditanstault fur Weideraufbou), for the development of an integrated water transport system for the city of Kochi. Kochi Metro Rail Limited (KMRL) has signed a memorandum of understanding (MoU) with the State government to set up a special purpose vehicle (SPV) to operate, maintain and manage Water Metro, the passenger ferry system. The SPV, called Kochi Water Metro Limited (KWML), will be a joint venture of the State government and KMRL. **The government's equity contribution will be 74% and KMRL's share will be 26%.**

The project envisages the development of 15 identified routes, connecting 10 islands along a network of routes that span 78 km with a fleet of 78 fast, electrically propelled hybrid ferries plying to 38 jetties. More than 1,00,000 islanders are expected to benefit from the water metro.

It is envisaged to be a socially inclusive transport system than being just a transport service with focus on improved livelihoods.

The infrastructure needs to be specifically identified in response to the water transport challenges that exist in the system currently. Being at the nascent stage, the mode of transport requires establishing routes and future locations that are currently underserved or not served and have potential to be efficient transport centers. These locations must support socio-economic travel patterns to become a successful route. While there is land based movement, in those coastal cities, a supplementary mode of transport which is water based can be explored subject to its cost effectiveness. A detailed study in this regard is to be conducted for establishment of passenger water transport by:

- Detailing of coastal cities with dire need of supplementary mode of transport, here, water transport
- Understanding the routes for regular operations of passenger water transport
- Identifying the potential business modalities, feasible options could be Revenue Sharing, Viability Gap Funding and Annuity for balanced mix of govt. support and private operations in water transport

To elaborate this further with the adjoining Capital cost, let us consider the following cost break-up of a Ferry vessel operations figures extracted from one of the Ferry services currently in operation,

Table 6: Typical example of an operational ferry service

Vessel Capital Cost – INR 107 Cr (30% equity, 70% debt)	
Loan tenure – 12 years	Ticket earnings – INR 0.04 Cr (per trip at 70% utilization)
Loan interest – 11%	Annual Earnings – INR 28.69 Cr
No. of trips/ day – 2	Annual OPEX – INR 21.52 Cr (75% of earnings)
Net Annual Income – INR 7.17 Cr	

While the service is operationally sustainable, case becomes unviable considering capital cost of the vessel. Hence, it is proposed that the landside capex is provided by the Government.

OPERATIONALIZATION OF FERRY CIRCUITS

Based on stakeholder's interest, following O-D pairs have been identified for the development of international ferries:

Table 7 Proposed routes for international ferries

	Proposed routes	Viability	Remarks	Infrastructure availability
1	Karaikal - Jaffna (Sri Lanka)	✓	Short distance ferry, hence viable	**Karaikal** – Berth no. 9 **Jaffna** – Infra development to be taken up in consultation with Govt. of Sri Lanka
2	Vishakhapatnam - Chattogram (Bangladesh)	×	Long distance ferry with more than 24 hours journey. Lack of interest from parties mainly due to lack of sustainable demand	
3	Paradip - Chattogram (Bangladesh)	×	Lack of interest from parties mainly due to lack of sustainable demand	
4	Kolkata - Chattogram (Bangladesh)	✓	Kolkata – Chattogram can be considered	International river cruise tourism has already been initiated between Kolkata and Bangladesh. Ferry services can use same infrastructure.
5	Kochi - Seychelles (East Africa)	×	Long distance ferry with more than 24 hours journey. Lack of	

6	Kochi - Madagascar (East Africa)	×	interest from parties mainly due to lack of sustainable demand	

For domestic O-D pairs (Passenger/ Ro-Ro/ Ro-pax), following O-D pairs have been identified.

Table 8 Identified O-D pairs for domestic ferries development

S.No	Origination	Destination	S.No	Origination	Destination
O-Ds receiving maximum interest			**O-Ds receiving least interest**		
1	Jamnagar	Mundra/ Mandvi	31	Hazira	Diu
2	Hazira	Pipavav	32	Hazira	Kochi
3	Mumbai	Goa	33	Dahej	Diu
4	Okha	Mandvi	34	Dahej	JNPT
5	Dahej	Ghogha	35	Kattupalli	Haldia
6	JNPT	Pipavav	36	Kattupalli	Kolkata
O-Ds receiving medium interest			37	Kattupalli	Paradip
7	Hazira	Okha	38	JNPT	Mundra
8	Hazira	Somnath Temple	39	JNPT	Porbandar
9	Hazira	Dahej	40	JNPT	MbPT
10	Hazira	Mumbai/ JNPT	41	Kochi	Kavarati (Lakshadweep)
11	Dahej	Kochi	42	Jamnagar	Kandla
12	Mumbai	Mandvi	43	Sikka	Mandvi
13	Okha	Mundra	44	Gujarat/Maharashtra	Goa/Kerala
14	Paradip	Kolkata	45	Daman	Diu
15	Hazira	Victor	46	Hazira	Mahuva
O-Ds from MIV 2030			47	Kerala	Mangalore
`16	Okha	Dwarka	48	Rozi	Mangalore
17	Dwarka	Porbandar	49	Kandla	Kochi
18	Porbandar	Veraval	50	Hazira	Mangalore
19	Veraval	Diu	51	MbPT	CBD
20	Mumbai	Sindurgarh			
21	Sindurgarh	Goa			
22	Goa	Kannur			
23	Kannur	Kozhikode			
24	Kozhikode	Kochi			
25	Kochi	Thiruvananthapuram			
26	Kochi	Rameswaram			
27	Rameswaram	Malappuram			
28	Malappuram	Nellore			

S.No	Origination	Destination	S.No	Origination	Destination
29	Nellore	Kakinada			
30	Dwarka	Lakshadweep			

However, a detailed market study needs to be conducted before taking the above O-Ds for implementation.

While for Kolkata – Chattogram international ferry service, landside infrastructure is available, infrastructure development will be required for Karaikal – Jaffna ferry service.

Proposed infrastructure development at Karaikal

It is proposed to use berth no.9 for the Ferry service (Max Length–110 m; Draft – 8.5 m).

Table 9 Proposed infrastructure development at Karaikal

Proposed berthing facilities	Proposed Terminal facilities	Suggestions from Bureau of Immigration
▪ Exclusive Passenger Berth, Safe and Tranquil throughout the year ▪ Convenient Embarkation and Disembarkation facilities can be arranged ▪ ISPS complied and all safety measures in place ▪ Separate passage, waiting hall available for Passengers ▪ Facilities for loading of Provisions / Supplies ▪ Garbage reception facility as per MARPOL	▪ Customs waiting, examination halls ▪ Separate Baggage drop-off and reclaim area ▪ Baggage scanning and vehicle scanning facility ▪ Facilities for Medical Examination and First Aid ▪ Office space for Immigration, Customs, CISF authorities ▪ Additional Terminal outside Port Limits including Transportation facilities ▪ Baggage Handling including scanners, Trolleys, Porters ▪ Modern health center to be set-up ▪ Information Counter of India Tourism, Custom, Immigration ▪ Foreign Exchange, Police / Port Security ▪ Passenger Lounge with TV's and Cyber Café ▪ Duty Free Shops, Canteen & Rest Rooms ▪ Parking lots for Cars, Buses, Taxis etc. ▪ Communication & Public address facility ▪ Transit Hotel	▪ Dedicated terminal with requisite space for performing functions of Immigration, Customs, Health and Security and capable for facilitating the maximum passengers at a time should be made available by the concerned port authorities. In the absence of a dedicated terminal, concerned Port should make necessary arrangements for a temporary arrangement, with all facilities. ▪ Immigration counters (15-20) proportionate to the passenger traffic should be put in place at the terminal to cater to the requirements of Arriving and Departing pax. ▪ An Entry Refusal room should be provided at the arrival area of the terminal for detaining passengers who are refused entry for various immigration related reasons. ▪ The terminal should have uninterrupted power supply, installation of LAN and UPS and high-speed internet connection for ensuring uninterrupted services. ▪ Separate server Room and UPS Room should be provided with uninterrupted power supply at the terminal itself. ▪ A dedicated corridor from the vessel to the Terminal on par with the Airport model should be set up, so that every person, passenger/crew, getting on/off into and from the vessel should mandatorily pass-through immigration, which would ensure that the security is not breached or compromised. ▪ Adequate waiting/queuing area should be made available in front of the Immigration counters for the passengers and crew. ▪ Queue managers and proper signages should be put in place for effectively managing the traffic. ▪ Terminal should also be provided with proper air-conditioning, seating, drinking water and rest/washroom facilities for both the passengers/crew as well as the staff members of

		various agencies operating from the terminal. Wherever possible separate rest/washroom facilities should be made available to the staff of various agencies operating from the terminal. ▪ The terminal should also be equipped with CCTV cameras for effective surveillance of passengers/crew and staff of various agencies moving in and out.

STANDARD INFRASTRUCTURAL SPECIFICATIONS

The existing water transport facilities in the country are categorized into three major segments of Sea/ Coastal and inland transportation:

- **Fast Passenger Ferry** - Only for Passengers
- **Ro-Ro Ferry** - Only Roll-on and Roll-off
- **Ro-Pax Ferry** – Roll-on Roll-off Cargo and Cars with passengers

Major parameters that govern the type of suitable infrastructure are Location; Passenger Load; Type of vehicles; Type of Cargo; Water depth; Environmental Conditions; Operational Season; Siltation and dredging and Last Mile connectivity. The operator has to make a choice of the vessel, depending upon the depth available and the type of berth. If there is a standardization of the infrastructure at berths, then it is much easier to fix up the vessel, its modifications and operationalisation.

The ideal arrangement shall be to have offshore and onshore infrastructure close to each other for loading and unloading operations and comfort of passengers and safety and economy.

To provide Ro-Ro/ Ro-Pax service the critical aspect is safe and efficient rolling on and rolling off vehicles from the vessels. For this the most important aspect is of the ramp for RoRo /RoPax vessel and the ramp at jetty side. The ramps shall be suitable to the different tidal range. Based upon the tidal range the gradient/slope of the ramp is decided. In India, tidal range varies from 1 meter to 11 meters. It increases from south to north. Hence for the sake of understanding the tidal range and take a decision on type of the infrastructure, entire coastline is divided into nine zones,

Figure 54 Indian coastline zonal categorisation

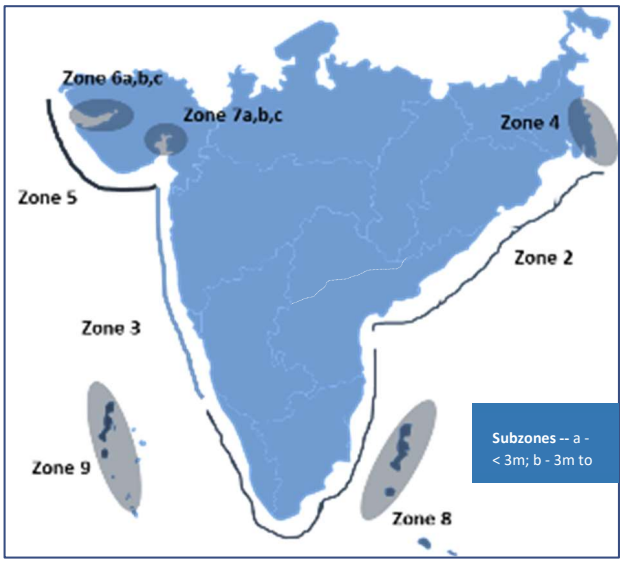


Table 10 Zone classification for infrastructure development, Passenger water movement

	Classification
Zone 1	Low tidal range, south
Zone 2	Moderate tidal range, east
Zone 3	Moderate tidal range, west
Zone 4	Inland waterways
Zone 5	Medium Coastal Gujarat, south
Zone 6	High tidal range, Gulf of Kutch
Zone 7	Highest tidal range, Gulf of Khambhat
Zone 8	Andaman & Nicobar Islands
Zone 9	Lakshadweep Islands

The following types of vessels may be developed under each of the zonal category:

Table 11 Vessel types based on each zone

Zone	Passenger	RoRo	RoPax
Zone 1	Type 1	Type 2	Type 1
Zone 2	Type 1	Type 2	Type 3
Zone 3	Type 1	Type 2	Type 3
Zone 4	Type 1	Type 2	Type 3
Zone 5	Type 1	Type 2	Type 3
Zone 6	Type 3	Type 2	Type 3
Zone 7	Type 3	Type 2	Type 3
Zone 8	Type 1	Type 1	Type 1
Zone 9	Type 1	Type 1	Type 1

- **Type 1 (tidal range < 2m):** Vessel ramps (+3deg to -6m) facilitate transfer of passenger, cargo vessels and trucks safely
- **Type 2 (tidal range between 2m to 5m): RC ramp and with short linkspan with winch –** Plan or Elevation; Fully automated using synchronized hydraulic pistons on port side and starboard side of ramp and sensors
- **Type 3 (tidal range > 5m):** Conventional floating pontoon concept - Combined linkspan cum pontoon, Separate truss bridge and pontoon

The types of the vessels have been identified using an assessment of various factors that can be used for the different categories of Ro-Ro/ Ro-Pax/ Passenger terminal facilities as summarized below:

Table 12 Types of vessels based on different categories

Factor	Passengers only	Passengers + 2 wheelers	Passengers + 2 wheelers & LCV	Passengers + All commercial vehicles
Seasonal/ 365 days operation	Seasonal	365 days	365 days	365 days
Shore Access	Floating walkway	Floating walkway	Steel ramps	Steel ramps
Floating Pontoon	HDPE pontoons and interlinked by bolts	HDPE pontoons with steel edges	Steel or RC pontoon	Steel or Pontoon
Design life	10 years	10 years	30 years	50 years
Draft of Vessels	~ 3 to 4m	~ 3 to 4m	Up to 4 m	Up to 15 m
Free board	~ 1 to 1.5m	~ 1 to 1.5m	~ 2 to 3m	~3 to 4m
Suitability	Inland, back water, calm areas sheltered by Island or breakwaters	Inland, back water, calm areas sheltered by Island or breakwaters	Calm water locations, near mouths of rivers, minor ports	Ports and open sea locations with breakwater or protection against waves

The materials used for the construction of fixed and floating infrastructure including floating pontoon and linkspan is listed in the table below,

Table 13 Type of material for different infrastructure

Description	Fixed	Floating
Onshore Facility	RC Construction	
Offshore Facility		
Approach Trestle	RC construction	
Breasting and Mooring Dolphins	RC construction	
Guide Pile	Structural steel	
Pontoon		Steel, RCC and HDPE
Linkspan		Steel
Walkways		Steel, HDPE and RCC
Ramp	Steel	

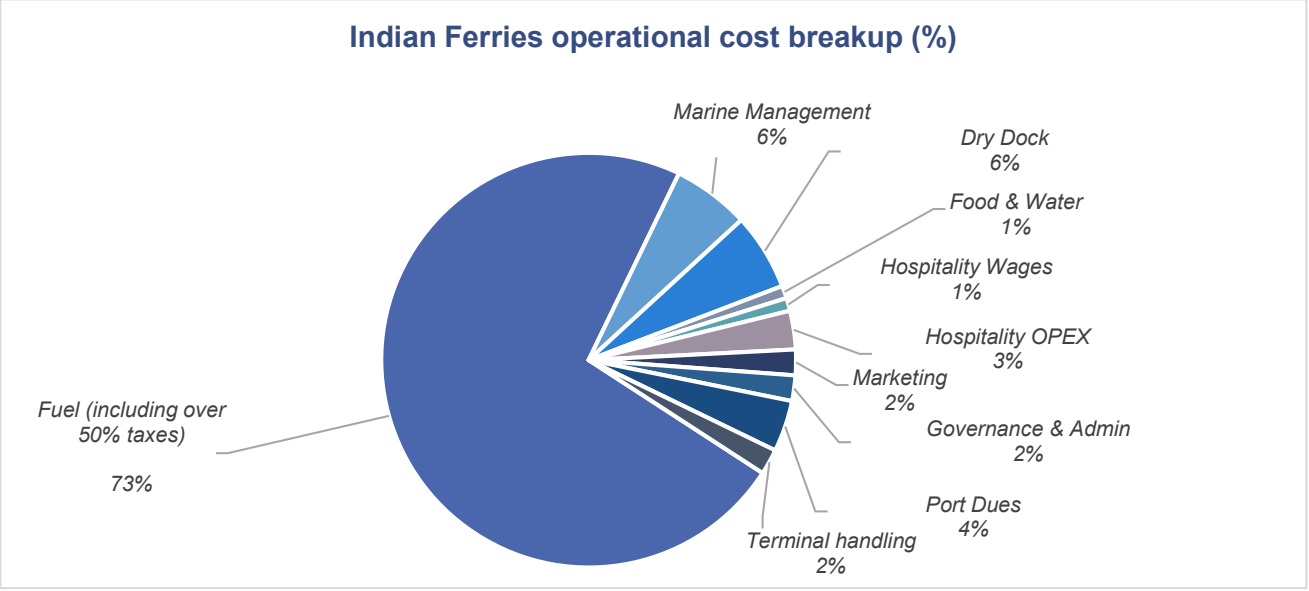
POLICY INITIATIVES

SUPPORT IN OPERATIONS

To understand the viability of the models in the Passenger Water Transport and routes to be identified, let us understand the economics with the cost to operate that is incurred by the Indian ferry companies. The figure below shows the various costs, where notably fuel cost comprises of over 70 % share of overall operational cost, besides the fuel cost currently facing over 50% of taxes.

It is to be noted here that the fuel prices of 73% comprise of ~50% of taxes only.

Figure 55: Operational cost breakup of a leading ferry company

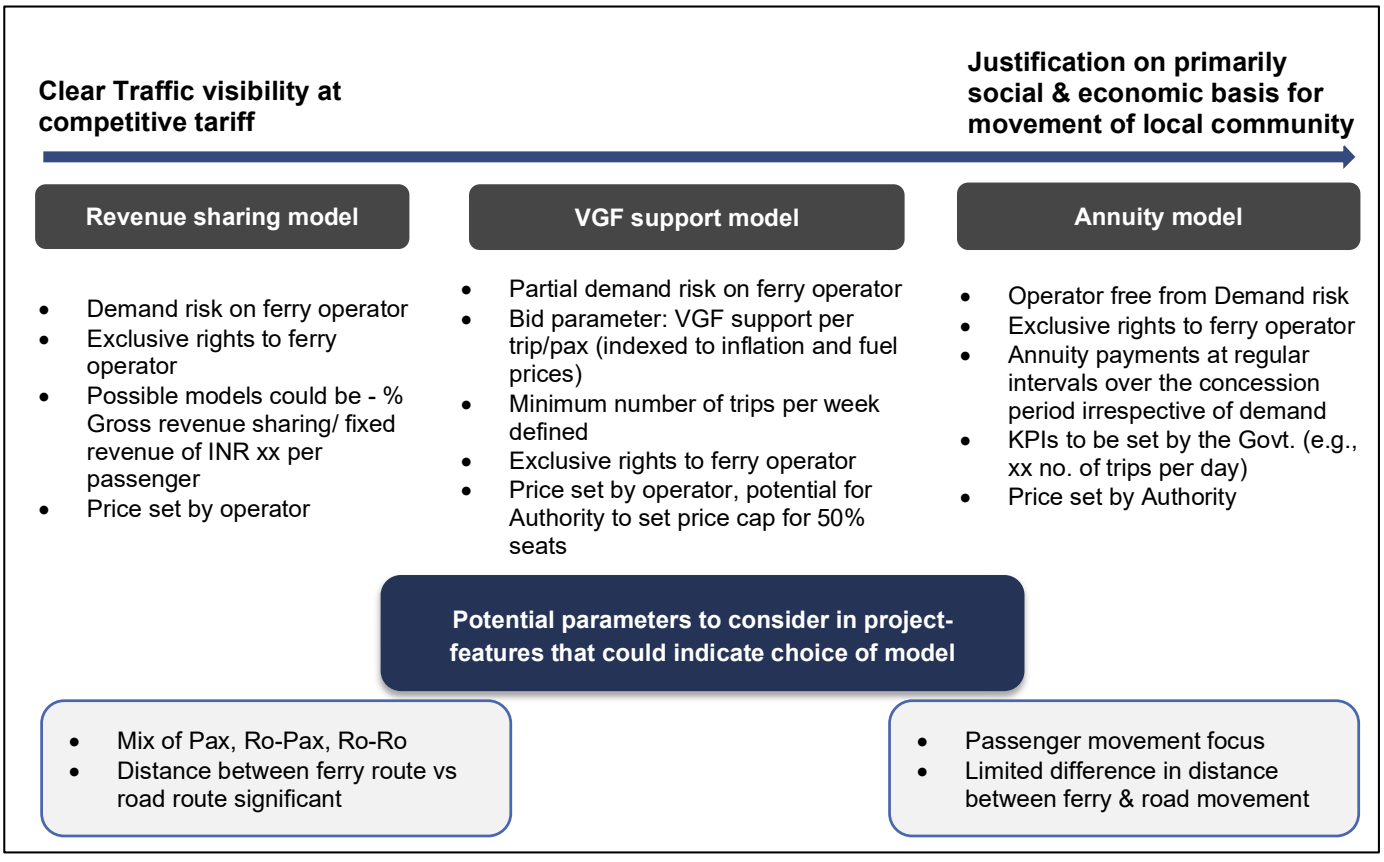


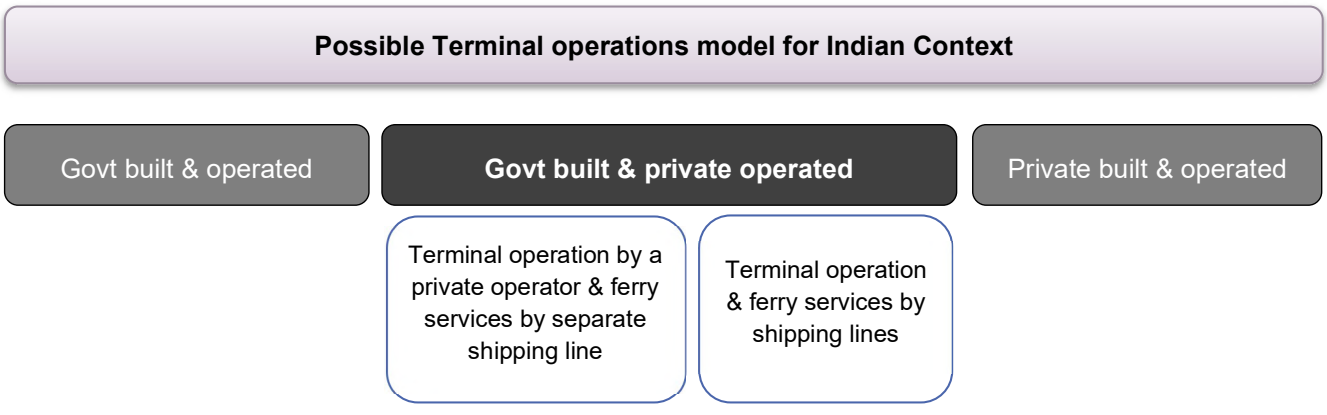
This tax component makes overall operational cost high for the operator. It becomes a challenge for an operator to become operationally sustainable.

Combining the cost of operations and capital required to establish and operationalize the ferries vessels, business models have been analysed to see the viability of operations and identify the gap fund. Based on traffic visibility and socio-economic factors, 3 models can be used to operationalize ferry services:

- Revenue sharing model with demand risk on private operator
- Annuity model with demand risk on Government
- Viability Gap Funding (VGF) support model with partial demand risk on private operator

Figure 56 Viability assessment for various ferry operations models (PPP) in Indian context





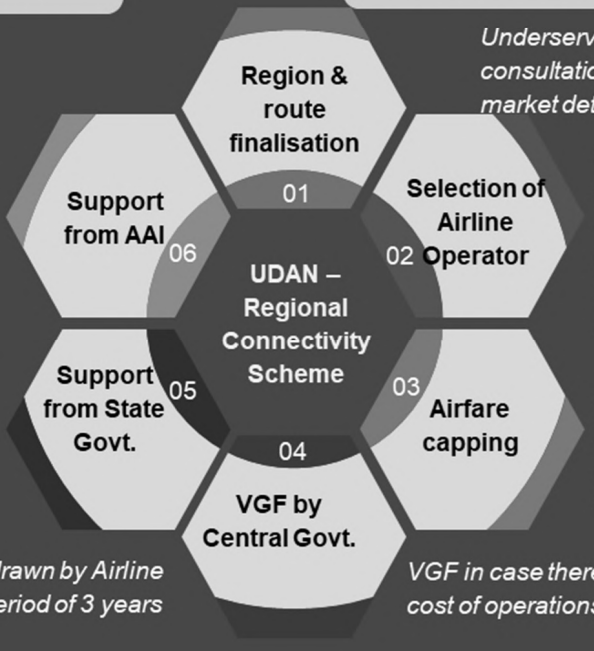
The above options have been suggested based on a detailed study of UDAN scheme in India's aviation sector.

CASE STUDY: Regional Connectivity Scheme (RCA) ~~ UDAN (Ude Desh Ka Aam Nagrik)

Instead of making it obligatory for airlines to start operations at underserved and unserved airports by providing some rebate, the pioneering approach adopted in RCS was to invite airlines to bid for routes suitable for airline profitability choosing the number of subsidized seats and number of flights per week, while the government supported them by providing Viability Gap Funding (VGF). Under-served airports are airports having not more than seven flights a week and unserved airports are airports having no flights during the last two flight schedules.

The main aim was to make it affordable for the population. Therefore, the price cap of Rs.2500 per hour journey was created by the Govt, so that for a short journey people were willing to use flights. If airlines needed to connect these regional airports, it had to be commercially viable for them. If a particular route did not have enough traffic, then that route would not be commercially viable for airlines. So, concessions and viability gap funding came as a solution for airlines. The airline operators were be supported through:

1. Financial support (Viability Gap Funding – VGF) to meet the gap
2. Concessions by the Central govt, state govts and airport operators



Underserved/ unserved regions in consultation with State Govts and market determined routes

Minimum Performance Specifications with respect to its RCS flight operations (to connect minimum 3 and max 7 airports through network). Minimum VGF/ RCS seat

Certain seats earmarked as RCS seats with Airfare caps. For 1 hour flight, fare capped at Rs 2,500

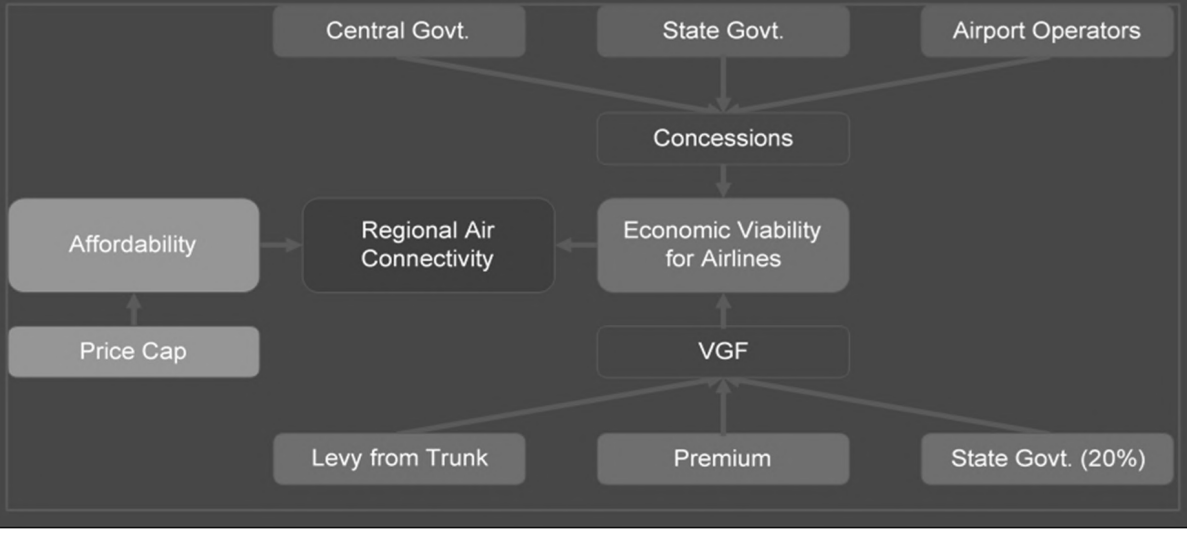
VGF in case there exists a gap in revenue and cost of operations

Excise Duty @2% on ATF drawn by Airline operator for period of 3 years

Land free of cost and free from all encumbrances. Water, electricity & other utilities on concessional rates. Reduction of VAT to 1% or less on ATF

Exclusivity of operations. No landing and parking charges. No terminal navigation landing charges on airlines

Business Model of RCS



The existing Regional Connectivity Scheme (RCA) - UDAN was studied to draw parallels with water transport. Similar financial support arrangement within Govt. and Private parties in the form of PPP can be customized to meet the cost effectiveness and affordability in the operations of passenger water transport.

Table 14: Parallels between UDAN and water transport

Parameters		UDAN	Water Transport	Remarks
CAPEX	**Land**	By State govt - free of cost and free from all encumbrances	By State govt - free of cost and free from all encumbrances	Govt investment may be proposed for the routes which will be part of Connectivity Scheme
	Infra	Runways by Central/ State Govt. Multi-modal hinterland connectivity by state. Terminals by operator	Fairway and jetties by Central Govt, Multi-modal hinterland connectivity by state	
	Carriers	Airlines to buy their aircrafts	Operators to procure/ charter vessels	
OPEX	**Fuel**	Central Excise Duty @ 2% ATF for 3 years. Reduction of State VAT to 1% or less on ATF at RCS Airports for 10 years	Suitable reduction may be provided in Central Excise Duty and State VAT for ferries	Central excise on ATF of 11%, VAT on jet fuel b/w 0% - 30% was reduced in UDAN. Similar reduction may be proposed in water transport
	Utilities	Power & water at concessional rates by State	Power & water at concessional rates by State	
	Terminal Charges	Exemption of Terminal Navigation Landing Charges. 42.5% discount on Route Navigation & Facilitation Charges – By AAI	Exemption from Port dues/ terminal charges	Port dues account for 4% of overall OPEX of ferries. IWAI has exempted terminal charge for certain O-Ds
	Fare	Capping on 50% seats with VFG from Govt. Service Tax concession on tickets for RCS seats. Parties asking for minimum/ no VGF per seat to be selected	An upper capping may be fixed on limited number of seats	Decision on capping of fares may be done based on detailed analysis

INSTITUTIONAL INITIATIVES

LOW-COST FUNDING FOR PROCUREMENT OF VESSELS

Details on Maritime Development Fund (MDF) is provided in Vessel Finance section

FERRY LICENSING PORTAL AND UNIFORM RULES

1.1.1.1.1.1. SINGLE PORTAL FOR FERRY LICENSING

A single website (portal) for all vessels in India can bring in a sea of change in the business outlook. Presently, there are many people, resources and various websites which are poorly organized and fail to deliver quality services for the sector. Pooling all the resources and maintaining a single portal will be economical and better utilized. With the common website, activities can be carried out centrally and the monies can be transferred to the respective bodies to avoid conflict of interest. Due to reduced burden on the local state departments, they will be able to carry out periodic inspections ensuring safety of the vessels, training the crew, maintaining navigation aids etc.

When implemented using a common set of frameworks, the hassles of operating vessels pan India wise will reduce. The local governments can be entrusted with mandatory inspections, which can be done with the help of a domain expert in a state or utilizing services of Universities or Ports in the vicinity. The delays in issuing licenses and other permits can be reduced. The model can be worked out with pooling personnel of state governments, who by deputation can render services centrally. The model benefits to remove skepticism of state governments and improve interdepartmental relationships. The particulars, extent and number of vessels will generate good quality data to continuously monitor emissions from the sector and can implement MBMs to regulate the greenhouse gas emissions. The national security will improve due to a single entity handling licenses, controlling vessel movements. A suspicious vessel can be identified quickly.

UNIFORM SET OF RULES

Further, uniformity in the rules will improve safety, security and environmental performance. The latest developments or new measures can be brought in quickly, such as the issue cited earlier with the report of National Disaster Management. A single set of rules that explicitly defines a vessel type is better than a number of discrete rules complicating definitions and interpretation of certain specialties. It should be appreciated marine trade is highly specialized and there can exist a number of different types of vessels engaged in the same geographical location.

Ferry Information system in lines with Bhuvan portal

The existing Bhuvan portal can be populated by National Remote Sensing Agency to include information on inland and coastal navigation, including ferry licensing, permits and registrations.

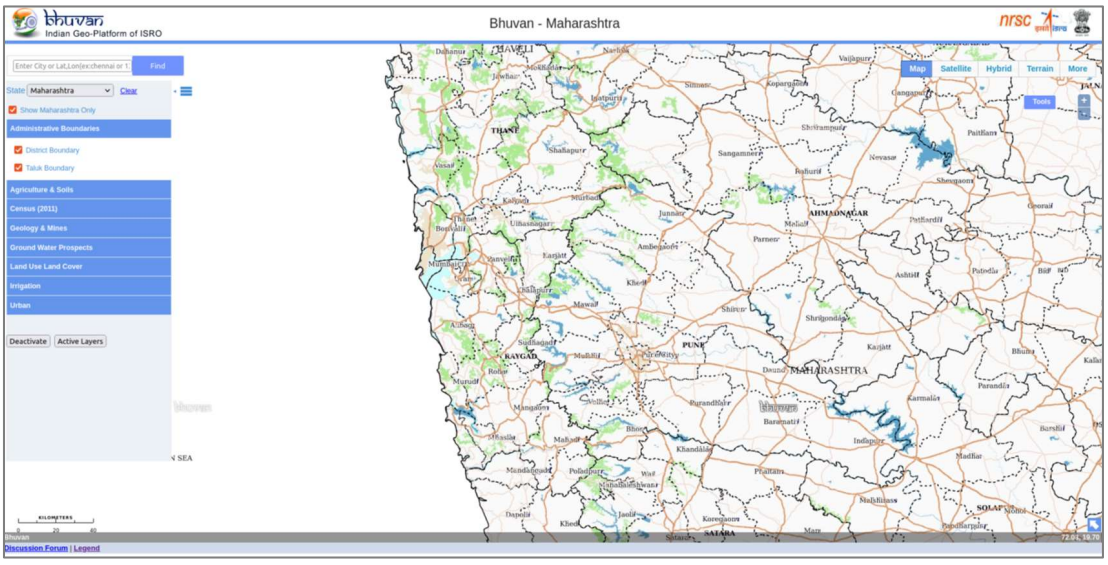
Figure 57: Multiple applications can be populated by National Remote Sensing Agency

A coastal information system is operational on the Bhuvan portal. But that caters exclusively to the Ministry of Home Affairs and focuses on West Bengal. This shows that NRSC and ISRO have readily available data that

can be made available for facilitating navigation, identifying jurisdiction of respective authorities, their contact websites, addresses and other useful data by coordinates.

The below snapshot shows the different layers available in Bhuvan that can show boundaries of local government bodies such as zillas, panchayats etc. Such a layer can be added to maps to show respective responsibilities and limitations with regard to ferry licensing or permits.

Figure 58: Snapshot of Bhuvan portal showing boundaries of local government



Another close map showing Mumbai port in detail on Bhuvan. Such maps can be enhanced to show the harbour crafts domain and ports jurisdictions, IV vessels operational zones.

Figure 59: Snapshot of Bhuvan portal showing operational zones

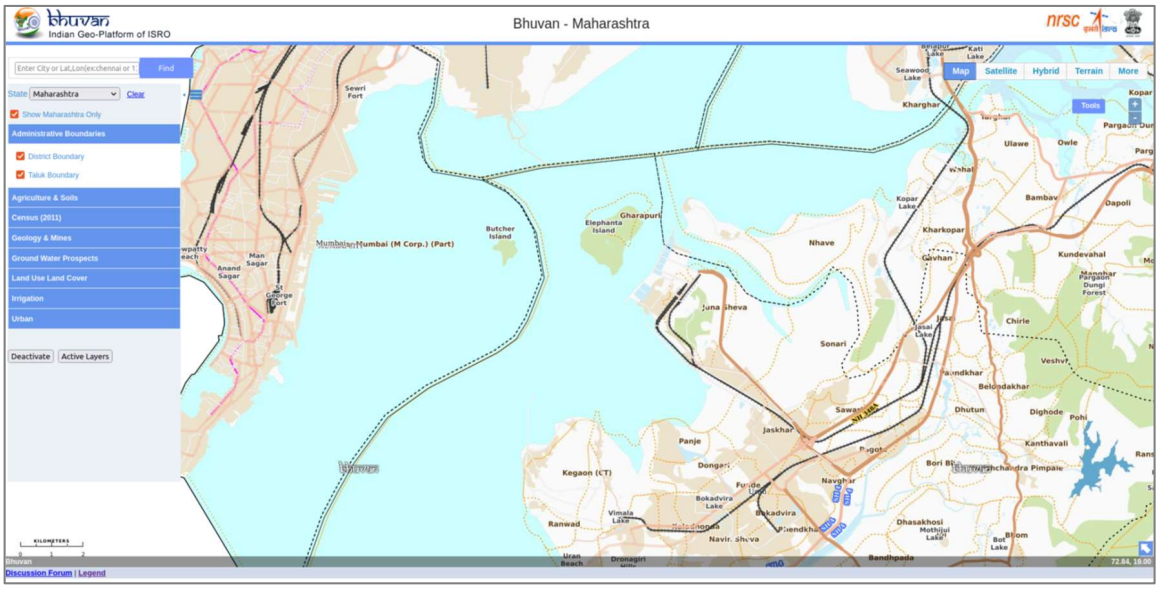
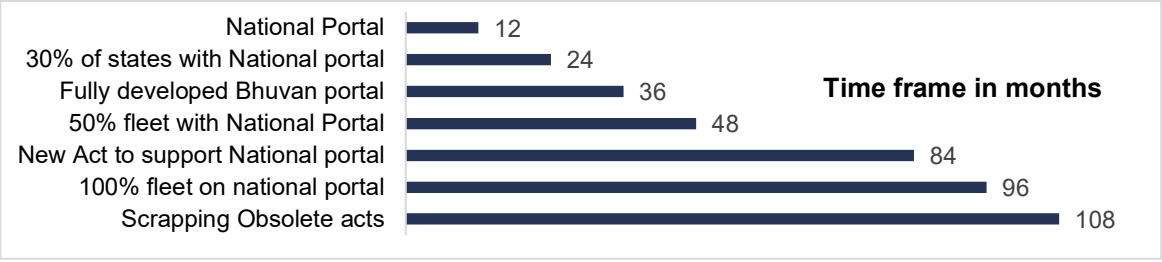


Figure 60: Timeframe for implementation



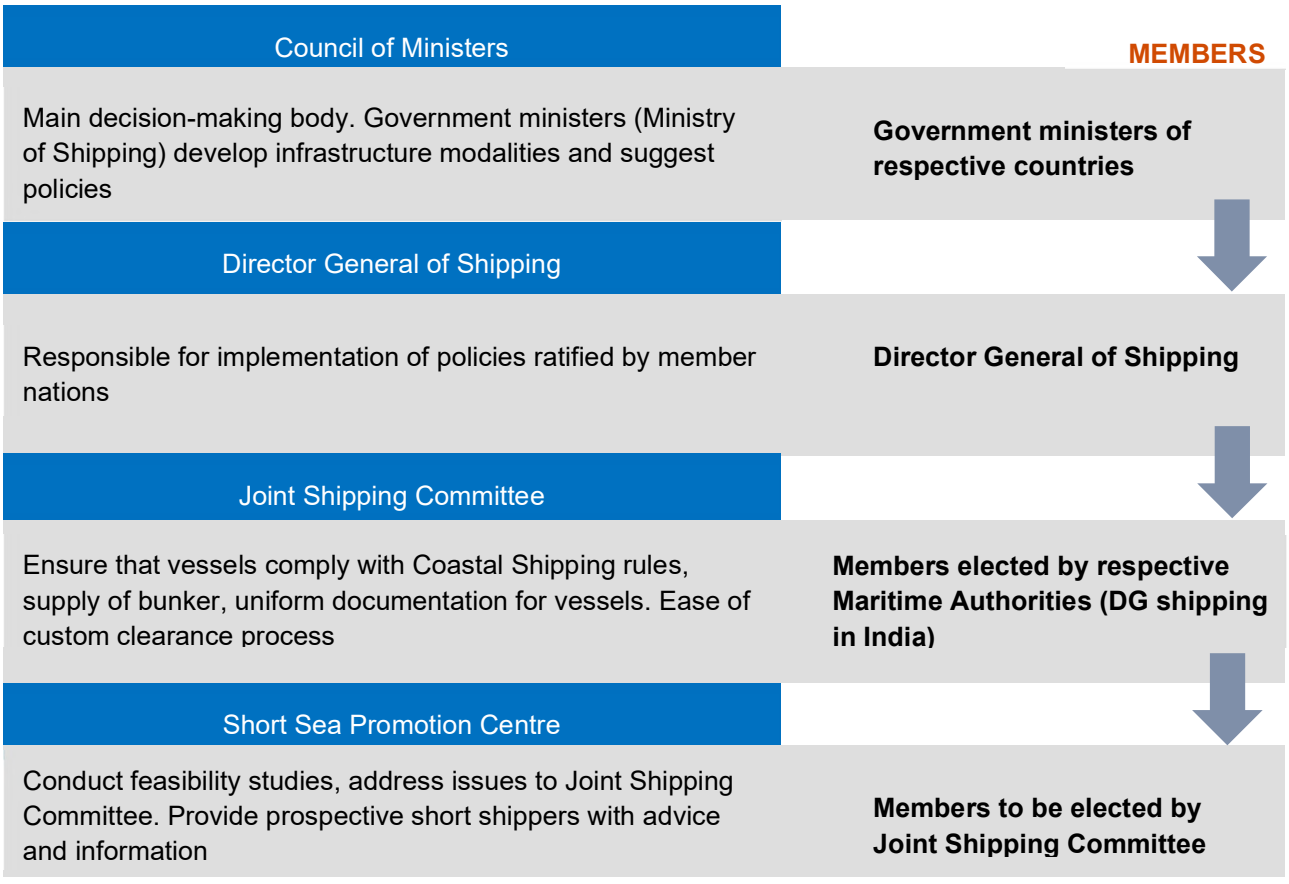
DEDICATED STRUCTURE TO GOVERN AND REGULATE INTERNATIONAL FERRIES

To govern and regulate ferries, there will also be a requirement of a dedicated institution.

Table 15 Proposed governance structures for ferries: India-Bangladesh, India-Sri Lanka

India – Bangladesh	India – Sri Lanka
Coastal Vessel Agreement (CVA) exists between India and Bangladesh. The Agreement allows shipping companies of India and Bangladesh to convey cargo on both the sea and rivers in both countries using owned or chartered vessels that are registered to RSV (coastal) standard	New agreement proposed for India - Sri Lanka ferry/ cruise operations as no agreement currently exists
Specific issue to be taken care of: **"Inclusion of passenger ferries in existing Coastal Vessel Agreement with detailed SOP"**	The agreement to cover the following: • Develop modalities for infrastructure development • Develop, amend and adopt policies. Implement applicable policies sanctioned by member nations • Establish tariff mechanism and align terminal charges • Finalize vessel specification, manning norms and ensure vessel comply with shipping rules • Develop SOPs & training manuals for customs & immigration etc.

Figure 61 Proposed Governance structure for India – Sri Lanka Short Sea Shipping Agreement



KEY PERFORMANCE INDICATORS

Key Performance Indicators	Status (as of 2021)	Target (2030)	Target (2047)
India's ranking in terms of passenger volume in Asia Pacific	4	3	1
No. of Indian ports amongst top 20 ports ranked by total calls (cruise) in Asia Pacific	1	2	4
Number of cruise passengers travelled in year	4 lakhs (<1% global share)	18 lakhs (4% global share)	50 lakhs
Number of ship calls made (Home +port calls)	450	1,000	2,170

Theme 3
Enhance modal share of Coastal Shipping & Inland Waterways

COASTAL SHIPPING

CURRENT LANDSCAPE

The coastal shipping sector in India is still in its nascent stage compared to other countries and other modes of transport. It is well established that compared to other modes, waterway transportation is a cost-effective, sustainable and environment friendly mode of movement. Maritime shipping is the world's most carbon-efficient form of transportation – far more efficient than road or rail transport. On a per metric ton of cargo basis a large container vessel emits half the carbon dioxide than rail and almost one-sixth to that of road transport, thus, playing an important role in reducing carbon emission and pollution in the mainland. In spite of these advantages of waterway movement, India is not able to fully utilize its 7,500 km coastline and over 14,000 km of navigable inland waterways. In the past few years, several initiatives have been taken to promote coastal shipping such as green channel clearance, priority berthing, discount on vessel and cargo related etc. A rapid growth of coastal shipping underlines the positive impact of these initiatives. However, the country has not realized the full potential of its waterways. With only 6.4% modal share of water transport, India's transport modal share is relatively more skewed towards road and rail. This has significant implications on congestion and pollution levels on key land-based trade routes.

CHALLENGES

HIGH FIRST AND LAST MILE COST

Coastal shipping is multimodal in nature and is dependent on other transport modes for first and last mile movement. While the water transport cost is cheaper than road/rail cost, end-to-end multimodal coastal shipping costs may not always be cheaper vis-à-vis direct rail/road movement because:

- Origin/destination centers located at more inland locations from the coast
- Even for the cases when the location is located closer to coast, the last mile cost is high because of long lead distance from existing ports.
- Inefficiency in the first/ last mile movement due to existing set-up of storage infrastructure, which are aligned with road/rail movement.

EMPTY RETURN COSTS INCREASED TARIFF

If there is no return cargo available on the return leg of coastal movement, the cost of vessel empty return is recovered from the shipper. This empty return cost reduces the competitiveness of coastal shipping vis-a-vis road and rail modes, which does not explicitly recover the empty return cost from the movement. Additionally, road and rail modes have the flexibility to direct the rakes or trucks to locations where the cargo is available, reducing the impact of empty return costs.

SMALLER PARCEL SIZE OF INDIVIDUAL PLAYERS AND LACK OF AGGLOMERATION

While road and rail mode have the flexibility to handle smaller parcel size of cargo, coastal shipping requires a larger shipment size to efficiently utilize the available vessel. However, the parcel size available with individual players may not be sufficient to utilize the vessel capacity. For example, in case of steel, EXIM Supramax vessel is suitable for coastal shipping, whereas the individual players' shipment size ranges from 5,000 to 20,000 MT which is not adequate to efficiently utilize Supramax vessels and partial loading of vessels leads to high voyage costs per ton of cargo.

INADEQUATE HANDLING AND STORAGE INFRASTRUCTURE AT PORTS

Voyage cost is one of the critical components of multimodal coastal shipping costs because of its dependency on market conditions. During the loading/unloading operations, vessel lie idle and charter and bunker costs are added to the coastal shipping costs. Delay in loading/unloading of vessel increases the turnaround time at berth and leads to higher coastal shipping cost.

INADEQUATE CONNECTIVITY OF PORTS/ BERTHS WITH ORIGIN/DESTINATION CENTERS, RESTRICTING COASTAL MOVEMENT OF CARGO

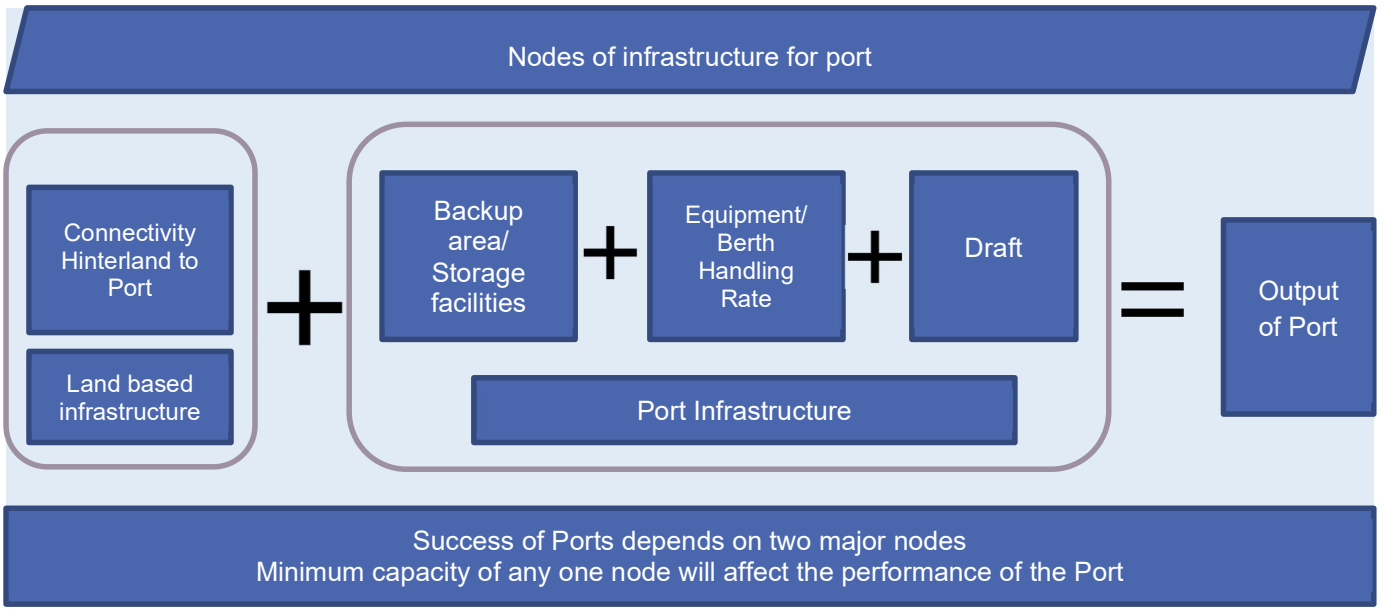
Infrastructure connecting ports/coastal berths to production or consumption centers is constrained with excessive dependency on a single mode, leading to congestion and higher first or last mile costs.

KEY INITIATIVES

INFRASTRUCTURE INTERVENTIONS

The way ahead for coastal shipping is improving both on the onshore side and the evacuation side. If both the nodes of infrastructure are improved vis a vis coastal shipping it can make coastal shipping more viable.

Figure 62 Nodes of infrastructure for Ports



Four broad infrastructure interventions are proposed to enhance coastal shipping.

Port based agglomeration centres	**Port based warehouses/ silos**
Road/ Rail/ IWT connectivity/ expansion projects	**Coastal berths development nearest to coast-based production/ demand centers**

**Infrastructure development in the proposed locations (tentative) will be based on detailed study*

PORT BASED STEEL AGGLOMERATION CENTRES AT LOAD PORTS

At port-based agglomeration centres steel commodities of individual players will be aggregated to make suitable shipment size for loading the vessels. International Examples: British Steel- Italy Steel Park, Steel Logistics center- Hagen.

Advantages

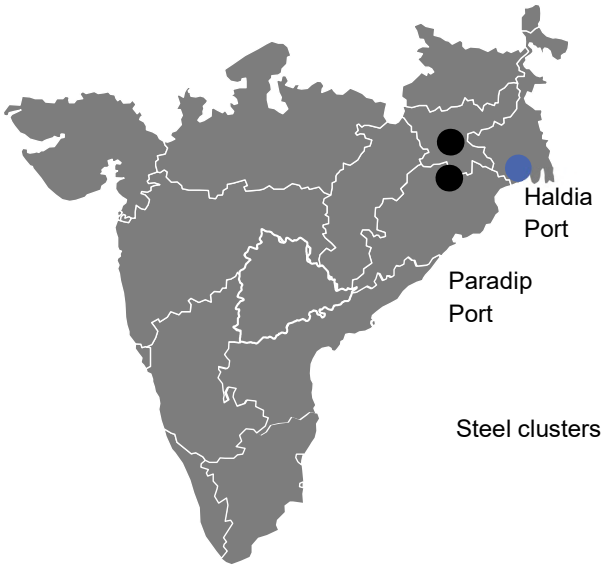
- Cost reduction through economies of scale
- Cargo agglomeration will also provide smaller players with increased market access who are restricted to serve the regional markets only owing to high transport cost for small parcel size movement.
- Ecosystem of freight forwarders may develop, and future production units may develop near these centres.

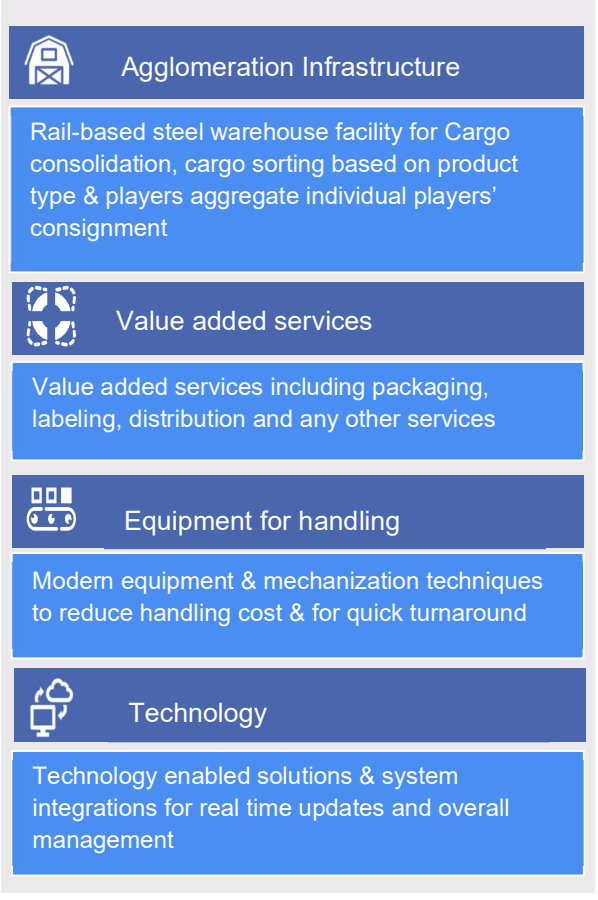
Large steel clusters are located on east coast of India from where the steel cargo is currently moving to west through rail and road. These steel clusters are located within 150-350 km from the east coast ports of Paradip and Haldia. Developing steel agglomeration centres at or near the Paradip and Haldia port will allow steel players located in the steel clusters to utilize the coastal shipping mode.

Steel Clusters

- **Paradip:** Angul, Dhenkanal, Kalinganagar, Rourkela
- **Haldia:** Jamshedpur, Bokaro and Durgapur

Figure 63 Potential location for Steel agglomeration centre





Agglomeration center at Paradip and Haldia are expected to handle ~ 3 MMT and 4 MMT of steel annually by FY25, respectively.

At Paradip port, an agglomeration facility of 84,000 MT capacity with a land area of 8 acres is required. And, at Haldia dock complex, an agglomeration facility of capacity 0.13 million MT with a land area of 13 acres is required.

Figure 64 Agglomeration Services Centre case study | Jiulong Steel Logistics Park in Zhangjiagang, PRC

Agglomeration Services Centre case study | Jiulong Steel Logistics Park in Zhangjiagang, PRC

Spread over an area of 8 million sqm, houses logistics companies, processing units & trading companies

Provide integrated common user facilities and all-round logistics service that players can leverage for Inventory, cutting and pre-processing, distribution & information

Envisages development of high-end services like recycling of faulty products, e-commerce platform, steel production plant

Internationally, the steel agglomeration centres are either developed by an anchor steel player (Jiulong Steel Logistics Park in Zhangjiagang, PRC) or by a steel logistics player on the backing of long-term commitments from multiple steel players (DB Group Steel Logistics Centre Hagen, Germany).

In Indian context, the proposed agglomeration centers may be set-up through government interventions (example by port authorities through PPP mode or by leading PSUs such as SAIL.

Table 16 Potential business model for steel agglomeration center

Infra component	Potential Business model
Land ***(~8 acres at Paradip, 13 acres at Haldia)***	By a) Major Ports under long lease as per latest land policy b) Steel player having land allocated at Port *(e.g., Tata Steel - 184 acres, SAIL - 35 acres of KoPT land at Haldia already allocated)*
Infrastructure ***(~84k MT for Paradip, 0.13 MMT for Haldia)***	a) Steel players (in case of single player) b) Third party Operator (in case of multiple players)
Operations	a) Steel players (in case of single player) b) Third party logistics player (in case of multiple players)

PORT BASED WAREHOUSES/ SILOS

Port based warehouses would be required for cement and food grain cargo.

The port-based warehouses would help in removing the inefficiencies in the first/last mile movement. Details of location, size, facilities and investment required for port-based warehouses are discussed in this section.

Food grain Depots

Last mile movement of food grain from unload port to end consumers via destination food grain depot is inefficient, leading to higher coastal shipping costs. In the existing set-up of coastal movement, food grains are dispatched to grain depots, which are located inland, from unload ports and then moved to end consumers for consumption. In case of port-based warehouses, food grains can be stored in grain warehouses at or near the port and then can be directly moved to end consumers without the requirement of first transporting the grains from port to FCI depots located inland and then to end consumers. This reduces the inefficient movement and brings down the overall last mile costs.

Coastal districts of Karnataka, Kerala and Tamil Nadu together constitute ~85% of coastal shipping potential of food grains in India. FCI food grain storage depots in these states suggests that FCI has storage capacity shortage in ~27 coastal districts that are within 200 km of a port in these 3 states FCI's owned/hired food grain storage capacity in some of the coastal districts are not sufficient to meet the grain demand of the districts as per FCI storage norms. FCI would be developing/hiring additional warehouses to serve the storage requirement at these districts. It is proposed that instead of creating all the additional storage capacities in inland locations of districts, a port-based warehouse can be developed for storing the food grain that can be potentially shifted to coastal mode and serving the districts which have storage shortage. Existing FCI depots located in the coastal districts need not be to be shifted immediately; these warehouses can be replaced with port-based warehouses when the lease/ contract period expires.

Figure 65 Potential location for Food grain warehouse/ Cement silos

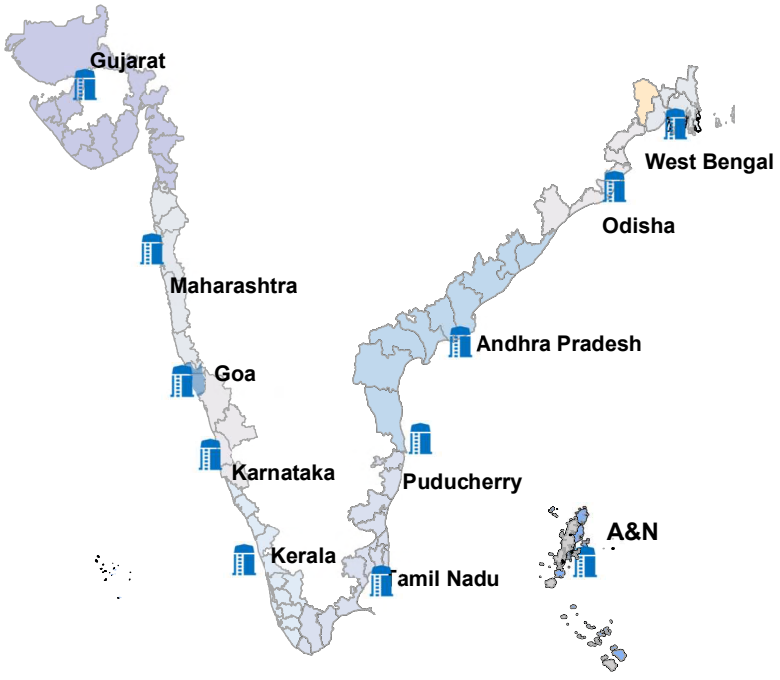


Table 17 Potential Business model for Food Grains warehouse development

Infra component	Potential Business model
Land	Land to be allocated to FCI at a concessional rate

Infrastructure	By FCI (through MoFPD)
Operations	By FCI

Table 18 Current system with FCI depots located at district locations & Policies

Cost	Transportation leg	Km	Cost (INR/MT)
FCI share	Unload port to FCI depot located inland	200 km	800
State share	FCI depot to end consumer (PDS shops)	50 km	300
	Total last mile cost		**1100**

Table 19 Proposed port-based warehouse system & Policies

Cost	Transportation leg	Km	Cost (INR/ MT)
FCI share	Unload port to port-based warehouse	5-10 km	50
State share	Port based warehouse to end consumer (PDS-shops)	150 - 250 km	850
	Total last mile cost		**900**

FCI - current policy restricts movement of food grain from one revenue district to another

Policy to allow movement to multiple coastal districts from a port-based warehouse

Mechanism for FCI to share cost saving from port-based warehouse with the state

Typically, a food grain warehouse can handle 0.2 tons per sq. feet of built-up area. Since ports have additional land space for truck and rail movement, the warehouses can be developed with 75% area utilization. Therefore, if the FCI depot is expected to handle ~200,000 MT food grains in a year, it would need a built-up area of ~160,000 sq. ft. and a land area of ~220,000 sq. ft. (5 acres). To achieve viability, land cost should be in range of INR 25-35 million per acre (for example, warehouse in NMPT will result in IRR of ~15%). If port land cost is higher, then the land has to be leased at a discounted rate for viability of warehouse. As per Land Policy clause 16.2 (h) of the ports, land can be allocated on nomination basis to government departments, CPCUs, SPSUs and a concession of up to 50% can be provided in cases where any. CPSU/SPSU/Statutory Authority enters into JV with private party and the said CPSU/SPSU/Statutory Authority is the lead promoter and has the largest shareholding in the said JV. Thus, port land can be allotted at concessional rate to government bodies including FCI and the additional revenue generated from port charges of food grain movement, can offset the higher lease rental from expensive port land, ensuring viability for FCI depot and generating equivalent revenue for the port through port charges.

Cement Silos

Movement of cement in break-bulk form results in low loading/ unloading rate, increasing the turnaround time of the vessel. Higher turnaround time of vessel increases the voyage cost and thereby total coastal shipping cost. Movement of cement in bulk form would result in faster loading/unloading of cement at ports provided that port has a silo infrastructure near berth. Bulk cement is moved from vessel to a silo near berth and vice versa through a fill pipe, increasing handling rate by 4 times compared with bulk/bulk (without silo near berth) handling rate. Port based cement silos would reduce vessel turnaround time and thereby the cost for movement through coastal shipping.

On the east coast, cement silos are required at load ports of Krishnapatnam and Machilipatnam which will serve the requirements of cement plants located inland in Kadapa and Nalgonda districts of Andhra Pradesh and Telangana, respectively. Further, these cement plants would require port-based silos at unload ports of Paradip, Gopalpur, Haldia and Cochin to serve the destination markets of Odisha, West Bengal and Kerala, respectively. On the west coast, large cements players in Gujarat such as Ambuja and Ultratech are already utilizing coastal shipping from their coast-based plants. There are other plants in Gujarat and Maharashtra coastline such as Sanghi cements, JSW cements which can utilize coastal shipping. Cement silos at unload port of JNPT, New Mangalore and Cochin would bring additional traffic from players already utilizing coastal shipping, and from other players who have their manufacturing facilities near the coast and would require silo facility at destination ports.

COASTAL BERTHS

In certain cases, the cargo needs to be unloaded at the ports, which are not optimally located along the coast, increasing the first/last mile costs and thereby coastal shipping costs. In order to reduce the first/last mile costs, coastal berths can be developed in the coastal locations nearest to the production/demand centers with all the facilities required for handling and storage of cargo. To develop these proposed coastal berths, estimated total investment of INR 2–3 billion (excluding the cost of land) is required. The coastal berths can be developed by major/non-major ports/State Maritime Board/state governments with financial assistance from “Coastal Berth Scheme” launched by the Ministry of Shipping.

The following coastal berth can be developed apart from augmenting existing coastal handling infra.

- Coastal berth in Gujarat: Coastal berth in Gulf of Khambhat (Dholera or region above Dahej) reduces last mile distance to Ahmedabad cluster to ~100 – 150 km from existing 300-350 km from Kandla port. Proposed port of Dholera can be utilized for coastal berth development to reduce the dredging cost.
- Coastal berth in Thane, Maharashtra: Coastal berth in Phalghar region in Thane district reduces last mile distance to 10-50 km from existing 130km from Mumbai/JNPT port to 10-50 km. Proposed port of Nandgaon can be utilized for coastal berth development to reduce the dredging cost.
- Coastal berth in Machilipatnam, Andhra Pradesh: Coastal berth in Machilipatnam in Krishna district reduces first mile distance from Nalgonda to 200 km from existing 400 km to Kakinada port. Proposed port of Machilipatnam can be utilized for coastal berth development to reduce the dredging cost.
- Coastal berth in Kori Creek, Kutch, Gujarat: Coastal berth in Kori Creek in Kutch district reduces first mile distance for major cement and salt players in the region. A small port can be set up in Kori Creek for this cargo potential. Additionally, group captive jetty can be developed here, where captive jetty is used by multiple investors.

In addition to the above projects, the development of the following already planned coastal berths (projects sanction under Coastal Berth Scheme) need to be prioritized.

- Planned coastal berth at JNPT: A coastal berth of capacity 2.5 MMTPA is being developed at JNPT. The berth capacity can be expanded to handle 3-5 MMT of additional steel and cement cargo by FY25.
- Planned coastal berth at Old Mangalore port: Development of coastal berth needs to be prioritized. The planned berth can be made equipped to handle 0.8-1 MMT of cement cargo by FY25

CONNECTIVITY INFRASTRUCTURE

Excessive dependency on a single mode, leading to congestion and higher first or last mile costs constrain ports as well as production or consumption centers. In many cases, suitable connectivity infrastructure is not available. To facilitate faster and smooth first/last mile movement of coastal cargo, adequate connectivity infrastructure needs to be developed at existing and upcoming ports/berths. In addition to connectivity projects identified as part of MIV and Sagarmala Program, following connectivity projects may be taken up post detailed study.

Table 20 Potential connectivity projects apart from the ones given in MIV and Sagartat program

Port	Project
Kolkata Port	Road/Rail Connectivity between Kolkata and Howrah via underground tunnel/flyover
Vizag Port	Road connecting Vizag Port from Sheela Nagar junction to NH-16 (Former NH-5):
	Four lane connectivity from East Breakwater to Convent junction:
	Fly over bridge from Sea-horses junction area to dock area at Vizag Port:
	Access to the proposed extension of Container terminal
	Construction of flyover-under-pass at Vizag airport junction
	Construction of flyover bridge - FOB at Nathayyapalem - Mindi on NH
	Direct connectivity to Mindi Yard from E.Co. Railways- SC Railways
	Upgradation and maintenance of Railway tracks in Eastern sector
	Electrification of VPT railway lines 45.143 TKM:
	Improvement of railway tracks and rectification of sharp curves
Krishnapatnam Port	Four laning of NH 4 from Gandrajupalle (Andhra Pradesh /Karnataka border) to Reningunta
Kattupalli Port	Chennai Peripheral Road project (133 Kms)
Chennai Port	Elevated approach road from Outer ring road to zero gate, connecting Maduravoyal with Nazarethpet
	Development of Jolarpet rail terminal and connectivity - Extended gate facility through rail
	Elevated expressway to Chennai Port, along a new alignment
	Extended gate facility at Tondiarpet ICD by CONCOR
Tuticorin Port	Eight laning of VOC road from Port Trust Circle to NH 45B junction
	Six laning of SH 176 Thoothukudi to Tiruchendur:
	Six laning of NH 45B (38) Tiruchirappalli to Tuticorin
	Six laning of SH 49 Nagapattinam to Thoothukudi:
	New line between Karaikudi and Thoothukudi via Ramanathapuram:

POSSIBILITY OF MINI-PORT – THE CONCEPT

Tidal MINI PORTS with one or two berths where the Mini bulk carriers and Mini Container ships can operate, when “NOT ALWAYS AFLOAT, BUT SAFELY AGROUND” (NAABSA) can be a major boost for coastal shipping. It requires a fresh thinking by port operators, ship owners and need changes in Charter party regulations, but will certainly be a big booster for Coastal Shipping as our coastline has too many shallow Tidal ports, where dredging requirement makes them uneconomical. The cost of Infrastructure will be lowered drastically, unlike the Major ports. The first requirement is to accept the NAABSA (Not Always Afloat, But Safely Aground) as an approved part of the Certification and Insurance process of operation of Coastal ships. This is accepted in certain parts of the world, especially South America. It is certainly not unsafe, if the intertidal area is not rocky.

The next is the understanding of this concept by Ship Owners and Port Authorities. It would possibly need some Shore power supply arrangement or an internal circulating cooling system for the power generators of the vessels, during the low tide hours. A stronger bottom for these vessels may need to be considered.

Further is the realization that these feeder points (Mini Ports) are so convenient to construct, at a fraction of the huge investments in new Berths at regular ports, save on the huge dredging costs, give a boost to local specific design ship construction, and create more local employment. The decongestion of Coastal Highways is the bonus.

CONCEPT

- Sites to be selected from existing non-functioning “non-major” port locations
- Should have water depth over 3 meters every day at high tide, easily accessible from sea
- Soft sandy silt for ship to be safely aground at low tide
- One or two berths for 100 TEU container ship or 3000 tons bulk cargo with cranes, storage yard & space for truck / trailer turnaround
- Industrial complexes in close proximity
- Short distance from highway and railhead
- Special status as mainly local cargo and feeder service to export- import hubs.

PROS

- Minimum legal hassles as ports are already notified.
- Minimum cost of infrastructure
- Minimum dredging requirements
- Develop local talent for managing the port services and allied employment.
- Develop industries in proximity for easy flow of raw materials and finished goods at lower logistics costs
- Local shipbuilding gets a boost too

The true picture of the most economical locations for Mini Ports would be visible once we map the demand and supply centres around the Coastline, especially close to Small and Medium Enterprises.

USE CASE: Gujarat may be a probable potential hub for this, where there are suitable locations at every 100-200 Kms along the 1600 Km long coastline. There are well spread MSME manufacturing hubs all over the state. There are already a large number of "Notified" ports (44) on the Gujarat Coastline so the legal hurdles are minimal. Major Industries like Reliance, Essar, Birla Copper, could build their own ports and derived great savings by their investments. The Mini Ports will provide similar benefits to the MSME sector.

The easy Locations in Gujarat for instance can be those notified Ports which become almost dry at low tide but have above 3 meters+ of water depth at the mean high tide. They are generally soft sandy soil locations, as most are on river estuaries or the silted area of Gulfs:

- Jaffrabad
- Victor/ Chanch/ Mahuva
- Nargol/Vansi Borsi/ Billimora
- Mahi River estuary
- Dholera/ Khambhat

- Ghogha/ Talaja/ Alang
- Sikka (almost ready)/ Jodiya
- Narmada river estuary
- Mandvi (almost ready)/ Jakhau/ Koteshwar

Since many of these points have reasonable road connectivity too, but lack the Berthing & mooring Infrastructure, and are curtailed by the Customs regulations of the BRITISH ERA, a trial pilot project at any FOUR locations, one on each side of the Gulf of Khambhat and one each on the Northern and Southern Parts of the Gulf of Kutch may be thought about. Final selection of a site can be based on an intertidal area check and traffic verification.

One Berth or Jetty with Container / Bulk handling crane with some back up space for storage and vehicle parking is the basic facility that will be required. Some of these locations will soon become RoRo Terminals. A vessel of 2000 Tonnes or 200 TEU may be able to turn around in 1 or 2 or maximum 3 Tide cycles of about 12 hours 30 minutes each. This is a concept suggestion, and the possibilities may be explored as per business, financial and technical considerations by respective state maritime boards

POLICY INTERVENTIONS

Apart from infrastructure solutions, a coastal incentive scheme is needed for operations resulting in less emissions than other modes.

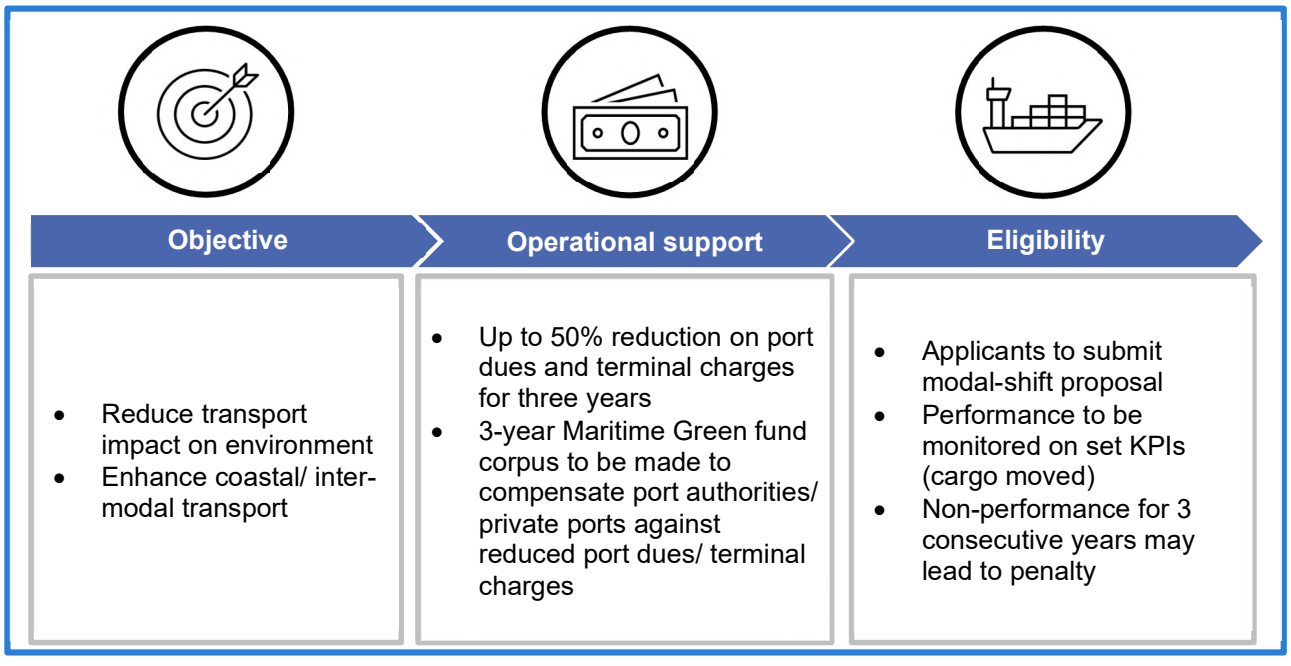
REDUCTION IN PORT DUES AND TERMINAL CHARGES

One method of incentivizing usage of coastal shipping is to reward industries that contribute towards reducing its carbon emissions even if in small and limited measures by using coastal shipping for transporting raw material and/or finished products.

Companies in India have hitherto used the transportation system created by the State, viz. the road and the rail network. The awareness of the real social and environment cost of these modes of transport is not extensive.

To promote movement by coastal shipping, port dues & terminal charges reduction may be offered for operations that are resulting in less emissions than other modes.

Figure 66 Coastal shipping: Suggested port dues & terminal charges reduction



GST REBATE FOR USAGE OF COASTAL SHIPPING

This is an opportune time for the Government of India as well as State Governments to push for modal shift for transportation of raw materials and finished goods to the markets through the use of Coastal shipping and inland waterways.

The consequential reduction in carbon emissions and fuel consumption should be rewarded with an abatement in GST with input tax credit. A company routing at least 50% of its transportation through coastal shipping would be eligible for an abatement in GST payable up to 2% on goods which have been transported using coastal shipping.

PSU & COOPERATIVE COMPANIES TO OFFER CARGO SUPPORT

Coastal shipping is world over recognized as efficient and environment friendly mode of transport, especially for bulk goods. The existing Road and Rail network is at their peak carrying limits suffering from congestion and capacity constraints. With the rising traffic and shrinking capacity, the challenge is to have sustainable transportation system to achieve the next level of growth. In furtherance to this, Road and Railway sector has also increased the level of pollution in the country exponentially. Moreover, passenger movement on both these modes have been given priority over cargo movement. Coastal Shipping can help resolve this situation and offer comparatively reliable services and environment friendly solution. It will not only reduce the capital and operational expenditure for expanding overloaded infrastructure but will also help in boosting the overall ecosystem for coastal transportation which is need of the hour. It will further help in lowering energy use, and emission standards along with enhanced safety levels by providing means for safer transportation. Major benefit at societal level will be the potential of this sector to further generate employment opportunities and contribute towards reduction in unemployment rate to some extent.

Hence, it is proposed that certain percent of cargo for three commodities food grains, coal and fertilizers of Public Sector Undertakings (PSU's), statutory corporation of Government of India, state PSU and cooperative societies be diverted to coastal shipping in order to offload the burden from Rail and Road sector as well as to reduce carbon emissions.

To begin with, above agencies dealing with transportation of food grains), coal (Power & Steel PSU's) and fertilizers PSU's and Cooperative societies will be mandated to transport 10% of their monthly cargo via coastal shipping/inland waterways by December 2023 by aligning their cargo routes and potential ports/terminals for competitive movement via coastal shipping/inland waterways. This can result in additional coastal movement of 55-60 Mn tons per annum along with potential savings of ~INR 2500 crore as well as help reduce carbon emissions.

TAXATION RELATION

VESSEL REPAIR

a. Issue: GST applicable on reverse charge basis on Indian shipping companies who procure MRO services abroad. Indian flag vessels engaged in EXIM trade to pay 5% GST on MRO services availed in international geography. Further, Indian shipping companies face difficulties in getting the required MRO services in India as there is limited availability of space in efficient shipyards such as Cochin Shipyard while smaller shipyards do not provide the required services. This increases the cost of repairs and thereby increasing the cost of transportation

a. Recommendation: Though the notification is aimed to help the Indian Shipyards in attracting vessels. However, this has added cost to Indian Flagged vessels in EXIM as in order to reduce the tax burden the vessel would have to come to India.

VESSEL FUEL

Key taxation related issues in the Vessel Fuel along with the suitable recommendations are as follows:

a. Issue: Inputs to vessels such as Furnace Oil, Spares, lubes etc. are charged at 5% with no provision of Input Tax Credit in both time and voyage charters. Rate schedule for Voyage charters as well as for Time charters has a condition that no input tax credits can be availed on inputs - Notification 11/2017 Central Tax (Rate) & Notification 1/2018- Central Tax rate. As the Rate schedule restricts the use of ITC on inputs for shipping sector, taxes paid on inputs become costs to the company and increases the cost of transportation. This problem is not faced by others in the transportation sector because their main fuel viz. Diesel and Air Turbine Fuel (ATF) are not under the GST regime whereas the main fuel for ships viz IFO is within the GST regime. However, the shipping industry can avail of ITC on fuel only if the restriction in the Rate Schedule is removed.

a. Recommendation: Allow Ship Owners to have Input Tax Credit on the Inputs to the vessels such as Furnace Oil, Spares, lubes etc. which are critical for its operations. This would help in lowering the cost of transportation of goods. This reduction would help in reduction of logistics cost thereby positively impacting the economy

COASTAL SHIPPING

Key taxation related issues in the Coastal Shipping along with the suitable recommendations are as follows:

a. Issue: No input tax credit is available on goods purchased in various states in coastal shipping due to place of supply

As per Section 10(1)(a) of the IGST Act, the place of supply for goods is 'location of the goods at the time at which movement of goods such as furnace oil, lubes, spares, ship stores, etc. terminates for delivery to the recipient'. However, consumption is taking place in place from where the shipping companies are providing transportation service which could be different State / Ports. Hence, shipping companies cannot avail input tax credits on the inputs, and this would result in significant blockage of input tax credit in various States. This hugely impacts the competitive and pricing ability of Indian flag vessels providing coastal transportation. Similarly, when the ships move to other states for the purpose of dry dock, spares etc. are purchased for the consumption during dry dock. In such cases, the vendors charge CGST and SGST as the place of supply of goods falls in the same state. Therefore, the company loses out on the GST credit

a. Recommendation: Following interventions are required:

- Changing the definition of place of supply for shipping companies from "location of the goods at the time at which movement of goods terminates for delivery to the recipient" to "location of the principal place of business of the shipping company".
- Rate Schedule to be amended since it speaks of conditional rate with no credit for input goods other than Capital goods.

b. Issue: Wage Cost contributes ~30-33% of the vessel operating cost. Salaries of Indian Seafarers on Indian Flagged vessel operating within coastal waters are subject to TDS before payment as compared to wages of Indian Seafarers on Foreign Flagged vessels where these are not subjected to TDS

b. Recommendation: Level playing field to be introduced on the deduction of TDS on wages of seafarers for both Indian and Foreign Flagged Vessels by either removing TDS on Indian Seafarers on Indian Flagged vessels operating in coastal waters or including the wages of Indian Seafarers on Foreign Flagged vessels operating in coastal waters.

MULTIMODAL TRANSPORT

Key taxation related issues in the Multimodal Transport along with the suitable recommendations are as follows:

a. Issue: Higher GST of 12% on the multimodal transportation

- Applicable GST rate for single mode of transport (road or railways) is 5% while for coastal shipping / inland waterways, where it is predominantly multimodal movement, it is 12%.
- Higher GST rate adds another layer of cost over and above the logistics cost for transportation of cargo through coastal shipping / inland waterways.
- For commodities with lower GST, such as fertilizers, this becomes an additional cost

a. Recommendation: To ensure coastal shipping is not at a disadvantage, a representation needs to be sent to GST Council to reduce the GST on multimodal transportation to 5%.

MISCELLANEOUS

Key taxation related issues include for Operators and Cargo Handling along with the suitable recommendations are as follows:

a. Issue for Cargo Handling at Ports: Higher rate of GST of 18% on handling charges at ports. This rate is charged even in case such as service is availed for commodities like Agri Products on which GST is exempted. This increases the unutilized credit with multi modal companies.

a. Recommendation: The rate is reduced in case the service is availed for a commodity which is taxable under GST and exempted in case it is availed for commodities which is exempted from the levy of GST to reduce the handling cost and increasing the competitiveness

INSTITUTIONAL INTERVENTION

For optimal utilization of coastal mode, there is a need for focused and pro-active marketing and promotion effort to educate these players on the advantages of coastal shipping/ IWT.

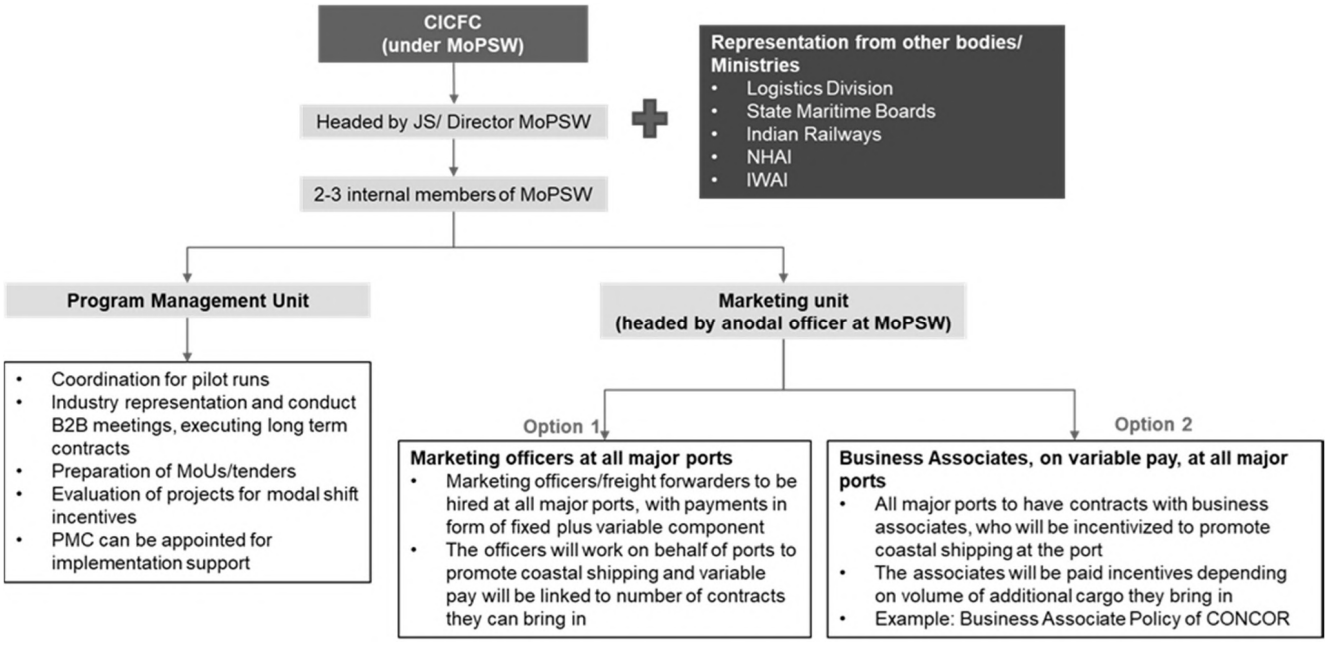
A coastal shipping promotion cell namely, Coastal and Inland cargo facilitation center (CICFC) should be established under the purview of Ministry of Shipping. The promotion cell will undertake active B2B meetings with the target groups such as cargo owners, shipping companies, logistics service providers, transport companies, terminal operators, industry associations, and ports, facilitating the on-ground movement of cargo through coastal shipping. Additionally, the agency will act as interface between authorities and industry, and organize communication between stakeholders, identify the bottlenecks, involve in research based on identified gaps and suggest suitable policy action for Ministry.

Germany: Short Sea shipping and Inland Waterways Promotion center (SPC) established by Federal Ministry of Transport and Digital Infrastructure

- *Creates interface between federal authorities and industries; facilitates result-oriented policy making*
- *Provides free consulting services to forwarders to determine shift potential to waterway*
- *Increases awareness through participation in trade fairs, exhibitions*
- *Provides knowledge support to industry players with expert information and education opportunities*
- *Increases networking of water transport players and builds image of water transport*

Promotional efforts of the cell can also include providing modal shift incentives and supporting players by taking a share of the risk in the start-up phase of a new service, similar to some international examples such as EU's Marco Polo Scheme. Evaluation of projects would be undertaken by promotion cell for ratifying modal shift from road rail to coastal.

Figure 67: Proposed institutional structure of CICFC



INLAND WATERWAYS

CURRENT LANDSCAPE

Transport sector comprising of railways, roadways, ocean and coastal shipping, inland waterways, pipelines and airways is critical infrastructure for economic development of any country. Navigable waterways are a fuel-efficient, environment friendly and cost-effective mode of transport. Water transport is also a safe, cheap and lower carbon footprint mode of transport. A developed transport system enables optimum cost of transportation in a multimodal network utilizing strengths of all modes on case-to-case basis. In some of the developed countries (e.g., USA, China and many countries of Europe), the modal share of the Inland Water Transport (IWT) sector is much higher than the IWT sector in India, thus benefitting their economies significantly through a self-sustainable supplementary mode of transportation.

India has several rivers, canals, creeks and backwaters which have the potential to be developed and used as cost effective and efficient inland waterways. Till early 20th century, the IWT had been used as an important mode of transportation in various parts of the country. However, due to various factors, including rapid development of road and railways, limited industrial development in the country, less attention paid to preservation and development of inland waterways etc., many waterways lost their competitive edge to the rail and road modes.

A major boost to IWT Sector has been provided by the Government of India through enactment of National Waterways Act, 2016 (No.17 of 2016) dated 26th March 2016 which came into force w.e.f. 12th April 2016. With the enactment of the National Waterways Act, 2016, the total number of national waterways is now 111 including 05 waterways declared through earlier Acts. 111 National Waterways cover a total length of 20,375 kms spread across 24 States in the country. National Waterways of India are well in line to become the lifeline of the country. Inland Water Transport (IWT) has a potential to supplement the overburdened Railways and congested Roadways.

After declaration of 111 National Waterways, a number of techno-feasibility studies were carried out in order to ascertain the technical commercial viability of these National Waterways. Out of these declared 111 National Waterways, Inland Waterways Authority of India (IWAI), under Ministry of Ports, Shipping & Waterways, has identified 25 viable NWs for further development Based on the findings technical and commercial studies and identifying projects to promote IWT up to 2030.

Table 21 IWT: Total Cargo Movement

Year	Cargo
2021-22	*109 Million Metric Ton*

CHALLENGES IN INLAND WATERWAYS

Despite the strong growth witnessed in the past years, the potential of IWT remains unexploited. Modal share of IWT in freight movement is 2% leaving significant room for growth. Key impediments in development of this sector include - limited infrastructure availability, shortage of inland vessels and non-availability of return cargo. Further governance issues due to overlapping jurisdictions also slow down the sector progress.

Specific constraints responsible for the current low volume of trade through waterways are as below.

LACK OF SUFFICIENT LEAST AVAILABLE DRAFT (LAD) FOR COMMERCIAL MOVEMENT OF CARGO

Navigation infrastructure has improved but is still inadequate for an 'all-weather' round-the-year movement. Major routes suffer from siltation, shifting of channels and lack of 24x7 navigation facilities

LIMITED CAPACITY AT TERMINALS AND POOR LAST MILE CONNECTIVITY

Inland terminals on both India & Bangladesh sides have limited capacity to handle enhanced traffic along with manual handling infrastructure at some of the locations (up to 3 days for unloading 1000 tons of cargo). Further, the infrastructure for last mile connectivity is not adequate at most of the locations.

HIGHER COST DUE TO LONGER FIRST/ LAST MILE DISTANCES

IWT as individual mode holds promise to provide most economical mode of transport. However, when considered for door-to-door connectivity (various parcel sizes, navigable waterway lengths, first and last mile distances, et all.), it has been estimated that the maximum combined first and last mile distance, for long navigable waterway distance should be approx. 80-100 Kms. Longer first/ last mile distance increases the first/ last mile connectivity cost and makes the IWT less attractive. To make the waterways attractive as a mode of transportation, cargo centres (production and consumption) should be developed closer to waterways.

UNAVAILABILITY OF VESSEL FLEET

Vessel availability remains a significant challenge on Indian waterway routes and acts as an impediment to sector growth. Limited vessels and lack of confidence in players to procure vessels have resulted in little upliftment of the inland waters sector.

REGIONAL TRADE POTENTIAL NOT REALIZED

India is connected with neighboring countries (Bangladesh, Bhutan, Nepal & Myanmar) through 5000 km of waterway corridor (integrated with other modes). Further India is investing in various regional projects such as IBP, Kaladan project for enhanced regional trade. Despite such initiatives, the overall potential of waterways for regional transport is not being fully realized. Various infrastructure & regulatory issues such as complexity of rules and procedures have resulted in underutilization of IWT for cross-border trade. A broader focus of deregulation is needed to make waterway transport easier to use.

PROPOSED INITIATIVES

In order to address the above issues and accelerate cargo movement through NWs the following focus areas have been identified.

ENHANCING DOMESTIC WATERWAY TRANSPORT

INFRASTRUCTURE INTERVENTIONS

Development of necessary infrastructure to enable movement of cargo and passengers on the National waterways is one of the most important aspects for promotion of the sector. At present, approximately 96 million tons per annum (MMTPA) cargo is transported annually through functional NWs. Priority development of NW-1 has been undertaken through Jal Vikas Marg Project (JMVP). Jal Marg Vikas Project is the first major infrastructure project on development of Inland Water Transport sector in India. The development objective of JMVP project is to enhance transport efficiency and reliability of Inland Waterways for handling logistics. The project comprises of several components and subset activities that aiming to develop Inland shipping, the improvement in ports and marine infrastructure may increase navigability for 1000-1500 Dead Weight Tonnage barges along NW-1 stretch from Haldia-Varanasi (1380 Kilometers) by FY 2023.

ENHANCEMENT, SUSTENANCE, AND DEVELOPMENT OF INFRASTRUCTURE AT 23 PRIORITY NWS

A phase-wise plan to enhance terminal and allied infrastructure across 23 priority NWs by 2030 has been formulated (refer below table). The NWs identified for infrastructure enhancement include NW-1, NW-2, NW-3, NW-4, NW-16, NW-97, NW-9, NW-27, NW-68, NW-111, NW-5, NW-57, NW-8, NW-52, NW-44, NW-94, NW-40, NW-37, NW-10, NW-83, NW-85, NW-91 and NW-73.

As per the development plan given in table below, it is expected that the approximately 120 million tons per annum (MMTPA) cargo will be transported annually through 23 NWs.

Table 22 IWT: Development Plan 2030

Waterway	Mapping for Development by 2030			
	Cargo (MMTPA)	Infra	Port Conn.	First/ Last Mile Conn
NW-1	12.14	3 MMTs at Varanasi, Sahibganj & Haldia 1 Nav. Lock 2 IMTs Night Nav Aids 60 community jetties 10 Ro-Ro terminals Upgrade Farakka nav lock	24-hour connectivity with Haldia & Kolkata	Road connectivity with NH existing. Rail connectivity with MMTs at Varanasi, Sahibganj & Haldia
NW2	0.4	Connect & Develop IBP (Daudjhandi- Sonamura & Dhuliyan to Rajshahi) Terminal at Jogighopa, Maia, Sonamura Slipway at Pandu LAD – Neamati to Dibrugarh 2.5 m	Through IBP route Pangaon (Dhaka) Chittagong Haldia	Improved road connectivity with all terminals.
NW-3	0.96	-	With Kochi	Improved road connectivity with all terminals.
NW-4	6.2	Development Vijaywada-Kakinada Rajahmundry-Polavaram 3 Ro-Ro terminals	With Kakinada	Connectivity to nearest highway from Ro-Ro terminals
NW-16 (48kms)	0.011	Development in additional 23 kms Upgradation of terminals at Karimganj & Badarpur	Through IBP route Pangaon (Dhaka) Chittagong Haldia	Improved road connectivity with all terminals.
NW-97 (IBP) Sunderbans	5.59	Improved Custom facility at Hemnagar	Haldia Kolkata	Improved road connectivity
NW-86 Rupnarayan	0.011	Permamnent terminal at Kolaghat	With Haldia & Kolkata	Improved road connectivity with terminals & Kolaghat Thermal Plant

Waterway	Mapping for Development by 2030			
	Cargo (MMTPA)	Infra	Port Conn.	First/ Last Mile Conn
NW-9 Alappuzha-Kottayam Canal	0.01	Integration with NW-3 Night Navigation	With Kottayam	Improved road connectivity with Kottayam Port
NW-27, 68, 111 (Goa)	4.31	3 floating terminals Night Nav Aids RIS	Mormugao Port Trust	Improved road connectivity with all terminals.
8 New Waterways (NW-5, 57, 8, 52, 44, 94, 40, 37)	2.72	Development planned as per requirement for modal shift		
NW-10, 83, 85, 91 (Maharashtra)	38.87	Sustained Development Planned Projects: • Expansion of existing captive jetty facilities by construing additional berths at village Vave (Tal Pen, Dist. Raigad) • Expansion of existing multipurpose jetty facilities by construing additional berths at village shahbaj (Tal. Alibag, Dist. Raigad) • Construction of new captive jetty for servicing proposed Cement Plant at village Shahabaj (Ta; Alibag, Dist. Raigad) • Upgradation & Development of existing port facilities at Dighi Port and construction of new facilities (Tal. Shrivardhan and Murud, Dist. Raigad) • Construction of Shipyard at Village Rohi (Tal. Mhsala, Dist. Raigad) • Upgradation of existing multipurpose jetty facilities at village Sanegaon (Tal. Roha, Dist. Raigad) • Construction of captive jetty at village Korlai (Tal. Murud-Janjira, Dist. Raigad) • Expansion of existing Greenfield port facilities at Jaigad, Dist. Ratnagiri		
NW-73 (Gujrat)	48.96	Sustained Development Planned Projects: • Development of jetties and floating pontoons are planned as per discussion with the State authority.		

DEVELOPMENT OF FV AND ICLP AT VARANASI & SAHIBGANJ

Efficient logistics and transport systems are a critical enabler for sustaining and indeed accelerating this level of economic growth. The ability to move freight seamlessly and cost effectively from centres of production to centres of consumption or to export markets is a key driver for growth and jobs.

In order to address this shortfall, it is imperative to develop the network in a way that ensures the right freight flows on the right mode and creates enablers to maximize the efficient use of entire transport and logistics networks. A freight village is a designated area where facilities for various modes of transportation, distribution of goods and other logistics are available in a synchronized manner at a large scale. Thus, the concept of Freight Villages offers the possibility to develop well organised facility with trimodal transport connectivity and other utilities.

Considering above, it has been planned to develop Freight Village, Varanasi (Uttar Pradesh) and Industrial Cluster & Logistics Park (ICLP), Sahibganj (Jharkhand) with the objective of bringing the logistics' companies and manufacturing & trading companies near these multimodal terminals by allotting land so that a productive logistics neighborhood is established and ease of doing business is enhanced. The Freight Village will also provide support to stimulate development of a professional logistics industry in the area.

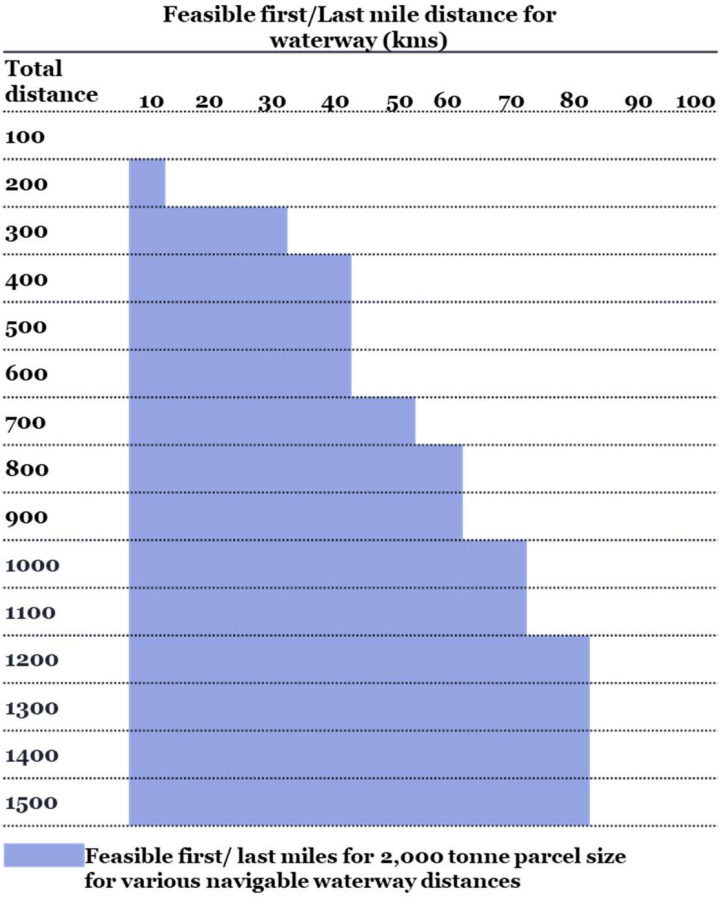
Figure 68 Features of a Freight Village/ICLP

POLICY INTERVENTIONS

IWT mode as individual mode holds promise to provide most economical mode of transport. However, when considered for door-to-door connectivity (various parcel sizes, navigable waterway lengths, first and last mile distances, et all.), it has been estimated that the maximum combined first and last mile distance, for long navigable waterway distance should be approx. 80-100 Kms. Longer first/ last mile distance increases the first/ last mile connectivity cost and makes the IWT less attractive. Such analysis is very important to devise strategies for improved cargo agglomeration and mode shift to national waterways, which is a sustainable alternate mode of freight transport.

Assessment conducted for an average parcel size of 2,000 tonne; Other assumptions include improved service levels due to proposed NW 1 infrastructure improvements: Night navigation of 20 hours considered from current 14 hrs; Mechanized handling considered yielding improved handling at the rate of 500 tonne/ day from current 200 tonne/ day (manual handling).

Figure 69 Key results of feasible first and last mile analysis for various navigable waterway lengths



Assessment conducted by the Consultant on distance of key cargo centres (industrial clusters) along NW 1 to assess the potential for agglomeration and modal shift from current mode of transport to NW 1 (based on the above analysis) suggests the following:

- Cargo centres (industrial and consumption clusters) assessed in key states have revealed that such centres are located at an average distance of 60-80 kms from the nearest terminal/ jetty on NW 1. To make the waterways attractive as a mode of transportation, cargo centres (production and consumption) should be developed closer to waterways.
- EDFC offers a distance advantage for majority of the proposed mega industrial clusters in the region

Given the overlapping influence areas of EDFC and NW 1, complementary (and not competing) industrial and logistics planning will be a key to economic success of the region and both these mega infrastructure ventures.

International cases

Globally, creation of industrial and logistics zones along major waterways has been an underlying practice for enabling cargo aggregation for waterways and alternate revenue generation through land monetization.

a) Case study: Planned economic activity along River Yangtze in China

Revered as the "Mother River", River Yangtze dominates China's inland water transport sector traversing across eastern, central and western China and is one of the busiest rivers for freight traffic worldwide. In 2010 the "**Yangtze River Delta (YRD) Regional Plan**," was released which aimed at promoting the YRD as a key international gateway for the Asia-Pacific region, and an important global center for services and manufacturing industries. In 2013, the region's GDP was close to USD 1.47 trillion (accounting for 17.2% of national GDP). More and more foreign investors chose to establish their businesses in YRD's many development zones, on account of preferential policies. The YRD houses five major types of development zones:

1) **Economic and Technological Development Zones (ETDZ)** (e.g Hangzhou Economic & Technological Development Area (HEDA))**:** 4 variants of ETDZ's planned based on their specific emphasis, such as:

   - Technology intensive industries and emerging industries;
   - Export and international trade (inc. export processing zones and bonded zones);
   - Tourism and service industry; and
   - Cooperation between Chinese and foreign countries.

2) **High-Tech Industrial Development Zones (HTDZ):** They are designed for the commercialization of research and specific technology-heavy industries, such as IT, electronics, pharmaceuticals and new materials. HTDZs offer a more sophisticated package of tax exemptions and reductions than ETDZs,

however, provided that an enterprise's business scope has to be sufficiently technology-heavy to qualify for entry to an HTDZ.

3) **Export Processing Zones (EPZ):** They are bonded logistics areas generally located within an existing development zone for the purpose of export processing.

4) **Free Trade Zones** (FTZ) are designed for export processing, international trade and bonded operations, and are exempt from Chinese customs. Enterprises established within these zones can receive tax refunds on exports, imports and VAT. Prominent FTWZs are Shanghai Free Trade Zone, and the Ningbo Free Trade Zone (NFTZ).

5) **Bonded Logistics Zones** (BLZ): They are specifically designed for logistics operations and are usually located near ports or airports to facilitate the aggregation of shipments or assembly. Import duties and import-related taxes on goods entering bonded zones from overseas are handled as follows:

Table 23: A summary of preferential policies offered in the different zones

Incentive	ETDZ	HTDZ	EPZ	FTZ	BLZ
15% Corporate Income Tax and further rebates to Foreign Investment Enterprises (FIE) with an operating period of more than 10 years	✓	✓	✓	✓	✓
Exemptions and reductions on municipal income tax	✓	✓			
Exemptions from remittance tax	✓				
Exemption from customs duty and imports tax for specific products and goods	✓	✓			✓
Exemption from VAT and VAT refunds		✓	✓	✓	
Tax refunds upon entry into the zone			✓		
Fiscal support related to advanced technology research				✓	

With the upcoming infrastructure development on National Waterways, India is envisaging a cargo projection of 100 MTPA by FY 2022-23. However, to realize this projection, there is a need for a more coordinated and scientific approach towards planning for future industrial and economic zones along NW1 and other key national waterways, thereby enabling better manufacturing competitiveness of the industry units through logistics cost and time efficiencies.

- It is hereby proposed that the Department of Industrial Policy and Promotion (DIPP) may in their policy framework include provision for preference towards setting up new industrial centres / logistics hubs in proximity to NWs to promote cargo movement through national waterways which is an efficient and eco-friendly mode of transportation. It is also requested that such directive be communicated to various hinterland states benefitting from key national waterways to include such provisioning and emphasis in the respective state industrial policies. To incentivize industrial cluster locating along national waterways, DIPP may kindly consider adopting various strategies as below:
    - Rebate on land lease for industrial clusters located along national waterways and at key terminal locations

- Offering multi- modal transport options and logistics zones within industrial clusters to industrial units, such as, railway access directly to site, warehousing, customs zone, free trade warehousing zones (if applicable), etc.
- IT integration between shippers, forwarders, multi-modal service providers to offer a co-operation platform for enhanced and seamless freight flows
- Provision of common amenities such as Sewage Treatment Plant, Effluent Treatment Plant etc for applicable industrial clusters along waterways through centre/ state funding
- Offering innovative incentives to industry units depending on annual cargo commitments for waterways offered by industry units, etc.
- Collaborative implementation, operation and maintenance of freight villages/ logistics zones within industrial clusters by Indian Railways and its subsidiaries (DFCCIL, etc) with IWAI and MoPSW
- Joint cooperation and leveraging of land owned by railways, MoS, IWAI, other state/ centre agencies for identifying and creation of industrial landbank along key national waterways

- Further in order to operationalize the same, IWAI requests that a Joint Co-ordination Committee be formed with representation from members of DIPP, relevant state industrial agencies, Indian Railways and IWAI to discuss and strategize efforts of Centre and States towards creation of future industrial and logistics land banks along national waterways.

ENHANCE REGIONAL CONNECTIVITY THROUGH WATERWAYS WITH BANGLADESH, NEPAL, MYANMAR AND BHUTAN – EWAC-TG

India is connected to neighboring countries such as Bangladesh, Bhutan, Nepal & Myanmar through a network of waterways, road & railways. Various individual projects are being undertaken with these countries under the existing treaties as below:

Bangladesh - A Protocol on Inland Water Transit and Trade (PIWTT) exists between India and Bangladesh under which the two Governments have made mutually beneficial arrangements for the use of their waterways for movement of cargo between the two countries for passage of goods between two places in one country through the territory of the other, in accordance with the laws of the country through the territory of which goods are moving. The Protocol is valid up to June 2026.

Under this Protocol, Inland vessels of both the countries can ply on the designated protocol route and dock at Ports of Call in each country, notified for loading / unloading of cargo. There has been significant improvement in the movement of cargo vessels in an organized manner on the Protocol route carrying both the transit cargo to NE region of India and vice-versa and export-cargo to Bangladesh.

The Indian transit cargo is mainly coal, fly-ash, POL and ODC for power projects in NE region. The other potential cargo for movement is fertilizers, cement, food grains, agricultural products, containerized cargo etc. There are 10 Protocol routes covering 2650 kms with 13 Ports of Call (PoC) each in both countries. In the year 2020-21, approximately 3.56 MMT cargo had been moved on Indo Bangladesh Protocol Routes (IBP).

For better utilization of this route, a dredging contract is being executed through MEA between Ashuganj – Zakiganj & Sirajganj – Daikhawa stretch at 80:30 cost ratio between India & Bangladesh.

Nepal - The possibility of trans-boundary connectivity has received a fillip from India's recent progress in the development of National Waterways for shipping and navigation as an environment friendly, sustainable and economically viable mode of transport. Nepal could take this as an opportunity to get connected to the Indian waterways through its rivers and roads to access an alternative mode of riverine transport movement to open seas from Kolkata Port.

Due to the proximity of Nepal with the State of Bihar and Uttar Pradesh in India, the trans-boundary connectivity between India and Nepal is on the anvil to witness new era through National Waterway-1 (Haldia-Varanasi stretch covering 1390 km) which is being developed under Jal Marg Vikas Project for the capacity augmentation of shipping & navigation with the technical and financial assistance of the World Bank at a cost of Rs. 4633.81 crores. Following routes have been identified for inclusion in the Indo-Nepal Treaty of Transit:

- Kolkata/Haldia – Sahibganj (by inland waterways): Sahibganj-Manihari (inland waterways): Manihari-Jogbani/ Biratnagar (by road)
- Jogbani/Biratnagar- Manihari (by road), Manihari- Sahibganj (by inland waterways), Sahibganj - Kolkata/Haldia (by Inland waterways),
- Kolkata/Haldia – Sahibganj (by inland waterways); Sahibgunj-Bhagalpur -Jogbani/ Biratnagar (by road).
- Jogbani/Biratnagar- Bhagalpur- Sahibganj (by road/rail), Kolkata/Haldia (by inland waterways),
- Kolkata/Haldia – Kalughat (by inland waterways): Kalughat – Raxaul/ Birgunj (by road),
- Raxual/Birgunj- Kalughat (by road/rail) Kalughat- Kolkata/Haldia (by inland waterways)
- Kolkata/Haldia–Varanasi (by inland waterways): Varanasi-Sunauli/ Bhairawa (by road)
- Kolkata/Haldia–Varanasi (by inland waterways): Varanasi-Banbasa/ Mahendranagar (by road)

To initiate cargo transportation between India & Nepal through waterways, the following have been planned to be completed by 2030:

- Develop container terminal at Kalughat.
- Port led connectivity of Varanasi, Kalughat & Sahibganj for Nepal bound cargo.

Myanmar - The Kaladan Multimodal Transit Transport Project has been conceptualized by Ministry of External Affairs (MEA) to provide an alternative connectivity to the North Eastern Region of India with the Kolkata port and rest part of the country. The project envisages connectivity between Haldia/Kolkata in West Bengal through sea route up to Sittwe (539 km) in Myanmar. Thereafter through Inland Water Transport up to Paletwa (158 K M) and by road from Paletwa to Indo - Myanmar Border to Mizoram (110 km).

The development works under the protocol are already underway and Phase 1 of the same has been operationalized. Key development works under Phase 1 include

• Construction of Port and IWT terminal at Sittwe

• IWT terminal at Paletwa

• Fairway development

• Construction of 6 IWT vessels & Other ancillary infrastructure

• O&M of the project is outsourced to a private player on long term revenue sharing basis

Bhutan - The agreement on Trade, Commerce and Transit signed in July 2017, which declares Dhubri on National Waterway-2 as an agreed exit/ entry point in India for EXIM movement of Bhutan. In addition to the above arrangement, a SoP for the MoU on use of Inland waterways for transportation of bilateral trade and transit cargoes between Govt. of Bangladesh and the Royal Govt. of Bhutan was signed in April 2019.

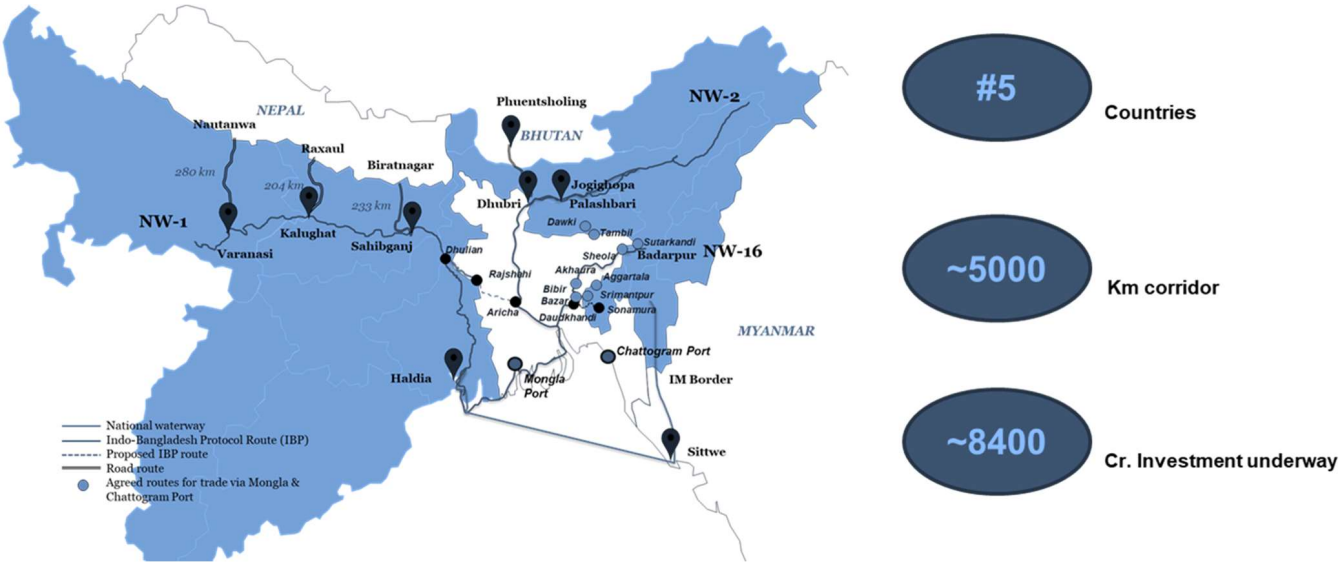
Bhutan has been exporting significant quantity of stone aggregates through the land route for different construction projects in Bangladesh. Bhutan's trade community finds the export of stone aggregates and boulders to Bangladesh more economically viable through the inland waterways which serves as a supplementary alternate mode of transportation. It also offers larger shipment size as compared to road, avoiding congestion on land routes. Bhutan's stone aggregates originating from Phuentsholing (Bhutan) are being transported from Dhubri (NW-2) to Narayanganj (Bangladesh) using the IBP route since July 2019. Stone aggregates were transported by trucks from Phuentsholing in Bhutan which is 160 KMs from IWAI's Dhubri jetty. AS on date only Dhubri IWT Terminal is declared as entry exit point in the Protocol on Trade and Treaty between India and Bhutan. Demand has come from Bhutan side to include Jogighopa and Pandu as entry / exit point in the Bhutan has been exporting significant quantity of stone aggregates through the land route for different construction projects in Bangladesh. This will further enhance the use of IWT for the export of Bhutanese cargo to Bangladesh. IWAI has also given its consent to include Pandu and Jogighopa as exit/ entry points in Trade agreement.

Apart from the above initiatives, an integrated connectivity project is being conceptualized to utilize 5000 km of regional waterways for seamless trade & transit.

Eastern Waterways Connectivity – Transport Grid

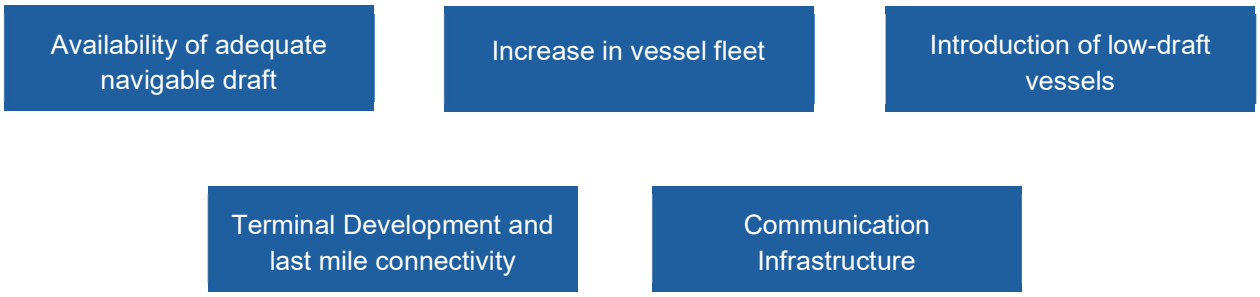
Govt. of India has been firming up the plan to develop the Eastern Grid (comprising NW-1 (Ganges), NW-2 (Brahmaputra), NW-16 (Barak) and certain international routes) of about 5000 km navigable waterways to boost regional integration and trade with South Asia (BBIN) and Eastern South Asia (including Myanmar). Seamless connection between the waterways would also create opportunity for developing an economic corridor connecting North Eastern India with rest of India through Bangladesh and also linking Bhutan and Nepal to Bangladesh and India through multimodal connection. About INR 8400 Cr. worth projects are already underway to augment the capacity of waterways infrastructure.

Figure 70 EWAC-TG Program



Further, following interventions are proposed to develop fit-for-purpose infrastructure, ranging from multimodal terminals, last-mile linkages, increasing vessel fleet to availability of adequate navigability and guaranteed draft.

Figure 71 Interventions to develop infrastructure



INFRASTRUCTURE INTERVENTIONS

AVAILABILITY OF ADEQUATE NAVIGABLE DRAFT - UNDER DREDGING ACTIVITIES TO IMPROVE IWT CONNECTIVITY BETWEEN INDIA AND BANGLADESH

Providing sufficient draft to large vessels will help in commercial movement of higher volume of cargo at given point in time. This will also reduce transportation cost on account of economies of scale. In this regard, following projects are proposed.

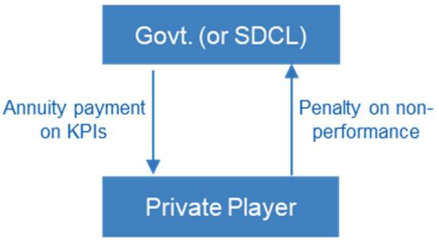
- Capacity augmentation (dredging & nav aids) of NW2 & NW16 including tributaries
- Capacity augmentation (dredging & nav aids) of Kolkata – Mongla – Dhaka stretch
- Capacity augmentation (dredging & nav aids) of Dhulian to Aricha (route 5 & 6)

Regular dredging should be carried out at regular intervals to maintain assured depths along priority corridors so that these routes can be made operational and viable throughout the year.

Proposed Business model for maintenance dredging

Under this model, Government will hire private players on contract basis. The role of private players will be to do maintenance dredging against annuity payments from the Government. Government will have to set dredging KPIs based on past 10–15 years trends and in-depth analysis. In case of non-performance on any of the set KPIs, penalty will have to paid by private players. Once the sector is established, PPP model can also be explored in dredging activity.

Figure 72 Business model for maintenance dredging

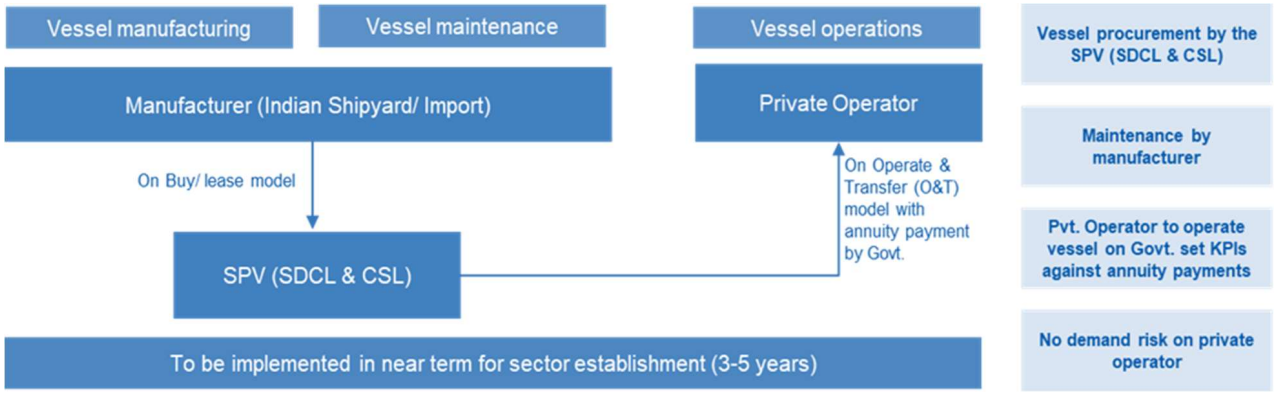


INCREASE VESSEL FLEET IN THE SECTOR WITH SUITABLE PPP MODELS

There is a limited fleet available in IWT sector in India. Most of the movement is happening Bangladeshi vessels which are sub-standard. Limited vessels in Indian side and lack of confidence in players to procure vessels have resulted in little/ no-upliftment of the inland waters sector in India. To establish the sector, following business mode have been proposed for procurement, operation and maintenance of vessels.

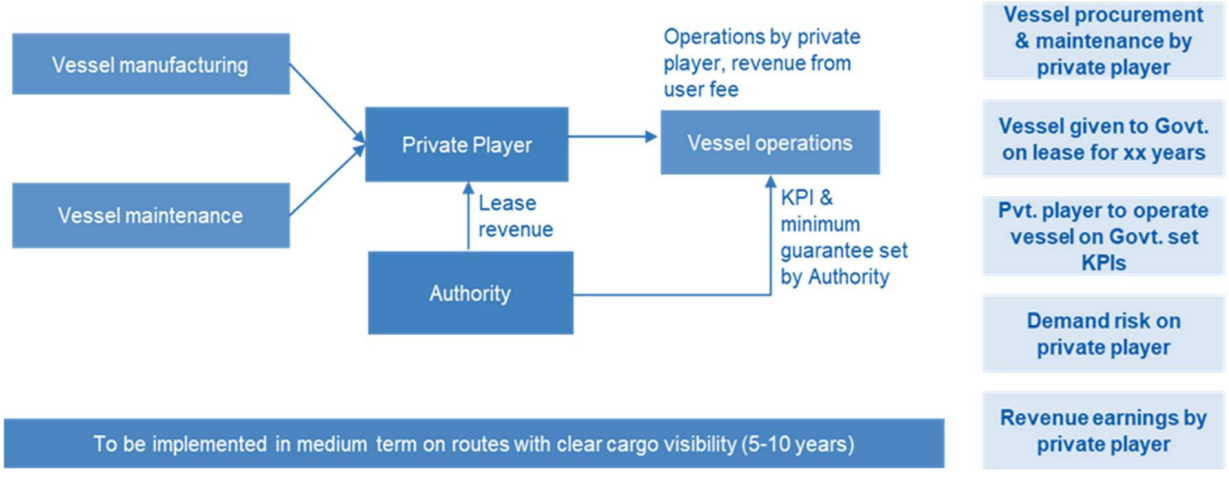
Model 1: Capital investment by government, private players to operate with no demand risk – In the near term (3-5 years), vessels have to be procured by government through an SPV (between Sagarmala Development Company Limited and Cochin Shipyard Limited) either through domestic manufacturer or import. Vessel maintenance will be done by the manufacturer. The role of private sector will be to operate the vessels on Government set KPI against annuity payments. Thus, there will be no demand risk on private operators.

Figure 73 Model 1 for procurement, operation and maintenance of vessels



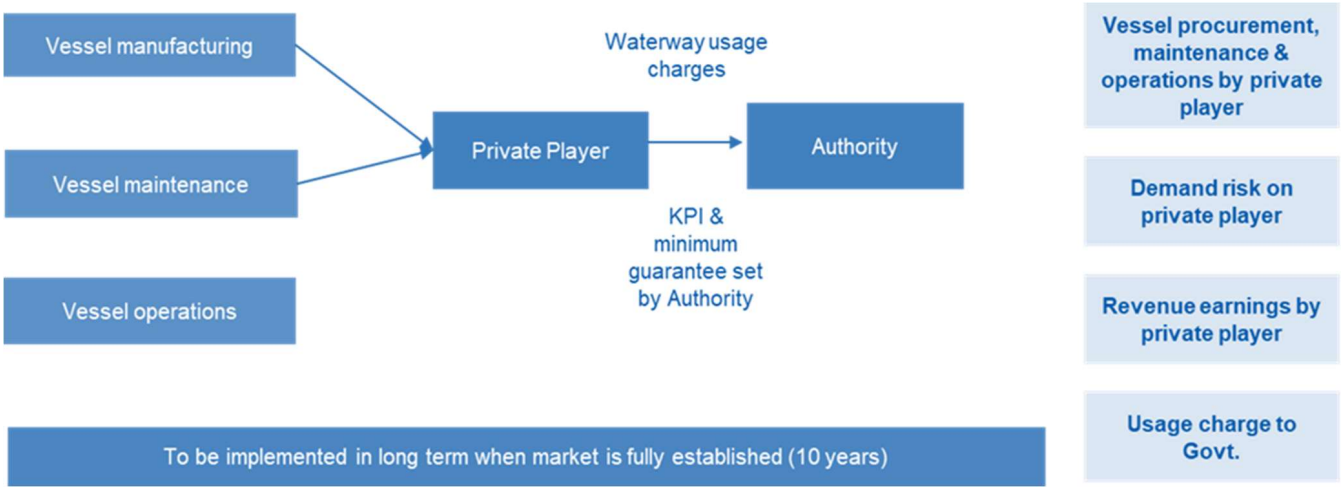
Model 2: Procurement & maintenance by private, lease revenue protection by government; Operating cost recovery through end user fee – This model can be implemented in the medium term (5 -10 years) when cargo visibility is established in the sector. Under this model, vessel will be initially procured by private players. The procured vessels will be given to Government on lease for fixed number of years. Further, the role of private players will be to operate and maintain the vessels on Government set KPIs. Private players will earn revenue from leased vessels and from users by levying user charge.

Figure 74 Model 2 for procurement, operation and maintenance of vessels



Model 3: Full demand risk transferred to private sector once baseline of strong performance on waterways established on key routes - This model can be implemented in the long term (>10 years) when the sector is fully established. Under this model, the role of private players will be to procure/ manufacture, operate and maintain the vessels on Government set KPIs. Private players will earn revenue from users by levying user charge. A certain percentage of revenue earned will also be shared with the Government.

Figure 75 Model 3 for procurement, operation and maintenance of vessels



INTRODUCTION OF LOW-DRAFT VESSELS

Introduction of low-draft vessel designed vessels (tug-barge combination) can help in moving higher volumes of cargo on low-depths. Other advanced nations/ regions have adopted low-draft designed vessels which has helped them to transport more volumes of cargo in less draft and reduce transportation cost.

Figure 76 Case study – Usage of tug-barge combination across different nations

Case study – Usage of tug-barge combination across different nations

European Union

Push convoys in lower reaches with one push boat and up to 6 barges (~18000 tons)

China

Push convoys/ tow barges in lower reaches with 5000 – 30000 tons capacity

USA

Push convoys/ tow barges with one push tug and up to 15 barges (~22,500 tons)

More volumes in less draft Reduction in transport cost

Payload capacity is directly proportional to water depth (ranging from 2m to 12m)

Standard low draft tug barge flotilla may be designed based on Indian conditions

For National Waterways -1, M/s DST Germany was appointed to design low draft self-propelled vessels. A consultant may be appointed to design low draft tug barge flotilla as per IBP river characteristics. The largest tugboat is used in River Danube (European Union) which has an arrangement plan as follows:

Figure 77 Largest tugboat of River Danube (EU) – Karadjordje

Largest tugboat of River Danube (EU) – Karadjordje

General arrangement plan

L = 40.45 m
B = 13.0 m
H = 2.8 m

Power = 3 x 1294 kW

V = 14Km/h

Load capacity = 12 barges of 1700 DWT each

TERMINAL DEVELOPMENT AND LAST MILE CONNECTIVITY

Many inland waterway routes, especially on the Bangladesh side, lack sufficient terminal infrastructure and handling equipment to cater to large vessels (> 2,000 gross register tonnage). To make integrated coastal shipping-inland waterway routes more attractive and to enable a modal shift from roadways to multimodal routes including IWT, it is important to develop state-of-the-art terminal infrastructure and establish multimodal hub ports that can serve as gateways for these routes. While a few multimodal and inter-modal terminals are under construction on NW 1, upgradation should be prioritized at key terminals such as Ashuganj and Narayanganj in Bangladesh and Haldia in India as they do not have adequate handling equipment and storage facilities. Developing inland hub ports with multimodal facilities can also be explored near Dankuni and/or Tribeni in India and near Chandpur and/or Khulna in Bangladesh. Ashuganj, in particular, could serve as a multimodal logistics hub, rather than just a transshipment point. Given its strategic location, ongoing infrastructure upgrades under the Ashuganj-Agartala rail project and navigability improvements on the Dhaka-Chittagong stretch, Ashuganj could serve as a cargo aggregation/disaggregation point for trade between Bangladesh, Myanmar and Bhutan and Nepal while improving trade between mainland and North-east India. This requires modernization of the loading/unloading infrastructure as well as storage facilities and strengthening of rail links to ICD Siliguri/ICD Amingaon. Moreover, the possibility of regular RO-RO services should be explored on the waterway route between Kolkata and Ashuganj, from where a dedicated road corridor can connect it with Agartala via Akhaura. This will enable Indian trucks to carry cargo from Kolkata to Agartala without the need for transshipment. Following projects are proposed for improving terminal handling capacity and last mile connectivity at key trade routes:

- Mechanization/ upgradation of Indian & Bangladeshi Ports - Uttarpara (near Dankuni /Tribeni), Haldia in India; regions near Chandpur, Khulna/ Narayanganj in Bangladesh
- Upgradation of Ashuganj Port as a MMLP, including RoRo facilities
- Development of MMLPs Bogibeel & Silchar
- New terminal development at Kolaghat
- Custom bonded terminals development/ upgradation at Maia – Godagari, Ghojadanga – Bhomra, Sonamura – Daudkhandi & Dhubri – Chilmari with fairway development
- Improved last mile connectivity infrastructure at terminals

INVEST IN DIGITAL INFRASTRUCTURE

End-to-end supply chain visibility is important for traders and shippers. Digitalization can help enhance efficiencies of all stakeholders in the waterways value chain. Establishment of an integrated regional digital platform to provide a comprehensive solution that brings together all stakeholders. The platform may comprise of three main elements: (i) RIS; (ii) a data platform for barge operators, allowing them to control data on their vessels, voyages, cargo and crew; and (iii) integrating the data platform with booking and transport management platforms of shippers and logistics service providers.

POLICY AND REGULATORY INTERVENTIONS

CUSTOM PROCESS SIMPLIFICATION

Simplification of customs procedures through a single-window clearance system – It is recommended that countries in the region work towards developing an integrated network in the form of a single-window clearance system for the entire region to simplify the process of obtaining clearances and permissions.

Transparency in rules and regulations- Agreed rules and procedures must be published online on an integrated digital portal, ideally linked with the single-window system. Outreach efforts should be undertaken by the IWAI and BIWTA to inform shippers and CHAs of all relevant rules and procedures.

Simplify customs arrangement and inspections - Regional agreements and protocols should importantly work to simplify customs arrangements and the need for inspection (as most of these often designate common routes and ports). Consideration should be given to simplifying the process for accreditation of ship- and cargo-owners or their agents, specifically those engaged in regular trade, subject always to using a 'trust but verify' approach to ensure such traders comply with legal, management, safety and cargo security provisions required by customs

Progression to a 'one cargo- one seal' system where cargo is customs checked in the country of origin once and then again only in the country of destination would be desirable. To ensure smooth processing, countries can consider aligning their documentation procedures according to the guidelines set by WCO

Utilization of AEO and other programmes in India and Bangladesh - While both India and Bangladesh have the AEO programmes within the WCO's framework of Standards to Secure and Facilitate Global Trade, the procedure for accreditation needs to be simplified to expand these programmes, so that more entities can benefit from the faster clearances offered to AEOs.

Rationalization of voyage permissions - Customs rules (and payments) for cargo to be separated from the operation of the ship. Also, vessels in the sub-region need to obtain advance voyage permissions for use of inland waterways. The SOPs should be suitably amended to align to the requirements of coastal shipping whereby term permissions for a calendar year are provided

HARMONIZED STANDARDS

Harmonization of product-wise testing and quality standards between countries - Countries need to work towards alignment of testing and quality standards, coupled with greater reciprocity regarding recognition of quality certification provided in one country by the other. Alignment of testing and quality standards will improve transparency, reduce duplication and constant manual interventions, which will be critical for enhancing the value proposition of integrated coastal shipping and inland waterway routes

EASE OF RESTRICTIONS

Prevailing restrictions need to be eased across several areas.

Facilities used to offload and load cargo within a particular port of call should be the shippers' choice.

Freedom of navigation - Vessels engaged in inland trade should be at liberty to choose their routes when navigating between named ports of call, border crossing points or other approved landing places (subject to design limitations and impact on navigability and safety). In addition, vessels engaged in tramp services across borders should also be free, within the limits of navigation, to call at any port or terminal in India or Bangladesh where there may be a cargo requiring carriage.

Alignment of the transit rules between India and Bangladesh with the transit rules to Bhutan/ Nepal - There is a need to create transit provisions which allow each country access to multimodal transport services in the other. In this context, transit rules made between India/ Bangladesh and Bhutan/Nepal provide landlocked countries rights of access to and from the sea and freedom of transit by all means of transport, based on the principal of international law, specifically the United Nations Convention on the Law of the Sea 1982. Similar rules should be formulated between India and Bangladesh.

Development of rules for different vessels engaged in intra-regional trade - There is a need to develop simple but differentiated rules for ships engaged in liner and tramp trade as well as small local vessels, in line with internationally accepted practices/guidelines developed by UNESCAP and WCO for the region

RATIONALIZATION OF PORT CHARGES

Rationalization of port charges - There is a need to review and rationalise port charges on a commodity-by-commodity basis to make IWT competitive versus other modes to enable a modal shift.

CREATE A MULTILATERAL AGREEMENT TO INCLUDE ALL RELEVANT COUNTRIES AND DISCARD EXISTING BILATERAL RULES

As shown in the above sections, multiple bilateral agreements (e.g.. PIWTT, Coastal Shipping Agreement, etc.) between countries currently govern regional trade and transit, including waterways. However, they include different rules to regulate the operation of ships and other means of transport, despite allowing, in most instances, use of the same waterway routes and ports. It is recommended that the various rules and SOPs be converged into a single multilateral/ regional agreement, specifying a uniform set of policies governing goods in transit and trade. Policies formulated under the agreement should ensure uniformity in rules irrespective of whether transport is via inland waterway vessels, or coastal or foreign-going ships. A process for the formulation of a regional agreement should be started in the short term while adopting a long-term view with phase-wise implementation milestones.

INTRODUCTION OF INNOVATIVE VESSEL FINANCING SUPPORT THROUGH FISCAL INCENTIVES AND SUBSIDY PROGRAMMES

Countries should formulate suitable policies to provide financial and technical support to innovative players in the sector (drawing on international best practices) to incentivize them to invest in infrastructure and market development programmes. Following are the financial incentives to promote inland waterways sector which can be explored:

- Innovative fiscal incentives such as discount on port dues for inland vessels having a Green Award Certificate (as done by Port of Rotterdam)
- Financial support to local ship builders for bringing in green, cutting-edge technologies (as done in GRENDEL and Sustainable Shipbuilding subsidy in Europe) can be explored to promote construction and development of environment-friendly vessels.
- Tax incentives for use of greener modes such as IWT
- Excise duty exemptions on fuel used in IWT
- Loan guarantee schemes

It is suggested that respective countries can begin with national programmes in the short term. Countries can then coordinate to jointly introduce favorable policies to incentivize investment from private sector players in the region over the medium term.

Countries such as the UK, USA, Germany, France, China, Finland, Netherlands, Singapore assist the purchase, construction and reconstruction of vessels through various public and private schemes for guarantee. Agreements of guarantee include pre-delivery and post-delivery terms and conditions. Funds are procured through the National Treasury/Bank or an agency of the National Treasury/ Nationalized Bank of respective countries/ unions. Guarantee for up to 80% of the Actual Cost and 90% of the Actual Cost of certain classes of vessels are provided. Repayment periods usually extended up to 25 years. Interest rates comparable to National Treasury rate of respective countries

Figure 78 Case study - Federal Ship Financing Program (Title XI), USA

Case study - Federal Ship Financing Program (Title XI), USA

Primary

1. **Vessels** - **Purchase and construction of commercial vessels** such as ferries, bulk, container, cargo, tankers, tugs, towboats, barges, dredges, oceanographic research, floating power barges, offshore oil rigs and support vessels and floating drydocks

Key Benefits

1. Guarantee for up to **75 percent of the Actual Cost** for barges and 87.5 percent of the Actual Cost of certain classes of vessels
2. Repayment periods up to **25 years**
3. Interest rates comparable to **U.S. Treasury rate** for comparable-term securities
4. Fixed or floating rates
5. Stimulate the growth and modernization of the U.S. Merchant Marine and U.S. shipyards

Eligibility

- Exhibit sufficient **operating experience** and ability to operate the vessels on an economically sound basis
- Exhibit creditworthiness and the ability to repay guaranteed debt, keep a positive working capital balance and an **aggregate debt level at no more than two times its net worth**

INSTITUTIONAL INTERVENTION

ADEQUATE INSTITUTIONAL MECHANISM TO PROMOTE AND GOVERN IWT MOVEMENT

Based on a review of various international institutional mechanisms and taking into account the need for long-term trans-boundary water sharing, joint initiatives for improving trans-boundary navigation and promoting IWT, it is recommended that a 2-phased approach can be considered for sector institutionalization.

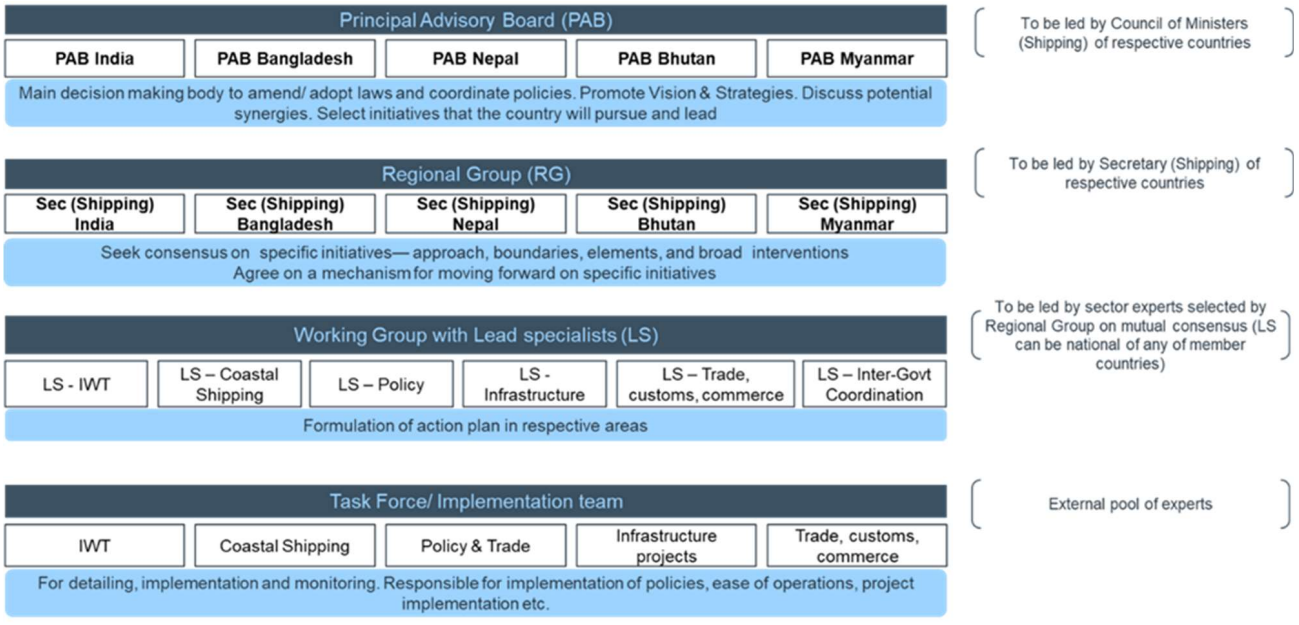
Phase I - Strengthen the existing institutional structure between India & Bangladesh

- Increase meeting frequencies of SSLT from annual to half yearly basis
- Increase meeting frequencies of Standing Committee from annual to every quarter
- Enhanced role of Joint monitoring Committees to cover dredging & infrastructure development, river navigation, digital integration, policy implementation, trade facilitation and resolution of operational issues

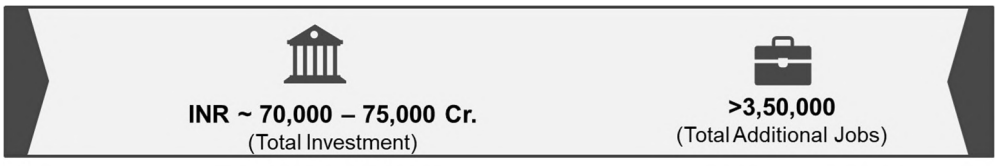
Phase II - Establish regional governance structure to include countries like Nepal, Bhutan & Myanmar

- Set up a new Institution for joint governance of eastern waterway grid with inclusion of other countries
- Develop MoUs and Association agreements to establish more profound regulatory framework
- Functional scope to include regulatory, observatory, advisory services with representative from each member states

Figure 79 Proposed regional governance structure



Total investment required and potential job opportunities

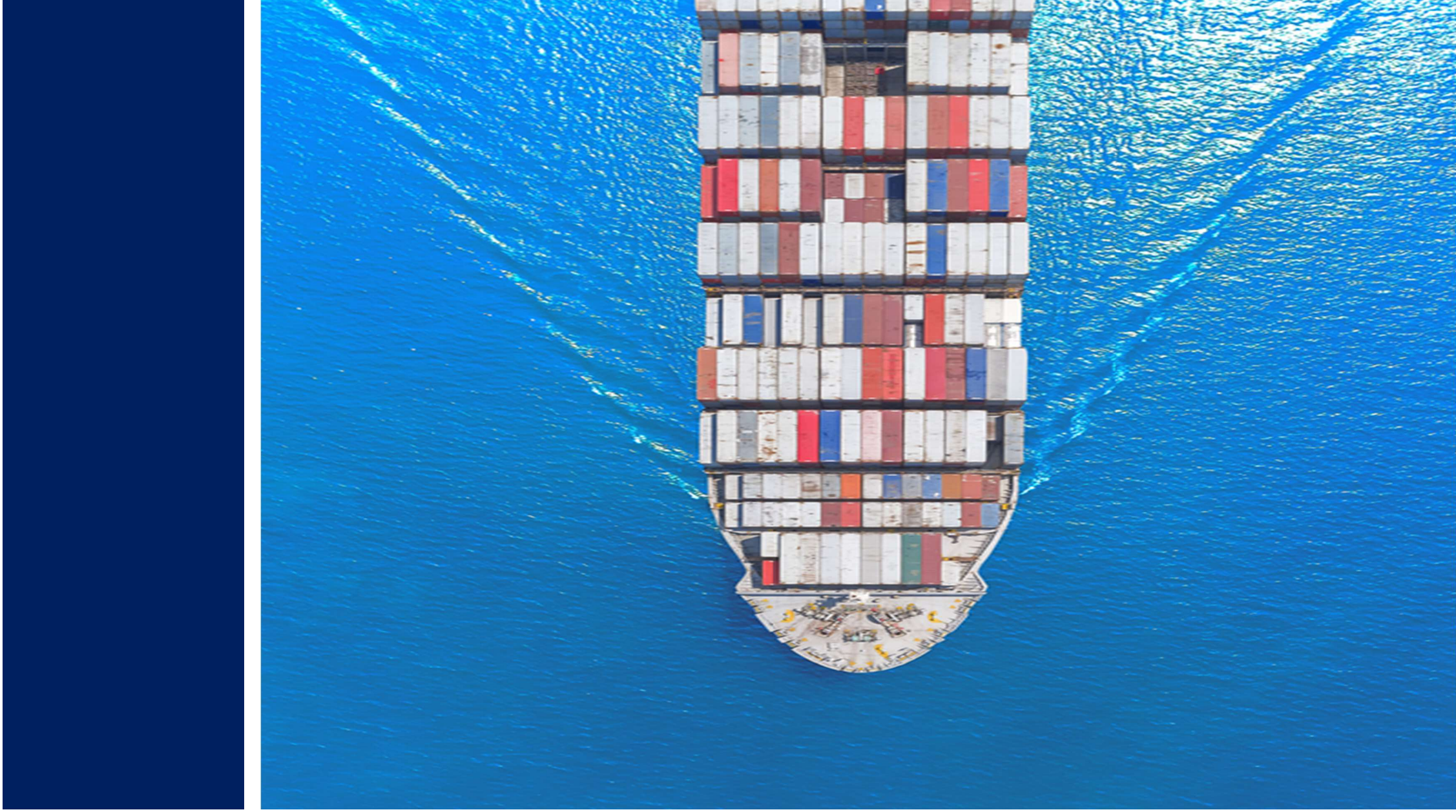


KEY PERFORMANCE INDICATORS

Metric	Status (as of 2021)	Target (2030)	Target (2047)
Increase coastal cargo volumes (MTPA)	148	230	1,300
Increased modal share of coastal shipping	6%	7.5%	12%
Increase inland water transport volumes	109	>200	>500
Regional trade and NE India movement to rest of India through waterways	~4.3 Mn tons[1]	30 Mn tons	125 Mn tons
No. of operational waterways	22	23	>50

1 Current movement of ~25 mn ton between India Bangladesh of which 15% is via waterways; NE India to/from rest of India movement of ~65 mn tons with limited movement via waterways; Share of waterway taken at 30% for regional movement and 15% of NE India movement by 2030 with cargo growth at 7%

Theme 4
Promote maritime clusters



MARITIME INDUSTRIAL CLUSTERS

CURRENT LANDSCAPE

The study for the promotion of marine industrial clusters has been undertaken across the following key elements:

1. Promoting Maritime Industrial Clusters to encourage port-led industrialization
2. Infrastructure improvements for fishing activity
3. Promoting sustainable dredging

In the subsequent sections and sub-sections, the current landscape, challenges and initiatives are discussed in detail.

PROMOTING MARITIME INDUSTRIAL CLUSTERS TO ENCOURAGE PORT-LED INDUSTRIALIZATION

The maritime industrial clusters focus to harness the benefits of a coastline that is more than 7,500 km long and propel the port-led industrialization. It envisions to derive the optimal benefits arising due to port based industrial and logistics activities.

The maritime industrial clusters are envisioned to be spatial economic regions comprising a group of coastal districts or districts with a strong port linkage. These clusters are bounded land parcels that could comprise industrial units, manufacturing units including MSMEs and requisite infrastructure to cater to their needs. The cluster could be in the immediate hinterland of the ports (existing and new proposed ports), within a radius of 100 km with a sizeable domestic market and export potential. Each of the clusters will have discrete land banks and a minimum size based on the analysis of scale economics for a given industry.

The maritime industrial clusters are aimed at promoting the development of port-proximate industrial clusters, encourage port-led development, reduction of logistics costs and time for the movement of goods and enhance the global competitiveness of the Indian manufacturing sector. The maritime industrial cluster is envisioned to facilitate export-led coastal economy based on labor-intensive sectors and will result in employment creation. It shall increase export growth since large manufacturing industries are assisted by ancillary industries.

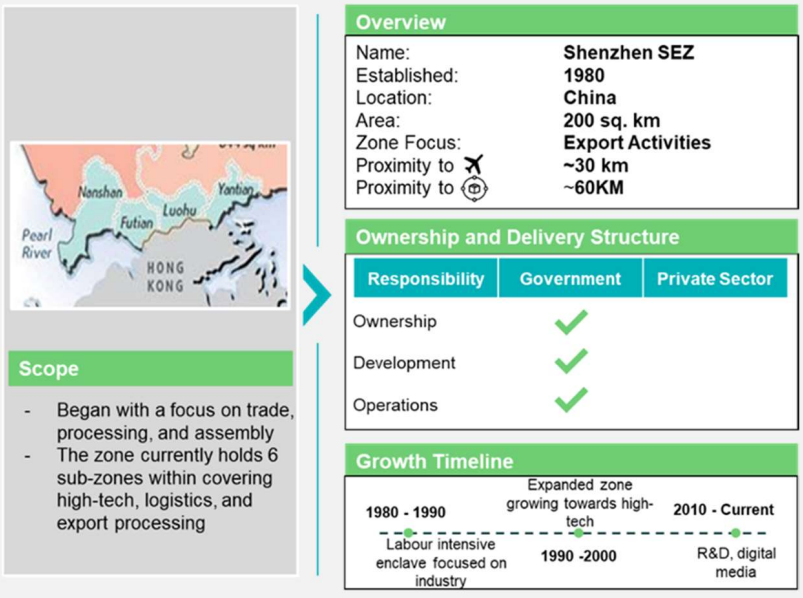
Figure 80 Shenzhen Special Economic Zone

Shenzhen Special Economic Zone along the port of Shenzhen was created in 1980s as a catalyst for the Chinese economy to transition from a centrally planned economy to one that incorporated aspects from both a centrally planned and a free-market economy. Shenzhen Special Economic provided flexible land and labour markets, attractive incentives to investors and a foreign trade regime that was liberalized over time. Global firms, which found their operations turning expensive due to high and rising wages shifted to Shenzhen and brought with them the technology, modern management practices, investment and links to export markets to the zone. The zone's coastal location allowed these firms to import inputs from abroad, process them using local labor and export the final products.

The City on the back of the Special Economic Zone, had in 2020 total EXIM trade of USD 430 Bn with a GDP of ~ USD 370 Bn. The city in its Economic Zone has more 70,000 registered technology-based enterprises. The Shenzhen Port Container Terminals in the year 2020 had the total throughput of 26 Mn TEUs[19].

[19] Source: https://www.yict.com.cn/about-throughput/annual-throughput.html?locale=en_US

The following provides the overview of the Shenzhen Special Economic Zone:



The following are the key incentives that have led to the success of Shenzhen Special Economic Zone in China

- **Incentives[20]:**
  - Land Incentives
    - Export oriented and high-tech enterprises need to pay half of the land use fee in the first five years
    - High-tech enterprises, research projects and production sites exempted from the payment of transaction charges on transfer of land-use, registration fee and trading fee
    - Newly acquired land for the establishing high-tech enterprises are exempted from the property tax for first five years
  - Financial Incentive
    - International investors are exempted from Income Tax for repatriation of profits
  - Fiscal Incentives
    - Lower corporate income tax rate of 15% for international firms as compared to 30% applicable on domestic manufacturers.
    - Export and Imports from the SEZ are duty free[21]

[20] Source: https://documents1.worldbank.org/curated/en/294021468213279589/pdf/564470PUB0buil10Box349496B01PUBLIC1.pdf
[21] Source: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Africa_Economic_Brief_-_Chinese_Special_Economic_Zones-Lessons_for_Africa.pdf

The following are the expectations from both Government's and manufacturer's objective from port led industrialization:

- Government's objective of port led industrialisation
    - Reduce logistics cost for manufacturers in order to make them more competitive
    - Promote export-import and domestic trade that would help in:
- Boost economic growth of the country
- Allow for increased port utilization and generate additional revenues for ports
- Generating employment
    - Utilise unused port land parcels
    - Socio and economic development of the area
- Manufacturer's expectation in selecting industrial sites
    - Suitable site location for
- Better trade connectivity – close to suppliers and to market
- Reduced supply cost of raw materials
- Availability of skilled labour at competitive price
- Presence of supporting infrastructure such as training, educational facilities, housing, energy and utilities
    - Ease of availability of land
- Low cost of land, favourable rentals/lease, long lease tenure, required size, encumbrance free, etc.
    - Attractive incentives and subsidies for industries
    - Stable business and regulatory environment

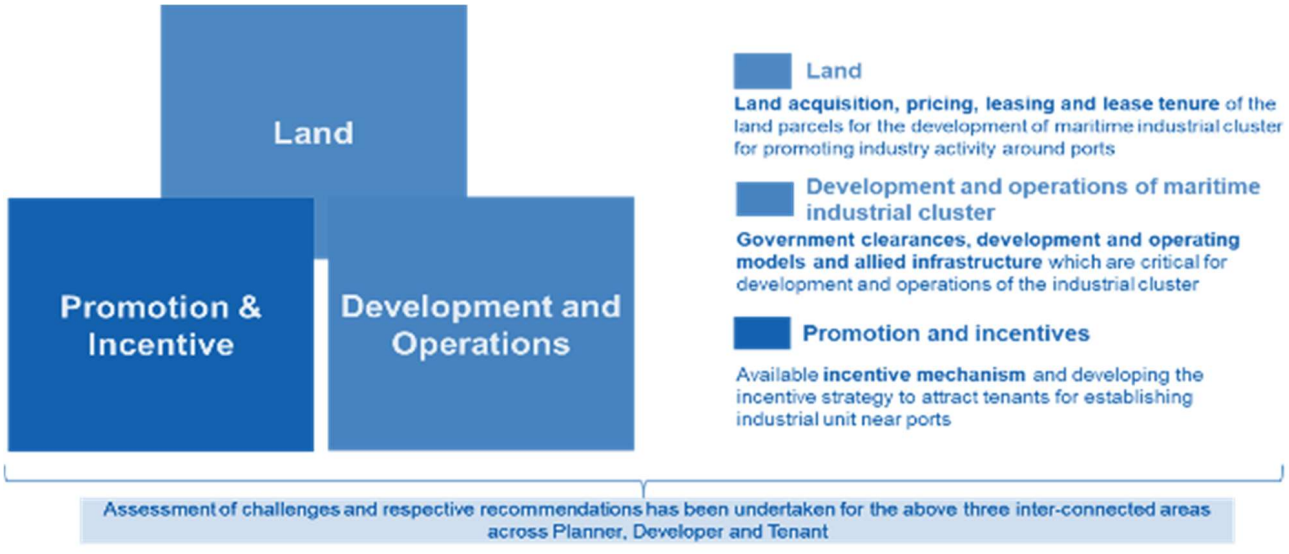
The Ports would be required to meet the expectations of Government's objective from maritime industrial cluster to promote port-led industrialization and the manufacturers expectations in selecting industrial sites. The ports can take insights from State Industrial Development Corporations (SIDCs), which offer services and infrastructure in alignment with the manufacturer's expectations to attract investments. The following provides an illustrative case for enablers of automobile industry and the offerings of GIDC Sanand, which have helped in attracting major automobile manufacturers:

Figure 81: Case Study: GIDC Sanad offering versus expectations of Automobile Industry

	Ease of Land Availability	Industrial Area Proximity/ Resource suppliers	Connectivity	Supporting Infrastructure	Skilled Manpower	Incentives & Subsidies
Enablers for Automotive industry	✓Low cost of land ✓Simpler lease/ rental terms ✓Long lease tenure ✓Encumbrance free	✓Production centres for aluminium, steel, plastic, rubber, glass electronics, electrical, tyres, body works units etc. ✓Paint & textile units ✓Other ancillary units supporting value chain	✓Link & proximity to railways, airports, industrial corridors, ports etc. ✓Market proximity –internal & export	✓Developed utilities – electricity, drainage, internal roads, ETP, STP etc. ✓Housing, markets and recreational facilities for the workforce	✓Educational, research & training institutions in vicinity providing skilled resources ✓Low labor cost and easy availability	✓Favourable industrial policy and regulatory environment • Land cost, manufacturing, HR incentives, power and logistics subsidies
Sanand GIDC Industrial Area - Offerings	✓Competitive land pricing ✓Payment options available ✓Up to 99 years of lease tenure ✓GIDC owned land	✓Well developed raw material sourcing and auto components manufacturing ecosystem ✓Close to Ahmedabad-Vadodara industrial cluster	✓Connect with all major ports ✓Access to DMIC industrial corridor, international and domestic airports and railways	✓Well planned utility infrastructure ✓Doorstep power & gas ✓**Close to Ahmedabad** city - access to good housing, schools markets etc	✓Ahmedabad provides all the skill, training and research facilities requirements ✓No labor shortage	✓Auto & auto components under **thrust sectors** in state's industrial policy ✓Attractive incentives in land cost, lease term, relocation, R&D, capital and infra development incentives etc ✓**Marketing assistance**

The development of maritime industrial cluster to promote port led industrialization is addressed through providing recommendations towards challenges faced across the following three areas that are inter-connected:

Figure 82: Three key areas for implementation and promotion of Maritime Industrial Cluster



FISHING ACTIVITY IN INDIA

Fisheries is an important sector in India, providing employment to 16 million people and contributing to the food security of the country. Presently, India ranks second in aquaculture and third in fisheries production, contributing 1.03% to the national GDP and 6.58% to the agriculture GDP (ref. National Fisheries Policy 2020).

The sector has been one of the major contributors of foreign exchange earnings with India being one of the leading seafood exporting nations in the world. The marine exports stand at about 5% of total exports of India and constitute 19.23 % of Agri-exports (2017-18). During 2018-19, export of marine products stood at 1.3 Mn tonnes and valued at INR 46,589 crore (USD 6.73 Bn).

The Government of India has introduced National Fisheries Policy, 2020 with a vision "*To develop an ecologically healthy, economically viable and socially inclusive fisheries sector that contributes towards economic prosperity and wellbeing of fishers and fish farmers and provides food and nutritional security to the country in a sustainable and responsible manner*".

PROMOTING SUSTAINABLE DREDGING

Dredging as an activity is undertaken in maritime infrastructure development during construction of the facility and during the operations phase. The dredged material that is extracted during the dredging process is to be used in other areas as dumping of the dredged material leads to environmental damage. The dredging material that is extracted during the capital dredging in the present scenario is party dumped in the water. The other uses of dredged material as current practice include:

1. Breach nourishment through bypassing of littoral sand e.g., East Coast Port
2. Land reclamation
3. Land fill
4. Use for construction material

Sustainable dredging is a dredging approach that is not harmful to the ecosystem, preserves natural resources and supports long term ecological balance. Dredging vessels (simply Dredgers) play an important role in sustainable dredging. For example, the trailing suction hopper dredgers that suction out the deposits are the major cause for turbidness in the dredged water-part. Hence, modern dredgers should ensure that the process of dredging is carried out without any debilitating effects There is a need to develop sustainable dredging solutions to reduce the overall impact of the activity on the environment.

CHALLENGES

CHALLENGES IN DEVELOPMENT OF MARITIME INDUSTRIAL CLUSTERS FOR PROMOTING PORT-LED INDUSTRIALIZATION

The challenges in the development of Maritime Industrial Clusters are discussed below across the three key areas, i.e., land, operations and development, and promotion and incentives:

LAND RELATED CHALLENGES

The land related challenges are across the following key areas:

Figure 83: Land related challenges across key areas

The challenges related to land acquisition are critical for implementation of Maritime Industrial Clusters promoting port led industrialization

1. **Land availability:** Availability of contiguous land is critical and optimum utilisation of the land available with the ports and acquisition of land when required, assume significance. Requirement of land will be

driven by the potential of the Maritime Industrial Cluster in an area with its economic and industrial characteristics, availability of ores, minerals, raw materials, etc. On the other hand, setting up the Maritime Industrial Cluster in an area will also provide new opportunities hitherto unexplored, which will develop the area through industrialization and employment generation. In coastal areas there is limited surplus port land available for utilization due to CRZ Restrictions, Pollution Control Regulations, etc.

2. **Land acquisition:** Land acquisition is one of the major structural constraints to the process of fast industrialization and improvement in infrastructure. The Government of India enacted the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013.

   The RFCTLARR Act introduces a distinction between the treatments of land acquired for a set of specified public purposes for the government's own use, hold and control and that acquired for the same public purposes, but for private or PPP projects. However, the Act permits acquisition without consent when land is for the government's use, hold and control, it requires the consent of 80% of the owners if the land is acquired for private projects and of 70% if acquired for PPP projects.

   The Act was perceived to solve the issues related to land acquisition for development of infrastructure for industries, which will support and empower the economy and help in generating jobs for the people in the country. However, problems in land acquisition persist for several infrastructure projects when the projects are being developed by private players or on PPP basis. The issues in the act are mainly related to lack of clarity on benefits accrued to landowners and lack of implementation of Resettlement & Rehabilitation (R&R) of the affected parties as mandated by law.

3. **Land allotment, lease and lease tenure**:
   a. Land allotment to tenants: The current practice for allotment of land to tenants is through Tender-cum auction. This may create bottleneck to retain investors as they may lose out on price bid. In addition, the PPP investors may not be willing to partner through tender-cum auction route.
   b. Land lease to tenants**:** Ports are bound by land policy guidelines for pricing (offering limited flexibility) and the land cost is determined based on the prevalent land values, transactions registered, auctioned prices, etc. This provides ports with limited flexibility to ports for providing land price incentives
   c. Land lease tenure for tenants: The lease tenure offered by port authorities based on the policy guidelines is 30 years with a provision of extension irrespective of quantum of investment being made and whether a developed land parcel is available or not. This is comparatively lesser than that offered by state industrial development authorities where lease upto 99 years is provided without any extension.

DEVELOPMENT AND OPERATIONS

The following provides the challenges related to development and operations of Maritime Industrial Cluster:

1. Required central government clearances of projects
2. No definite structure/operating model for port industrial area development and management
3. Environmental restrictions, which may impact area usage, approvals/clearances and result in restricted or limited sectoral offering for development
4. Allied infrastructure gaps such as access to highways, ports, railways and airports, internal road, utilities, social infrastructure.

PROMOTION AND INCENTIVES

The following provides the challenges related to availability of promotion and incentives in Maritime Industrial Cluster:

1. Absence of incentive mechanism for port industrialization and dependency on central, state and sectoral incentive schemes to attract investments
2. Nascent investment & trade promotion experience with ports

IMPACT OF CHALLENGES IN DEVELOPMENT OF MARITIME INDUSTRIAL CLUSTER

The following provides the impact of the challenges across the three key areas on the stakeholders of the Maritime Industrial Cluster which include planner, developer and tenant:

Table 24: Impact of challenges

Challenges / Institution		Port Authority / Developer	Tenant
Land issues	Availability of contiguous land for industrial development	Unsuitable for cluster development More compliances, increase in cost Planning for common infra	Expansion planning/ setting long term goals
	Inflexible land acquisition act	Providing contiguous land, on time and encumbrance free Delay in project	-
	High land pricing - not-aligned with market/circle rate	Lower investment attractiveness	High lease payments
	Shorter lease tenure	Lower investment attractiveness Increases risks / project revenue cycle Difficulty in obtaining finances	High lease payments Expansion planning/ setting long term goals
	Land allotment – tender cum auction bidding	-	Lengthy process
	Transfer charges	Impact on cost of project	-
	Quality of land	Increase in developmental cost	-
Operational & Developmental Issues	Structure/type of operating model	Synergy in planning, financing, marketing execution, incentives & benefits	
	Environmental impact/restrictions	Restricted offering – loss of major investors	Compliance challenges

Challenges / Institution		Port Authority / Developer	Tenant
		Compliances challenges & project delays	Expansion restrictions
	Allied Infrastructure gaps - transport/trade infrastructure, utilities, social infrastructure	Lower investment attractiveness Increase in project cost	Ease of doing business Better ecosystem for workforce High cost of services
Promotion & Incentives	No incentive mechanism in place for port led industrialization	Lower investment attractiveness	Foregoing benefits
	Nascent Investment & trade promotion experience	Planning & execution - project delays Loss of investor's confidence Increase in cost	Co-ordination issues Project delays

CHALLENGES IN INFRASTRUCTURE IMPROVEMENTS IN FISHING ACTIVITY

The following are the infrastructure constraints that result in post-harvest loss of fish and thus also impact the overall income of the fishing community:

1. The processing facilities are located at a distance from the fishing harbours and landing sites. This leads to the loss of post-harvest loss as there are conventional methods used for storage of fish in transit.
2. The available quality of fishing harbours and land sites result in congestion for unloading the fishes from the vessels, which impact the overall catch.
3. Fishing vessels that are currently being used consume significant amount of fuel and thus have a large proportion in the overall operating cost for catching fish
4. There is limited availability of cold chains near the fishing harbours and landing sites and thus the conventional
5. The quality of road connecting the fishing harbours and landing sites with the processing plants and demand centers is inferior.

CHALLENGES IMPOSED BY THE CURRENT DREDGING TECHNIQUES

The following are the challenges being implemented from the current dredging techniques:

1. In the current dredging techniques, the dredgers cause some turbidity during excavation as well as during the flow of sediments from the hoppers and barges. The plumes arising from trailing suction hopper dredgers are caused by the discharge of sediment-laden water from the hopper, which can form surface or near bed plumes. This can harm the marine environment
2. The dredgers use low grade fuels as energy source emitting disadvantageous harmful emissions in the exhaust gases of the ship's prime movers.

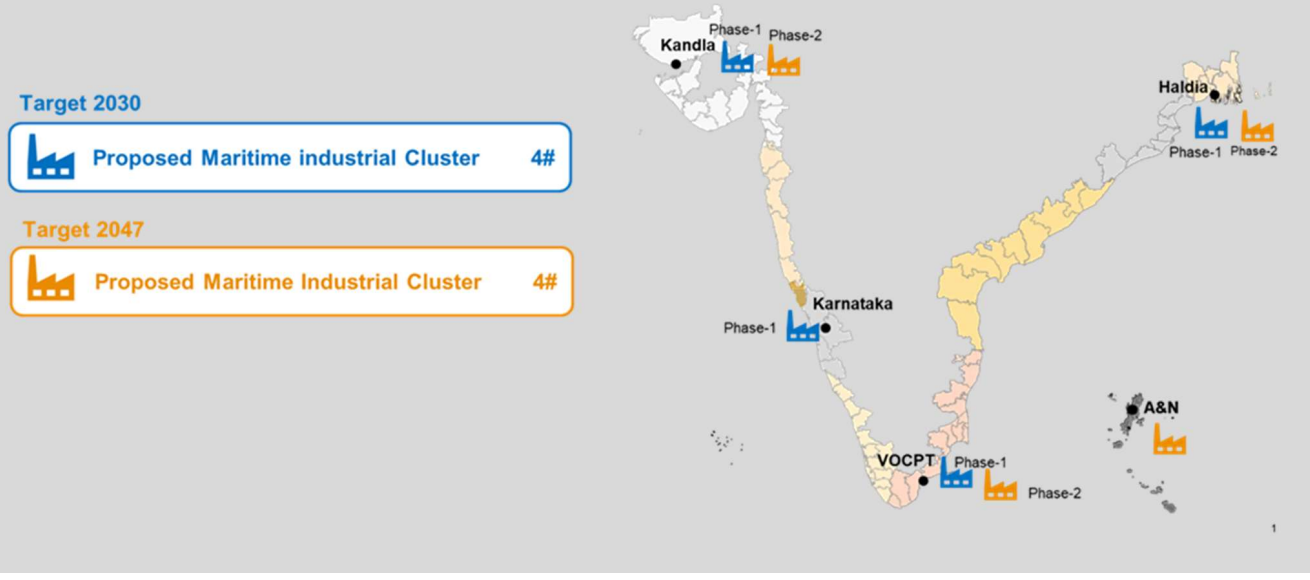
3. The shape and size of the hull influences the wave pattern of the ship, which finally influences the energy consumption of a vessel at a given sailing speed.
4. The dumping of the dredged material in the sea impacts the underwater environment.

KEY INITIATIVES FOR PROMOTING MARITIME INDUSTRIAL CLUSTERS

INFRASTRUCTURE INITIATIVES

The following provides the location of development of Maritime Industrial Cluster by 2030 and 2047:

Figure 84: Locations for developing maritime industrial cluster



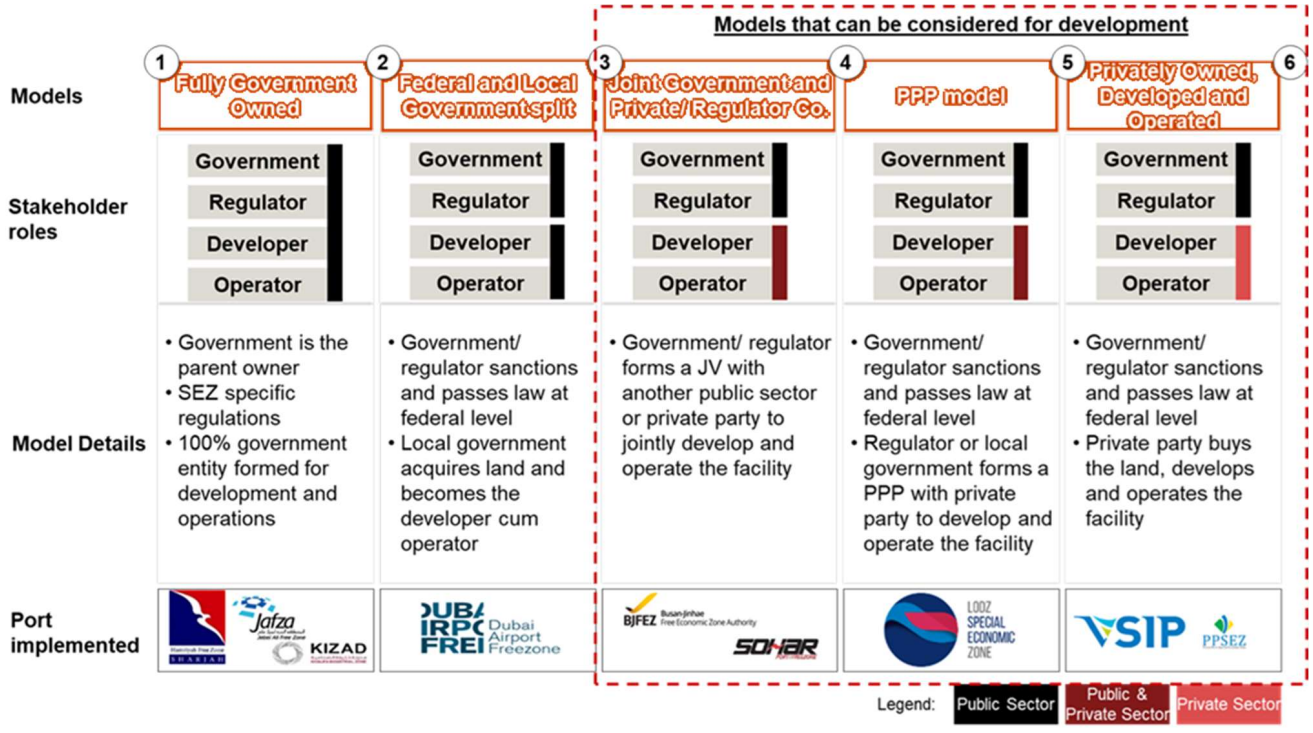
DEVELOPMENT MODELS FOR PORT-LED INDUSTRIALISATION

The development of infrastructure would involve three major stakeholders from the government side, which include ports, state government and central government along with private developers. The development of a balanced structure between these stakeholders is critical for building the industrial infrastructure. The ports have undertaken the development on its land parcel on standalone basis. Therefore, to further expand the scope of development and create industrial infrastructure, co-development models need to be considered. The following provides the different development and operating models across international geographies:

1. Fully government owned model
2. Federal and local government splitting the roles for development and operations of port led industrial park
3. PPP model
4. Privately owned, developed and operated

The following provides the details of each of the five models and the ports in which these have been implemented:

Figure 85: International Case Studies of different development models



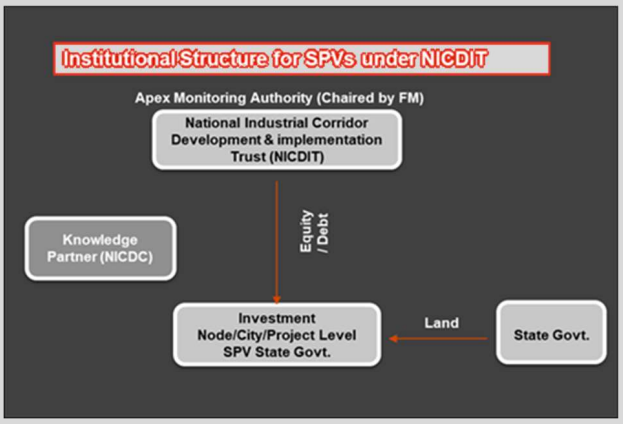
The following provides the detailed case study for Sohar Port Industrial Zone:

Figure 86: Sohar Port Industrial Zone (Case Study)

In India, one of the examples of such collaboration is the Industrial Corridor Program. The central government through NICDC is developing various nodes across states. However, considering that certain components of

project are in the control of state government such as land, infrastructure utilities, state incentives and others, it was necessary to ensure participation and interest from the states.

Indian Case Study: Central government through NICDC is developing various nodes across states. However, since certain components of the project are in the control of state government such as land, infrastructure utilities, state incentives and others, it was necessary to ensure participation and interest from the states. The following provides the key highlights of the structure being formed by NICDC:

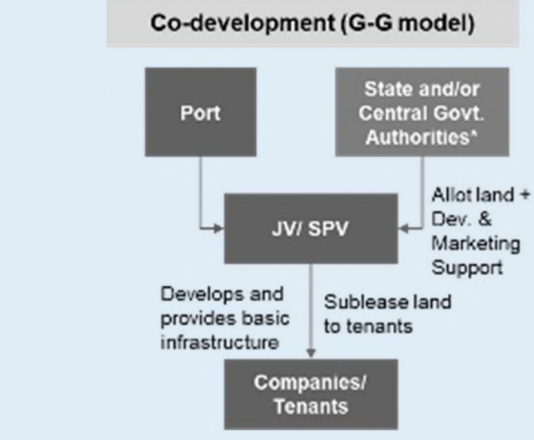


- NICDC is the Project Development Partner or Knowledge Partner to all SPVs and state government agencies for the implementation of industrial nodes/ cities
- NICDC establishes SPVs for project implementation, operation, maintenance, and management of industrial nodes.
- In the SPV, the state government contributes its share through land
- The SPV management includes directors nominated by concerned state government/state nominated nodal agency

The following are the three models that can be explored by ports for developing **maritime industrial clusters to promote port-led industrialization on Plug & Play Concept on PPP Model**:

- **Co-Development Model**: In this model, the Ports will form a JV / SPV with the State Industrial Corporations (SIDCs) and / or Central Government Authorities such as NICDC. The SIDCs and Central Government Authorities to come based on the requirement of a particular location. The following provides the salient features of the structure:

Figure 87 Structure of Co- Development Model

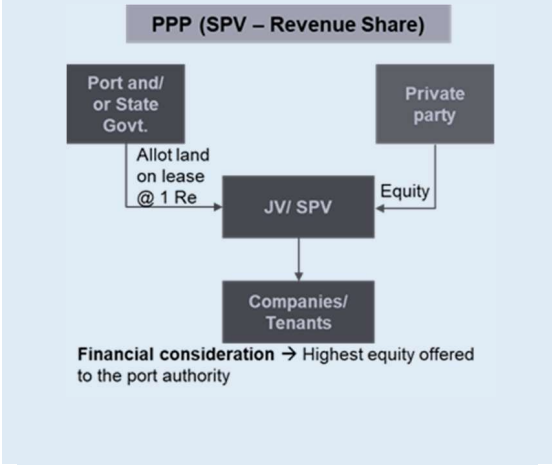


  - Both Port and SIDCs and / or Central Government Authorities to:
    - Bring together land required for the development of industrial infrastructure
    - Jointly market the Project
    - Invest Equity in the JV / SPV for construction of industrial park
  - JV / SPV to undertake the following activity:
    - Development of land parcel including creation of trunk and support infrastructure such as internal roads, Common Effluent Treatment Plant (CETP), Water Treatment Plant (WTP) etc.
    - Development of connectivity infrastructure to nearest state and / or national highway
    - Provide marketing support to the ports
    - Provide necessary incentives (based on the recommendations of Ports, SIDCs and / or Central Government Authorities)

- Provide land on lease rentals to the investors

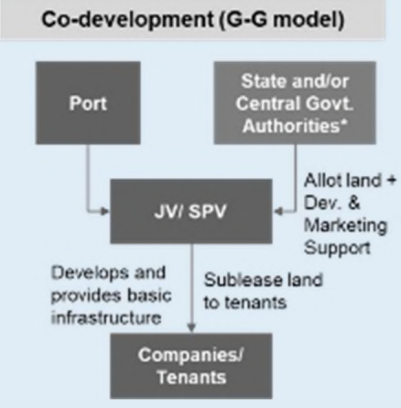
- **PPP model (SPV-Equity Participation)**: In this model, the Ports will form a JV / SPV with a private industrial park developer. The following provides the salient features of the structure:
  - Both port and private players to undertake the following activities:
    - Port to bring land for the development of industrial infrastructure
    - Jointly market the project
    - Private player to invest equity in the JV/SPV
    - Port to undertake development of CETP, WTP, etc. and connectivity infrastructure
  - JV / SPV to undertake the following activity:
    - Development of land parcel including creation of trunk and support infrastructure such as internal roads, utilities, etc.
    - Provide marketing support to the ports
    - Provide land on lease rentals to the investors
    - Undertake operations and maintenance of the industrial infrastructure

Figure 88 Structure of PPP Model (SPV – Equity Participation)



- **PPP model (SPV-Revenue Share)**: In this model, the ports will form a JV / SPV with a private industrial park developer. The following provides the salient features of the structure:
  - Both port and private players to undertake the following activities:
    - Port to bring land for the development of industrial infrastructure
    - Jointly market the project
    - Private player to invest equity in the JV/SPV
    - Port to undertake development of CETP, WTP, etc. and connectivity infrastructure
  - JV / SPV to undertake the following activity:
    - Development of land parcel including creation of trunk and support infrastructure such as internal roads, utilities, etc.
    - Provide marketing support to the ports
    - Provide land on lease rentals to the investors
    - Undertake operations and maintenance of the industrial infrastructure

Figure 89 Structure of PPP Model (SPV – Revenue share)



REVIEW OF LAND ACQUISITION ACT

The challenges in the land acquisition through RFCTLARR Act, 2013 for development of the industrial infrastructure-based PPP mode need to be reviewed. The following major features can be captured from the National Highways Act, 1956, for land acquisition for PPP based port-led industrial development:

- Appointment of competent authority by the Central Government for overlooking the land acquisition process
- Competent authority has been provided powers for dispute resolution within fixed time frame
- Competent authority determines the compensation
- Arbitration as per Arbitration and Conciliation Act, 1996 in case compensation disagreement between the concerned parties

The incorporation of such features may help development through PPP model and reduce the overall land acquisition cost, which would help both the developer as well as the tenant.

DEVELOPING COMMODITY-BASED CLUSTERS

The maritime industrial clusters proposed in Kandla, VoCPA, Haldia and Andaman & Nicobar Islands can focus on the following commodities:

- Bulk clusters for basic input industries such as power, refineries & petrochemicals and cement
- Discrete manufacturing clusters, in the labor-intensive sectors of electronics, automotive, apparel, furniture and food-processing.

The ports need to undertake further assessment and identify 2-4 focus sectors for developing the Maritime Industrial Cluster.

ADOPTION OF INVESTOR FAVOURABLE POLICY AND REGULATIONS

The land pricing, lease, lease tenure and allotment are the four key areas in which need be favourable for the investors. This is required since these are the major costs for setting up manufacturing units in the port area. The following discusses in detail the recommendations across the three key areas:

1. **Flexible land pricing:** The State Industrial Development Corporations (SIDC) have the flexibility to fix the land (lease/sale) pricing when compared with ports for industrial land allotment.

> **Case Study: Land Cost Incentive Scheme provided by Tamil Nadu**[22]
>
> Under the Land Cost Incentive Scheme, The Government strives to provide land to industries at competitive rates. For eligible projects in SIPCOT in “A” & “B” districts, land allotment will be made at a 10% concessional rate and at a 50% concessional rate in “C” districts for land up to 20% of EFA. The timelines for allotment of Land in SIPCOT Industrial Area shall be as per Tamil Nadu Business Facilitation Rules 2018 and a deemed approval shall be issued on expiry of the time limit.

The Ports can also have flexibility in land pricing while offering the land to manufacturing units. The following are the proposed initiatives that can be taken:

[22] Source: Tamil Nadu Industrial Policy 2021

- Revising land policy guidelines should be considered for providing flexibility in pricing and payment mechanism for anchor investments (anchor investor may be defined based on criteria like land area, investment size, employment potential).
- Reserve pricing in land allotment for PPP development projects need to be reconsidered to support private participation.

2. **Lease rentals:** The cost of land near the ports is higher as compared to adjoining areas due to the availability of infrastructure. This impacts the lease rentals that can be charged by the Port-Led Industrial Park to the tenants and thus the competitiveness of the land provided by State Industrial Development Corporation increases. ***Therefore, the ports need to provide the competitive lease rentals in line with State Industrial Development Corporations.*** The following provides the comparison between the upfront premium charged by the Coastal Economic Units (CEUs) established at ports such as Kandla, Kamarajar and VoCPT and the SIDC industrial parks in the region:

Figure 90: Comparison of Upfront Premium charged by CEUs at ports and SIDCs in the region

Sr. No	Competitors	Distance from Kandla (Km)	Upfront premium (In INR Per sq. meter)
A	SIPC Kandla	-	3500 - 4000
B	GIDC Industrial Estates		
1	Mandal	276	2900
2	Saykha	504	2100
2	Dholera SIR	319	2500

Sr. No	Competitors	Distance from Ennore (Km)	Upfront premium (In INR Per sq. meter)
A	CEU Kamarajar	-	4000-4500
B	SIPCOT Industrial Estates		
1	Tiruvallur	50	1600-1700
2	Kancheepuram	90	2600-2700
3	Vellore	142	800-900
4	Krishnagiri	280	1700-1800

Sr. No	Competitors	Distance from Tuticorin (Km)	Upfront premium (In INR Per sq. meter)
A	CEU VOCPT	-	3400-4000
B	SIPCOT Industrial Estates		
1	Thirunelvel	50	380-400
2	Tuticorin	20	380-400
3	Sivagangai	188	135-200
4	Dindigul	225	400-500

3. **Land allotment:** It is proposed that allotment of the land parcel to tenants may be undertaken on application-based allotment. The application-based allotment can also allow in accepting single bids in the absence of competitive bids. It is also recommended that dedicated land zoning may be made for PPP development to promote plug and play industrial infrastructure. The following provides the difference between land allotment methods across tender-cum auction method and application-based allotment:

Figure 91: Difference between tender-cum-auction v/s application-based allotment method

Particular	Current method – Tender-cum-auction	Alternate method – Application based	Example
Ease of Process	X Complicated process. MSMEs lack capacity to participate	✓ Easy to access and understand	• Dholera Special Investment Region (DSIR), an area spread across ~920 sq. km. in Gujarat is also marked under SIR act,2009. • Under the land policy, there is a provision to offer land on First Cum First Serve basis via application route.
Suitability for initial phase of development	✓ H1 bidder is selected for land allotment. Hence, authority may realize value higher than base price	X First applicant is selected and hence, no addition value is realized other than base price	
Selection process	X Requires a competitive bid which becomes difficult for MSME unit.	✓ First applicant is selected	

4. **Lease tenure:** Lease tenure of land parcels is another critical aspect impacting the attractiveness of a particular location in attracting tenants. Port authorities have increased the tenure from 30 years to 60 years. However, it is less as compared to State Industrial Development Corporations. Therefore, it is recommended that

a. Ministry of Shipping through the Land Policy Guidelines may provide lease tenure that is competitive to that offered by competing SIDCs

b. Flexible lease tenures may also be considered (and allotment may be done through annual or upfront or interval-based payments) to suit the need of investors

The following provides the comparison in the lease tenures provided by SIDCs and Lease period offered by authorities of port led development:

Figure 92: Comparison between lease period of SIDCs and port led development

Lease period offered by State industrial development authorities

Lease period offered by authorities of port led development

Industrial estates	Lease period	Coastal Economic Units	Lease period
Gujarat (GIDC)	Max 99 years	Smart Industrial Port City, Kandla	60 years
Andhra Pradesh (APIIC)	Max 99 years	Tuticorin Coastal Economic Unit (CEU)	60 years
Maharashtra (MIDC)	Max 95 years	Kamrajar Coastal Economic Unit (CEU)	60 years
Uttarakhand (SIIDCUL)	Max 90 years	Kakinada Special Investment Region	90 years

INCENTIVE MECHANISM

The incentives are required to attract tenants and investors for making investments in the industrial park being developed. Therefore, there is a need to establish an incentive strategy for attracting investments. The incentive strategy to be aimed at making the country competitive and attracting manufacturing units to establish positions in the country. An analysis has been undertaken to assess the cost competitiveness of India as compared to China.

Figure 93: Case Study: Mobile manufacturing cost comparison b/w India and China

Particulars	China	India (compared to China)	Remarks
Raw Material	44.8%	+5%	Basic Customs Duty is applicable on some of the components, increasing the overall cost of raw material in India
Transport	0.1%	+10%	Logistic Cost in India is as much as 2% of Raw Material Cost
Labour	5.0%	-10%	Labour Cost in India is 10% lower than China, though labour productivity in China is higher
Utilities	3.8%	+10%	Utility Cost in India is 10% higher than China coupled with lower efficiency in India
Quality Assessment and Training	6.3%	+20%	QA and Testing Cost in India is 20% higher than China due to cost associated infrastructure and capabilities
Licensing	3.8%	+3%	
Administration	10.1%	-13%	Overall administration cost in India is 13% lower than China due to higher capability at management level
Debt Obligation	2.9%	+70%	Interest Rate in China is 4.5% compared to 10.5% in India
Tax Implication	2.6%	+15%	Corporate Tax rate in India and China are on par
Capital Expenditure	5.5%	+22%	Cost of Setup is more expensive in India due to landed cost of Machinery and higher construction costs
Markup	15.1%	+4%	
TOTAL	100%	+7%	

Operating expenses are lower in China due to lower cost of raw materials, utilities, logistics expenditure

Interest rates in China are considerably lower than India leading to lower cost of capital

Developed land is available in China at lower cost

China offers tax holidays and rebate for acquisition of land

Incentive strategy to be made in the country to make establishing and operating the manufacturing unit more cost competitive

Thus, the incentive strategy for maritime industrial clusters to promote port-led industrialization to make setting up of manufacturing unit more cost competitive by bridging the cost gap between India and China. The incentives that can be provided can be categorized into fiscal, financial and additional incentives. The fiscal incentives mainly focus on direct and indirect tax exemptions, while financial incentives focus on supporting loans, repatriation of profits, etc. and additional incentives can be provided by the ports. The following are some of the case studies from international examples wherein fiscal and financial incentives are provided:

Figure 94: Case study: Fiscal and financial incentives in other countries

	Khalifa Industrial Zone, United Arab Emirates	Jebel Ali Free Zone, United Arab Emirates	Mongla Export Processing Zone, Bangladesh	Export Processing Zone, Gabon
Fiscal incentives				
Corporate Taxes	Companies registered in UAE free zones are exempt from corporate tax, capital gains tax	Corporate tax exemption for first 50 years, extendable subject to certain criteria	• Exemption of tax on dividends. • Minimum tax exemption of 4 to 11 years depending on the type of sectors and percentage of exports.	100% exemption on corporate tax
Income Tax Exemption	100% personal income tax exemption	100% personal income tax exemption	• Income tax exemption up to 5 years • Reduced rate after 5 years/ tax holiday is levied at 12% to 28% depending on the income.	• 100% exemption on income tax • 100% exemption on capital gains tax
Custom Duty Exemption	Restricted • 100% import and export tax exemption • JVs with local companies are exempt from import duties on raw materials • Foreign companies are exempt from import duties kept in bonded status and re-exported from UAE • Raw material import duty exemption for manufacturing businesses	100% import and export tax exemption	• Exemptions of Customs Duty on capital goods and raw materials. • Non-export oriented companies are entitled to import project related capital goods free of Customs Duty.	No special duty on the import of plant and machinery or spare parts for industries
VAT Refund	No obligation to register for VAT unless sales turnover in the country exceeds AED 375000	No VAT	-	-
Financial Incentive				
Foreign Labour	No restriction on foreign labour	No restriction on foreign labour		-
Repatriation of profits	100% repatriation of capital & profits	100% repatriation of capital and profits	Full repatriation of capital invested from foreign sources is allowed by Bangladesh. Similarly, profits and dividend accruing to foreign investment may be transferred in full.	100% repatriation of profits allowed
Foreign Ownership	100% foreign ownership allowed	100% foreign ownership	-	-
Loan and Aids		Ability to mortgage premises to a bank or financing company	-	-

The following are the schemes available from Government of India and State Government(s) for attracting industries:

Table 25: Incentive schemes for manufacturing units

Scheme	Detail	Implementing Agency
Production Linked Incentive (PLI) Scheme	• There are 13 sectors in which benefits under PLI Scheme are available. • The scheme provides fiscal incentives of a certain percentage on incremental sales (over base year). • The scheme aims to attract investment in the areas of core competency and new age technology to ensure efficiencies and create economies of scale enhance exports and make India an integral part of the global supply chain.	Ministry of Heavy Industries and Public Enter
Incentives for Special Economic Zones[23]	• **Incentives available to tenants** ○ Duty free import/domestic procurement of goods for development, operation and maintenance of SEZ units ○ 100% Income Tax exemption on export income for SEZ units under Section 10AA of the Income Tax Act for first 5 years, 50% for next 5 years thereafter and 50% of the ploughed back export profit for next 5 years. (Sunset Clause for Units will become effective from 01.04.2020)	Ministry of Commerce and Industry

[23] Source: http://sezindia.nic.in/cms/facilities-and-incentives.php

Scheme	Detail	Implementing Agency
	○ Exemption from Minimum Alternate Tax (MAT) under section 115JB of the Income Tax Act. (withdrawn w.e.f. 1.4.2012) ○ Exemption from Central Sales Tax, Exemption from Service Tax and Exemption from State sales tax. These have now subsumed into GST and supplies to SEZs are zero rated under IGST Act, 2017. ○ Other levies as imposed by the respective State Governments. • **Incentives available to Developers** ○ Exemption from customs/excise duties for development of SEZs for authorized operations approved by the BOA. ○ Income Tax exemption on income derived from the business of development of the SEZ in a block of 10 years in 15 years under Section 80-IAB of the Income Tax Act. (Sunset Clause for Developers has become effective from 01.04.2017) ○ Exemption from Minimum Alternate Tax (MAT) under Section 115 JB of the Income Tax Act. (withdrawn w.e.f. 1.4.2012) ○ Exemption from Dividend Distribution Tax (DDT) under Section 115O of the Income Tax Act. (withdrawn w.e.f. 1.6.2011)	
Incentives under Trade Infrastructure for Export Scheme (TIES) Guidelines[24]	• Central Government assistance for infrastructure creation will be in the form of grant-in-aid, normally not more than the equity being put in by the implementing agency or 50% of the total equity in the project subject to a ceiling of INR 20 Cr. • Priority would be given to infrastructure projects involving significant contribution of stakeholders and bank financing. In States with relatively better export infrastructure and institutional capacity, PPP projects would be encouraged so that the funds under TIES can be optimally leveraged	Ministry of Commerce and Industry
Incentives under MSME Cluster Development Program (MSME-CDP)	Infrastructure Development Projects under the scheme would cover Projects for infrastructural facilities like power distribution network, water, telecommunication, drainage and pollution control facilities, roads, banks, raw material storage and marketing outlets, common service facilities and technological backup services for MSEs in the new/ existing industrial estates/areas. Development of Flatted Factory Complexes can also be undertaken under this component. The following are the available incentives: • Grant will be restricted to 60% of the cost of Project (Rs.10 crore for Industrial Estate & Rs.15.00 crore for Flatted Factory Complex). 80% for Projects in NE & Hilly States, Island territories, Aspirational Districts/LWE affected Districts, industrial areas/estates/ Flatted Factory Complex with more than 50% micro/village or women owned or SC/ST units • State/UT Governments will provide suitable land for the Projects	Ministry of Micro, Small and Medium Enterprises
Incentives Available for Capital Subsidy in State Industrial Policy	Incentives are available through capital subsidy schemes under the industrial policy of states. The following provides some of the available incentives provided by states: • Gujarat: ○ For tenants ▪ Capital subsidy of 10%-12% of eligible Fixed Capital Investment (excluding land) upto Rs 40 Cr. to be paid in equal instalments for 10 years to tenants ○ For industrial park development ▪ Assistance upto 80% of the eligible project cost upto Rs 25 Cr. for developing common infrastructure facilities ▪ Financial assistance at 25% of eligible fixed investment (excluding land cost) upto a Rs. 30 crores for developing industrial park	State Government

[24] Source: https://commerce.gov.in/wp-content/uploads/2021/07/TIES-revised-guidelines-FY22-to-FY26.pdf

Scheme	Detail	Implementing Agency
	▪ Financial assistance at 25% of fixed investment upto Rs. 20 crores for constructing industrial worker housing	
Employment Subsidy	Under the Jharkhand Textile Policy, a one-time skill development subsidy of INR 13,000 is provided for training / skill development in the textile sector	State Government

In addition to above, the ports can provide the following incentives to the manufacturing units:

- Incentives such as subsidized cargo handling charges, preference in berthing of dedicated vessels, right of way for pipelines and providing infrastructure for sourcing raw material to industrial area making it available on site, etc. may incentivize developers and investors
- Port authorities may also cross-subsidize investment occurred for development of such area through conforming minimum guaranteed cargo movement by the industrial units
- Central and state government schemes such as bonded manufacturing facilities, tax incentives under warehousing, etc. may be used for offering incentives to investors

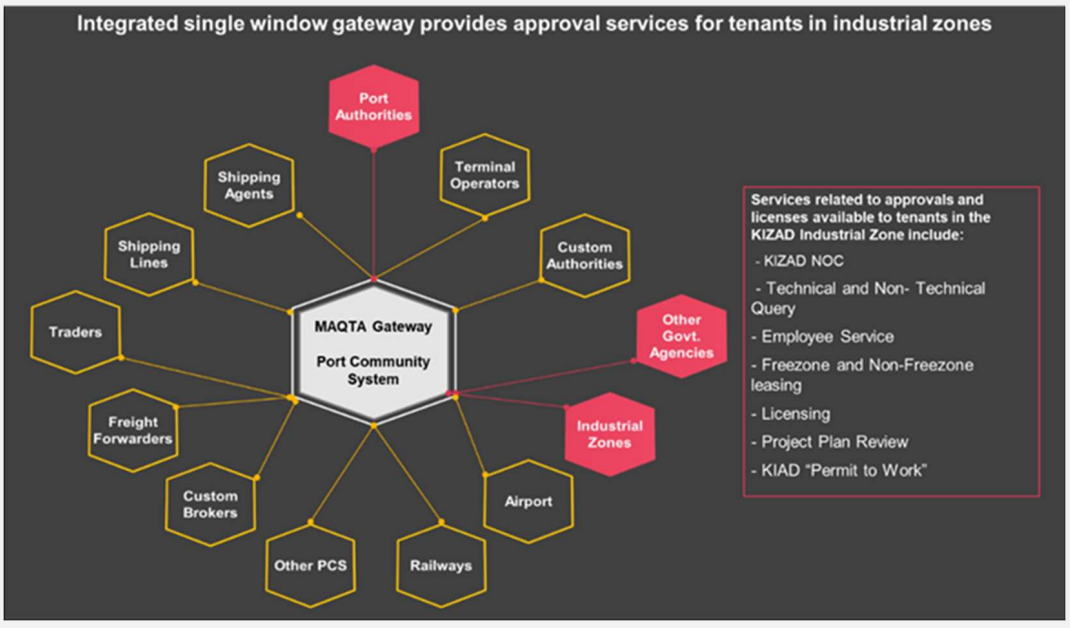
A Maritime Industrial Cluster Incentive scheme needs to be developed by Ministry of Ports, Shipping and Waterways. The incentive scheme can be focused to reduce the cost competitive gap to attract tenants to these Maritime Industrial Cluster. The provision of the following incentives can be considered:

- Incentives that can be provided by Government of India
  - Direct and indirect tax incentives like those provided to SEZs
  - While the government is providing the incentives to 13 sectors under PLI scheme, it may be considered that a sector agnostic PLI scheme can be provided for the manufacturing units in Maritime Industrial Cluster
- Cargo linked incentives can be provided by ports to the manufacturing units, which generate EXIM and coastal shipping cargo

INSTITUTIONAL INITIATIVES

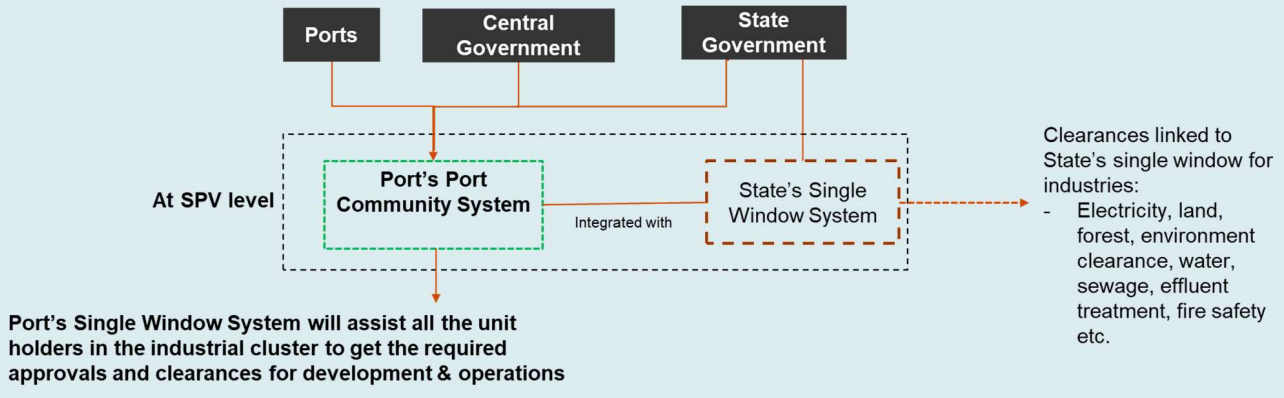
In order to reduce the timeline for getting the requisite approvals, a Single Window Clearance system can help in addressing the issues related to delay in obtaining clearances by the tenants. It will also help in boosting investments in the Maritime Industrial Cluster. In international geographies, systems have been developed integrating the Port Community System and local government system to provide clearances to the tenants.

Figure 95: MAQTA Gateway System (Case Study)



In India as well the Port Community Systems, which have been implemented in the major ports can be integrated with the Central Government Single Window and State's single window approval process to allow for a faster approval process for the tenants. The following provides the structure of the Single Window Clearance Process.

Figure 96: Structure for proposed single window clearance process for ports



KEY INITIATIVES FOR IMPROVING THE FISHING INFRASTRUCTURE

The following are the initiatives proposed for promoting fishing infrastructure in the country:

1. Promoting development of fish processing plants within the Maritime Industrial Cluster with a possibility of plug and play infrastructure. This will help in reduction in the time from landing to processing and then exporting.
2. Creation of a cold chain infrastructure near the fishing harbours and jetties on PPP basis for minimizing the post-harvest loss.

3. Introduce private sector investments in the fishing industry through PPP investments with focus on developing or refurbishing the port harbour and landing sites.
4. Use of modernized fishing vessels can help in providing solutions to the challenges faced by the fishing industry. These can be undertaken through extending the use of technology to the fishing vessels
5. Development of connectivity road infrastructure need to be undertaken to allow for after evacuation of the harvest once it lands on the fishing harbour to minimize the losses.

Figure 97 Case Study: Vietnam has implemented infrastructure initiatives for fisheries sector

The Vietnam Government has implemented the Master Plan 2030 for the fishing sector. As part of the Master Plan Keen Gang, Ba RiaVung Tau, Nha Trang city, and Hai Phong to be developed as Fishing Port Centers. These are existing ports in the country in which fishing activity is undertaken. The development would allow for creation of an infrastructure for efficient handling of the fishes from the vessels.

In addition, in the country the fishing processing plants are located adjacent to the fishing port. An example of such development is Tho Quang Fishing Port, which has Tho Quang industrial park adjacent to it. The park mainly has fishing processing industries which allows for reduced time from the land site to the processing plant. In addition, the Danang Container Terminal is located ~5 kms from the industrial park and fishing port, thus allow for the faster and efficient movement of the processed fish from the plant to the port with minimizing the losses.

KEY INITIATIVES FOR PROMOTING SUSTAINABLE DREDGING

The following are the initiatives proposed for promoting sustainable dredging:

1. **Use of alternate fuel dredgers:** The dredgers that are being implemented for operations in the sea and waterways in the country can be LNG Powered or Bio Fuelled or have hybrid engine, which can undertake dual-fuel operations under both LNG and Marine Gas Fuel.

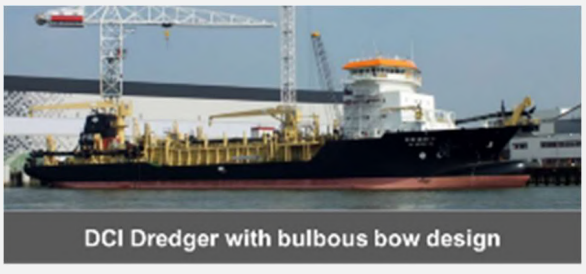
Figure 98 Case Examples: Internationally there have been dredgers built to promote use of sustainable fuels:

1. LNG powered dredger: Port of Rotterdam is going to implement the use of LNG powered dredgers for undertaking maintenance dredging. In addition, a dredging firm in Belgium has procured LNG Powered dredger and will be used in both capital and maintenance dredging.

2. Bio fuelled dredgers: Port of Hamburg has contracted a dredging company Jan De Nul Group to undertake dredging suing Biofuels.
3. Dual engine dredgers: A Dutch ship repair and conversion company named Damen Ship repair & Conversion has implemented the conversion of first of its kind dredger with dual fuel. The dredger can undertake operations both on LNG and Marine Gas Oil.

2. **Implementing dredgers with improved hull design:** The hull design of the dredgers can be improved with the implementation of more bulbous bow design dredgers. The usage of bow designed dredgers can result in reduced wave-making resistance and thus helping in less fuel consumption and more sustainable dredging operations

Case Examples: **In India, Dredging Corporation of India (DCI) has implemented dredgers with bulbous bow design. The following provides the dredger being used by with improved hull design:**



DCI Dredger with bulbous bow design

3. **Sustainable disposal of dredged material:** A study may be conducted to assess the chemical and physical properties of the dredged material. This assessment will allow for developing sustainable disposal mechanism of the dredged material.

International Case Example: The Port of Antwerp has implemented innovative solutions for sustainable disposal of dredged material. The following provides the innovative solutions:

1. The Port of Antwerp has contracted a Dutch Company, Amoras. The firm procures he dredged material from the Port and recycled the dredged material into building material. The firm prepares the building material through mechanical dewatering of the dredged material and

converting them into clay grains. These can be used in the construction industry basis their available usage

2. Another example of sustainable use of dredged material being implemented by Port of Antwerp is the use of Pontoons with diffuser heads to allow disposal along the sand bars on the banks

MARITIME ISLAND CITIES

CURRENT LANDSCAPE

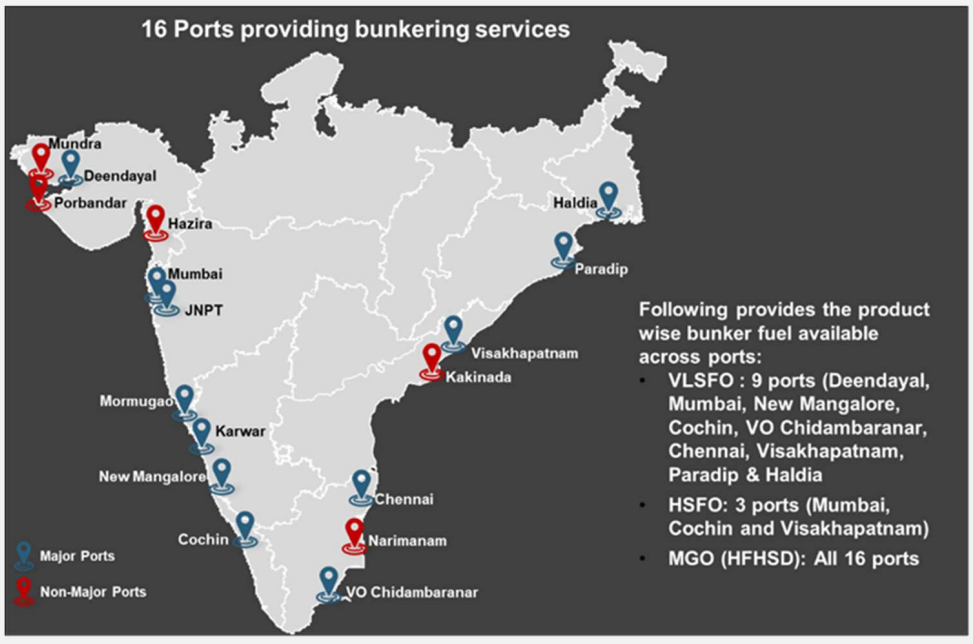
India has a total of 1382 offshore identified islands consisting of 1093 shapes (islands) and 289 Points (Rocky/ Rocky Islets) under database finalized by Surveyor General of India (SGI) in 2016. 1093 islands can be used for strategic development purposes. Island development can be across various use cases related to maritime activities (e.g., bunkering, ship breaking etc.), tourism, energy generation, fisheries, agriculture, etc. Globally maritime nations have utilized their islands to drive some of these activities in a sustainable manner.

There are 26 islands that have been identified which will further take forward the Atmanirbhar Bharat Initiative by unlocking the potential. The 26 islands that have been shortlisted to be developed over the next decade are in Union Territories of Lakshadweep and Andaman & Nicobar Islands, the State of Gujarat, Maharashtra, West Bengal and Tamil Nadu. There are certain themes such as development of eco-tourism facilities, ship repair, sea plane building and repair, maritime training institute, Free Trade Zones and bunkering terminals that are proposed to be developed. However, the current study is limited to the themes which are related to maritime sector as discussed below:

Island city providing bunkering services

The bunkering services is provided across 16 ports in the country along the Western and Eastern Coast. The following map provides the ports providing the bunkering service along with the type of bunker fuel which is provided:

Figure 99: Ports providing the bunkering services and the available of bunker fuel product across ports



India currently has a small market share in fulfilling the bunkering demand. The following provides the overview of the bunkering services provided in India:

- **Market Share**: India caters to 1% of the total bunkering demand with 0.42 MT (2020) of bunker sale to international vessels as compared to Singapore with more than 50 MT
- **Customers:** Major customers of Indian Bunker mainly include domestic vessels, coastal vessels and defense ships
- **Players:** Government owned oil refineries have the largest market share of ~82% out of which IOCL has the highest share of ~41%. Adani Bunkering is the only private player with 18% market share along with other small players providing bunkering services across ports in the country
- **Cost Structure:** Bunker fuel sale price to international flag vessels and domestic vessels has ~5% of taxes included over base

Island cities to be developed as Transshipment Free Trade Zone

Free Trade Zones comprise of warehouses which are deemed Foreign Territories/Ports/Warehouses for Storage and Other value-added activities under the extant Customs Law. Currently in India is there are no Free Trade Zones neither on the mainland and on the island.

Island cities to be developed as Ship Repair

The ship repair industry in the country comprises of both public sector and private sector entities. The Public Sector entities such as Cochin Shipyard has the highest ship repairing capacity at 1,25,000 DWT, while the private sector has a lesser capacity. The total number of ships repaired in FY 2019-20 is 478 ships of which 332 ships were repaired in private shipyards while 146 were repaired in the public sector shipyards.

In addition to the ship building yards, some of the major ports also provide the ship repair facility. These ports include Syama Prasad Mukherjee Port, Deendayal Port Authority and Visakhapatnam Port Authority.

Island cities to be developed as vessels spares and stores hub (at Kalpeni island (Lakshadweep))

The vessel spare and stores would be located in proximity to the east and the west trade route. These stores will also have an opportunity to provide spares to large mother vessels which could not be accommodated in ports and shipyards.

CHALLENGES

UNAVAILABILITY OF SINGLE NODAL AGENCY

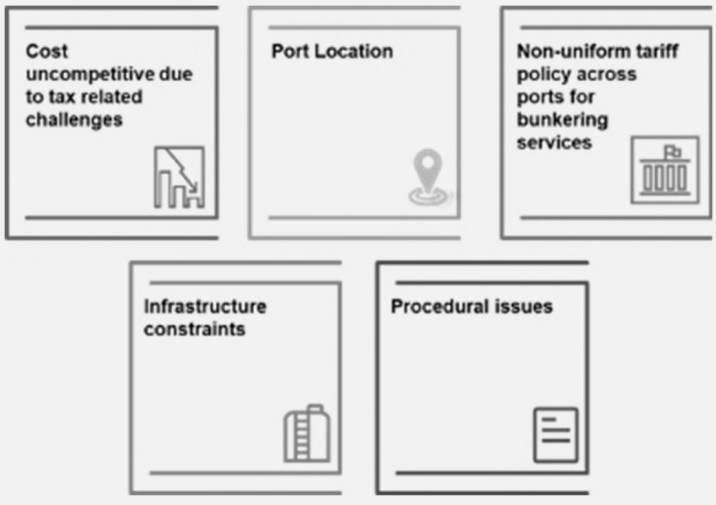
The availability of a single agency required for implementing the interventions is required. In the present scenario, there is no single implementing agency for providing approvals and liaison with other government bodies for implementing the projects. For implementing any project, there are multiple government agencies which are involved in providing the required approvals and these agencies currently work on standalone basis.

The challenges in implementing the various themes for developing the islands as maritime cities is discussed in the subsequent section.

CHALLENGES IN RELATION TO BUNKERING SERVICES

The challenges that are currently present can be categorized across 5 key areas which are provided as below:

Figure 100: Challenges across 5 key areas of bunkering services



The following provides the details of the challenges across five key areas:

- **Tax related challenges**: Taxes and Duties on the Bunker fuel reduce the cost competitive advantage when compared to other bunkering hubs. The GST applicable on bunker fuel is 5% with no provision of Input Tax Credit on both Indian and foreign flagged vessels.
- **Port location:** The current location providing bunkering services are not on the international trade routes. The ports such as Mundra, JNPT, Cochin, Chennai, Kakinada etc. which currently provide bunkering services, and these are currently located away from the international trade routes.
- **Tariff Policies:** The following provides the challenges related to tariff policies of the ports:

- There is currently no uniform policy across ports for providing bunkering services to vessels. The ports which provide bunkering services levy tariff on the supply of bunker oil to the tariff based on their tariff guidelines. This non uniformity of tariffs makes the ports unattractive for bunkering and the vessels would only take bunkering service at the time call is made to the port.
- The ports providing bunkering services charge the vessels anchorage charges based on their policies for undertaking bunkering services. This policy of levying anchorage charges on the vessels is different across different ports. Thus, the additional layer of the charge above the taxes increases the cost of undertaking bunkering services at Indian Ports higher.

- **Infrastructure Constraints**: The following are the infrastructure constraints which make the bunkering services in India uncompetitive:
  - The bunker barges undertake limited operations during the night resulting, while the bunkering services is round the clock operation. Therefore, there is a reduced attractiveness for the vessels due to increase waiting time.
  - Most of the ports in India do not have separate barge loading jetties. Barges are loaded at same jetties where cargoes are handled and get loading permission from the ports only when jetties are free from cargo operations of the vessels. This results in increasing the time for providing bunkering services to the vessels
  - The presence of private players in the bunkering sector is low as compared to state owned refineries and oil companies.
- **Procedural Constrains**: The following provides the procedural constraints which result in lower attractiveness of bunkering service in the country:
  - Customs procedure is a major impediment in the growth of bunkering.
  - Due to the prevailing Customs approval process, the ship owners need to place indent at least 2 working days in advance and the deliver bunker on the same day on ship owners enquiring bunkers is difficult. At few ports, Customs does not allow oil companies to load barges unless Customs official comes on-board the barges for supervision and product loading in the barges is not allowed until the bunker receiving vessels arrive at berth / anchorage.
  - The bunker barges currently are not treated as floating storage and need to load every time there is an individual bunker nomination
  - The Indian Banks take 2 days in foreign currency remittance from international vessel owners to the Indian bunker suppliers. This time gap results in reduced supply of bunker in a reduced time.

CHALLENGES IN RELATION TO TRANSSHIPMENT FREE TRADE ZONE

The following are the challenges that need to be addressed for developing island cities as Transshipment Free Trade Zone:

- Land Availability on Islands: Based on the current guidelines, minimum 25 hectares (~61 acres) of land is required for developing a Free Trade Zone. The islands in the country, due to their existing ecology, the availability of the contiguous land as per area requirement of the guidelines would be difficult.
- Tax Benefits: There is currently no major incentive available for setting up of the transshipment free trade zone as the fiscal incentives available under the SEZ policy have been withdrawn.
- Currently there is no definite structure for developing and O&M of Transshipment Free Trade Zone with private sector involvement

CHALLENGES IN RELATION TO SHIP REPAIR

The following are the major challenges faced for ship repair industry:

- The ship repairing in the country is time consuming process with inconsistent results and reduced efficiency
- There is a lack of availability of spares within the country as majority of the Original Equipment Manufacturers (OEMs) are present in international geographies
- The custom procedures for clearing the imported spares are complex which increases the lead time for repairing the vessel as ~65% of the components of the vessels are imported.

KEY INITIATIVES TO PROMOTE ISLANDS AS MARITIME CITIES

INSTITUTIONAL INITIATIVE

CREATION OF NODAL BODY FOR DEVELOPING THE ISLANDS

The initiatives for developing the islands as maritime cities across the themes has been discussed in the subsequent sections. However, a nodal body may be created for undertaking the developing the themes on the islands. ***It is proposed that the responsibility area of Andaman Lakshadweep Harbor Works (ALHW) can be expanded to oversee the development of islands maritime cities.*** The following provides key responsibility areas of ALHW towards developing islands as maritime cities:

- **Review and Implementing Policies**: ALHW will work with the Central Government Ministries such as Ministry of Tourism, MoPSW and other concerned ministries & departments to implement policies for promoting islands as maritime cities.
- **Undertake studies and land identification**: Studies for identification of specific land parcels within the islands for developing key themes such as Bunkering Terminal, Sea Plan Building & Repair facilities etc.
- **Investment Facilitator**: Act as the nodal point for the private sector for any clearances or handholding for setting up facilities on the island
- **Monitoring of projects**: Monitor Island connectivity projects which have been proposed by MoPSW for timely completion and ensure maintenance of the connectivity infrastructure created

ALHW to align with NITI Aayog for further expanding the development of islands as maritime cities including funding support for undertaking activities such as preparation of Master Plans etc.

Figure 101 Case Example: Sentosa Development Authority

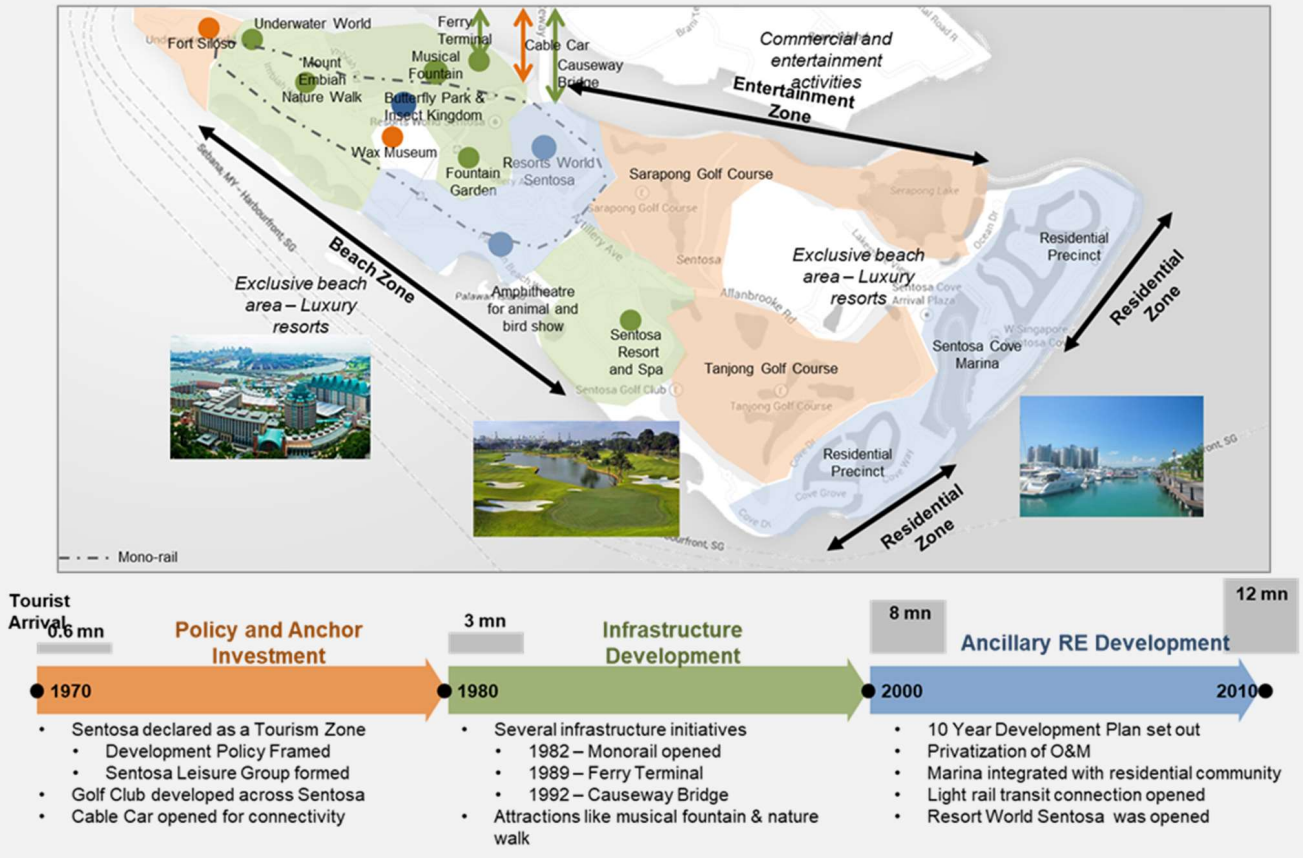
Sentosa Development Corporation (SDC), a statutory board under the Ministry of Trade & Industry that oversee the development, management, marketing and promotion of the island of Sentosa. The SDC was established in 1972. The following are the key activities undertaken by the Sentosa Development Corporation:

- Facilitate infrastructure development – Allot sites to developers through tender on revenue sharing basis, define permissible usage of site, decide building topology
- Developed Sentosa sustainability plan, protecting endangered species, 40 Ha of protected natural areas, heritage assets, adopt environment sustainable design, maximum efficiency in use of energy
- Inter-agency collaboration - SDC has embarked on several collaborations with other agencies, including the Infocomm & Media Development Authority and Ministry of Transport, to create and test-bed new technologies and solutions

- Branding Promotion - Island is also known for playing host to world-class events such as SMBC Singapore Open, HSBC Women's World Championship. These events help promote the brand in international markets through partnership and sponsorship opportunities
- Promote Innovation - Sentosa X Enterprise offers a win-win partnership, where innovators and enterprises benefit from a risk-sharing arrangement while working on projects that could boost Sentosa's vibrancy and attractiveness. (up to $100k grant provided to innovators on eligibility)

Post the development of SDC, the following provides the evolution of Sentosa island as an island city:

Figure 102: Sentosa Island Development



POLICY AND REGULATORY INITIATIVE

INCENTIVE FOR OVERALL DEVELOPMENT OF ISLANDS AS MARITIME CITIES

As part of Atmanirbhar Bharat initiative, Island development as Maritime Cities will be a key focus for coming years. There are 26 islands that have been identified which will further take forward the Atmanirbhar Bharat Initiative by unlocking the potential for Maritime Island cities. The 26 islands that have been shortlisted to be developed over the next decade are in Union Territories of Lakshadweep and Andaman & Nicobar Islands and the State of Gujarat. The themes such as development of eco-tourism facilities, ship repair, sea plane building and repair, maritime training institute, Free Trade Zones and bunkering terminals that are proposed to be developed. The development of these themes can then be further expanded to other islands to unlock the entire potential of all the islands in the country.

It is proposed that specific policies to promote and incentives maritime and tourism activities on islands should be put in place including tax holiday for eligible activities under the section 80-IA of Income Tax Act for a period of 15 years. This tax holiday will promote infrastructure development and thereby creating economic growth of these islands.

The total investment of more than INR 10,000 Crores is envisaged for the next decade for developing the 26 islands as maritime cities. This investment is expected to have a positive impact on the economy of both the Union Territories and the country. The proposed investment is expected to generate 50,000+ direct and indirect employment on the islands.

KEY INITIATIVES IN RELATION TO ISLAND CITY PROVIDING BUNKERING SERVICES

The interventions for maritime city providing bunkering services are proposed across the following key areas:

Port location, bunker fuel price, product mix and infrastructure are considered the key success factors for major bunkering hubs and need to be considered for developing a maritime city providing bunkering services

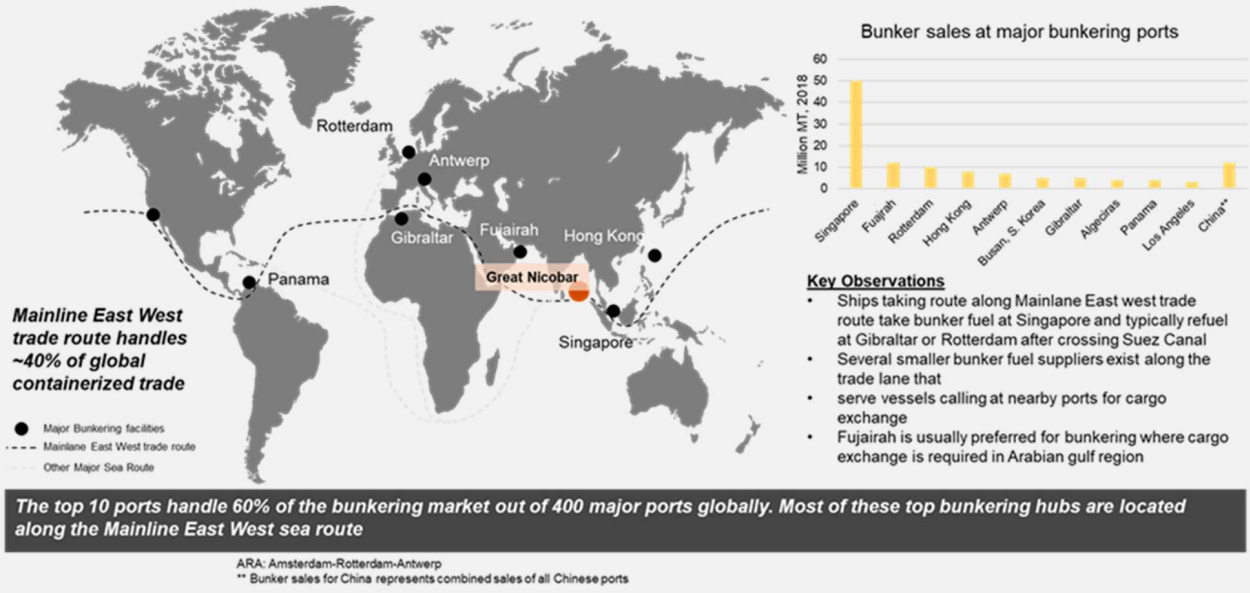
INFRASTRUCTURE INITIATIVES

PORT LOCATION

The port location near to the mainline routes is critical for the success of a bunkering terminal. The major bunkering hubs are located along the main trade routes which allow the vessels to undertake bunkering operations without deviating from their main routes. ***Therefore, it is proposed that Greater Nicobar Island can be considered for development of a bunkering hub due to the following reasons:***

- Greater Nicobar is in close proximity to Malacca Strait (the route for East West trade route) and also to Singapore (a major transshipment and bunkering hub)
- Vessels voyaging in East West Trade can have bunkering services at Greater Nicobar due to proximity
- Vessels in the coastal waters along East Coast, Bangladesh and Myanmar can also benefit from bunkering services at Greater Nicobar

Figure 103: Case Example: Major bunkering hubs are located along the maritime trade routes



INFRASTRUCTURE AND PRODUCT MIX

The major bunkering hubs have both port infrastructure capacity and the product mix. The following are the key recommendations for promoting bunkering services through Greater Nicobar Island:

- Provision of night navigation which would help in providing bunkering services through day and night
- Development of separate bunker oil loading points to allow for unhindered bunkering services to the vessels
- Bunker barges should be treated as floating storage and should be allowed to keep always loaded instead of Customs permitting barge loading against individual bunker nominations. Once the bunkers are delivered to multiple vessels, Bunker supplier can submit copies of Bunker Delivery Notes to Customs and reloading of barge should again be allowed for next deliveries. This shall enable Bunker Supplier to deliver bunkers as and when demanded by ship-owners at short notice.
- Availability of bunker products on the similar lines to major bunkering hubs

The following provides the international case examples

Table 26: Case Example: Available product mix across the major international bunkering hubs

Port	Bunker Barges	Fuel availability type
Singapore	210	Marine Gas Oil (MGO), Low Sulphur Fuel Oil (LSFO), Liquified Natural Gas (LNG), High Sulphur Fuel Oil (HSFO), ULSFO, VLSFO
Rotterdam	157	Heavy Fuel Oil (HFO), LNG, VLSFO, HSFO, ULSFO
Fujairah	35	VLSFO, IFO, LSFO, Marine Fuel Oil, MGO

POLICY AND REGULATORY INITIATIVES

COMPETITIVE BUNKER FUEL PRICE

The following are the proposed recommendations for making the bunker fuel price competitive:

1. **Fiscal incentives**
    a. Exemption of payment of GST on supply of bunker fuel to international flagged vessels on international voyage as it will fall under export category
    b. Reduction in number of days from 2 to 1 day for remittance from overseas vessel owners
2. **Incentives in Port Charges**
    a. Anchorage charges can be waived off for the vessels undertaking bunkering services
    b. Reduce the barge delivery charges by reducing the port dues on the bunker barges

Following are the case examples providing the incentives available in major international bunkering hubs:

Figure 104: Case Example: Incentives available in international bunkering hubs

Incentives		Global Example
Cost advantages	Tax exemption on services rendered	• Singapore & Fujairah- Exemption on local tax duties on bunkering fuel sale to foreign going vessels as it is treated as export • Singapore- Bunkering fuel supply is nontaxable • **China –** Providing USD 23 for every ton of VLSFO produced
Funding	Grants and equity contribution by the government in procuring barges	• Singapore- Maritime and Port Authority of Singapore offers grant up to USD 1.5mn per barge to promote sustainability via LNG bunkering
Enablement	Reducing port charges such as port dues, berthing charges, etc. for vessels taking bunker fuel	• Singapore- Vessels availing multiple facilities like bunkering and MRO are offered discounts on port charges
	Removing minimum asset requirement	• Rotterdam & Fujairah- These major port do not have any minimum barge requirement for fueling

INSTITUTIONAL INITIATIVE

PRESENCE OF MULTIPLE INTERNATIONAL PLAYERS

following are the basis of two models which bunkering services are provided at the ports:

1. Model 1: Single player providing all the services
2. Model 2: Separate players providing supply, trading and distribution services

It is proposed that the second model comprising of multiple players providing bunkering services to be adopted. This will allow for greater competition resulting in better services. This model is prevalent in major bunkering hubs globally. The following provides the case example for involvement of multiple players providing bunkering services at the major hubs:

Figure 105 Case Example: Multiple Players provide bunkering services at the major hubs

Particulars	Singapore	Rotterdam	Fujairah
Bunkering models	Bunkering models Model 1: Single player providing all the services Model 2: Separate players providing **supply**, **trading** and **distribution** services		
No. of service providers	~45 Companies	~25 Companies	~15 Companies
Storage Capacity	143 million barrels	157 million barrels	66 Mn barrels
Major service providers	Shell, bp, EQUATORIAL, SENTEK, PetroChina, GLENCORE	CHEMOIL, Gulf, NORTH SEA, ExxonMobil, TOTAL, OILCHART	bp, AKRON, ADNOC, Al Arabi Bunkering Company
The presence of several global service providers has helped in better positioning these ports as major bunkering hubs. Moreover, it has also helped create a competitive market space in terms of quality as well as pricing			

KEY INITIATIVES IN RELATION TO ISLAND CITY TO BE DEVELOPED AS TRANSSHIPMENT FREE TRADE ZONE

The following are the interventions proposed for developing Transshipment Free Trade Zone themed island city:

INFRASTRUCTURE INITIATIVE

Greater Nicobar Island can be considered for the development of Transshipment Free Trade Zone due to the following reasons:

- A transshipment port is proposed on the Greater Nicobar Island. The availability of transshipment port will allow for availability of cargo
- Greater Nicobar is in close proximity to Malacca Strait (the route for East West trade route) and also to Singapore (a major transshipment hub). This would allow for the Transshipment Free Trade Zone to attract the cargo for South and South East Asia moving on the trade route.

The following provides the location of Greater Nicobar Island with respect to the East West Trade Route:

Figure 106 Greater Nicobar Proposed for Development of Transshipment Free Trade Zone

KEY POLICY AND REGULATORY INITIATIVES

Providing fiscal incentives on the like those provided to the Special Economic Zones (SEZs): The following are the fiscal incentives provided to the SEZ which can be considered for tenants and developers of the Transshipment Free Trade Zone:

- Incentives available to tenants
  - Duty free import/domestic procurement of goods for development, operation and maintenance of SEZ units
  - 100% Income Tax exemption on export income for SEZ units under Section 10AA of the Income Tax Act for first 5 years, 50% for next 5 years thereafter and 50% of the ploughed back export profit for next 5 years. (Sunset Clause for Units will become effective from 01.04.2020)
  - Exemption from Minimum Alternate Tax (MAT) under section 115JB of the Income Tax Act. (withdrawn w.e.f. 1.4.2012)
  - Exemption from Central Sales Tax, Exemption from Service Tax and Exemption from State sales tax. These have now subsumed into GST and supplies to SEZs are zero rated under IGST Act, 2017.
  - Other levies as imposed by the respective State Governments.
- Incentives available to developers
  - Exemption from customs/excise duties for development of SEZs for authorized operations approved by the BOA.
  - Income Tax exemption on income derived from the business of development of the SEZ in a block of 10 years in 15 years under Section 80-IAB of the Income Tax Act. (Sunset Clause for Developers has become effective from 01.04.2017)
  - Exemption from Minimum Alternate Tax (MAT) under Section 115 JB of the Income Tax Act. (withdrawn w.e.f. 1.4.2012)
  - Exemption from Dividend Distribution Tax (DDT) under Section 115O of the Income Tax Act. (withdrawn w.e.f. 1.6.2011)

Reducing the requirement of land for developing Transshipment Free Trade Zone: The minimum area requirement is 25 ha of contiguous land for an FTZ (called as Special Economic Zones in India; SEZ includes Free Trade Warehousing Zone also in ordinary parlance). It could be difficult to have 25 ha (62.5 acres) in a

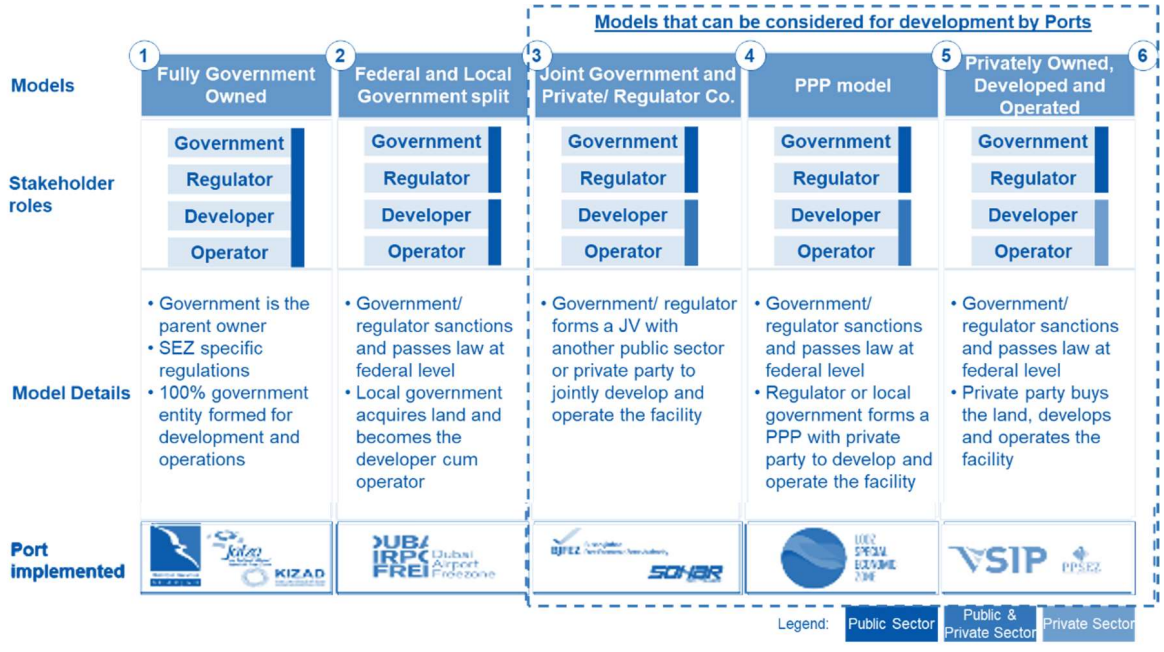
contiguous fashion in any island territory. Hence, the possibility of establishing a FTZ can be in Greater Nicobar as a start would require lesser quantum of land and once the traffic is established, the facility can be expanded. ***Therefore, the minimum land requirement of 25 ha can be relaxed to 10 ha***. It has to be done at the level of the Dept. of Commerce in the Ministry of Commerce & Industry by making necessary amendment in SEZ Rules 2006.

KEY INSTITUTIONAL INITIATIVES

Development Model for Transshipment Free Trade Zone: The development of infrastructure would involve three major stakeholders from the Government side which include Ports, State Government and Central Government along with Private Developers. The development of a balanced structure between these stakeholders is critical for building the infrastructure for the Transshipment Free Trade Zone. Therefore, co-development models can be considered for developing the Transshipment Free Trade Zone.

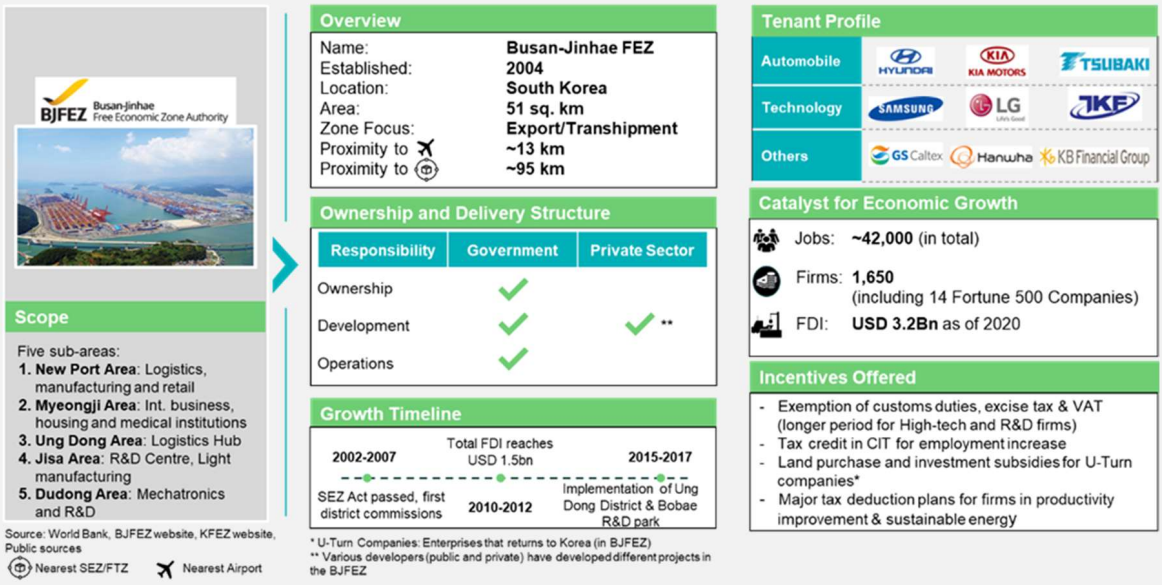
The following provides the international examples basis which the Free Trade Zones have been developed:

Figure 107: International Case Studies on different models for developing Transshipment Free Trade Zone



The following provides the detailed case study for Busan-Jinhae Free Economic Zone developed in South Korea:

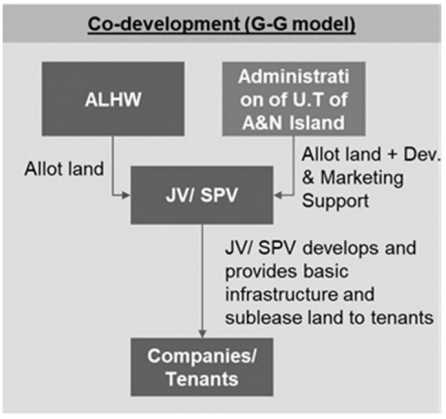
Figure 108: Case Study: Busan-Jinhae Free Economic Zone developed along with Private Sector



The following are the three models that can be explored by ports for developing **Transshipment Free Trade Zone**:

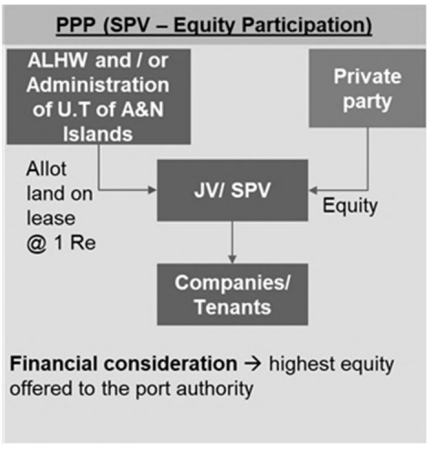
- **Co-Development Model**: In this model, Andaman Lakshadweep Harbor Works (ALHW) will form a JV / SPV with the Administration of Union Territory of Andaman& Nicobar Island. The following provides the salient features of the structure:
  - Both ALHW and Administration of Union Territory of Andaman & Lakshadweep Island to:
    - Bring together land required for the development of industrial infrastructure
    - Jointly market the Project
    - Invest Equity in the JV / SPV for construction of industrial park
  - JV / SPV to undertake the following activity:
    - Development of land parcel including creation of trunk and support infrastructure such as internal roads, Common Effluent Treatment Plant (CETP), Water Treatment Plant (WTP) etc.
    - Development of connectivity infrastructure to nearest state and / or national highway
    - Provide marketing support to the Ports
    - Provide necessary incentives (based on the recommendations of Ports, SIDCs and / or Central Government Authorities)
    - Provide land on lease rentals to the investors

Figure 109 Structure of Co- Development Model



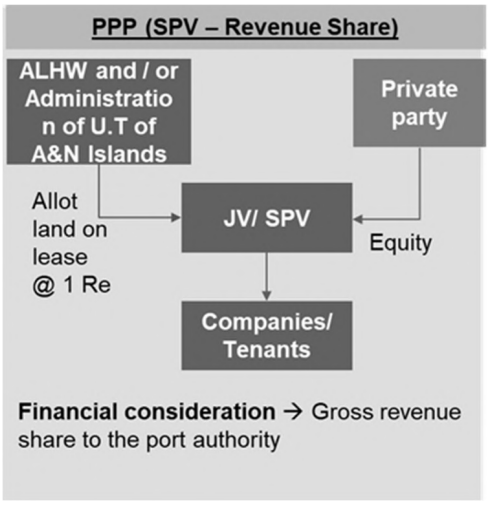
- **PPP Model (SPV-Equity Participation)**: In this model, the ALHW and / or Administration of Union Territory (U.T) of Andaman & Nicobar (A&N) islands will form a JV / SPV with a Private Developer / Logistics Player. The following provides the salient features of the structure:
  - Both Port and Private Players to undertake the following activities:

Figure 110 Structure of PPP Model (SPV – Equity Participation)



    - ALHW and / or Administration of Union Territory (U.T) of Andaman & Nicobar (A&N) islands to bring land for the development of free trade zone
    - Jointly market the Project
    - Private Player to invest equity in the JV/SPV
    - Port to undertake development of CETP, WTP etc. and connectivity infrastructure (if any)
  - JV / SPV to undertake the following activity:
    - Development of land parcel including creation of trunk and support infrastructure such as internal roads, utilities etc.
    - Provide marketing support to the Ports
    - Provide land on lease rentals to the investors
    - Undertake operations and maintenance of the free trade zone
    -
- **PPP Model (SPV-Revenue Share)**: In this model, the ALHW and / or Administration of Union Territory (U.T) of Andaman & Nicobar (A&N) islands will form a JV / SPV with a Private Developer / Logistics Player. The following provides the salient features of the structure:
  - Both Port and Private Players to undertake the following activities:
    - ALHW and / or Administration of Union Territory (U.T) of Andaman & Nicobar (A&N) islands to bring land for the development of free trade zone
    - Jointly market the Project
    - Private Player to invest equity in the JV/SPV
    - Port to undertake development of CETP, WTP etc. and connectivity infrastructure (if any)
  - JV / SPV to undertake the following activity:
    - Development of land parcel including creation of trunk and support infrastructure such as internal roads, utilities etc.
    - Provide marketing support to the Ports
    - Provide land on lease rentals to the investors
    - Undertake operations and maintenance of the free trade zone

Figure 111 Structure of PPP Model (SPV – Revenue share)



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KEY INITIATIVES IN RELATION TO ISLAND CITY TO BE DEVELOPED FOR SHIP REPAIR

The following are the interventions proposed for developing ship repair facility:

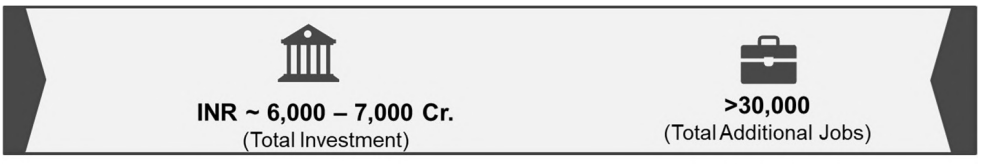
INFRASTRUCTURE INITIATIVE

- Location for development of Ship Repair facility: South Andaman (Port Blair) is shortlisted for the development of a ship repair facility. The location has an existing repair facility under the Administration of the Union Territory of Andaman & Nicobar Islands. The facility recently has been given to Cochin Shipyard for operations and maintenance. For increasing the capacity of the repair facility at the dockyard, land will be required. This land for future expansion will be provided by ALHW.

KEY POLICY AND REGULATORY INITIATIVES

- Extending the current Right for First Refusal policy initiative for Indian shipyards to 2030. This would help the shipyards in attracting more vessels for undertaking repair works.
- Simplification of customs procedures for priority clearance of the imports comprising of spare parts of the vessels. This will allow for reduction in time for completing the repair services
- A policy guideline can be provided for vessels availing cargo ROFR through Public Sector Undertakings (PSUs) and other Government Entities mandatorily be repaired in Indian shipyards only.

Total investment required and potential job opportunities.



KEY PERFORMANCE INDICATORS

As part of Action plan, globally benchmarked targets have been defined as mentioned below to help India develop islands as maritime cities.

Metric	Status (as of 2021)	Target (2030)	Target (2047)
Phase 1 of Maritime Industrial Cluster to be developed	-	DPT, VoCPT Karnataka and Haldia	14
Phase 2 of Maritime Industrial Cluster to be developed	-	-	DPT, VoCPT Haldia and Andaman & Nicobar Island
Post-Harvest Cluster for processing of fishes	-	5	15
Extension of m-Krishi Service	Currently used in Pilot	Extended to all fishermen	-
Number of bunkering terminals developed	-	1	1

Number of Islands developed for ship-repair	-	1	1
Number of Islands developed for vessel spares and stores		1	1
Number of Islands developed for Transshipment Free Trade Zone	-	1	1

Theme 5
Provide maritime professional services

MARITIME LAW

CURRENT LANDSCAPE

- India has a rich history in dealing with sea trade as well as a variety of trading and non-trading practices via sea within and beyond the confines of the country[25]. It was known in a range of historical records that in ancient time, there were several traders and merchants coming to India and going from India as well. Thus, there existed a variety of regulations, rules, and set of laws in this field from time immemorial. In India, maritime disputes can be resolved through arbitration, mediation and conciliation and cases are also decided in courts. Globally, the maritime sector is changing at a fast pace. This rapid growth requires immediate consultation and attention from the legal community when disputes arise and need to be resolved. Recently, throughout the globe, arbitration has emerged as the preferred choice of parties for resolution of their disputes, as the same provides parties with a cost-effective, flexible and confidential process to resolve disputes
- Owing to India's strategic location, its maritime industry has evolved manifold over the years. India holds a strong position as a maritime hub and as the country continues to invest in infrastructure, the maritime industry continues to expand, and thus more services are required, leading to multiplicity of disputes, and specialized adjudication that require the establishment of a specialized maritime arbitration centre. It is an acknowledged fact that owing to lack of support due to the absence of maritime specialized Arbitration Dispute Resolution (ADR) in India, parties are forced to look for alternatives in other countries
- Considering India's unique position in the international community and its share in international maritime trade, there is considerable scope in developing India as an ideal hub for maritime arbitration. This can be achieved through creation of a specialized framework to cater to the growing demand amongst players in the maritime industry for an arbitration framework for maritime disputes, by adoption of international best practices. There is a need for an ADR mechanism through an institution of international statue, based on a unique blend of adjudicatory, research and training services, and not like several already existing arbitration centres in India
- At present, various statutes covering the field of maritime law provide for intervention of courts of law in a varied manner with respect to several aspects covered by the said statues. Invariably, the authority of the State is attracted in the said scenario and therefore, authority of the courts of law is called upon to adjudicate on the said issues. However, commercial arrangements covering the field of maritime industry are different, in as much as the role of State in such arrangements is limited. Additionally, in cases where the State's role comes in to play, it is as a contracting party. In such cases of private contractual arrangements, converse to cases covering matters of public law, parties have the freedom of choice in so far as the medium of dispute resolution is concerned
- It is an acknowledged fact that owing to lack of support due to the absence of maritime specialized ADR in India, parties are forced to look for alternatives in other countries. Conversely, they are left to seek adjudication of their contractual disputes before the courts of law through the medium of ordinary civil law

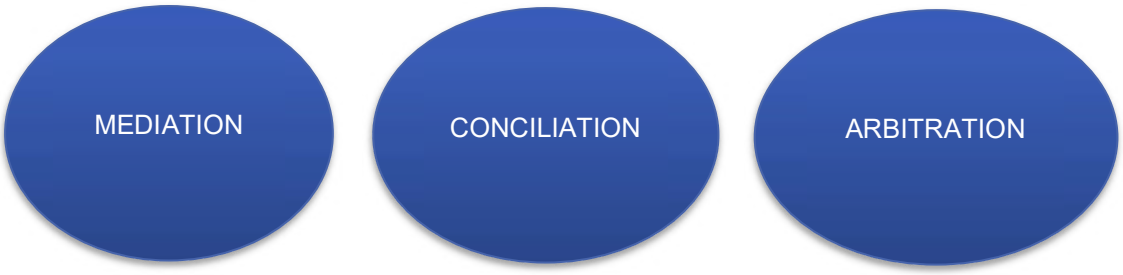
TYPES OF DISPUTE RESOLUTION

There are various types of dispute resolution methods that are adopted by the parties to resolve their disputes in an informal manner. Parties reach a solution by settlement or negotiation with the assistance of a third neutral

[25] Source: Webinar - India as a Maritime Power: Contemporary Perspectives, Centre for Aerospace and Defence Laws, July 31, 2020 https://cadl.nalsar.ac.in/event/india-as-a-maritime-power-contemporary-perspectives/

party and these methods have turned out to be an effective alternative to the litigation process. These methods are as follows:

Figure 112 Different types of dispute resolution methods



The process adopted by all the three are different but, the main purpose is to resolve the dispute in a way where the interest of the parties is balanced

MEDIATION

Mediation is an assisted negotiation and an informal process in which parties are aided by a third impartial person, who is the mediator, possessing specialized skills, requisite training and sufficient experience necessary to assist the disputed parties for reaching a negotiated settlement.

Mediation is confidential, non-binding and parties get to choose an alternative provided by the mediator. The mediator guides for reaching an amicable solution for both the parties. No strict procedures are followed by the parties, which makes the whole proceedings more informal and comfortable.

CONCILIATION

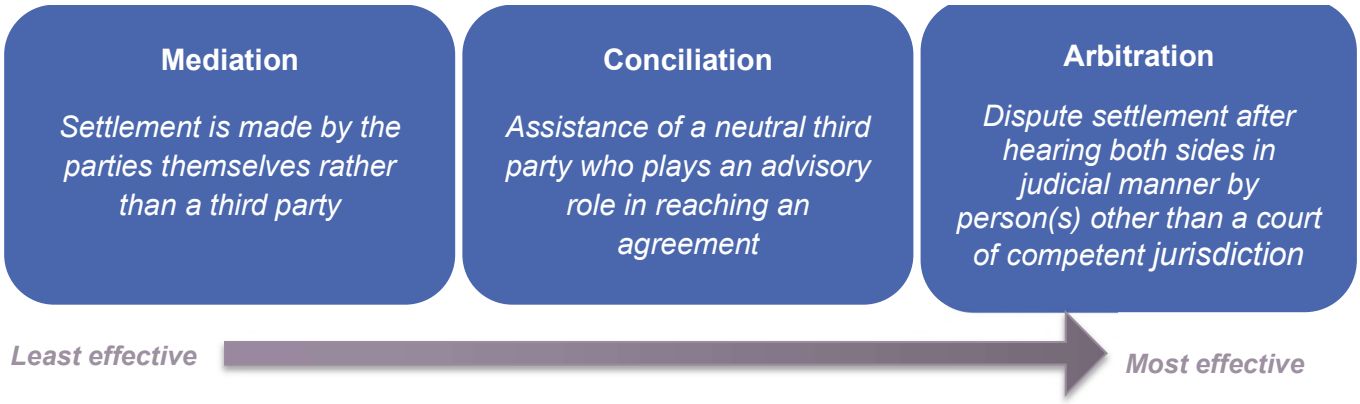
Conciliation is a type of ADR where the settlement is made out of court. There is no involvement of the court in the whole arbitral proceedings. The dispute is settled by a neutral third party, who is the conciliator. The conciliation process is voluntary as it is on the mutual discretion of the parties to choose conciliation as a method of resolving their dispute with the assistance of the conciliator, also the proposal is not binding upon the parties. They are free to follow or not follow the proposal given by the conciliator.

ARBITRATION

Arbitration is a form of dispute resolution method in which the parties avoid the court proceedings and instead decide to resolve their dispute through appointing a third person, who is known as an arbitrator. An arbitrator is appointed in labour disputes, business and consumer disputes and family law matters.

As per Halsbury's Laws of England para 501 (vol.2, 4th edition), "*An arbitration is the reference of dispute or difference between not less than two parties, for determination after hearing both sides in a judicial manner by a person or persons other than a court of competent jurisdiction*."

Figure 113 Least effective to most effective dispute resolution method



INDIAN CONTEXT

Arbitration Law in India is governed chiefly by Arbitration & Conciliation Act, 1996 (Act), which is based on the UNCITRAL model. This law came into force on 22 August 1996. This Act's primary objective is to provide speedy and effective dispute resolution for both international & domestic commercial arbitration, Conciliation and Enforcement of Foreign Awards in India. The Act is an evolving legislation and has gone through major amendments in 2015, 2019, and more recently in 2021 to cater to the demands of the various stakeholders.

In India, dispute resolution in maritime sector is currently administered by three apex bodies:

- **Indian Council of Arbitration (ICA)**
- **International and Domestic Arbitration Centre (IDAC)**
- **Society for Affordable Redressal of Disputes (SAROD-Ports)**

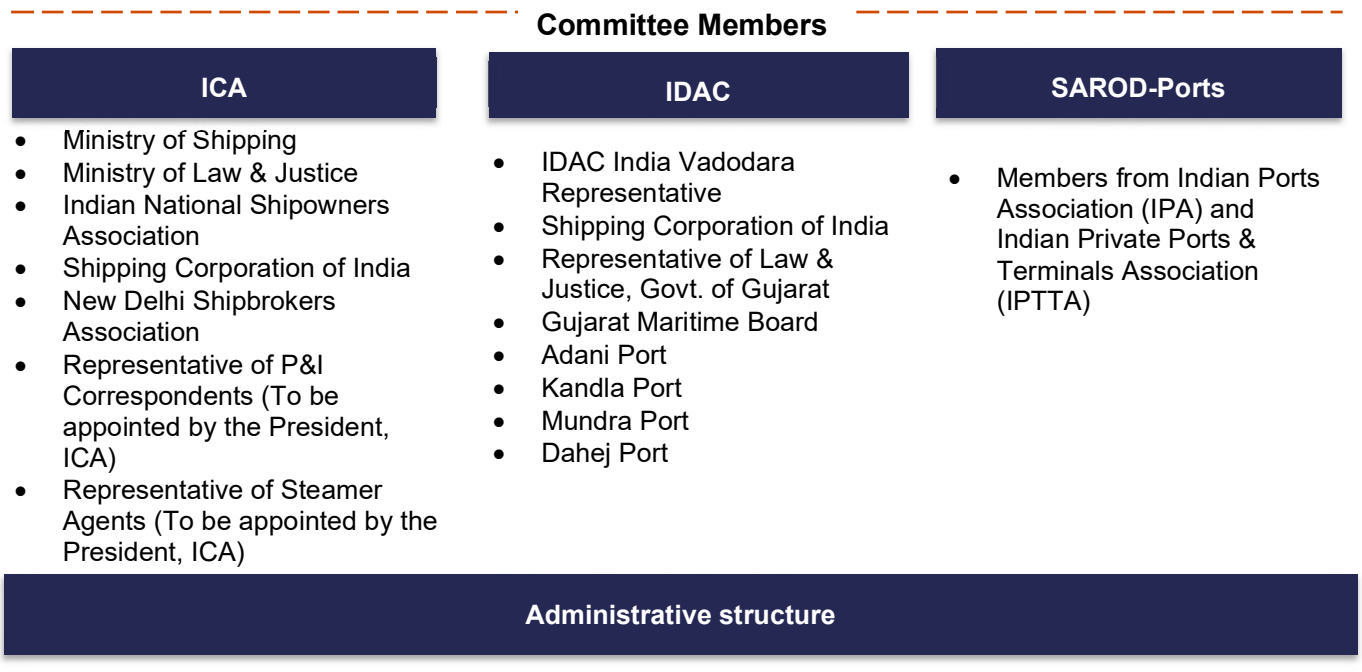
Table 27 Landscape of dispute resolution in maritime sector, India

Apex bodies	Organisation set up	Effective date	Governing Act	Scope coverage
Indian Council of Arbitration (ICA)	Set up in 1965 at national level under initiative of Govt. of India & apex business organizations like FICCI	Maritime Arbitration Rules (MAR) made effective from 01.04.2016 https://www.icaindia.co.in/Maritime-ArbitrationRules.pdf	MAR governed by the Arbitration & Conciliation Act, 1996 or any further amendments	MAR of ICA & IDAC applies to maritime disputes w.r.t commercial operations for domestic & international maritime arbitrations in India
International and Domestic Arbitration Centre (IDAC)	Set up in 2016 as non-profit Section 8 Company & promoted by arbitration practitioners	Maritime Arbitration Rules (MAR) made effective from 2020 https://idacindia.org/wp-content/uploads/2021/12/1.IDAC-India-Domestic-Arbitration-Rules_compressed.pdf https://idacindia.org/wp-content/uploads/2021/12/2.-IDAC-India-International-Arbitration-Rules.pdf https://idacindia.org/wp-content/uploads/2021/12/5.-IDAC-India-Maritime-Rules.pdf	MAR governed by the Arbitration & Conciliation Act, 1996 as amended by Arbitration & Conciliation (Amendment) Act, 2015	

		https://idacindia.org/wp-content/uploads/2021/12/4.-IDAC-India-Online-International-Arbitration-Rules.pdf https://idacindia.org/wp-content/uploads/2021/12/3.-IDAC-India-Online-Domestic-Arbitration-Rules.pdf		
Society for Affordable Redressal of Disputes (SAROD-Ports)	Registered as a Society under Societies Registration Act, 1860	Launched by MoPS&W in January 2020	Governed by the Arbitration & Conciliation Act, 1996 or any further amendments	• Applies to pending or future disputes between Port Authorities & Licensee / Concessionaire / Contractor • Also covers disputes between Licensee / Concessionaire & their Contractors

Each apex body has a constitution of Maritime Arbitration Committee comprising of members from maritime & shipping practice.

Figure 114 Administrative structure and Maritime Arbitration Committees under each apex body



CHALLENGES

As mentioned in the previous section, despite having such apex bodies, there are various challenges existing in Indian dispute resolution mechanism, especially when it comes to international disputes. The shipping industry is no longer concentrated within small number of people or single country but rather spreads worldwide. This contributes towards international exposure and disputes of the shipping industry. Owing to complex nature of maritime sector and involvement of domestic & transnational players, maritime sector is inherently a fertile ground for disputes.

Table 28 Challenges existing in Indian dispute resolution mechanism

Key areas of disputes in the maritime sector	
Port related	**Shipping related**
• Breach of various obligations by Authority & Concessionaire • Sharing various expenses related to the project • Handing over of port assets • Traffic not materializing due to court order on banning cargo • Non-compliance of internal process between Authority & Concessionaire • Change in consortium before signing Agreement • Unforeseen dynamic changes in business & absence of flexibility to overcome such dynamic changes • Aggressive bidding & optimistic projections w.r.t volumes & charges • Legality of decision of independent regulatory body after change in policy • Revision of land licence fees • Calculation of revenue share • Transitionary provision during dispute period	• Interpretation of charter party, any contract of affreightment & bills of lading • Carriage of goods by sea • Marine salvage, towage of vessels or other floating objects • Damages arising out of collisions, groundings, fire or any such accidents, including damage to fix or floating objects at ports • Interpretation of any shipping documents • Ownership of vessels & aspects relating to lines & mortgages • General average, particular average & matters arising out of contracts of marine insurance • Wreck removal & marine pollution • Use of ships in offshore, oilfield and/or seabed mining including specialized vessels, rigs and platforms • Ship building & repair contracts

Presently, there are more than 100 references pending before the Courts / Arbitration panel on contractual disputes of Major Ports alone

LACK OF EXCLUSIVE BODY FOR MARITIME DISPUTES RESOLUTION IN INDIA

Indian Council of Arbitration, which is the oldest body for dispute resolution is a multi-sectoral body where maritime sector is one of the various sectors. Although ICA is handling various international dispute cases across various sectors, its limited availability in maritime sector, lack of trust for empanelled arbitrators and delayed mechanism is pushing parties to go to Singapore International Centre for most of the disputes.

Further, IDAC is made effective from the year 2020 and promoted by arbitration practitioners in India. Since it has recently been made effective, it is too early to assess its success rate. Further, there hasn't been any instance found where an international case has been referred to/ resolved by IDAC.

Another important thing to mention here is that both ICA and IDAC are governed by India's Arbitration & Conciliation Act, which is applicable across all sectors. However, for international disputes, involving parties prefer international guidelines of London, Singapore, etc.

SAROD-Ports have been recently launched by the Ministry of Ports, Shipping and Waterways. SAROD-Ports will advise and assist in settlement of disputes through arbitrations in the maritime sector, including ports and shipping sector in major port trusts, non-major ports, including private ports, jetties, terminals and harbours[26]. It will also cover disputes between granting authority and Licensee/Concessionaire/ Contractor and also disputes between Licensee/ Concessionaire and their contractors arising out of and during the course of execution of various contracts.

SAROD-Ports are similar to the provision available in Highway Sector in the form of SAROD-Roads constituted by NHAI. Owing to the success of SAROD-Roads, the Union Cabinet approved SAROD-Ports as dispute resolution mechanism for PPP Projects as part of the Model Concession Agreement (MCA) amendments approved in January 2018 for Major Ports.

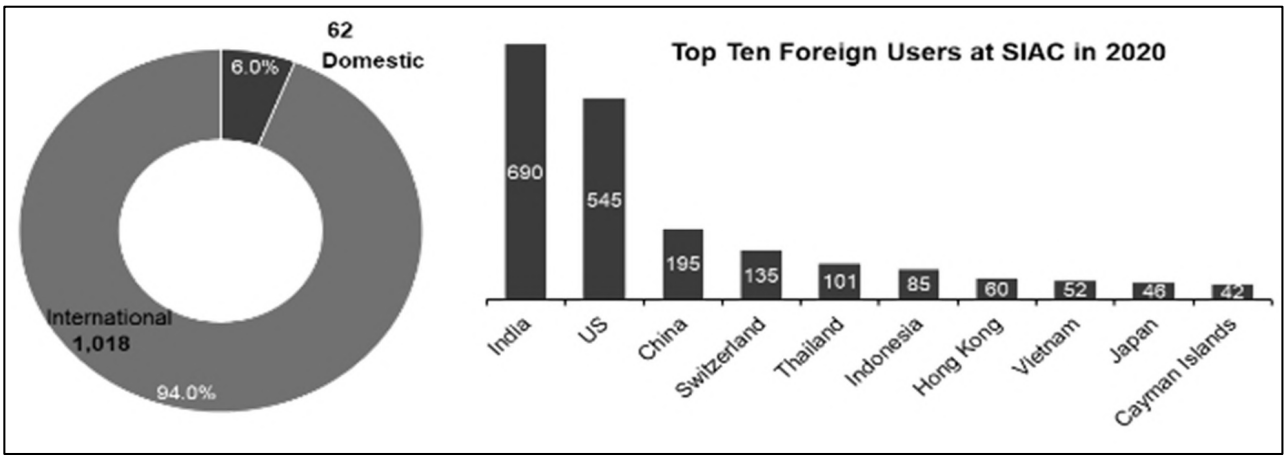
While for port related disputes, SAROD-Ports have provided the sector some hope for dispute resolution, for shipping related disputes, international arbitration is chosen for dispute resolution as disputants are based in different part of globe.

In case of shipping related disputes, constantly changing jurisdictions when a vessel moves from one country to another gives rise to difficult disputes that are not always possible to resolve by approaching national laws. Further, international contract involving Indian parties may not agree to put Indian Arbitration clauses.

The Singapore International Arbitration Centre (SIAC) is presently hearing the arbitration involving Indian parties

In 2020, 94% (1,018 #) of new cases filed with Singapore International Arbitration Centre (SIAC) were international in nature and India, US and China topped the foreign user rankings.

Figure 115 User profile of Singapore International Arbitration Centre



[26] Source: SAROD-Ports is Affordable Dispute Redressal Mechanism for all kind of disputes of maritime sector, PIB, Ministry of Ports, Shipping and Waterways, Sep 10, 2020

SUMMARY OF CHALLENGES W.R.T INDIAN DISPUTE RESOLUTION

Table 29 Summary of challenges in Indian dispute resolution system

Apex Bodies	Challenges	
Indian Council of Arbitration (ICA)	Oldest body for dispute resolution in India with multi-sectoral institution. Limited availability in maritime sector & slow dispute resolution mechanism compared to international bodies had led to parties approaching Singapore International Centre for most of the disputes. Guidelines for closing arbitration: 6 months to 24 months	Both ICA and IDAC are governed by India's Arbitration & Conciliation Act which is applicable across all sectors. While for international disputes, involving parties prefer international guidelines of London, Singapore etc.
International and Domestic Arbitration Centre (IDAC)	Has recently been made effective, i.e., from 2020. Too early to assess its success rate. No instance available where an international case has been referred to/ resolved by IDAC Guidelines for closing arbitration: 6 months to 18 months	
Society for Affordable Redressal of Disputes (SAROD-Ports)	Dedicated for resolving Port related disputes only No specific guidelines on time, but additional 10% fee if award is published within 6 months	No role in resolving shipping disputes

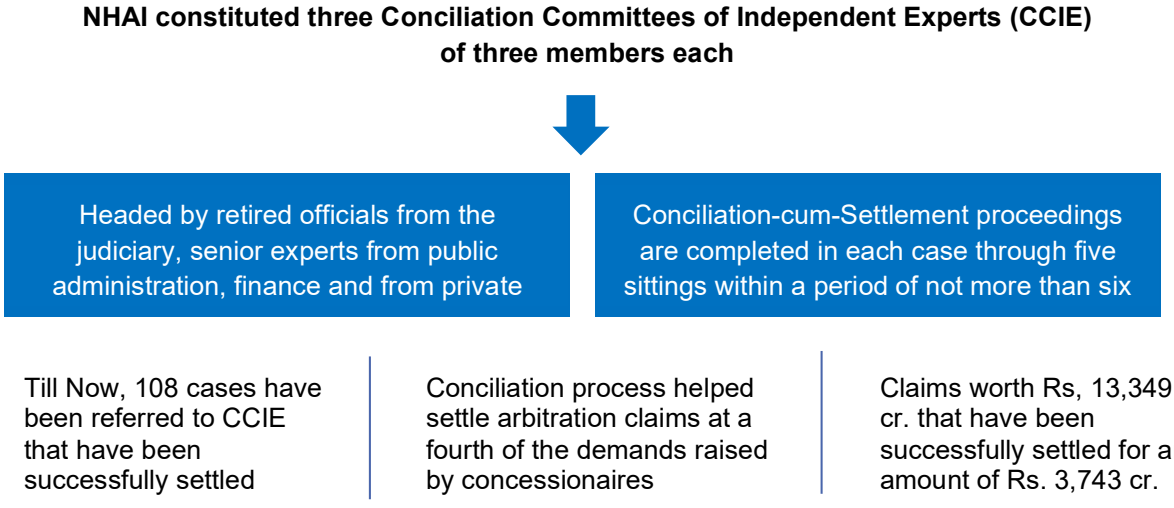
KEY INITIATIVES

POLICY INITIATIVES

FORMULATION OF CONCILIATION POLICY AND SETTING UP A CONCILIATION & SETTLEMENT COMMITTEE

The Cabinet Committee on Economic Affairs (CCEA) took certain decisions in its meeting held on 31.08.2016 for revival of the construction sector. These decisions were communicated by the NITI Aayog vide its two OMs No. 14070/14/2016-PPPAU dated 5th September 2016. One of these OMs titled “Initiatives on the measures for revival of the Construction Sector required all the concerned Departments/ Ministries/ PSUs to expeditiously examine the initiatives contained therein and take action for their implementation. The initiatives inter alia include establishing a system of conciliation of disputes for amicable settlement through appointment of Conciliation Committees comprising of independent experts in order to ensure speedy disposal of pending or new cases. Recourse to such conciliation is open before, during or after the arbitration proceedings. Following the aforesaid decision of CCEA and provisions of the Arbitration and Conciliation Act, 1996 (the Arbitration Act) Ministry of Road Transport & Highways has developed a mechanism of Conciliation Committee in the arbitration issues

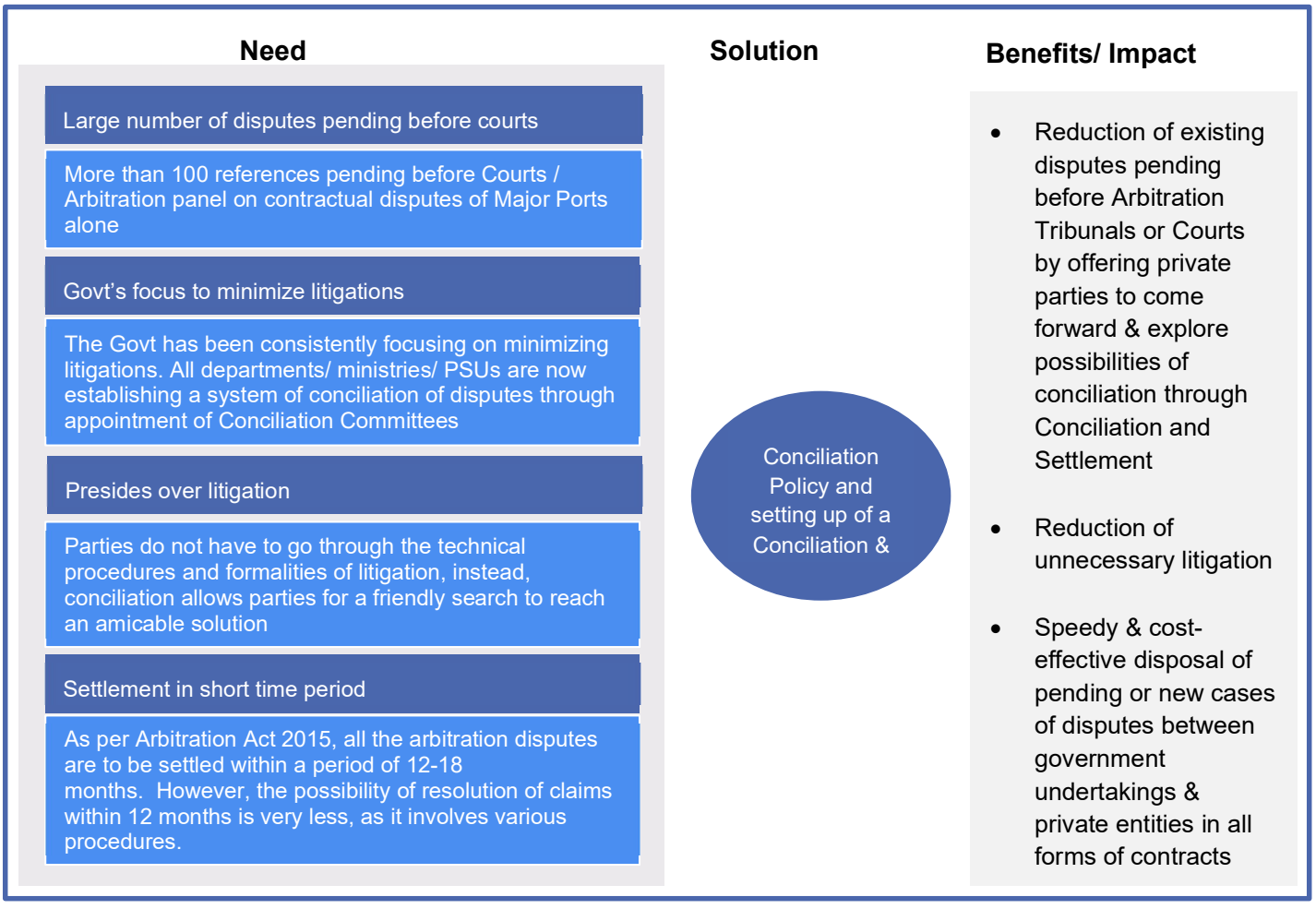
Figure 116 Case Study: Conciliation & Settlement mechanism established in Ministry of Road Transport & Highways, India



relating to them.

On the above lines, a Conciliation & Settlement Committee for deliberating the arbitration issues and exploring the possibility for amicable resolution of the outstanding issues for Port and Maritime Sector may be constituted.

Figure 117 Proposed Conciliation & Settlement Committee, Ports & Maritime sector



STANDARD OPERATING PROCEDURE FOR REFERRING THE CASE TO CSC

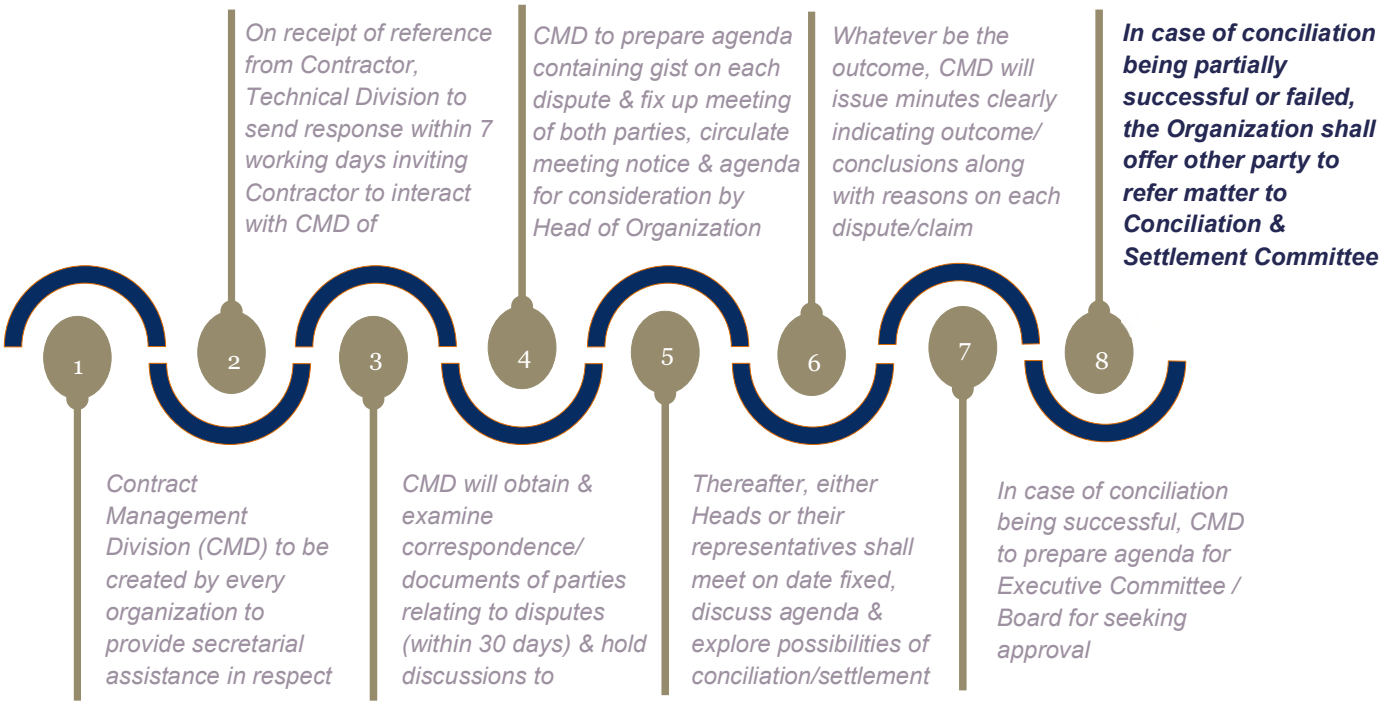
In order to ensure speedy disposal of pending or new cases of disputes between government undertakings in port, shipping and inland waterways and private entities in all forms of contracts, a procedure is proposed hereunder:

- On receipt of a reference from the Contractor (reference to 'Contractor' made herein includes Concessionaires/ Consultants/ Service Providers) as per the provisions in the agreement for conciliation of disputes through a meeting at the level of the Head (Chairman/CMD/MD) of the Organization (Major Ports, DG Shipping, IWAI, SCI , CSL etc.) and the Chairman of the Board of Directors of the Concessionaire / Contractor, the concerned Technical Division shall send a response within 7 working days, thereby inviting the Concessionaire/ Contractor/ Consultant to depute a team of their representatives to interact with the Contract Management Division of the Organization. A Contract Management Division (CMD) should be created by every organization to provide secretarial assistance with respect to the disputes
- The Contract Management Division (CMD) will obtain and examine the correspondence/ documents of the parties relating to the disputes, preferably within 30 days, hold discussions with the team of the Concessionaire/ Contractor/ Consultant/Service Provider and the Technical Division to crystallize the issues; prepare the agenda containing the gist on each dispute; fix up a meeting of both the parties and circulate the meeting notice and the agenda for consideration by the Head of the Organization.
- Thereafter, either the Heads or their representatives shall meet on the date fixed, discuss the agenda and explore the possibilities of conciliation/settlement. The conciliation may be successful or partially successful or may fail. Whatever be the outcome in the meeting, the CMD with the approval of Head of the Organization

will issue the minutes clearly indicating the outcome/ conclusions along with the reasons on each dispute/claim.

- In the event of the conciliation between the parties at the level of the Head of the Organization and the Head of the Concessionaire/ Contractor being successful, the CMD shall prepare the agenda for the Executive Committee / Board as per internal delegation of for seeking approval
- In cases, where the conciliation is partially successful or failed, the Organization shall offer the other party to refer the matter to the Conciliation & Settlement Committee consisting of Independent Experts as the conciliation is intended to be one consolidated package of settlement. Subject to the consent of the other party, the CMD would refer the matter to the Conciliation & Settlement Committee established under these guidelines

Figure 118 Standard operating procedure for referring the case to CSC



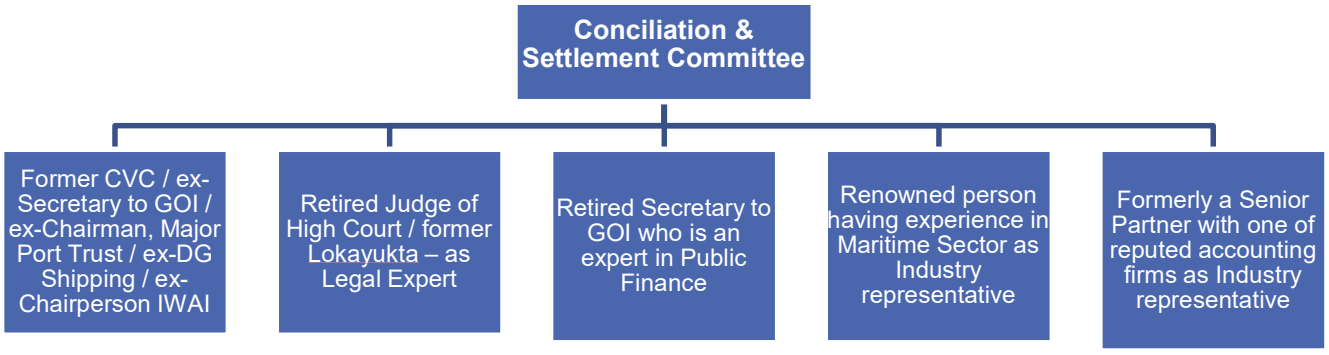
CAPACITY BUILDING INITIATIVES

CONSTITUTION OF THE CONCILIATION & SETTLEMENT COMMITTEES

On the same analogy as that of the decisions of the CCEA and the provisions contained in the Arbitration Act, Conciliation & Settlement Committees comprising of Persons from the panel of the following Independent Experts is proposed:

- Former Chief Vigilance Commissioner (CVC)/ ex- Secretary to the Government of India / ex-Chairman, Major Port Trust/ex-DG Shipping/ ex-Chairperson IWAI
- Retired Judge of a High Court / former Lokayukta – as Legal Expert
- Retired Secretary to the Government of India who is an expert in Public Finance
- A renowned person having experience in the Maritime Sector as Industry representative
- Formerly a Senior Partner with one of the reputed accounting firms as Industry representative

Figure 119 Composition of Conciliation & Settlement Committee, Ports & Maritime sector



Depending upon the response to this mechanism, the workload and requirements for speedy settlement of disputes, the panel may be expanded further with the approval of the competent authority.

BROAD TERMS AND CONDITIONS AND TERMS OF REFERENCE OF THE PANEL OF INDEPENDENT EXPERTS OF THE CONCILIATION AND SETTLEMENT COMMITTEE

- Upon receipt of the consent of the concessionaire/contractor/consulting agency/ service providers for making a reference to the Conciliation and Settlement Committee of Independent Experts, the Head of the Organization shall refer the matter to the Committees depending on the workload already available with the Committee. The consent of the Concessionaire/ Contractor/ Consulting Agency for conciliation shall also be deemed to be the consent to the Committee in terms of sections 63 and 64 of the Arbitration Act
- The Panel of Independent Experts approved under these proposed guidelines shall remain valid for a period of three years from the date of issue of these guidelines. Depending upon their response from the contesting parties and the workload, the Panel may be suitably expanded from time to time with the approval of the competent authority.
- The Conciliation process will be conducted under Part III of the Arbitration and Conciliation Act, 1996 as amended by Arbitration and Conciliation (Amendment) Act, 2015.
- A member of the Conciliation and Settlement Committee of Independent Experts (CSC) shall be paid a sitting fee of INR 50,000/- and INR. 5000/- for local transport charges for each day of proceedings. An out-station member shall be reimbursed the airfare by economy class in addition to the applicable taxes, if any, shall also be reimbursed as per actuals by the concerned organization.
- The Panel of Independent Experts shall meet in the first instance and evolve its own procedures and methodologies for undertaking the functions of the Conciliation and Settlement Committees.
- The CSC shall hold its day-to-day sittings at a suitable place as convenient to both parties and may hold as many sittings every month as it deems appropriate keeping in view the volume of work at its disposal. It is expected that the conciliation-cum-settlement proceedings shall be completed in each case through five sittings in a period of not more than six months from the day the reference is made to the CSC. In case any dispute requires more than 5 sittings, the same may be held at the discretion of the CSC with a cap on payment of fee for 5 sittings only.
- The CSC may give its recommendations on amicable settlement separately for each contract.
- The CSC shall develop its own procedures/ processes for dealing with matters referred to it. However, for the understanding of the parties, it may be noted that the procedure of CSC may not be treated as alternate arbitration proceedings, where both parties come with Statement of claims/ defence, arguments/ counter arguments, rejoinders, written submissions, etc., aided by their respective lawyers. The forum of CSC is a settlement forum, where mutual give and take constitutes the essence, rather than strict legal position of the

parties. Hence, the parties are expected to be brief and to the point before the CSC with regard to their respective stand and view the exercise in the spirit of conciliation/settlement.

- Based on the experience gained in the course of conciliation proceedings, the CSC may suggest/ recommend advisories to the Port Trust from time to time for improvement in its Contract Management Systems.
- The possibility of non-availability of any one of the members of the Conciliation and Settlement Committee in any proceedings cannot be ruled out. As such, the Committee comprising of the other two members shall be competent to proceed in the matter and the proceedings of the Committee shall not be vitiated if one of the three members is not present in the deliberations in the Committee. The recommendations/ decisions of the two-member Conciliation Committee in such a case shall be valid and binding on the parties.
- The conciliation process shall be conducted under Part III of the Arbitration Act. The Conciliation & Settlement Committee would either be able to resolve and settle the dispute(s) between the parties, or the process may fail. In case of failure of the conciliation process at the level of the Conciliation & Settlement Committee, the parties may withdraw from the conciliation process and take recourse to the laid down legal process of arbitration/ Courts. In the event of the conciliation proceedings being successful, the parties to the dispute would append their signatures to the settlement concluded by the Committee.

SUGGESTIONS FOR EXISTING LITIGATION CASES ALREADY PENDING BEFORE THE ARBITRAL TRIBUNALS/COURTS:

In cases of disputes pending before the Arbitration Tribunals or the Courts, the Contract Management Division (CMD) of the organization concerned, as proposed above, shall make an offer to the Concessionaire/ Contractor/ Consultant/Service Provider to come forward and explore the possibilities of conciliation through the Conciliation and Settlement Committee of Independent Experts as described in previous section. Wherever the parties to the dispute(s) agree to invoke the good offices of the Conciliation and Settlement Committee, the CMD shall make an appropriate reference to the Conciliation Committee, upon which the Committee shall proceed to examine such reference(s). However, wherever the parties agree to reach out to the Conciliation Committee, they shall be required to keep the proceedings pending before the Arbitral Tribunals/ Courts in abeyance.

It may be noted that this is an alternate dispute resolution mechanism being proposed to put in place with the approval by the Ministry of Ports, Shipping and Waterways and if the Concessionaire/ Contractor/ Consultant/ Service Providers is not willing to take recourse to this process or has any reluctance whatsoever in this behalf, there is no compulsion, and they are free to follow the provisions as per the law.

ESTABLISHMENT OF AN INDEPENDENT PARENT GOVERNING BODY AS MARITIME ARBITRATION CENTRE

In present times, the maritime sector is changing at a fast pace globally. This rapid growth requires immediate consultation and attention from the legal community when disputes arise and need to be resolved. In the recent times, arbitration has emerged as the preferred choice of parties globally for resolution of their disputes, as the same provides parties with a cost-effective, flexible and confidential process to resolve disputes. Owing to India's strategic location, its maritime industry has evolved manifold over the years. India holds a strong position as a maritime hub and as the country continues to invest in infrastructure, the maritime industry continues to expand, and thus more services are required, leading to multiplicity of disputes, specialised adjudication require the establishment of an International Maritime Arbitration Centre (IMAC). It is an acknowledged fact that owing to lack of support due to the absence of maritime specialised ADR in India, parties are forced to look for alternatives in other countries.

CURRENT STATUS AND GAPS

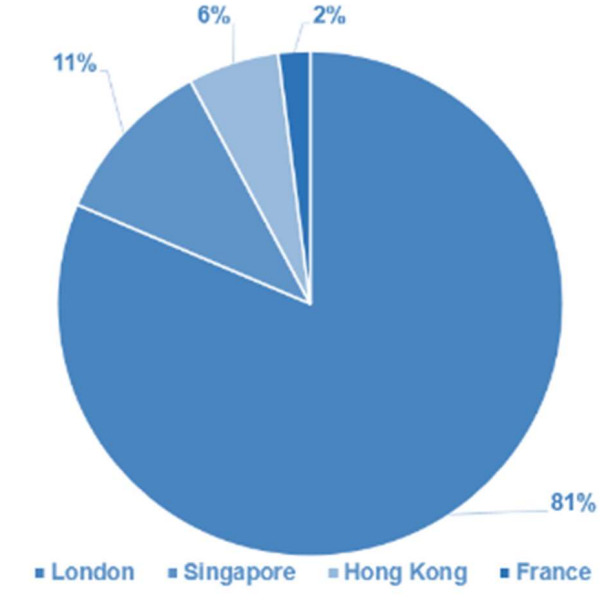
It is without a doubt that London Maritime Arbitration Association (LMAA) is still the leading arbitration centre for commercial disputes. Maritime arbitrations contribute significantly to the prime position London. Singapore

Chamber of Maritime Arbitration (SMAC) and Hong Kong Maritime Arbitration Group (HKMAG) have also taken learnings from London model only to prepare their arbitration rules. However, there is no dedicated body for maritime alternate dispute resolution in India on the lines of LMAA or SMAC or KHMAG; thus, India has a scope to put up an (cost effective) institution, in an infant form.

Figure 120 Global landscape of maritime arbitrations

Globally, over 15 countries having dedicated maritime arbitration associations with London, Hongkong & Singapore being most preferred associations

Figure 121 percentage distribution of total global maritime arbitrations



- London saw ~1,734 maritime arbitrations in 2019, up 14% from the previous year
- This number accounted for more than 80% of all maritime arbitrations globally with 229 in Singapore, 124 in Hong Kong, and 43 in Paris

As far as the Indian Arbitrators are concerned, they fare poorly in appointment as international arbitrators. As per London Court of International Arbitration (LCIA) data for 2015, out of 449 arbitrators appointed last year, there were no Indians. Similarly, even though most Indian arbitrations are seated in Singapore, SIAC report for 2015 records that out of 126 arbitrator appointments, only 3% were Indians. This is a clear case in point showing that Indians are excluded from the system of international arbitration.

Need for change

With the increasing focus to develop India as a modern international maritime nation with some significantly important maritime centres along the coast, it is logical to work towards establishing an international maritime dispute resolution centre, capturing a share of the international maritime arbitration activity, especially when one or both the parties are Indians.

India has the inherent benefit of language, education and intellect to develop herself into a world leader in the area of dispute resolution, especially when online hearings and use of AI in litigation and ADR are becoming gradually popular. This can follow the lines of medical transcriptions of radiology when USA was woefully short of such people. The concept of "resolve in India" needs to be considered gradually but seriously, especially for all maritime (a global industry) related disputes.

Maritime industry has its specific characteristics and peculiarities. In order to serve this industry, maritime arbitration centres have been carved out of the original commercial arbitration centres. SCMA (2009) and HKMAG (2019) are two examples, in addition to decades old LMAA. **It is strongly recommended to avoid creating maritime arbitration functions or divisions in India's existing commercial arbitration centres. Further, it is equally important to strongly discourage mushrooming of a number of other regional maritime arbitration associations and/or centres.**

Figure 122 Case Study: The London Maritime Arbitrators Association (LMAA)

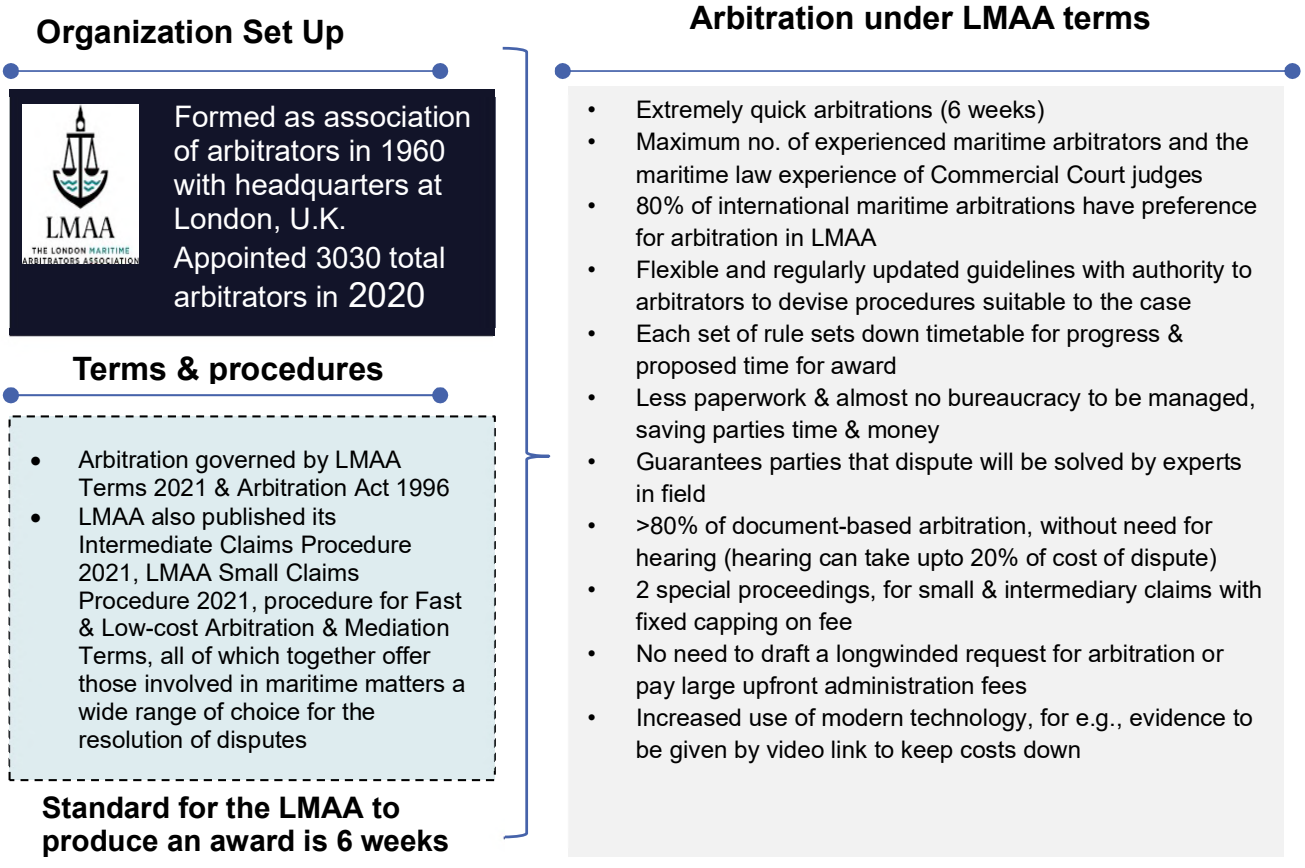
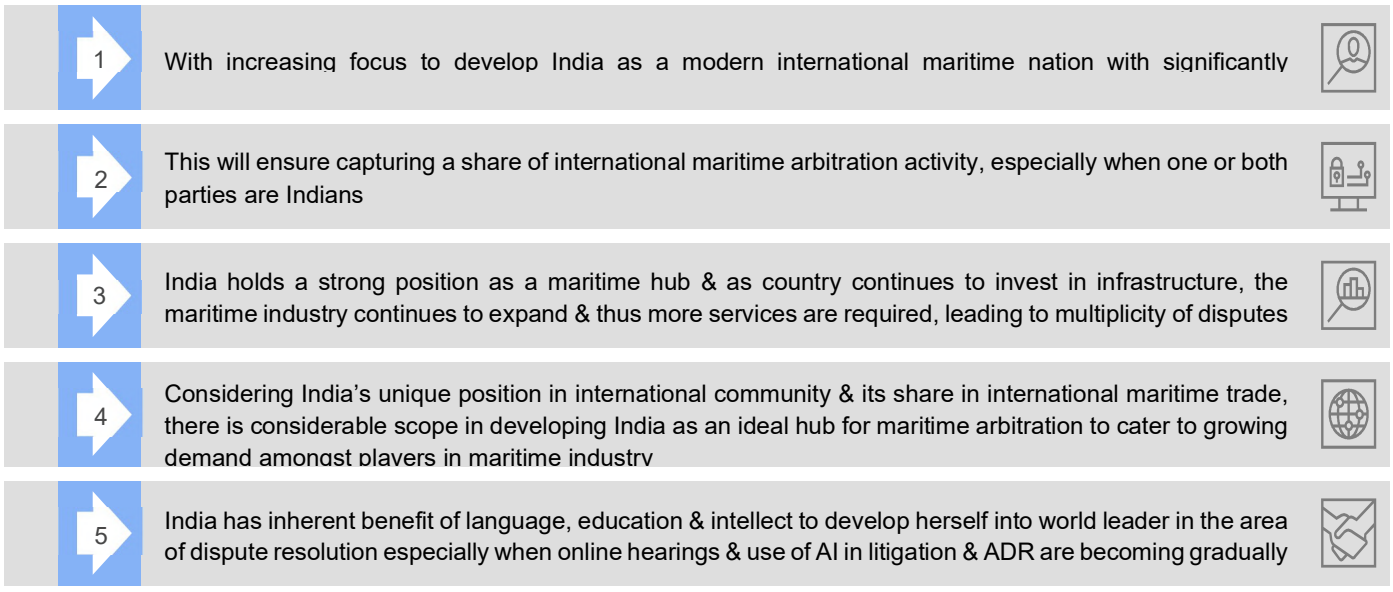


Figure 123 Scope for India as an ideal hub for maritime arbitration



Key pre-requisites

India as an "Alternate Dispute Resolution Centre" is more likely to succeed on a Global Scene, if we implement the following:

- Independent, industry governed, and merit-based institutional arbitration system with no compulsory appointment from government/ PSUs.
- Transparent and fair procedural rules ably supported by legal system [Common to all MACs, under the umbrella of MADRC]: Consider adopting best of LMAA/SCMA/HKMAG procedures
- Ensure autonomy of parties and incorporate their wishes in such as contract, arbitration rules, juridical seat of arbitration, etc.
- Establish panel and list of experienced professionals (with experience in commercial or technical shipping) as Maritime Arbitrators.
- Support & promotion provided by the PSUs and the large industrial & trading houses to adopt a suitable arbitration clause.
- Finality to awards by courts as well as applications for interim measures and enforcement of awards made by IMAC Arbitrators will instil confidence in the institution.

PROPOSED INTERNATIONAL MARITIME ARBITRATION CENTRE (IMAC)

Maritime arbitration centres are usually based in the significant international maritime centres, serving the domestic eco-system as well as providing an international dispute resolution service to parties that are based out of such jurisdictions. As can be seen from the corporate and fee structures, such arbitration centres (or associations) are not direct profit centres, and their existence is not to achieve financial goals in terms of ROIs.

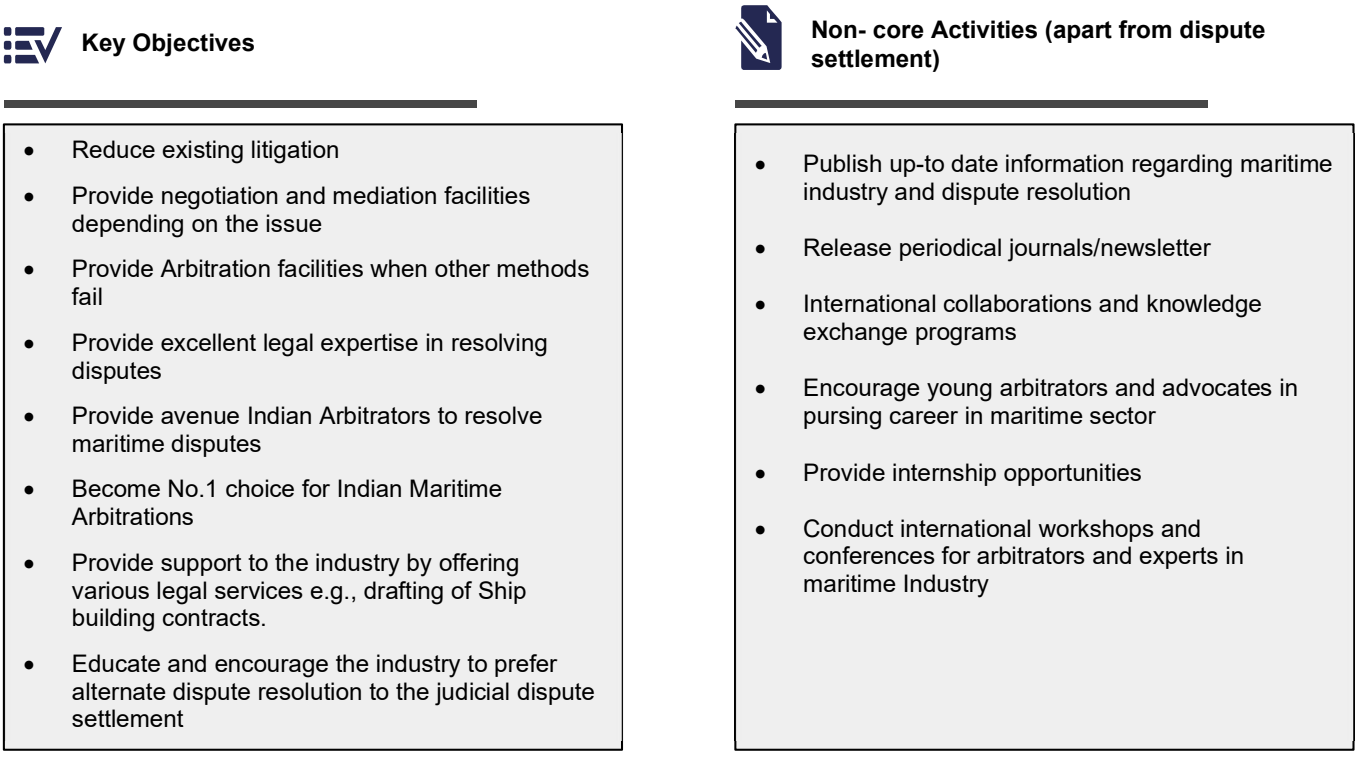
The proposed IMAC shall be developed with the aim to:

- collaborate actively and fruitfully with the maritime eco-system and related stakeholders
- showcase the capabilities of International Maritime Centres through increased visibility
- provide world-class quality and efficient services in Maritime dispute resolution

- facilitate and encourage Arbitration as a preferred mode of dispute resolution
- make India a global hub for the maritime arbitration
- promote the maritime law education and employment

Key objectives of the Maritime Arbitration Body

Figure 124 Objectives & activities of proposed Maritime Arbitration body, India



Types of disputes to be undertaken by the Maritime Arbitration Body

Table 30 Types of disputes to be undertaken, Maritime Arbitration body, India

Shipping	International trade and commodities	Marine Insurance	Maritime Investments
• Charter-parties & carriage of goods by sea, including bills of lading and Contract of Affreightment • Carriage of passengers • Shipbuilding, machinery breakdown & repair • Ship sale and purchase • Operations, management, agency and brokerage • Ship casualties, collision, grounding, salvage and pollution • Bunkering • Pool arrangement	• Trading and sale contracts, including quantity and quality, late and non-delivery, laytime, demurrage and detention • Finance, including letters of credit • Performance guarantees	• Jurisdiction and contracts for Marine Insurance • Cargo Insurance • Marine hull and machinery insurance • Liability issues • Protection and indemnity coverage	• Investment agreements both domestically and abroad • Investments in shipbuilding • Private participation and allied issues

Proposed plan of action under IMAC

Multi contract, multi jurisdiction, and multi nationality defines maritime industry. The industry players need a dispute resolution system that is private, cost & time effective and enforceable. Administration of institutional arbitration, clear and fair procedural rules, support of the courts (if and as required), support of Indian Navy in cases pertaining to collision of merchant vessels with the Indian Navy warships, etc., quality arbitrators and/or mediators, maritime legal support available locally are key elements to imbibe confidence in international players to decide where they want their disputes to be resolved. Following recommendations are made to develop an independent, industry run, and skills-based arbitration system:

- Identify the Arbitration Procedures to be used in IMAC. This can be done by development of new Maritime Arbitration Act or amendment in existing Arbitration and Conciliation Act 1996, in line with the international best practices.
- Adopt the LMAA rules/ SMAC rules with minor logical changes to ensure that such a body is recognised internationally.

LMAA terms provide guidelines across 19 elements, which can be studied while preparing guidelines for IMAC

- Similar to LMAA, IMAC shall be an independent body with no compulsory appointments from PSUs, Government or Industry Associations. IMAC to have its own governing body. International contracts may have this clause entered as a part of the agreement.
- Receive recognition by the industry of IMAC and motivate the parties to include IMAC Dispute Resolution Clause in the contract.
- Include existing segment specific panels (e.g. SAROD-Ports) under the IMAC umbrella to serve the parties desiring to base their dispute resolution clause upon them.
- Establish a panel and up-to-date list of commercial men (those with experience in commercial and/or technical shipping) as Maritime Arbitrators as well as certified lawyers with Maritime Law knowledge and experience.
- Collaborate with international Arbitration bodies/ experts for knowledge exchange.
- Cost structure and administrative procedures: Cost effective with least resistance to the process flow and a cooperative approach will help.
- IMAC to have services for mediation, arbitration-mediation-arbitration, mediation-arbitration, arbitration-mediation in addition to arbitration.
- Discourage mushrooming of other regional Maritime Arbitration Associations or Centers (Once such a body is established).

Table 31: The London Maritime Arbitrators Association (LMAA) Terms 2021

#	LMAA Terms 2021	Brief Description
1	Preliminary	This section provides description of 'the LMAA terms 2021' such as "the Act", "the Association", "tribunal", "Original arbitrator"
2	Application	Application section defines the applicability of above-mentioned terms. The terms are applicable to arbitral proceedings commenced on or after 1st May 2021. The section 14 of the act shall apply for the purpose of determining on what date arbitral proceedings are to be regarded as 'having commenced'

#	LMAA Terms 2021	Brief Description
3	The Arbitral Tribunal	Information related to the number of arbitrators and the time period within which the parties shall appoint the arbitrator. Further, the description of process for arriving at a decision through the appointed arbitrators is also provided in this section
4	Jurisdiction	Provides the information that the jurisdiction of the tribunal shall extend to determining all disputes arising under or in connection with the transaction, unless the parties otherwise agree, and each party has the right before the tribunal for determination of any further disputes arising after commencement of arbitral proceedings
5	Tribunal's Fees	This section provides the information related with regulating fee payable to the tribunal and other related matters such as the payment of the tribunal's fee and expenses is the joint responsibility of the parties, etc.
6	Arbitration Procedure	The section sets out the procedural guidelines for the arbitration process. It also provides the procedural guidelines in the absence of agreement
7	Interlocutory Proceedings	Under this section, the guidelines for following the procedures as set out in the second schedule is given. Further, the section provides the procedural guidelines in case of "arbitration on documents alone" and in case of "Oral hearings"
8	Powers of the Tribunal	Powers of the tribunal have been described in the section in addition to the powers set out in the Act. Specific powers have been described in the section to be exercised in suitable cases so as to provide a fair means for the resolution of the matters falling to be determined
9	Preliminary Meetings	This section provides the guidelines for holding preliminary meetings (whether required by the tribunal or held on the application of the parties), as and when required based on the circumstances.
10	Settlement	The settlement section provides the information related to duty of the parties to notify the tribunal immediately if the arbitration is settled or terminated, to make provision in any settlement for payment of the fees and expenses of the tribunal and to inform the tribunal regarding the manner in which payment of any outstanding fees and expenses of the tribunal is to be made
11	Adjournment	Under this section, information related to the payment share in case of adjournment is described for both the parties
12	Availability of Arbitrators	The sections provide the information to consult and ensure the availability of arbitrator if an early hearing is expected from the very outset
13	The Award	This section provides all the information related to the award of an arbitration. The section provides the information such as the time required for preparation of the award, procedure to be followed for signing of award, collection of awards, guidelines after receiving the award, correction or explanation of the award, etc.
14	Service of Documents	The section describes that when a party is represented by a lawyer or other agent then, all notices or other documents required to be given or served for arbitral proceedings along with all decisions, orders and awards made or issued by the tribunal shall be treated as effectively served on that lawyer or agent
15	General	Provides the information that any queries related to the award shall be made within 3 months of the award unless the tribunal agrees a longer period, the tribunal may dispose of its papers (unless either party request them not to do so) after 3 months of publication of the award
16	Questionnaire	The section provides the guidelines for formulating an effective questionnaire for the arbitration process in the most appropriate way
17	Checklist	The section provides a checklist with guidelines to be followed with a view to make the decision-making process cost-effective and efficient. The checklist provides guidelines for - "arbitration on documents alone", "Factual evidence “, “Expert evidence", "Documents for hearing", "Skeleton arguments", "Transcripts", etc.
18	Reconstitution of the Tribunal	This section provides an estimated hearing date within a reasonable time of the expected readiness date as notified by the parties
19	Guidelines for the conduct of virtual and semi-virtual hearings	In case of virtual and semi-virtual hearing, certain guidelines are to be followed which are provided under this section. These guidelines are with respect to "Early preparation for the hearing", "In advance of the hearing day", "Etiquette in-hearing", "Oral testimony from witness", "Electronic bundles" and "No. of screens required for hearing"

Advantages of establishment of IMAC

- The centre would provide viable and cost-effective alternative to Indian parties for resolution of their disputes arising out of, or in connection, with the maritime industry. In cases of contracts exclusively between Indian parties, the centre should act as the first choice for dispute resolution in the said contractual arrangements.
- In cases of contracts between Indian and foreign parties, the existence of a centre offering robust international dispute resolution services, through arbitration, exclusively in the field of maritime sector, would afford the Indian parties more level playing field when it comes to making the choice of choosing the desired forum for resolution of disputes under such contractual arrangements.
- Existence of a specialised forum for resolution of international maritime disputes, through arbitration, would enhance India's position as a global leader in the maritime industry and afford realistic chance of making India a hub for maritime arbitration.
- With the establishment of the centre, the disputes that are currently referred to adjudication under foreign arbitration centres, can possibly be adjudicated in India itself, which will lead to further development of maritime legal jurisprudence in India and strengthening of talent pool specialising in this field of law.
- The establishment of the centre, adoption of robust specialised rules which shall cater to the needs of the maritime industry and drawing upon specialised pool of arbitrators, would provide the maritime industry in India a go to forum for prompt consultation and adjudication when disputes arise and need to be resolved.
- The centre should offer a variety of dispute resolution services, i.e., institutional and ad hoc arbitration options, as well as fast-track and emergency arbitration, and mediation, etc., which will afford the industry the option of choosing the best dispute resolution services for their specific needs.
- Apart from administering dispute resolution services, the centre shall also focus on research and training activities in the field of maritime law with specialised courses covering legal aspects of maritime operations and dispute resolution which would lead to further development of maritime law jurisprudence and creation of specialised set of legal practitioners dealing with this specialised branch of law. Additionally, the same would also help in training and sensitising the maritime industry in India about various aspects of this branch of law.
- Increased activity owing to establishment of a specialised dispute resolution institution would attract international talent, which in turn would facilitate exchange of knowledge and experience leading to further advancement of India's maritime industry

IMAC establishment

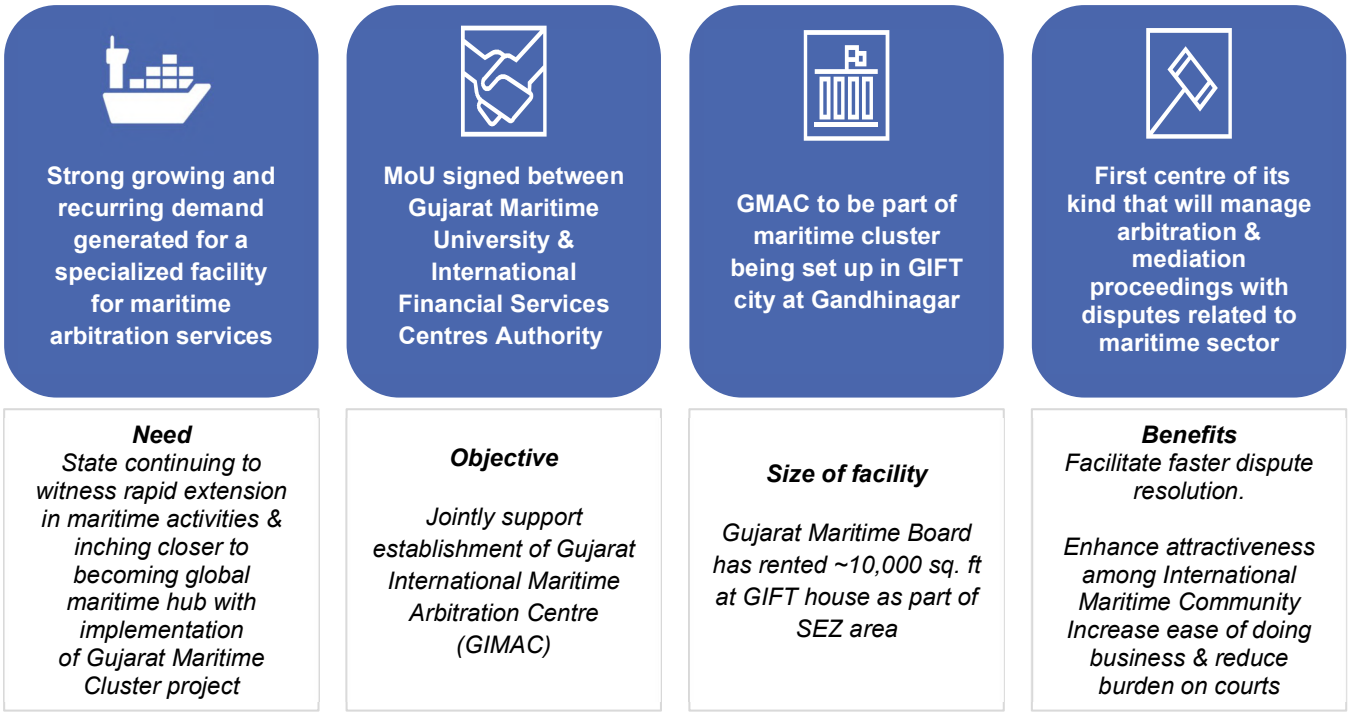
Two approaches may be followed while establishing the proposed IMAC.

Approach 1

Gujarat International Maritime Arbitration Centre (GIMAC) as the main body of arbitration, probably with the name changed to reflect a National Centre. On June 21, the Gujarat Maritime University and the International Financial Services Centres Authority signed a Memorandum of Understanding (MoU) at GIFT City to launch GIMAC.

Currently, GIMAC is not under central purview. To make GIMAC an international body, it has to be brought under central purview with a name change. The evaluation to consider the infrastructure, resources, administrative and functional structures. One of the advantages of this approach would be to avoid repetition and pooling of resources.

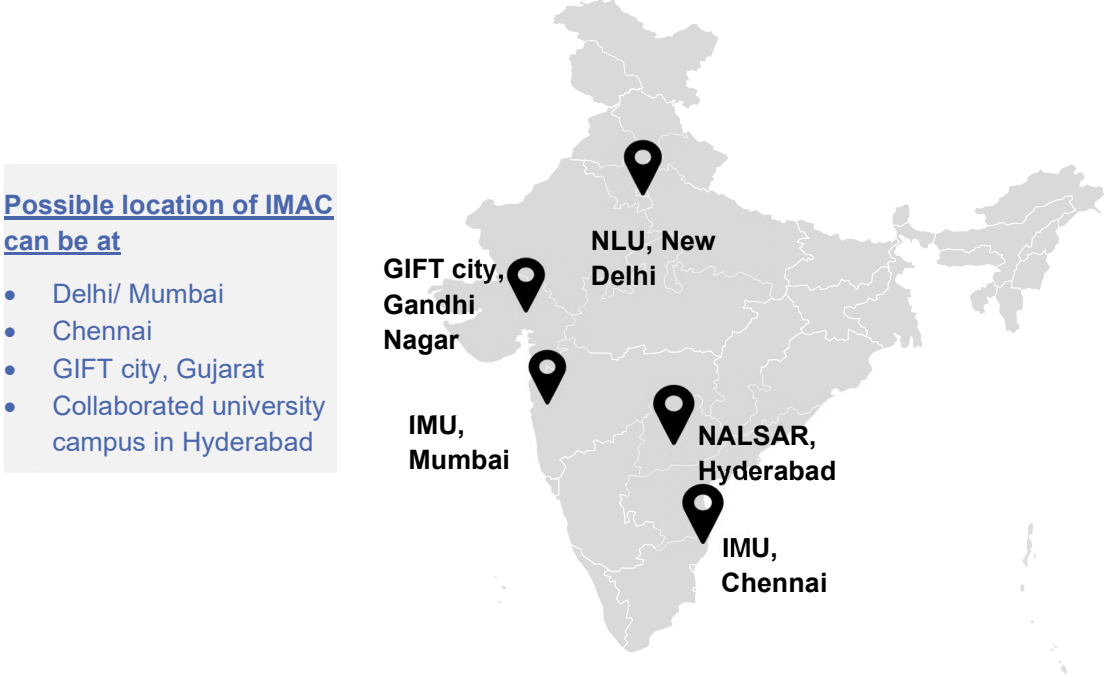
Figure 125 GIMAC: being developed in Singapore and Hong Kong Model



Approach 2

An independent parent governing body with flexibility for Maritime Arbitrations to be established across India. For making this successful, mushrooming of other regional Maritime Arbitration Associations or Centres (Once IMAC is established) to be discouraged.

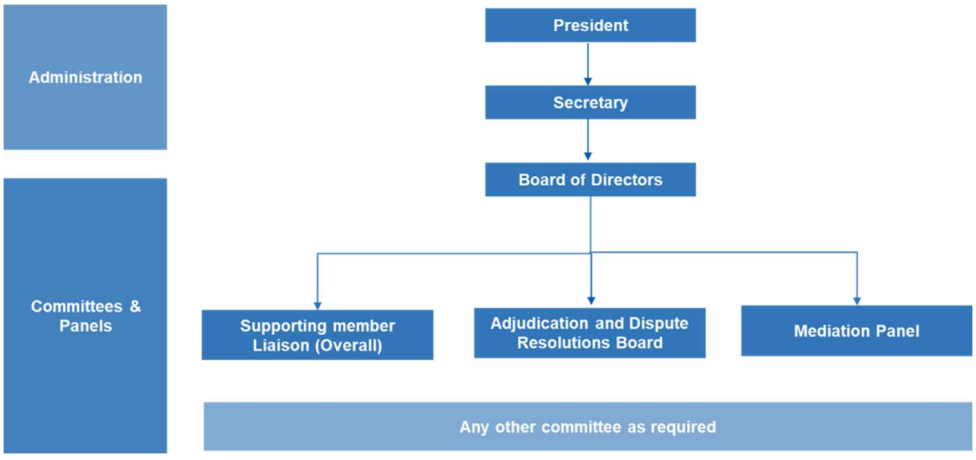
Figure 126 Proposed Regional Maritime Arbitration Associations or Centres



Proposed institutional mechanism

The proposed institutional structure of IMAC has been derived based on London & Hong Kong Model:

Figure 127 Proposed institutional structure of IMAC



Note: Board of Directors: *Comprising of a mix of experienced personalities from private, academic and public sector. (Example: A senior retired Judge, two practicing law firm partners, two independent domestic & international non-lawyer arbitrators/mediators, DG Shipping, Chairman of IPA, Chairman of Indian National Shipping Association)*

Figure 128 Institutional structure of LMAA

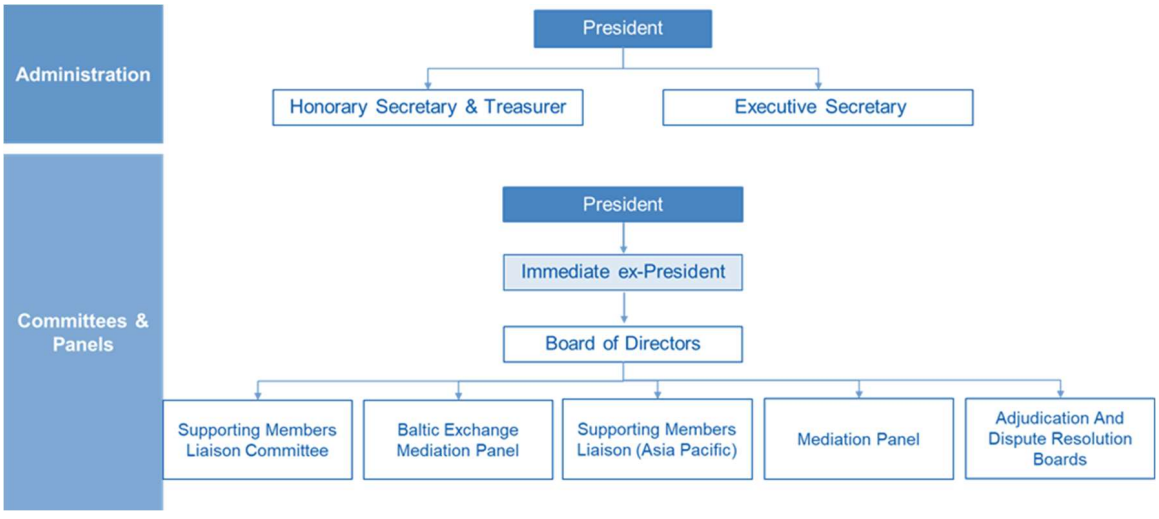
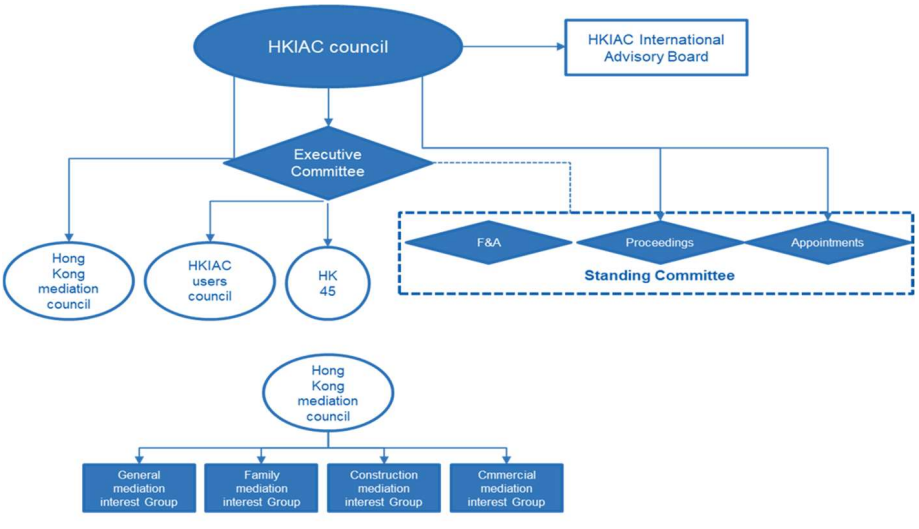


Figure 129 Institutional structure of HKIAC



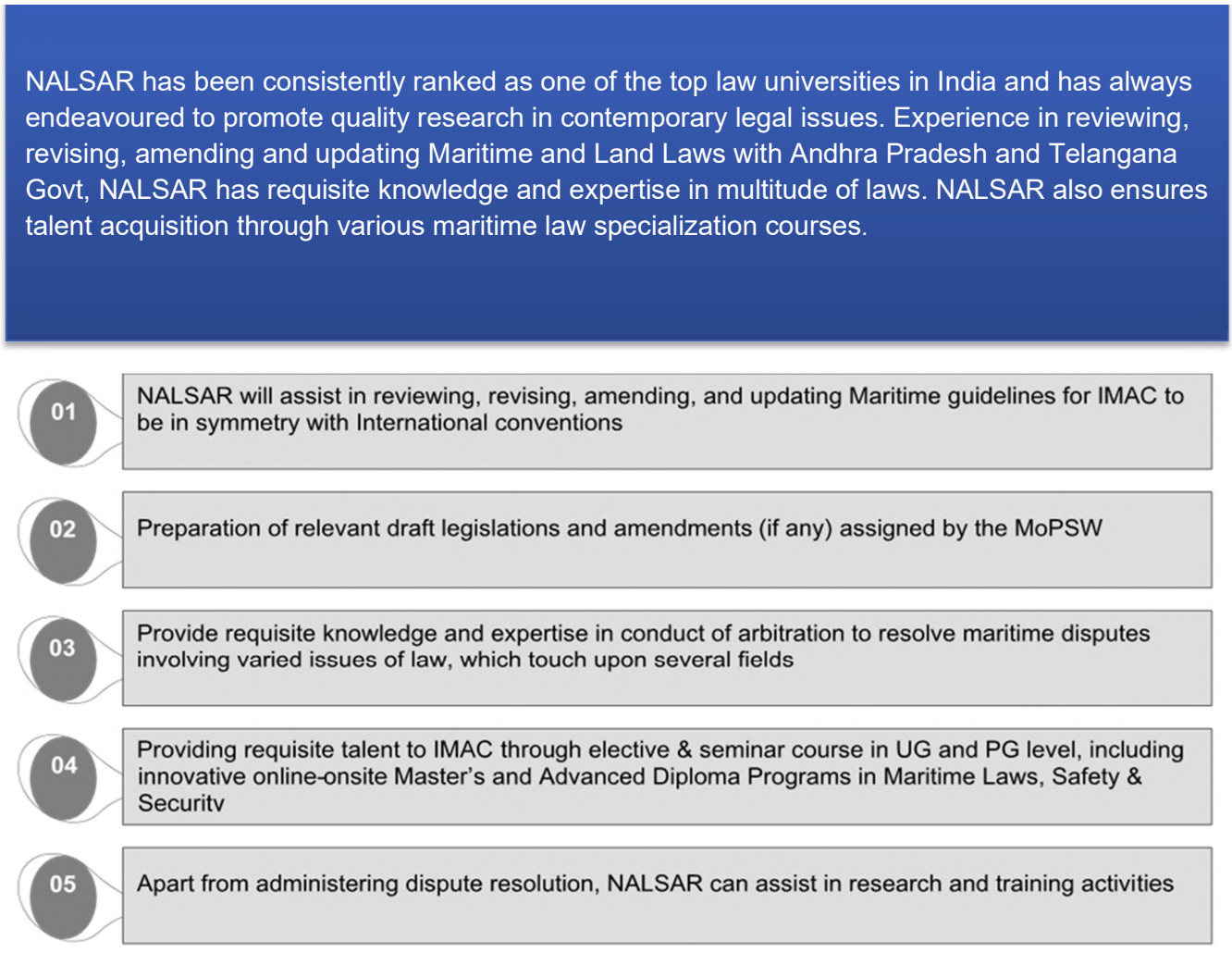
COLLABORATION OF MARITIME ARBITRATION CENTRE WITH A LAW UNIVERSITY

The exercise of drafting of the IMAC rules, as also the model clauses, shall involve various stakeholders, i.e., government officials, maritime law practitioners, arbitration practitioners, maritime law academicians, industry resource persons, etc. It is important to note that quite often, maritime law disputes involve varied issues of law, touching upon several fields of law, and therefore, it is imperative that practitioners with significant knowledge and expertise in conducting arbitration should be involved in this exercise. NALSAR University of Law can facilitate this exercise.

IMAC Centre shall maintain a strong panel of arbitrators drawn from varied fields of law and industry, who possess specialized knowledge to deal with varied issues arising in maritime dispute resolution. Strict admission criteria should be provided for inclusion in the said panel.

Apart from administering dispute resolution services, IMAC shall also focus on research and training activities in the field of maritime law and dispute resolution and NALSAR University of Law is in a unique position to do the same, considering its established resource, experienced faculty, robust infrastructure and prior experience in successfully establishing and managing specialized centres of law

Figure 130 Collaboration of Maritime Arbitration Centre with NALSAR



MARITIME INSURANCE

CURRENT LANDSCAPE

AVAILABILITY OF ALTERNATE FINANCING OPTION FOR EASE IN CAPITAL AVAILABILITY IN MARITIME SECTOR

Government of India has initiated various programs/ plans such as Sagarmala programme, Maritime India Vision 2030, and Nation Infrastructure Pipeline for the development of marine sector in the country. To implement projects identified under the aforementioned programs/ plans, investment of INR 3-3.5 lakh crore is required in next 5-10 years. Further, projects have been identified under the current GoI program "Promotion of Blue Economy - Logistics Infrastructure & Shipping (including Transshipment) which would require additional capital for implementation.

Considering the investment requirement for development of projects identified under the programs/ plans, arranging capital for the projects becomes one of the crucial steps.

Figure 131: Investment requirement in the maritime sector in next 5-10 years

Source – Maritime India Vision Document; Sagarmala document, India investment Grid

Note – Projects may overlap across different plans

INITIATIVES TAKEN BY GOVERNMENT OF INDIA TO IMPROVE CREDIT FLOW IN MARITIME SECTOR

Government of India has taken various policy/ regulatory related initiatives to make projects more investor friendly and improve credit flow in the maritime sector. Key initiatives are as follows:

- **The Major Port Authorities (MPA) Act, 2021 –** MPA Act 2021 was published on 18th February 2021. The Act seeks to provide for regulation, operation and planning of major ports in India and provide greater autonomy to major ports. Key changes made to make projects more investor friendly are as follows:

  - **Financial powers given to Major Port Authorities Board to raise loan (up to 50% of its capital reserve)** from any: (i) scheduled bank or financial institution within India, or (ii) any financial institution outside India that is compliant with all the laws to meet its capital and working expenditure requirements,

- Fixing of rates - The tariff regulation by TAMP for Major ports is removed. Major ports have flexibility to frame their own SOR following the Tariff Guidelines to be issued by the Government. Further, existing and future concessionaires also have complete freedom to fix their own tariff based on market conditions and such other conditions as may be notified.

- **Modal Concession Agreement (MCA) 2021 -** MCA for major ports have been revised to bring in best practices, market dynamics and recent policy developments in the port sector. Some of the key changes are as follows:
  - Flexibility to address changing market dynamics – Provisions included in the revised MCA such as change in cargo under change in law and unforeseen circumstances; change in dredging depths during concession period; Investment in additional assets with corresponding additional termination payments
  - Specified Concession Authority's KPIs and related Liquidity Damage provisions
  - Risk balancing while ensuring optimisation of cashflows: Lease rentals have been diluted to Re 1 with no notional loss to Authority as there would be higher royalty keeping the returns same for both parties. Also, bank guarantee before condition survey also done away and replaced with deemed performance security
  - Tariff setting freedom & minimum guaranteed cargo (MGC) - Clause related to levy and recovery of tariff revised to align in line with new major ports authority Act enabling concessionaire to fix tariff based on market conditions. Also, MGC have been linked to royalty payment.
  - Provision included for providing Right of first refusal to existing concessionaire.
- **Financial Assistance Policy on Shipbuilding -** Government has introduced INR 4000 Crores Financial Assistance Policy (FAP) for Indian shipyards for a period of 10 years, for contracts secured between 01.04.2016 and 31.03.**2026**. Under this scheme financial assistance equal to 20% of the lower of "Contract Price" or the "Fair Price" or "actual payments received" will be extended to Indian Shipyards for each vessel built by them. This rate of 20 per cent will be reduced by 3 per cent every three years
- **Government of India granted Infrastructure status to shipyard industry**
- **Ports and Shipping sector are eligible for 100% FDI under automatic route and avail ECB facility**
- **Subsidy of INR 1,624 Cr. over five years for Indian flagged ships -** Subsidy support to Indian shipping companies in global tenders floated by Ministries and CPSEs for import
- **RoFR for Indian Shipyards (for shipbuilding) -** To boost shipbuilding activities in India, the Ministry of Shipping has amended Right of First Refusal (ROFR) licensing conditions. As per the amendment, for any kind of charter of a vessel undertaken through a tender process, the first priority for RoFR would be given to Indian built, Indian flagged and Indian owned vessels
- **Efficient and time-bound dispute resolution mechanism "SAROD – Ports" launched in 2020**

Despite the above initiatives taken by Government of India, raising capital for financing projects in the maritime sector is difficult due to various challenges faced by the maritime sector.

1.1.1.1. AVAILABLE OPTIONS TO MEET FINANCING REQUIREMENT OF MARITIME SECTOR

Table 32: Available options for financing in maritime sector

Parameter	1. Banks	2. Wholly owned by Government (EXIM Bank, IIFCL)	3. External Commercial Borrowings	4. New proposed DFI (National Bank for Infrastructure and Development)
Structure	Private or public banks	Owned by GoI and has been operating in	Borrower can raise capital from foreign lenders in compliance	Owned by GoI and dedicatedly set-up for

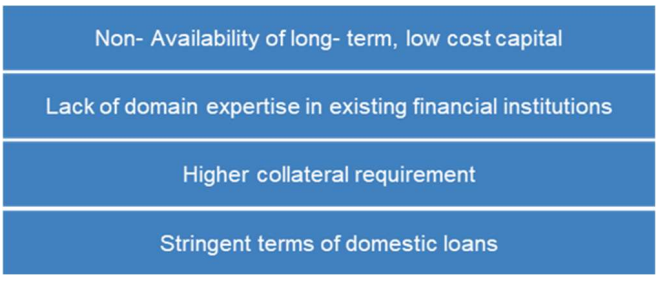
Parameter	1. Banks	2. Wholly owned by Government (EXIM Bank, IIFCL)	3. External Commercial Borrowings	4. New proposed DFI (National Bank for Infrastructure and Development)
		infrastructure and related assets sectors	with RBI ECB guidelines	infrastructure financing
Ability to raise low-cost capital in line with Global competitive rates	×* Primary source of capital is deposits	× Restricted by country's sovereign rating	× Financial position of maritime companies and sovereign rating put constraints on maritime companies to raise low-cost capital	× Restricted by country's sovereign rating
Arranging long-term capital	× Asset-liability mismatch	✓	✓	✓
Coverage of all maritime sub-sectors *(Infrastructure and non-infrastructure sub-sectors)*	✓	✓	×	×
Structure	Private or public banks	Owned by GoI and has been operating in infrastructure and related assets sectors	Borrower can raise capital from foreign lenders in compliance with RBI ECB guidelines	Owned by GoI and dedicatedly set-up for infrastructure financing

**Bank Loan – Bank reference rate + margin (11-13% INR terms)*

As indicated above, Commercial Banks, NBFIs such as IIFCL, ECBs and the newly proposed DFI are the available key lending instruments/ institutions in the maritime sector. Commercial Banks may find it difficult to provide long term capital of tenure 15-20 years (including moratorium period) due to inherent Asset & Liability Mismatch (ALM) constraints. Moreover, Banks have become cautious in lending due to rise in NPAs in the sector. Further, Government-owned financing institutions face difficulty in raising international capital at global competitive rate as their credit ratings are restricted by India's sovereign rating (BBB-[27]). Financial position of maritime companies coupled with sovereign rating put constraints on maritime companies to raise low-cost capital through External Commercial Borrowing route. The newly proposed DFI would also face constraint to raise capital at global competitive rate due to lower sovereign rating of India compared to other advanced economies. Moreover, the DFI is proposed to be focused on infrastructure sector. Shipping (Vessel financing, leasing and acquisition) has not been granted 'Infrastructure' status and therefore, would not come under the ambit of DFI.

CHALLENGES

The financing of projects in the maritime sector is a challenge primarily due to non-availability of long-term capital at competitive rates. Further, there are issues such as lack of domain expertise in existing domestic financial institutions, stringent terms of domestic loans for small & new shipping companies and higher collateral requirement by domestic Banks/ Financing institutions which restrict financing in the maritime sector. International institutions rely on credit rating of borrowers for investment. Given lack



[27] Fitch Ratings 2021

of robust track records of maritime companies and low sovereign credit rating (India – 'BBB -'), raising capital at global competitive rates becomes difficult. Further there are sector specific challenges which are mentioned below:

Table 33: Challenges in maritime sector

Sector	Requirements/ Challenges
 **Port and Inland waterways**	• **Large capital requirement with long payback period** - Port and Inland waterways infrastructure projects are capital intensive with large financing requirement. With an upfront high capital expenditure, such projects have a longer breakeven period and thus require longer debt repayment period. • **Visibility on future cargo traffic is difficult during financing which restrict availability of funds** - Forecasting future cargo traffic at ports are subjective in nature as it depends on various factors such as traffic in competing facilities, trade relations, trade cyclicity, regulatory dynamics, first and last-mile connectivity, type of cargo to be handled, port's model of governance. Due to these factors, lending institutions define the risk spread over the base lending rate to arrive at the debt cost for projects • **Large greenfield projects in ports *(e.g. development of outer harbor)* and terminal development projects in inland waterways may require innovative financing mechanism** - Port and Inland waterways infrastructure projects being capital intensive requires the developer to have an optimum low-cost capital structure and thus require innovative financing/ funding mechanism such as sub-ordinate debt, preferential equity, and credit guarantee etc. to protect the returns from the project
 **Shipyards**	• **Cost disadvantage for Indian shipyards vis-à-vis foreign shipyards** → Cost disadvantage for India in comparison with leading shipbuilding nations such as China, Korea and Japan are mainly due to labor cost, other material & finance costs. • **Long trade cycle resulting in requirement of high working capital funds** – The long trade cycle leads to increased gap between receivable and payables from a project. Thus, requires funds to meet the high working capital requirement. • There is limited availability of capital for financing/ funding capex towards expanding product range – new vessels & services like ship repair • Size and credit quality remains a concern with international lenders
 **Shipping**	• **High rate of interest vis-à-vis other countries and low debt tenure vis-à-vis life of the vessels:** Foreign shipping companies compete directly with Indian ships for India's EXIM and coastal cargoes. Indian ships have to be internationally competitive. Currently, cost of funds in vessel financing is high and debt tenure is low vis-a-vis life of the vessel/barge (15-20 years for coastal, 25-30 years for inland). These factors affect the ability of Indian ships to compete as the per day cost of servicing loans is much higher compared with foreign ships

Particulars	Indian company	Foreign company
Cost of financing	16% (INR terms) LIBOR +600 bps (USD terms)	Not applicable LIBOR +100 bps (USD terms)
Loan tenure	6-7 years	10-12 years

• **Shipping sector is not considered under 'Infrastructure sector'** - Despite having long useful lives of 15 – 20 years[28], shipping sector, comprising ships & floating vessels, have been kept outside the Harmonised Master List of Infrastructure sub sectors. Because of this, both banks and financial institutes do not address capital intensive industries such as ship financing and leasing.

• **Non-acceptance of barges as collaterals by senior** lenders - Under current provisions of SARFAESI Act, a ship cannot become 'collateral' and cannot be attached and sold

• Size and credit quality remains a concern with international lenders

• There is lack of buyers' credit / other financial facilities supporting marketing of products

[28]Coastal vessel useful life - 15-20 years

To summarise, maritime sector requires a dedicated institution with sector specific experts for project appraisal and ability to provide low-cost, long-term capital. However, the available financing options does not meet the said requirements as depicted in subsequent section. Further, shipping sector to be granted 'Infrastructure' status which will make the sector eligible to access long-term capital at competitive rates from infrastructure focused financing institutions.

Figure 132: Key financing requirements in maritime sector

KEY INITIATIVES

POLICY INITIATIVE

GRANT 'INFRASTRUCTURE' STATUS TO SHIPPING SECTOR

The share of Indian flag ships in India's EXIM trade has steadily decreased from 40.7% in 1987-88 to just 6.53% in 2019-20 leading to foreign exchange outflow. Despite having long useful lives of 15 – 25 years, shipping sector, comprising ships & floating vessels, have been kept outside the Harmonised Master List of Infrastructure sub sectors. Because of this, both banks and financial institutes do not address capital intensive industries such as ship leasing. The Shipping sector has the potential to stimulate other economy through its backward and forward linkages and contributes significantly towards creation of jobs in the country. It is therefore proposed to grant infrastructure status to shipping sector. This will help in promoting a greater number of Indian flag vessels and promote AatmaNirbhar Bharat in shipping sector.

Providing 'Infrastructure' status to moveable assets is not a new concept in India. Ministry of Finance, Department of Economic Affairs, in its notification no. F. No. 13/1/2017-INF, had issued an updated Harmonised Master List of Infrastructure which included 'Railway rolling stock along with workshop and associated maintenance facilities' under Infrastructure sub-sectors. In similar lines, shipping sector may also be granted 'Infrastructure status'.

INSTITUTIONAL INITIATIVES

CREATION OF DEDICATED MARITIME DEVELOPMENT FUND

The constraints in accessing the low-cost, long-term capital by large segment of the maritime sector in India on the one hand, and the need for large financial resources to meet the investment needs in line with the declared aspirations of the GOI to develop a vibrant maritime sector on the other hand, necessitates the need for a comprehensive approach.

GoI in the past had setup several sectoral Financial Institutions (FIs) to cater to the large and specific financing requirements of the infrastructure sectors which led to their well-rounded development. A few of them are mentioned below:

Table 34: Sector specific financing institutions

#	Sector	Sector-specific Financing Institutions
1	Power Sector	• Power Finance Corp. Ltd. (Long Term Lending for Power Projects)

		• REC Ltd (Long Term Lending for Power Projects)
2	Railway Sector	Indian Railway Finance Corporation Ltd. (Leasing of Rolling Stock and Project Assets to Indian Railways).
3	Housing Sector	• HUDCO Ltd. (Long Term Lending to Housing sector) • NHB (Refinancing of Housing Loans)

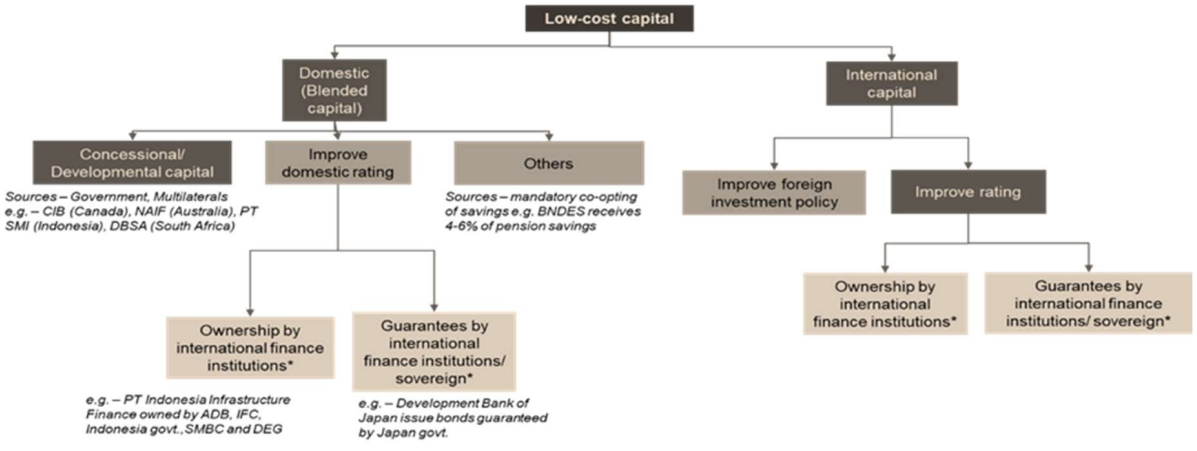
Above mentioned Financial Institutions, due to their sound knowledge about the sector, become borrower friendly by addressing / providing feasible solutions to the problems faced by borrowers due to sectoral issues. They also act as Facilitators / Nodal Agencies to implement the GoI initiatives / programmes to bring about structural reforms in their respective sectors. Also, sectoral FIs help their borrowers in improving their operational and financial performances by providing them technical and financial assistance for that purpose

Keeping the aforementioned key financing requirements of maritime sector and examples of sector specific financing institutions in India into consideration and a dedicated maritime sector focused institution - Maritime Development fund (MDF) is proposed. Further details on MDF are provided in "Offer maritime professional services" chapter.

Ways to arrange low-cost capital

Low-cost capital can be arranged through domestic (blended capital) and/ or international (institutional capital/ multi-laterals) as mentioned in the below figure. The key mechanisms to ensure low cost of capital for a financial institute would include supply of concessional/development capital from Government, ownership by high rated international financing institutes, mandatory co-opting of domestic savings (e.g. pension savings) and guarantee support from Government or international finance institutions.

Figure 133: Ways to raise low-cost capital



**Note –Having high credit rating (AA, AAA)*

Option 1: Dedicated maritime vertical under newly proposed DFI –The DFI will be 100% owned by Government of India. Therefore, cost of international capital at global competitive rates may not be possible as sovereign rating of India ('BBB-')[29] is low as compared to other advanced economies. The other way for option 1 to raise low-cost capital is the domestic (blended capital) wherein Government of India provides concessional capital to MDF.

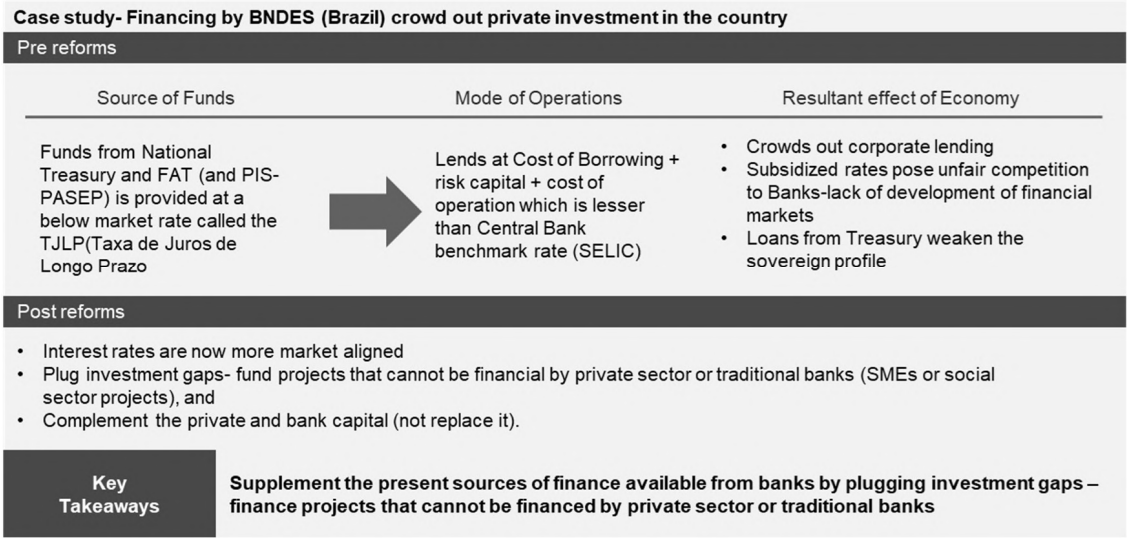
Option 2: Standalone MDF – High rated Multilateral/ Bilateral agencies (AA or above) have to take the majority ownership (51% or above) of the proposed MDF. Balance amount is initially proposed to be held by Ministry of

[29] Fitch Ratings, 2021

Ports, Shipping and Waterways (MoPSW), GOI directly or through its affiliated companies. This way superior rating can be obtained and MDF would be able to raise resources at a more competitive rate than what Indian entities/ sovereign entities would be able to raise globally and domestically.

However, it is to be ensured that low-cost financing does not crowd-out private investors. A good case study is of BNDES (Brazil) which was lending at less than the central bank's benchmark (SELIC) overnight interest rate. This made it hard for private lenders to compete as borrowings in Brazil are costly. Due to their credit worthiness, a large share of BNDES credit was going to large corporate players, who were best placed to receive funds from other private sources. As a result, private corporate lending was getting crowded out. Further, subsidized rates of lending by BNDES posed unfair competition to Banks and led to slower development of financial markets. However, post implementation of government reforms, BNDES interest rates become aligned to the market. BNDES shifted focus towards co-financing and reducing loan volumes in non-development finance areas. It focused more on areas where private credit market had failed such as lending to small and medium sized enterprises and for infrastructure finance.

Figure 134: Case Study - Financing by BNDES



Arranging long-term capital

There are two key stages of project life cycle – pre-commissioning stage and post-commissioning stage. Financing infrastructure at the pre-commissioning stage needs specialized capabilities to identify, evaluate and price 'construction period risks. Commercial banks are the largest financing institution in India which participate during pre-commissioning stage of an Infrastructure project. However, rising NPA in the sector has restricted the credit flow from Banks. The MDF is proposed to have sector specific experts to appraise projects and participate in financing of projects during pre-commissioning stage.

Institutional funds such as Insurance fund, pension funds prefer participating in post-commissioning stage of projects. Domestic Insurance and Pension market is growing fast and maturing. International Insurance and Pension funds actively looking for opportunities in India. However, there is low supply of viable and good quality operational projects. To overcome this, secondary deals to be encouraged that can allow banks to recycle their exposures post Commercial Operation Date of projects and flip over assets to long term institutional investors or listing of corporate bonds. It should be noted that cost of debt should not be same during pre-commissioning stage and post-commissioning stage of projects as risk are different at different stages. MDF can itself provide long term financing by channelizing long term capital from institutional investors or it can flip over the investment post commissioning of projects to long term institutional investors.

Board Structure of MDF

Maritime Development Fund is proposed to be developed as a mother fund with following considerations

Option 1: Dedicated maritime vertical under newly proposed DFI – The fund will be housed under the newly proposed DFI and will contain team of sector experts for project appraisal and evaluation.

Option 2: Standalone MDF – The fund will be constituted as a Company. Government of India and multilaterals to contribute 100% share capital. After establishment rating would change based on its shareholding and business performance. Option to divest in future for initial shareholders

Three institutes are envisaged under the mother fund

- **Non-Banking Finance Company** which primarily involved in lending activities
- **Investment vehicle/ Alternate Investment fund** which will participate in a project as an equity investor
- **Asset Reconstruction Company (ARC)/ Distress Fund -** To bring about a system for recovering Non-Performing Assets (NPAs) from the books of secured lenders and unlocking the value of Non-**Performing** Assets (NPA)

Figure 135: Institutes envisaged under Maritime Development Fund

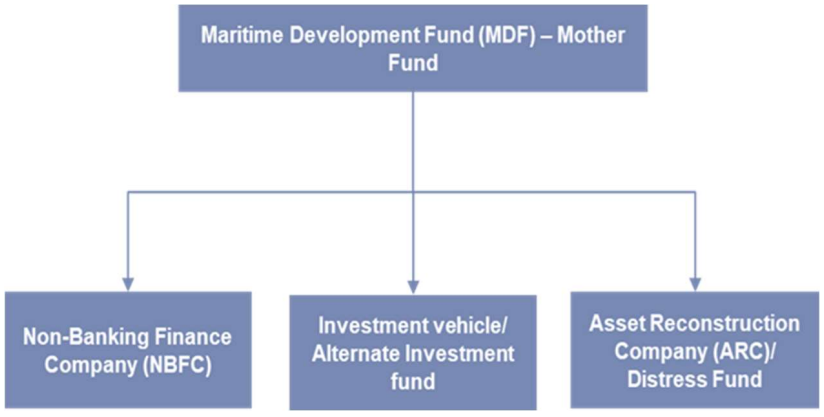
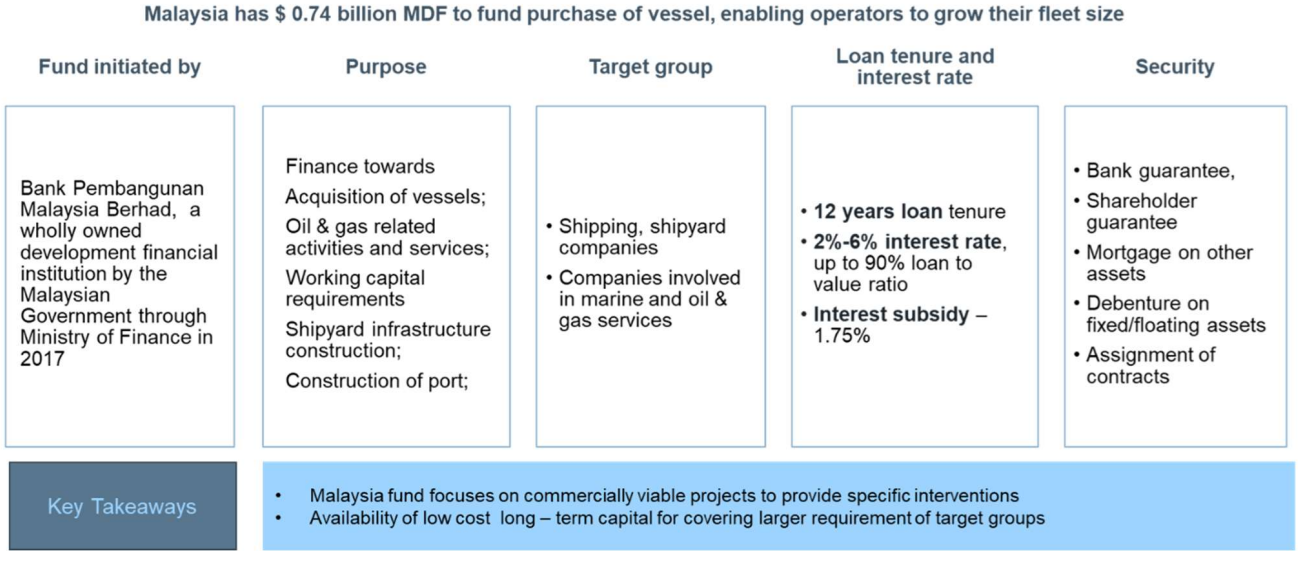


Figure 136: Case Study-Maritime Development Fund, Malaysia



Operationalizing MDF would require detailing on concept and partners

#	Key aspects	Considerations
1	Ownership	**Option 1** The fund will be housed under the DFI which is proposed to be fully government owned **Option 2**

		• Multilateral/ Bilateral agencies are proposed to take majority of the ownership to pierce sovereign rating • Government to approach Multilateral/ Bilateral agencies and present how MDF can provide value to the stakeholders and contribute to the overall economy
2	Regulatory provision	Review key amendments required in the existing regulation (NBFC-IFC, AIF, ARC) for efficient operation of MDF
3	Products to offer & corpus	Products to target considerations of arranging: • Low-cost, Long-term capital (e.g. BNDES Brazil, Maritime Development Fund Malaysia) • Attracting private sector (e.g. European Investment Bank, African Development Bank
4	Partners	Interactions with multilateral/ bilateral institutions to define role and institutional structure
5	Clarity on revenue potential for MDF	• Ringfencing of maritime projects revenues to create long term sustainability of fund e.g. Port VRC charges • Policy alignment for revenue streams of operational projects to flow to fund
6	Well defined appraisal mechanism	Guidelines on what type of projects will be evaluated, its review mechanism, targets to be achieved for disbursement, timelines for disbursement
7	Institutional structure to ensure robust implementation	Mechanism for coordination amongst various nodal agencies

Standing committee on transport, tourism and culture in its report dated 4th August 2021 has recommended **setting up a funding entity for maritime industry, like the Maritime Development Fund,** so that many of these initiatives, including requirement for reviving the shipyard industry can be supported.

MARITIME FINANCE

CURRENT LANDSCAPE

EXPEDITIOUS INSURANCE CLAIM SETTLEMENTS AND DEVELOPING REINSURANCE CAPABILITY IN INDIA

Insurance play crucial role in facilitation of maritime trade by providing security against losses and damages to the maritime property. However, it is not enough to simply pay the claims, but equally important is the quick indemnification of the covered losses. Expeditious settlement of insurance claims builds trust among the stakeholders involved in shipping business to continue their business activity without being worried about the consequences of financial losses caused to their property due to any fortuity. Further, faster claim settlement helps the Insureds to quickly recuperate from interruption in their business activity resulted from major casualties especially due to catastrophic losses.

Notwithstanding the points stated above, maritime incidents tend to be complex, complicated and time-consuming. Hence, a certain level of expertise is required among professionals handling these incidents

As far as reinsurance of maritime property risks is concerned, the Indian market has a large capacity to cover most Cargo and Hull risks. However, for insuring large vessels, offshore/ energy, Port package, and marine liabilities like P&I, Indian insurers depend on reinsurers for their expertise and capacity. Such policies are often backed by heavy reinsurance placements overseas.

CHALLENGES

At present, insurance claim settlement, process takes longer time compared to the other advanced markets overseas like Lloyds, which has developed ECF (Electronic Claim File) system, which ensures completely online and seamless claims experience to the policyholders. A closer look at the reasons for delay in settlement of insurance claims in India leads us to following root causes:

Manual paperwork and documentation – During filing of claim, high amount of paperwork and documentation is required. Further, the insured has to submit hardcopies of documents

Limited standardisation in marine policy

- Complex usage of policy wordings - Decoding insurance jargons can sometimes be confusing leading to multiple interpretations and delays
- Lack of standard proposal form in marine policies leading to issues of misrepresentation and non-disclosure at the time of claim
- Due to lack of standard Express Warranties and limited knowledge of drafting warranties, many claims get disputed

Claim process

- Limited standardization of the practices followed by the insurers during claims (e.g. agreeing to a panel of surveyors in policies, providing bank guaranties in collision cases, making direct payments of repair cost to shipyards etc.)
- Surveyors with no maritime background are being appointed to assess marine losses. Since the marine hull line of business is a specialized field, Surveyors need to be experienced and up to date with the latest developments in the area.
- Non-existence of arbitration clause for dispute resolution precludes any possibility of amicable settlement between the stakeholders

Reinsurance market capacity constraints - The available capacity of insurers is only that much which is representative by their absolute net retention. Therefore, many such risks are covered on Combined single limit (CSL) basis which is inadequate. Foreign reinsurers with presence in India prefer such risks to be underwritten in London or other reinsurance centers in the world. This is the reason for cession of reinsurance premium to overseas reinsurance centers / reinsurers. Further, there is limited expertise and experience of underwriting some risks e.g. cyber risks, shipments by drones.

KEY INITIATIVES

POLICY/ REGULATORY INITIATIVES

INCREASE AUTOMATION IN CLAIM SETTLEMENT FOR SMALL AND MEDIUM SIZE CLAIMS

Explore ways to increase automation and reduce paperwork in the claim settlement process for small and medium size claims (mainly of inland, fishing and sundry vessels)

Standardization in the claim settlement process

- Develop common understanding between insurers about use of standard proposal forms (marine policy document) for small and medium size claims
- Develop common understanding between insurers about standard practices to be followed at the time of claims such as issuance of bank guaranties, making direct payments to yards, inclusion of arbitration clause in marine policy document, setting-up arbitration committee etc.

Engaging seafarers for survey - Provision to be made in IRDAI (Insurance Surveyors and Loss Assessors) Regulations, 2015 to allow experienced seafarers/ maritime professionals in loss assessment

Reinsurance capacity creation - Development of reinsurance capacity is a long-term development. In order that the market starts developing its capacity, the ports can create a pool on a contribution basis based on the following criteria as a short-term solution:

- Type of cargo handled
- Tonnage of cargo handled
- Revenue earned
- Geographical location
- Risk survey
- Past loss experience

Ports can retain certain part of the risk at the pool level, and they contribute to the pool, which will entertain liability up to a certain amount. The next portion called the 'Primary Layer' can be the available capacity of the Indian market. This will be fully retained in the market and will be fully administered by an Indian insurance company with assistance of nominated risk managers and loss adjusters. Over the primary layer, Indian reinsurers can deploy capacity by pooling and that would add to the first layer above the primary or one can structure excess of loss reinsurance on a layer basis and price it appropriately so that ports pay appropriate premium for higher capacity requirement. With better risk management and improved loss experience, market retention can be increased thereby increasing reinsurance capacity.

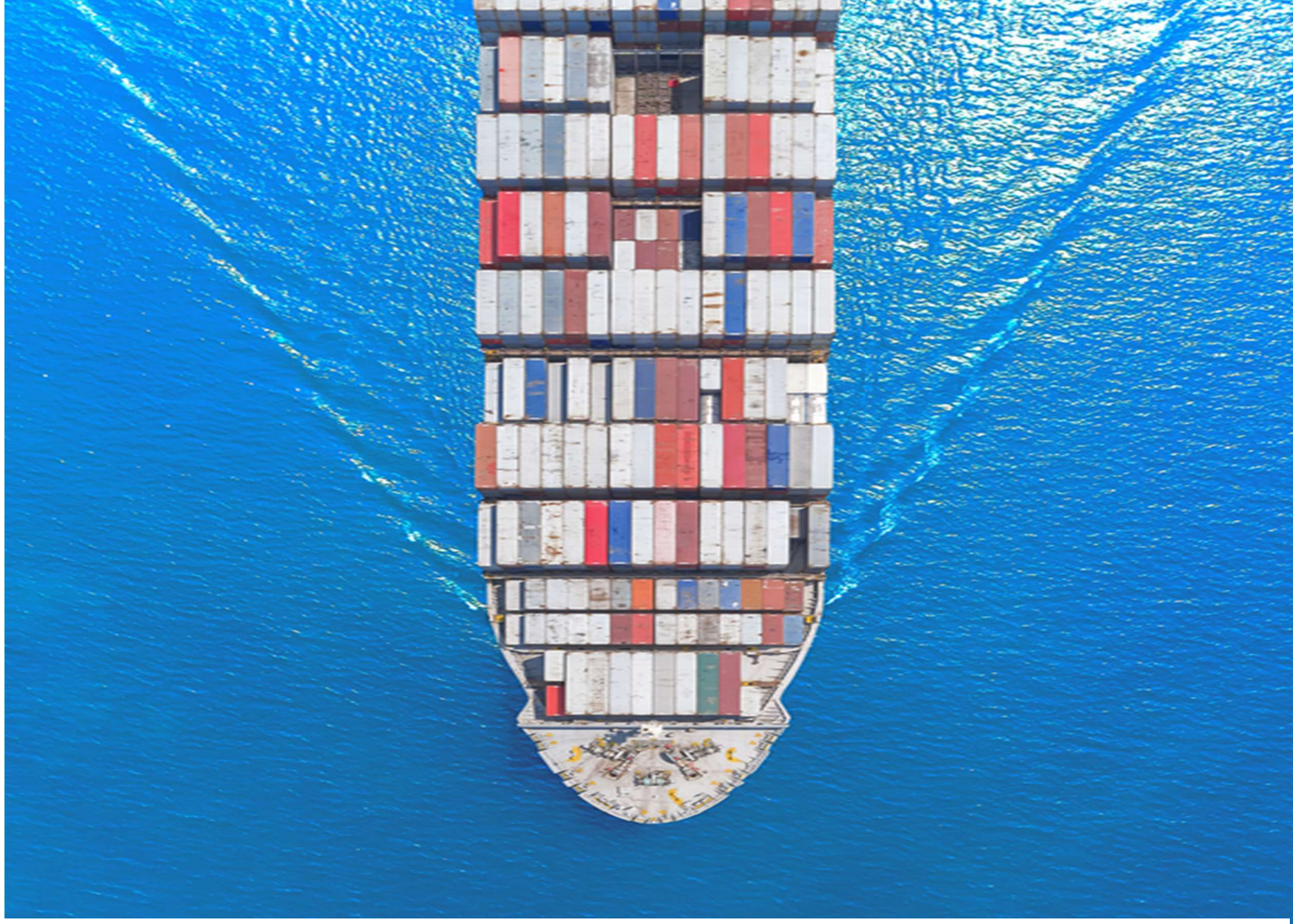
Optimum exploitation of P&I market – Government can explore possibilities for P&I clubs setting up their offices in India. Alternatively, a P&I insurance cover may be provided with support from GIC (Presently New India Assurance Company offers P&I cover with a limited capacity of $15 million with support from a overseas reinsurer).

KEY PERFORMANCE INDICATORS

Metric	Status (as of 2021)	Target (2030)	Target (2047)
India's position as leading 'Dispute Resolution Centre in the World'	-	Top 10	Top 5
Presence of centralised fund pool focusing at maritime sector	0	1	1
Time taken to settle claims (working days) for small and medium claims*	63-84 days	30-45 days	15-30 days

Theme 6

Become a global player in Shipbuilding, Repair & Recycling



SHIP BUILDING

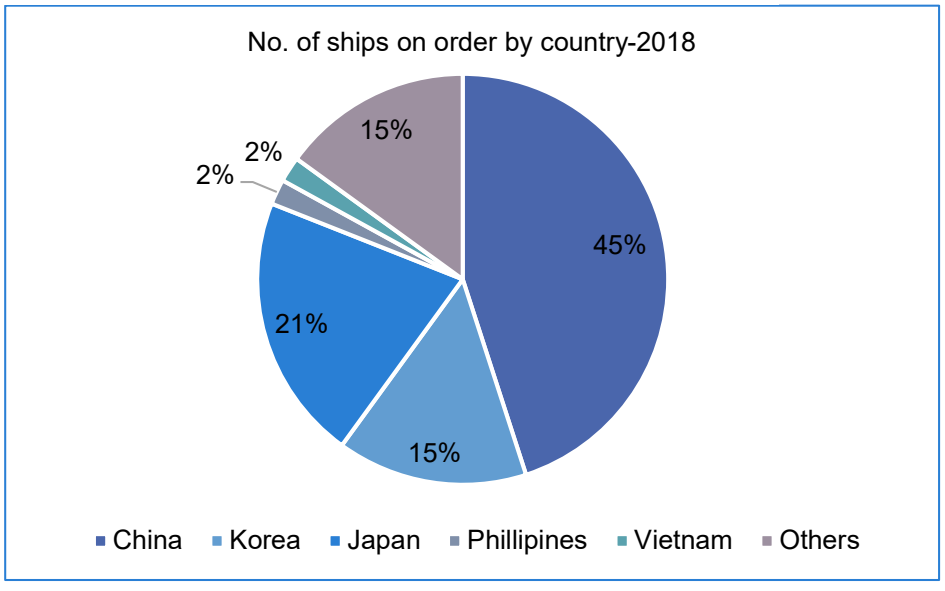
CURRENT LANDSCAPE[30]

Shipbuilding is technology driven, skill and material intensive assembly operation. Being a labor-intensive industry, the cost of labour plays an important determinant in a country's competitive position vis-à-vis others. Over the years, the industry has shifted from Europe to Japan and then to Republic of Korea and has now taken firm roots in China.

The factors governing this shift have been relatively high wage in Europe coupled with strong competitive strength of manufacturing and steel making sectors and active state support in the leading shipbuilding nations of East & Far East Asia. This decisive shift in shipbuilding activities from Europe to Asia has opened up window of opportunities for Indian shipyards in both public and private sectors. Over 80% of shipbuilding in 2018 occurred in China, the Republic of Korea and Japan.

Below chart suggests that China, Japan and Republic of Korea, were the top three nations[31] which accounted for a global share of 45%, 21% and 15% respectively in number of ships on order in 2018. Also, China, Japan and Republic of Korea were the top three nations which accounted for a global share of 36.3% 20.4% and 23.7% respectively in ships on order in terms of gross tonnage in 2018.

Figure 137 Country statistics: no. of ships on order, 2018



CURRENT INCENTIVES FOR INDIAN VESSELS

Presently, there are two major incentives currently for Indian vessels:

[30] Statistics of India's Ship Building and Ship Repairing Industry- Report 2019
[31] Statistics of India's Ship Building and Ship Repairing Industry- Report 2019

ROFR LICENSING CONDITIONS FOR CHARTERING OF VESSELS/SHIPS THROUGH TENDER PROCESS

To promote the demand of the ships built in India, priority in chartering of vessels is given to vessels built in India, flagged in India and owned by Indians under the amendments in the guidelines of ROFR (Right of First Refusal). Now it has been decided that for any kind of charter of a vessel undertaken through a tender process, the Right of First Refusal (RoFR) would be exerted in the following manner:

- Indian built, Indian flagged and Indian owned
- Foreign built, Indian flagged and Indian owned
- Indian built, foreign flagged and foreign owned

Provided that:

- All vessels flying the flag of India (i.e. registered in India) up to the date of issue of new circular by the Director General of Shipping shall be deemed to be Indian built vessels and will fall in category (i) above and
- The foreign flagged vessels permitted by DG (Shipping) under Section 406 of the Merchant Shipping Act, 1958 for chartering by an Indian citizen/company/society, who is building a ship in an Indian shipyard for registration under the Indian flag, as a temporary substitute for the Indian ship under construction, meeting the following two conditions shall be deemed to fall under Category (i) above.
    - 25% of the contract money has been paid to the Indian shipyard
    - 50% of the hull fabrication has been completed, as certified by recognised organisation.

SHIP BUILDING FINANCIAL ASSISTANCE POLICY (2016-2026)

To encourage domestic shipbuilding and to provide a level playing field vis a vis foreign shipyard, the Union Cabinet approved an INR 4,000 Crores Financial Assistance Policy (FAP) for Indian shipyards for a period of 10 years, for contracts secured between 01.04.2016 and 31.03.2026. Under this scheme financial assistance equal to 20% of the lower of "Contract Price" or the "Fair Price" will be extended to Indian Shipyards for each vessel built by them. This rate of 20 per cent will be reduced by 3 per cent every three years. Provided that at the time of release of financial assistance, if the actual payment received for a vessel is lower than the contractual price or fair price then financial assistance will be given on the actual payment received.

Table 35 Shipbuilding Financial Assistance Policy: Rates and Budget over the years

S. No.	FY	Rate of Financial Assistance (%)
1	2016-2017	20 %
2	2017-2018	20 %
3	2018-2019	20 %
4	2019-2020	17 %
5	2020-2021	17 %
6	2021-2022	17 %
7	2022-2023	14 %
8	2023-2024	14 %
9	2024-2025	14 %
10	2025-2026	11 %

The current incentives seem to have had a limited impact on attracting tonnage to the Indian flag. Further, the COVID-19 pandemic has disrupted almost every area of the shipping industry, after a promising 2019, with yard closures, logistical challenges and other delays.

NECESSITY OF STRONG SHIPBUILDING INDUSTRY

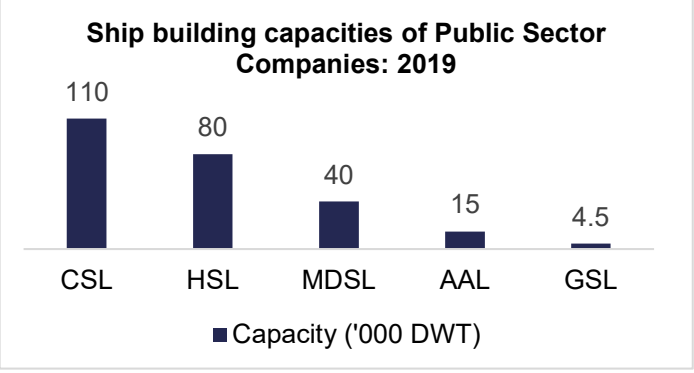
Shipbuilding is a strategic multiplier industry i.e., it drives growth in many manufacturing sectors as well as generates huge employment opportunities on account of strong linkages with multiple industrial sectors such as heavy engineering, electronics, iron & steel etc. Growth in shipbuilding drives the growth of the entire economy as shipbuilding industry has one of the highest investments and employment multipliers of any industry. In addition, shipbuilding can play a role of mother industry to heavy engineering (casting, forging etc.), similar to the role played by automobile industry in light engineering space.

In addition to the economic role played by the shipbuilding and ship repair industry, it also plays an extremely important role in helping maintain the maritime security of a nation. India has a large and growing navy and coast guard services which would require significant domestic shipbuilding capacities. Currently 37[32] out of a total of 39 Indian Navy warships under construction are being built in Indian Shipyards.

INDIAN SHIPPING TODAY

At present Indian shipbuilding industry has less than 1% of global share. Keeping in view that India has a coastline of 7500 km, inland water ways potential of over 20,000 km, shipbuilding has been identified as one of the key sectors under the 'Make in India' initiative.

Figure 138 Shipbuilding capacity of public shipyards, India

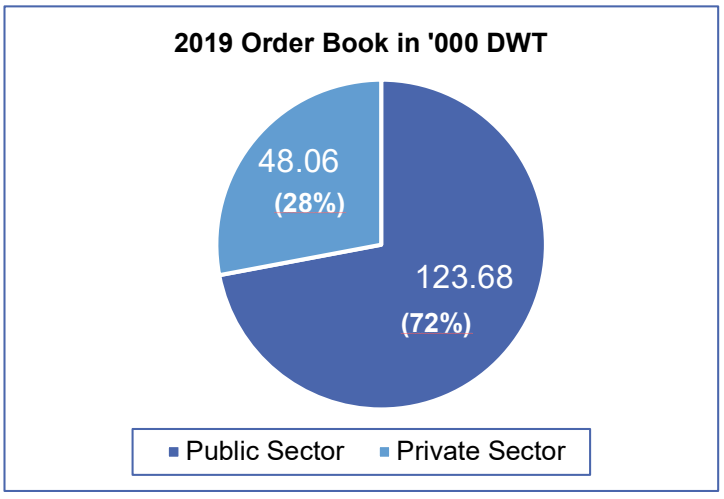


Amongst public sector companies [33], Cochin Shipyard Ltd. (CSL) possessed the maximum ship building capacity (110 thousand DWT) followed by Hindustan Shipyard Ltd. (HSL) (80 thousand DWT), Mazgaon Dock Shipbuilders Ltd (MDSL) (40 thousand DWT) and Alcock Ashdown Ltd (AAL) (15 thousand DWT). There are private sector companies as well such as Chowgule & Co. Ltd. (C&CL), Titagarh Wagons Ltd. (TWL), Timblo Drydock Pvt. Ltd. (TDPL), Mandovi Drydocks Ltd. (MDD), Udupi Cochin Shipyard Ltd. (UCSL), etc. which further adds to the shipbuilding capacity of India

Indian ship-building companies at the end of 2018-19 had **orders of 188 ships** with gross **DWT 171.75 thousand tons**. As on 31st March 2019 the public sector shipyards had orders of **111 ships of 123.68 thousand DWT** from domestic companies. Amongst reporting companies, in terms of numbers, Cochin Shipyard Ltd. (47) had the highest number of ships on order followed by Hindustan Shipyard Ltd. (16), Garden Reach Shipbuilding & Engineers Ltd. and Mazagaon Dock Shipbuilders Ltd. (14 each) and Goa Shipyard Ltd (9). Order book in terms of DWT was highest for Hindustan Shipyard Ltd with 58.32 thousand DWT, followed by Cochin Shipyard Ltd. with 49.27 thousand DWT and Garden Reach Ship- Building & Engineers Ltd. with 8.40 thousand DWT.

[32] Data based on comments provided by Indian Navy
[33] Statistics of India's Ship Building and Ship Repairing Industry- Report 2019

Figure 139 Order book of shipyards, public and private, India, 2019



In private sector category as on 31st March 2019, the shipyards had orders for **77** ships of total **48.06 thousand DWT**. Out of these, 14 ships with total capacity of 31.78 thousand DWT were export orders and remaining 63 ships with total capacity of 16.28 thousand DWT were domestic orders. Amongst the reporting ship building companies in the private sector, Reliance Naval & Engineering Ltd.[34] (28) had the highest number of ships on order with a total capacity of 1.50 thousand DWT followed by AC Roy & Co. (17) with a total capacity of 0.60 thousand DWT and Vijay Marine Shipyards (9) number of ships on order with a total capacity of 3.31 thousand DWT in 2018-19.

In terms of tonnage order book, the public sector and private sector accounted for a share of **72.0%** (123.68 thousand DWT) and **28.0%** (48.06 thousand DWT) respectively in the total tonnage (171.75 thousand DWT) of order book during 2018-19.

SUBSIDY AND BUDGETARY SUPPORT FOR DEVELOPMENT OF SHIPBUILDING SECTOR[35]

A number of measures have been initiated by Ministry of Ports, Shipping & Waterways to improve the viability of the ship manufacture and ship repair industry and encourage private sector participation, with emphasis on research. Following are some of the important recommendations with regards to the same:

- Government of India is supporting Indian shipbuilding industry since **1971** by various policy measures such as pricing policy and shipbuilding subsidy policy. However, these policies were only applicable to Central Public Sector Shipyards building commercial vessels viz. Hindustan Shipyard Ltd., Visakhapatnam in 1971. Later, in **1972** Cochin Shipyard was established and the policies were applicable to them also. The policies were modified from time to time in 1981, 1993, 1995, 1997 and 2000. In October **2002**, Government of India extended the shipbuilding subsidy scheme to all Indian shipyards including Non-Central Public Sector Shipyards and Private Shipyards. To make existing shipbuilding scheme applicable to all shipyards, following modifications were made:
    - For domestic orders obtained only through global tender process for construction of sea going vessel as defined under section 3(41) of Merchant Shipping Act 1958, 30% on the bid price at which the global tender was won was payable to the yard. However, the vessel was to be a merchant vessel of minimum length of 80 meters.
    - For export orders obtained through global tender process or otherwise for construction of any type/size of vessel, 30% subsidy on the bid price or reasonable price in case of negotiated orders, was payable to the yard. Price reasonableness certificate was issued by DG (shipping) for negotiated orders.
    - The shipbuilding subsidy scheme was applicable for those shipbuilding orders whose contracts were signed up to 14.08.2007. In Feb. 2009, the CCEA approved liquidation of committed liabilities amounting to Rs. 5152 crores for 228 vessels and for which contracts were signed up to 14.08.2007. The following decisions were taken by CCEA:
        - That subsidy to be released for all the cases for which contracts had been signed by 14.08.2007, as it is the committed liability of the Government of India. Subsidy will be released as per the guidelines

[34] Currently not operational (as per the information received from Cochin Shipyard Limited)
[35] https://shipmin.gov.in/sites/default/files/SBR_compressed.pdf

modified from time to time and subject to submission of requisite documents in the format prescribed. Accordingly, budgetary provision of Rs. 5152 crores approx. may be approved for the period 2008-09 to 2013-14

  - Department of Shipping, Ministry of Shipping, Road Transport & Highways has made budgetary provisions for all shipyards except Defence Shipyards. Ministry of Defence made budgetary provisions for Defence shipyards under the administrative control of Ministry of Defence
  - A new scheme incorporating modified quantum and conditions for subsidy/fiscal measures for all contracts signed after 14.08.2007 is submitted

- Modified guidelines were issued on 29.09.2009. Till 31.03.2014, subsidy has been released for 121 vessels amounting to Rs. 1142 crore. Partial subsidy (10%/20%) has been released for 47 vessels. Full subsidy has been released for 74 vessels.
- A Ship Building Financial Assistance scheme was also launched with an assistance for INR 4,000 Crores for Indian shipyards for a period of 10 years, for contracts secured between **01.04.2016** and **31.03.2026**.

POLICY SUPPORT IN OTHER COUNTRIES

POLICY SUPPORT MEASURES IN CHINA, KOREA, JAPAN AND BRAZIL

Policy measures pursued by other key shipbuilding nations like Korea, China, Japan and Brazil suggest that each country has pursued a mix of fiscal & non-fiscal incentives for encouraging development & growth of shipbuilding industry.

- In Korea, shipbuilding industry was supported in the initial years by key measures such as:
  - Direct subsidies of 30% on the price of each vessel introduced in 1968 which continued till 1986, by which time it had more than 20% market share of global industry.
  - Loans (both long term and working capital) provided at interest rates as low as 5% - 6% per annum with maturity terms of up to 10 years.
  - Exemption from a host of internal taxes for shipbuilding sector such as commodity tax, petroleum tax etc.
- In recent years, Korean government has assisted the shipbuilding industry in Korea through following steps:
  - All major Korean shipyards have access to government funded R&D efforts which substantially reduces their R&D costs
  - Korean government provides loan guarantees to domestic shipyards
  - Korean government provides for debt write offs in case of merger of weaker shipyards with financially stronger. This allows large shipyards to acquire shipbuilding assets at substantially low costs
- In China, the shipbuilding industry was supported during the initial years as follows (before 2008):
  - 17% subsidy on prices for Chinese Ship buyers for buying from domestic shipyards
  - Loans provided at interest rates as low as 2.7% per annum for both foreign buyers (Export Buyers Credit) of ships and domestic shipyards (Export seller's credit) selling ships for export.
  - Low interest-bearing working capital loans to shipyards for selling ocean carriers and export equipment domestically
  - Low interest-bearing credit facility to Chinese buyers for acquisition of vessels from Chinese shipyards Loss reimbursements to domestic shipyards

- After the 2008 financial crisis, the Chinese Government released the “Adjustment and Revitalization Plan in 2009” and “Five Year plan for Shipbuilding Industry” aimed at stimulating the industry and boosting China shipbuilding output to $188 Billion by 2015 respectively. Policy measures introduced in the plans were as follows:
  - Continued direct subsidy of 17% for Chinese ship buyers for buying from domestic shipyards.
  - Continued loans at preferential interest rates
  - Offered loans to foreign companies buying China made ships
  - Income/ Corporate Tax Exemption for up to 5 years
- Along with China and Korea, Japan continues to support its domestic shipbuilding industry and currently provides the following incentives:
  - Officially supported export credit: Export credit is provided in the form of financing and insurance where financing is provided by Japan bank for International Cooperation (JBIC) which is a state-owned export agency. Export credit insurance is provided to buyers or shipbuilders by Nippon Export and Investment Insurance which is also a state-owned export credit agency. Terms include minimum down payment of 20% of contract price, repayment term of 12 years, commercial interest reference rates established by participants of OECD, and equal principal repayment scheme.

POLICY MEASURES IN OTHER COUNTRIES

The table below highlights some of the measures introduced by the government of some other shipbuilding nations to improve access to low-cost funds.

Table 36 Case studies: global maritime nations and their financial assistance for low-cost indigenous shipbuilding

Country	Financial Assistance for improved access to low-cost funds to ship building sector
Vietnam	• Providing Vinashin (a state-owned multi-sector corporation with a shipbuilding division) with preferential loans • Allowing shipbuilders to retain total corporate income tax and capital-use tax for reinvestment (valid from 2002-2010) • Exemption on export taxes and land rent • Government to provide 50% of working capital requirements to State Owned Shipyards • State Development fund to provide loans (12 months payback and 2 years grace period) to cover infrastructure costs of new shipyards • Restriction on secondhand import of ships through import tariffs as high as 15% in certain categories of ships
U.S. A	• Price differential subsidy for constructing a vessel in foreign versus domestic shipyard
E. U	• Preferential interest rates
Russia	• Subsidized interest rate loans for shipbuilding
Turkey	• Financing through EXIM bank under incentive schemes for shipbuilding.

CHALLENGES

HIGH COST AND AVAILABILITY OF CRITICAL INPUT MATERIAL- RAW MATERIAL, MANPOWER AND TECHNOLOGY[36]

Indian shipyards face stiff competition in domestic markets (procurement of ships by Central/ State Government) as they have no protection against foreign shipyards due to absence of tariff barriers; Indian shipyards outbid by foreign shipyards in Indian and Global markets [Cost disadvantage of 20%-35%* vis a vis foreign shipyard].

Figure 140 Cost break-up of Indian vis-a-vis foreign shipyards

Breakup of cost disadvantage of Indian Shipyards vis-à-vis Foreign Shipyards:

- Taxation and Duties (4%-10%)
- Freight Charges (2% - 3%)
- Bulk Discount (5% – 10%)
- Design (2% - 4%)
- Interest Costs (5% - 6%)
- Other Costs (2% - 3%)

India has the lowest labor costs amongst the competing countries like China, Japan & Korea. The labor cost per worker in India is estimated at $1,192 per year, against $10,743 and $21,317 per worker in leading shipbuilding countries like South Korea and Singapore. However, this advantage is not translated into cost effectiveness because of factors like reliance on imports of critical raw materials and higher financing costs etc. From raw material perspective, India relies on imports for most of the inputs consumed in shipbuilding which puts cost pressures on Indian shipbuilding firms. On the other hand, China is one the cheapest steel manufacturer in the world which helps its yards to reduce costs and lower their shipbuilding prices in the global market.

Figure 141 Challenges faced by Indian shipyards in shipbuilding

1. **Spikes in cost of operations for Indian Shipyards**
2. **High dependence on ancillary industries creates barriers on private shipyards**
3. **High cost of raw materials and required capital unavailability/ taxes**
4. **Present work force has limited exposure to global practices and productivity strategies**

CHALLENGES IN DEBT FUNDING

[36] https://globalmaritimehub.com/wp-content/uploads/attach_608.pdf

The Indian shipbuilding, ship repair and IWT sector have all been declared 'Infrastructure' and are therefore entitled to long term, low-cost funds. Shipping is not infrastructure. However, shipping assets have a useful trading life of 15-25 years and therefore requires long term funding. Indian banks currently provide debt funds with a tenor of 5-6 years. Further, the cost of funds for Indian banks is high and consequently the cost of FOREX as well as rupee funds is extremely high as compared to what is available to foreign flag shipping companies in their home countries. Therefore, there is a need to ensure that long term, low-cost funding is made available for acquisition of new and second-hand shipping tonnage to Indian shipping companies.

Figure 142 Financial issues in Indian shipbuilding sector

In China, the government provides sovereign refund guarantees for certain class of vessels, thus removing any related burden on the shipyard. In Korea, shipyard financing has matured, and the evolved mechanisms drive the cost lower.

LIMITED NUMBER OF SHIPYARDS IN INDIA

There are 8 public and 20 major private sector shipyards in India. Out of 28 shipyards, 2 are under the Ministry of Ports, Shipping & Waterways, 4 are under the Ministry of Defence, 2 are under the control of State Governments and rest in private sector.

Most of these shipyards are currently engaged in building most of the Indian Navy (IN)'s warships and Indian Coast Guard (ICG) vessels, besides a few commercial ships to meet the government's requirements.

Figure 143 Current landscape of shipyards in India

The major shipbuilding nations have high number of shipyards as shown below:

Table 37 Number of shipyards in major maritime nations

Number of Shipyards	
China	Over 450
S. Korea	Over 400
Vietnam	~60
Brazil	21

U. S	117

LIMITED CAPACITY OF PRIVATE SECTOR SHIPYARDS

Indian shipbuilding industry suffers from lack of infrastructure and capacity. Within the three shipyards in the public sector, the dry-dock at Cochin Shipyard currently possesses maximum ship-building capacity of approximately 1,10,000 DWT. This will be enhanced to approximately 2,00,000 DWT when the new dry-dock at CSL is commissioned (likely by December 2022). Another four public yards are under Department of Defense Production, all mostly dependent on orders from the Indian Navy, Coastguard and the government.

Private sector shipyards can build vessels up to cape size vessels comparable to some of the leading shipyards in the world. Reliance Naval Engineering Ltd.[37] can build vessels up to 400,000 DWT and L&T Shipbuilding, Kattupalli up to 300,000 DWT, which includes large LNG Carriers. Smaller size LNG Carriers, Dredgers and other specialized vessels can be built by other shipyards also in the private sector, such as Shoft Shipyard, Chowgule & Co., Vijai Marine Shipyard, Mandovi Dry Docks, A.C. Roy & Co., Dempo Shipbuilding, etc.

At about 30,000 mt. DWT, the tonnage delivered by these yards in 2019-20 is quite insignificant. The yard orderbook is also low at 118,000 mt. DWT. While adverse market conditions are certainly to be partly blamed for the low performance, it is generally presumed that worker productivity in Indian yards is lower than global standards.

LACK OF SKILL DEVELOPMENT AND R&D CAPABILITIES

The major shipbuilding countries viz. Japan and South Korea have taken special efforts towards skill development and R&D of the shipbuilding industry. Japan established Shipbuilding Skill Development Centre in 2004, to develop training material and prepare necessary equipment to support training efforts. With respect to R&D and innovation, Japan's key measures include creating replacement demand by developing environmentally friendly and safer ships. During the 1980s, the South Korean government promoted University-Industry R&D activities which resulted in several collaborative initiatives. Recently, the Ministry of Knowledge Economy of South Korea has initiated convergence of shipbuilding and IT sectors to support the Smart Ships agenda. However, in India there is limited investment in R&D in ship designing and innovation.

NO UNIFIED PLATFORM FOR SHOWCASING THE PRODUCTS AVAILABLE FOR SHIP BUILDING

Currently, there is no unified platform for showcasing the products available for ship building. To be in line with international standards and the global market, a unified platform for showcasing the products available for ship building is required.

Korean Marine Equipment Association (KOMEA)	China Association of National Shipbuilding	Japan Shipping and Marine Equipment Association

KEY INITIATIVES

OFFSET COST DIFFERENTIAL THROUGH FINANCIAL ASSISTANCE

[37] Currently not operational (as per the information received from Cochin Shipyard Limited)

The existing policy for financial assistance to Indian Shipyards for shipbuilding contracts– Shipbuilding Financial Assistance Policy (approved by Government of India on 9th December 2015) is effective for shipbuilding contracts signed during the period- 1st April 2016 to 31st March, 2026.

This policy may be further extended for a period of 5 to 10 years at a rate of Financial Assistance in the range of 15% to 20% to attract more ship building contracts and boost the overall eco-system.

ESTABLISH A MARITIME DEVELOPMENT FUND

Keeping the key financing requirements of maritime sector and examples of sector specific financing institutions in India into consideration and a dedicated maritime sector focused institution - Maritime Development fund (MDF) is proposed. It can be either housed under the newly proposed DFI (National Bank for Infrastructure and Development) by Government of India or set up as an independent institution.

Option 1: Dedicated maritime vertical in the newly proposed DFI	Option 2: Standalone Maritime Development Fund

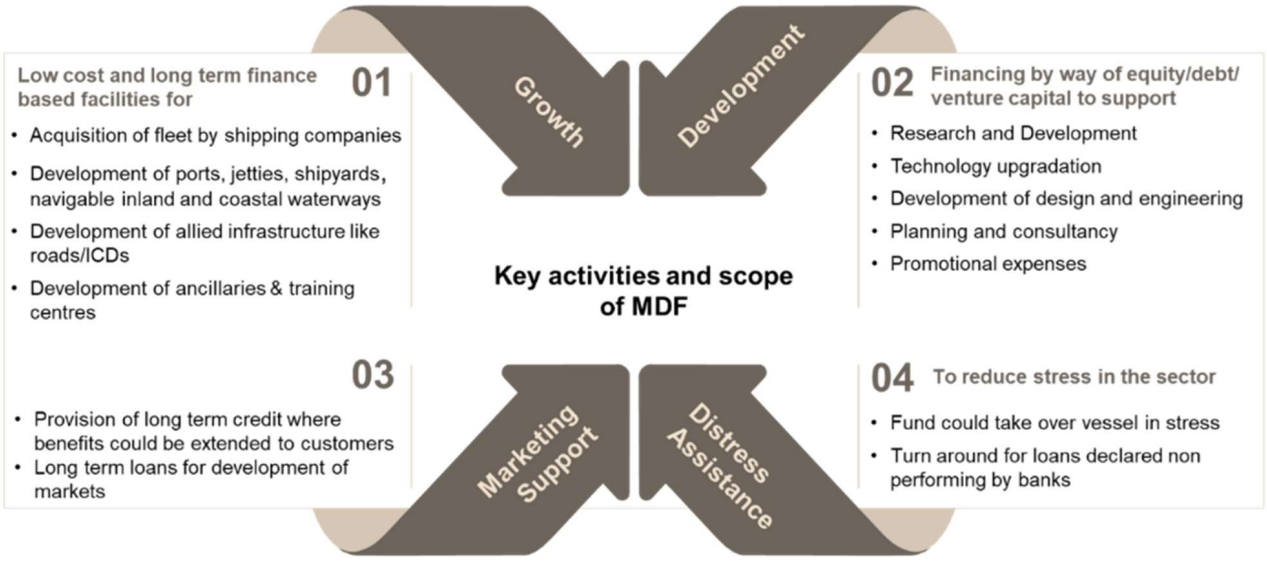
Objective, Key activities and scope of MDF

MDF shall be a fund corpus to enable raising long term capital from the domestic and international markets and on lend such capital to the maritime sector. The key objectives of MDF are as follows:

- Provide competitive long term financial assistance to maritime sector
- Supplement the present sources finance available from banks
- Design financing schemes appropriate for individual sector

MDF can be aligned to support multiple areas to promote maritime infrastructure and increase private participation. It will engage in financing through different financing instruments such as debt, equity, viability gap funding for growth and development of maritime sector. It will also engage in financing for marketing support to shipping companies for attracting cargo and buyers' credit support for ship building sector. It will provide other innovate financing instruments such as credit enhancement, guarantee support to maritime companies. Further, it will also provide distress assistance to maritime sector.

Figure 144 Key activities and scope of Maritime Development Fund



IMPLEMENT ATMANIRBHAR BHARAT PROVISIONS

There needs to be provisions for restricting the movement of foreign flag vessels for services of Government/ PSU duty. Following are the restrictions suggested for Port crafts, Small dredgers, Coastal and Offshore vessels and Inland Vessels. However, these are to be implemented subject to agreement with Govt/ PSUs/ Private stakeholders.

- PPP (Atmanirbhar) scheme to include PSU hiring/ chartering service till 2023
  - Class 1: Indian Flag, Indian built vessel
  - Class 2: Indian Flag, Foreign built Vessel
  - Non-local: Foreign Flag

- Post 2023, only Indian flagged vessels to be allowed to serve PSU/ Govt. requirements.
- Post 2025, Foreign built port crafts with 30+ years of age, not allowed for PSU/ Govt duty
- No foreign flag vessels with 20+ years age to be allowed for Govt/ PSU/ Private use

GRADING OF SHIPYARDS

It is proposed that grading of Shipyards based on technical capabilities may be done by Indian Register of Shipping to classify vessels that can be manufactured by any shipyard. Further, a policy may be evolved for selected shipyards for a combination of both defense and commercial projects to enhance capacity utilization and efficiency of yards.

PLATFORM FOR SHOWCASING PRODUCT

To be in line with international standards and the global market, there is a need to develop a unified platform for ancillaries to showcase the products available for ship building. Following are the requisite steps for establishing the platform:

- Establish an independent association and identify & include all the parties that directly or indirectly are a part of the ship building process, as members
- Create an online and/or offline ancillary platform for showcasing the products available for ship building.
- The website should categorize the products offered for easy search and reach

CREATE A COMMON DATA BASE OF STANDARD-VESSEL BASIC DESIGN

Most of the basic and detailed engineering are prepared from the scratch for every vessel manufactured, which costs approximately INR 30-40 lakhs. This cost can be saved if a common data base of standard-vessel basic design with pre-approval from Indian Register of shipping is present. IRS must drive standardization, improve design process and leverage cost economies

MoPSW to take the following steps,

- Selection of vessel designs to be standardized and create design database
- Collaboration with foreign shipyards and design house to houses to develop basic and functional design for each vessel type
- Approval provided by IRS basis existing norms and standards
- Creation of digital models for design and databank for all pre-approved vessel designs
- Usage of pre-approved design for customization of registered/member yards

SETTING UP SHIP BUILDING & REPAIR CENTRE OF EXCELLENCE

Setting up of shipbuilding & repair excellence is the need of the hour. This would facilitate thought leadership and innovation in Ship building and repair particularly for large and upcoming vessel segments. The CoE would also help in training & development of workers & officers through creation of functional & vessel specific training programs and further support development of ancillary ecosystem to reduce import content and enable faster movement of material. The CoE will also help in developing long term strategies for increasing India's global shipbuilding market share and act as a centralized business development unit for Indian shipbuilding industry for export of defense/commercial ships and shipboard equipment. The CoE will also formulate long term policies focusing on shipbuilding industry in India.

CEMS – A Centre of Excellence in Maritime & Shipbuilding is already institutionalized to develop competencies, employability, methodology & skills creating competencies for Industry 4.0. It is proposed that a detailed study outlining gaps in Indian shipbuilding & repair skills may be conducted and accordingly training programs may be developed at CEMS aligned with annual targets.

SHIP REPAIR

CURRENT LANDSCAPE

Ship repair Industry in India has not expanded over the years to its potential. India has a favorable location i.e., around 7-9 % of global trade passing within the 300 NM of coastline and hence huge potential lies in the country for becoming a major ship repair hub in the world.

CHALLENGES

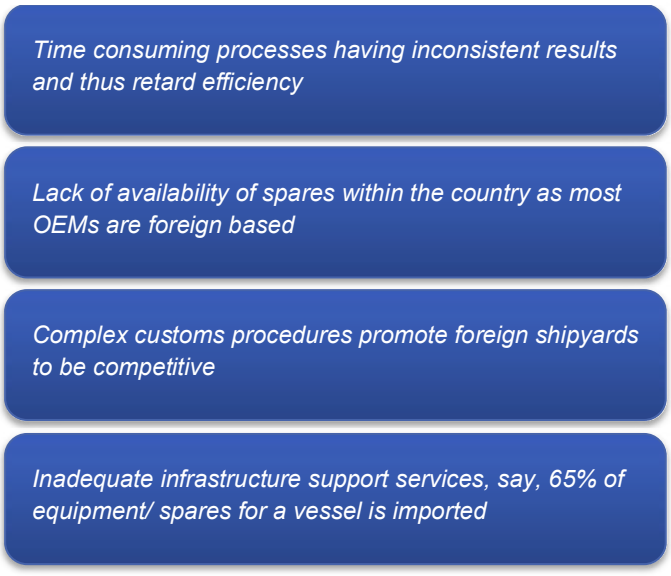
LACK OF SHIP REPAIR FACILITIES

Except for few main Shipyards in the country, majority of the other yards lack the ship repair ecosystem and supporting infrastructure to capture the market potential. Currently, there are only 45 dry-docks for repairing ships in India both in public and private sector. Along with that only 9 dry docks operated by 5 major ports. Today, Indian shipyards willing to take up repairs do not have the capacity of catering to special types of vessels. Several repair yards in India are constrained to accommodate large vessels due to shallow drafts in repair ports. This limits the ability of owners of larger tonnage to use existing facilities. There are some exogenous factors like regulatory and severe competition from foreign counterparts acting against the overall growth of the industry. As a result, the entire ship repair business of big ships, offshore rigs and vessels are lost to China, Singapore, Sri Lanka, Bahrain, Turkey and UAE and the country loses valuable revenue and foreign exchange.

LACK OF ANCILLARY SUPPORT AND COMPLEX CUSTOMS PROCEDURE

Timely delivery of the ship after repairs is of paramount interest for ship owners and is the first and foremost consideration for him to select a yard for sending his ship repairs, however, India is not able to perform well in ship repair because we have not developed a strong ancillary industry for marine work. Presently, India faces a shortage of spare parts due to a vicious cycle of lack of demand of spare parts and lack of stocking of spare parts, which leads to ship builders availing the services of neighboring countries such as Sri Lanka, Singapore and Hong Kong. The other major issue for lack of stocking of spare parts in India is due to the cumbersome process of return of unsold goods, attributed mainly to the rigorous custom procedures. Spares for a coastal vessel are to be treated as per Notification No. 50/2017 and so are subject to NIL duty. While foreign yards are able to procure and deliver spares and equipment quickly, our system of import and customs clearance procedures taking days and weeks to get parts cleared. Shipping companies are asked to file Shipping bills for provision of spares and stores, and provisions in coastal vessels. Due to this, already cleared imported goods/spares are produced once again to Customs by generating a local GST invoice, packing list etc.

Figure 145 Overview of challenges faced in ancillary support in Ship repair, India



COMPLEX CONDITIONS FOR SETTING UP A FREE TRADE WAREHOUSING ZONE (FTWZ)

Under SEZ Act, various provisions are provided for development of FTWZ, however, the conditions to set up a FTWZ are very cumbersome and so small-scale trades are not able to utilize this provision. The challenges include

- Minimum area requirement for establishing FTD – 124 acres of land
- Minimum size and revenue requirement, including a minimum balance of net foreign exchange
- Minimum investment requirement condition
- Cumbersome process for return of unsold spare parts or other goods involved in the ship building and repairing service

KEY INITIATIVES

DEVELOP SHIP REPAIR CLUSTERS AND SPECIALIZED REPAIR SHOPS

Lack of ship repair facilities in the country have hampered growth of the industry. It is therefore become necessary, to develop major ship repair clusters which can leverage clustered availability of skilled manpower, infrastructure, ancillary support, technology support and training facilities. Basic framework needed to encompass a Ship repair Cluster which provides eco system for all types of repairs. Infrastructure including docking facilities (dry dock /wet dock, floating docks, berths etc.), ancillary parks, OEM services centers, logistics including port connectivity, warehousing, facilities for workers etc. are the key requirement of the Ship Repair Clusters.

The suggested locations are Chennai, Kochi and Mumbai. Also, recently Cochin Shipyard Limited (CSL) on the inputs of Ministry of Ports Shipping and waterways (MoPSW) has proposed to engage Strategic Consultant for co-ordination and providing of detailed report for setting up of Ship repair Cluster (Mumbai & Kochi) in India with clear milestones and deadline for each milestone.

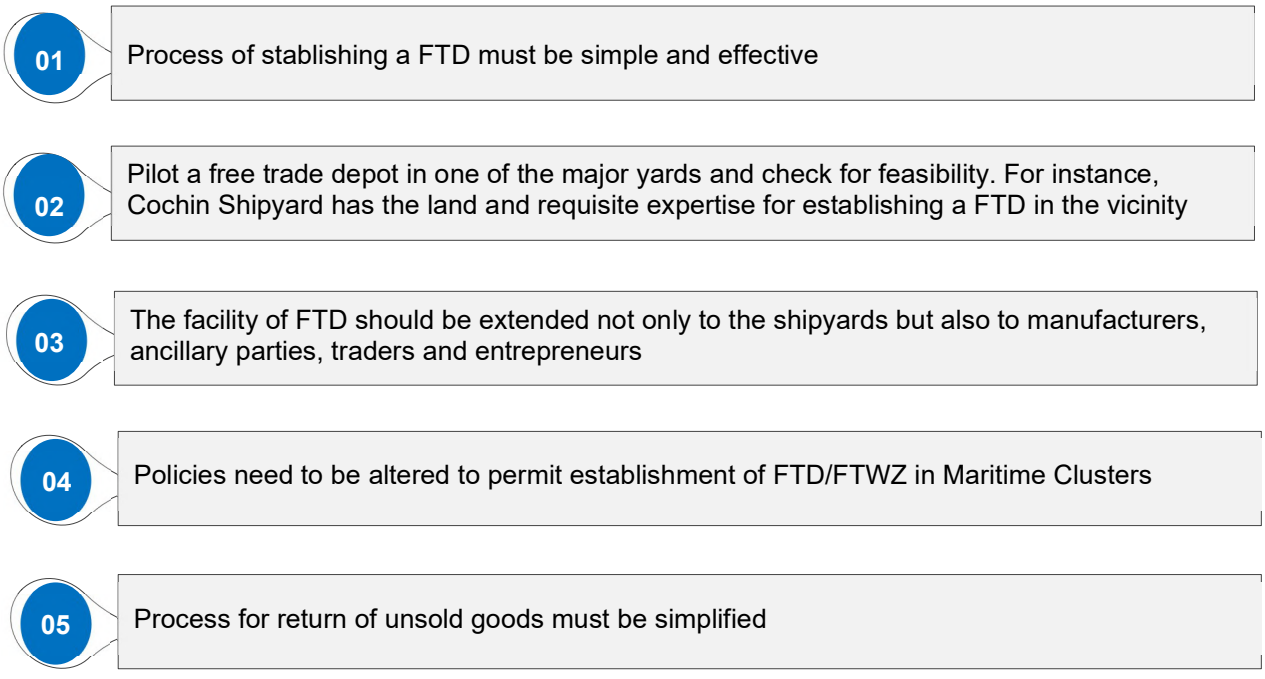
SIMPLIFICATION OF CUSTOMS PROCEDURES

It is proposed that customs procedure to be simplified by framing industry friendly import rules. In Singapore and UAE, shipyard import material for vessel's repairs under custom duty exemption. They remove and send vessel's parts for repairs under a self-certification scheme that is signed by both the shipyard and the ship owner. The urgent need is to make custom approvals and procedures simplified with no delays. Most of the repair yards globally enjoy the facility of direct delivery with no constraints from airport to ship at yard. Indian Shipyard's too must have this facility so that timely service can be offered to the ship owner.

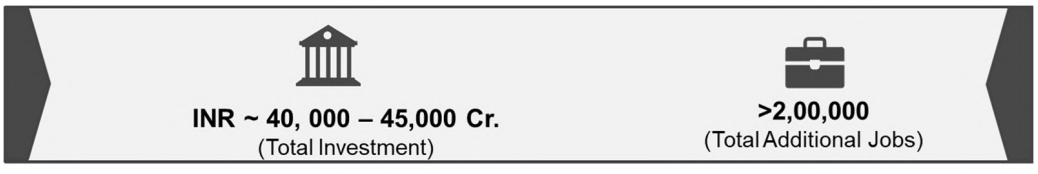
RELAXATION OF CONDITIONS FOR SETTING UP A FREE TRADE DEPOT (FTD)

It is imperative that we must relaxed FTWZ conditions for setting up a Free Trade Depot and enabling small scale traders to benefit from this feature, which in turn will act as a catalyst in expanding the ship repair sector in India.

Figure 146: Steps suggested for FTDs in shipbuilding and repair sector



Total investment required and potential job opportunities



SHIP RECYCLING

CURRENT LANDSCAPE

Ship Recycling Facility, Alang (Gujarat)

India ranks second in ship recycling, behind Bangladesh. The major contributor to India's ship recycling capacity is the facility at Alang, Gujarat which has **98%** of recycling capacity of India & globally Alang contributes **32.6%** of recycling volume.

Alang has 153 plots or ship-breaking yards developed on a 10-kilometer-long coast in Bhavnagar district. 131 plots have been allotted for ship breaking. However, only 80 plots have ships for breaking. Hence, at present 48 per cent of the existing ship-breaking capacity at Alang is lying idle.

- In the year 2011-12, 415 ships with a total 3.85 million Light Displacement Tonnage (LDT or weight of a vessel without fuel, cargo, etc.) had come to Alang
- This was the only year when the Alang shipbreaking had come close to its full capacity of 4.5 million LDT. Thereafter, there has been a steady decline in the number of ships coming for dismantling
- In 2019-2020, only 202 ships with 1.62 million LDT came. During the current year (till January 2021), 199 ships with 1.8 million LDT have come, which is a marginal improvement over last year's figure
- **Recycling capacity** planned to be augmented up to **9 million LDT**
- Current overall employment of **5.15 lakh people**
- Average Revenue Generated in the last 5 years- INR **55 Crores per annum**

CHALLENGES

Of the 153 plots in Alang, 131 have been allotted and **22 are vacant**

Higher **legal, admin** cost to comply HSE regulations

BIS not recognizing recycled steel- Challenges to reuse in other sectors i.e., real estate sector

~50% under-utilization of working plots handling average 2 MMTPA of LDT

Higher Taxes (Import Duty 2.5% and GST 18%)

KEY INITIATIVES

1.1.2. SHORT, MEDIUM & LONG-TERM GOALS FOR ALANG SHIP RECYCLING YARD EXPANSION

Table 38 Goals for Alang Ship Recycling Yard expansion

Short Term Goals	Medium Term Goals	Long Term Goals
Capacity Enhancement		**Capacity Expansion**

• Relaxation in Annual fixed Charges	• Auction of 8 plots as directed by the Honorable SC	• CRZ Clearance obtained	• Process for CRZ has been initiated
• Amendment in Constitution changes of plot holder	• Amendments in Reservation Policy (non-arbitrary manner)	• Land Acquisition is in progress	• Land Acquisition is in progress
• Transfer of Plots	• Auction of 14 plots	• Tenders for extension of road work has been invited	• PMC is being finalized for the proposed development

Figure 147 Expansion plans for Alang Ship Recycling Yard

1.1.3. REDUCTION IN TAXES

- Reduction in taxes/ duties i.e. Import duty (2.5%) and GST (18%) in line with the imported baled scrap

1.1.4. COLLABORATION WITH OTHER COUNTRIES

- Intervention of MEA, Govt. of India with European Union, OECD countries for sending their vessels directly to Alang without routing through Flag of Convenience (FOC) with subsidized selling price like Turkey
- MEA may also intervene with EU countries to send their vessels to Alang at subsidized rates considering HKC compliance status

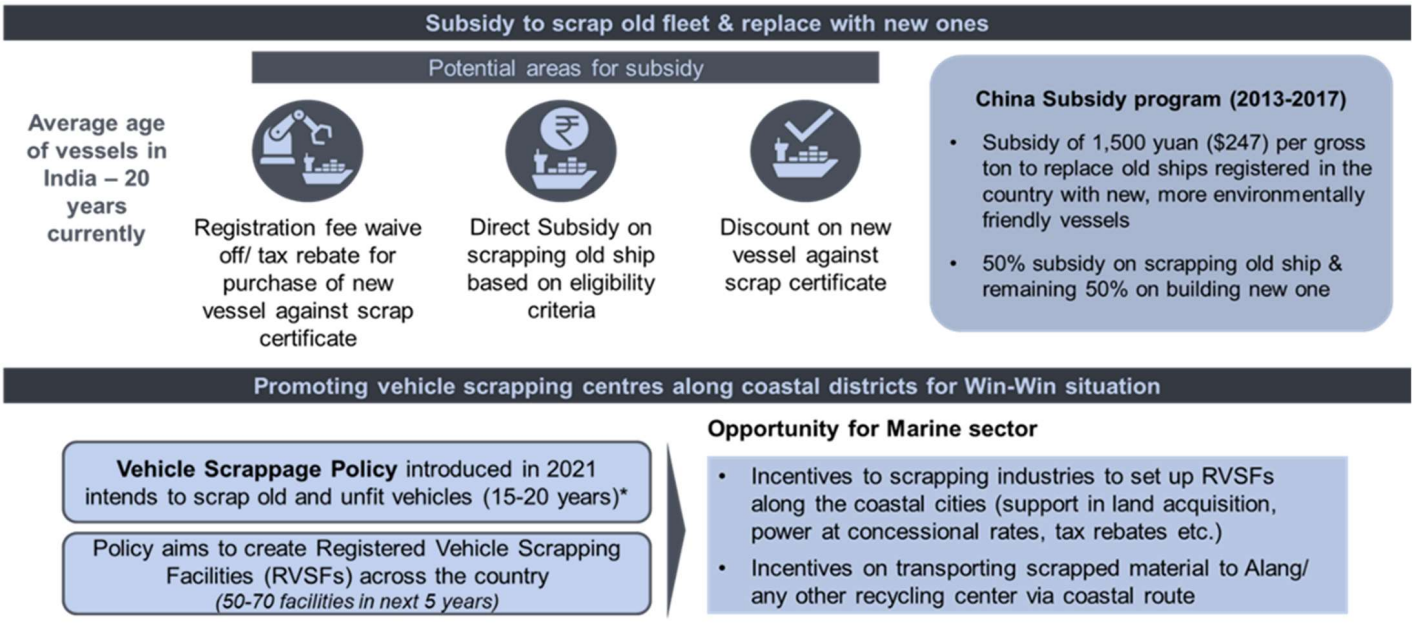
1.1.5. PERMIT FROM BIS

- The steel generated from ship recycling are of good quality, however, BIS does not permit this steel to be used in large construction projects
- Therefore, BIS may address this issue and permit accordingly, so the demand of the steel may rise leading to compete with other domestic virgin steel

1.1.6. VEHICLE SCRAPPING POLICY

- As per Ministry of Road Transport & Highways, up to 70 scrapping centres are to come up in next 5 year. These scrapping centres can be developed in coastal cities

- Scrapping centres can supply the scrap steel via coastal movement to the recycling yards efficiently, thereby



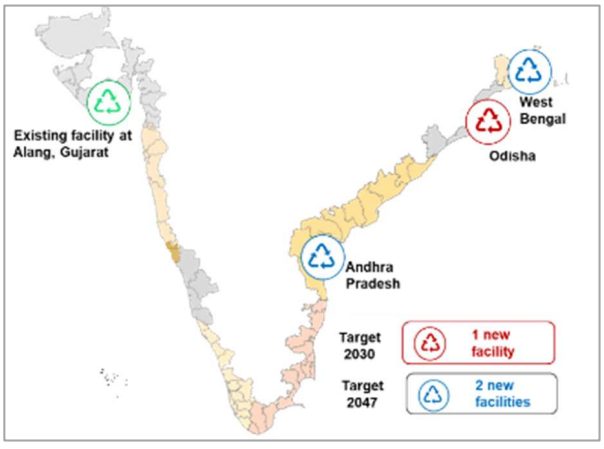
creating a strong eco-system of demand and **supply** between **scrapping centres and recycling yards**

Figure 148 Promotion of vehicle scrapping initiatives

1.1.7. ENHANCE EXISTING YARD CAPACITY AND DEVELOPMENT OF NEW CENTERS

Apart from Alang, India needs to develop more recycling yards especially in eastern side to capture the Bangladesh market which is currently India's biggest competition. The adjacent figure shows potential locations for development of these new facilities.

Figure 149 Potential location for development of recycling yards

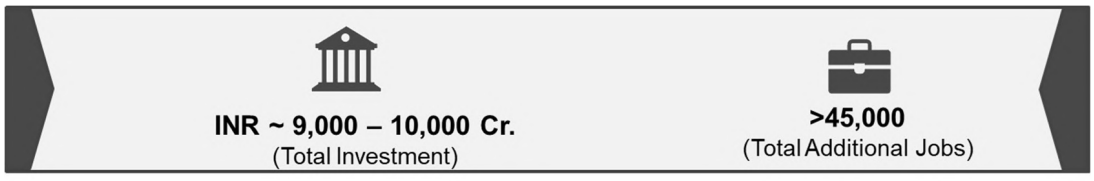


- 1 new facility is proposed by 2030 and 2 new facilities may be targeted to be open by 2047

Further, policy may be formulated to:

- **Incentivize** companies to develop scrapping centres in coastal cities
- Incentive based coastal arrangement to bring scrap to Recycling yards

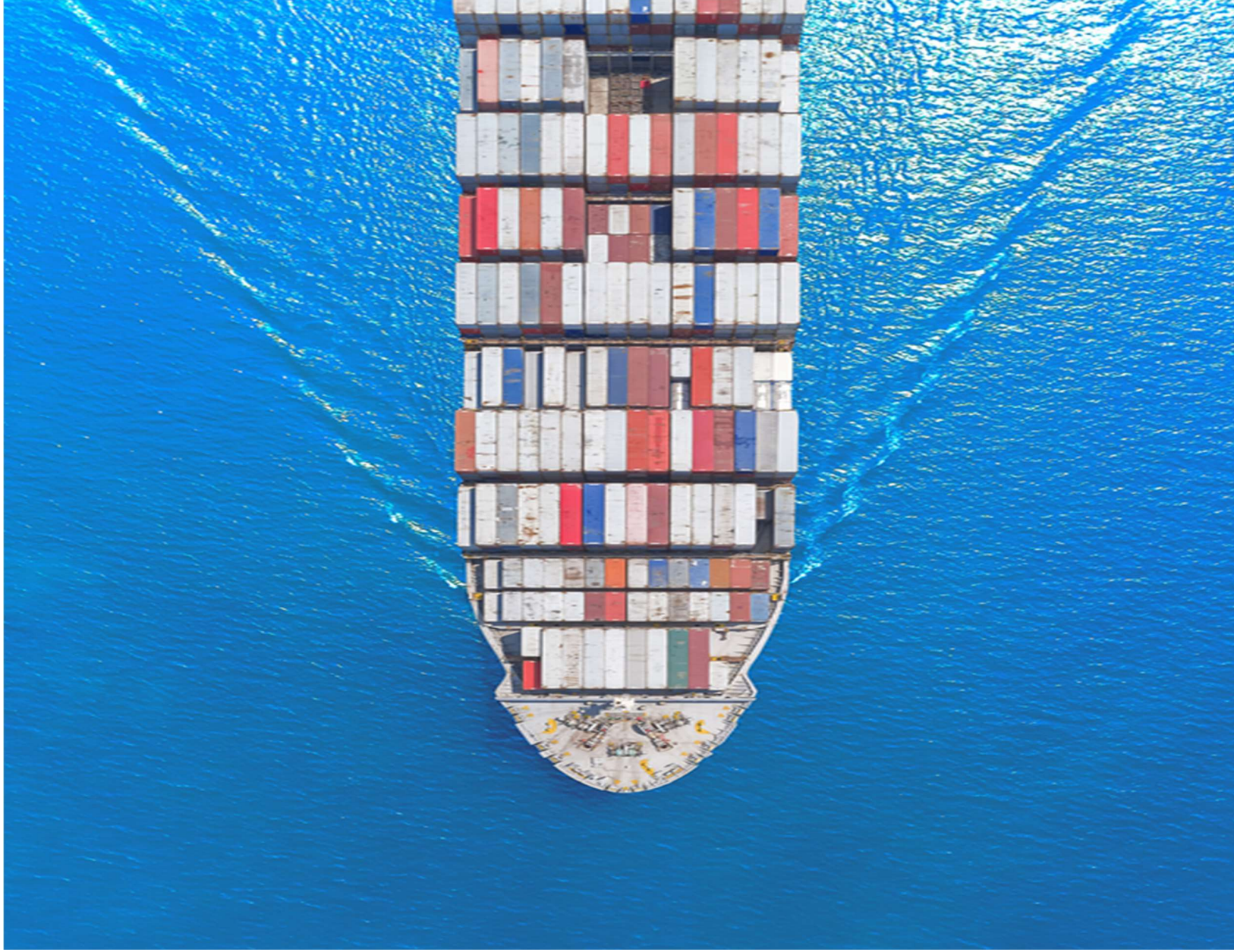
Total investment required and potential job opportunities



KEY PERFORMANCE INDICATORS

Key Performance Indicators	Status (as of 2021)	Target (2030)	Target (2047)
World Ranking in Ship Recycling	2	1	1

Theme 7
Develop world class education, research & training facilities



INNOVATION ECOSYSTEM

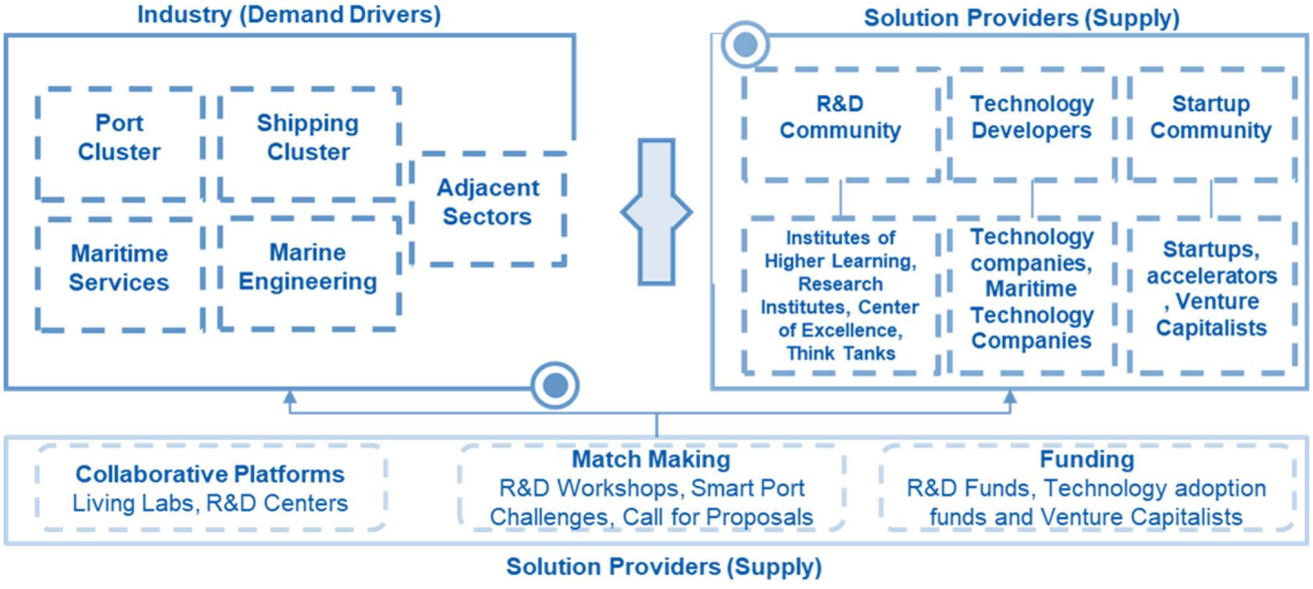
CURRENT LANDSCAPE

The maritime sector in the recent past has witnessed the influx of technology which have resulted in more efficient vessels, infrastructure and processes. This influx of technology is since evolving with new age technologies such as Artificial intelligence, Machine Learning, Robotics etc. The evolution in the maritime sector has resulted in the need for the required capabilities across its value chain. In order to cater to the need of the changing technology environment in the maritime sector, India needs to enhance its capabilities in the maritime education and research to drive innovation in the sector.

In the present scenario, the maritime education and research ecosystem in the country operates on standalone bases. There is non-availability of a platform to bring together the elements of maritime education and research which involves training, faculty etc. to drive the innovation in the maritime sector. The capabilities in the maritime sector in the country can be enhanced through developing an innovation ecosystem. The leading maritime nations in the world such as Singapore have developed a Maritime Innovation Ecosystem, the details of which are provided as below:

The Singapore Maritime Innovation Ecosystem comprises of a platform which brings together the demand drivers (comprising of Singapore Port and industry players), solution providers (startups and technology drivers) and research community (promoting research in the maritime institutes). The following provides the various components of Maritime Innovation Ecosystem:

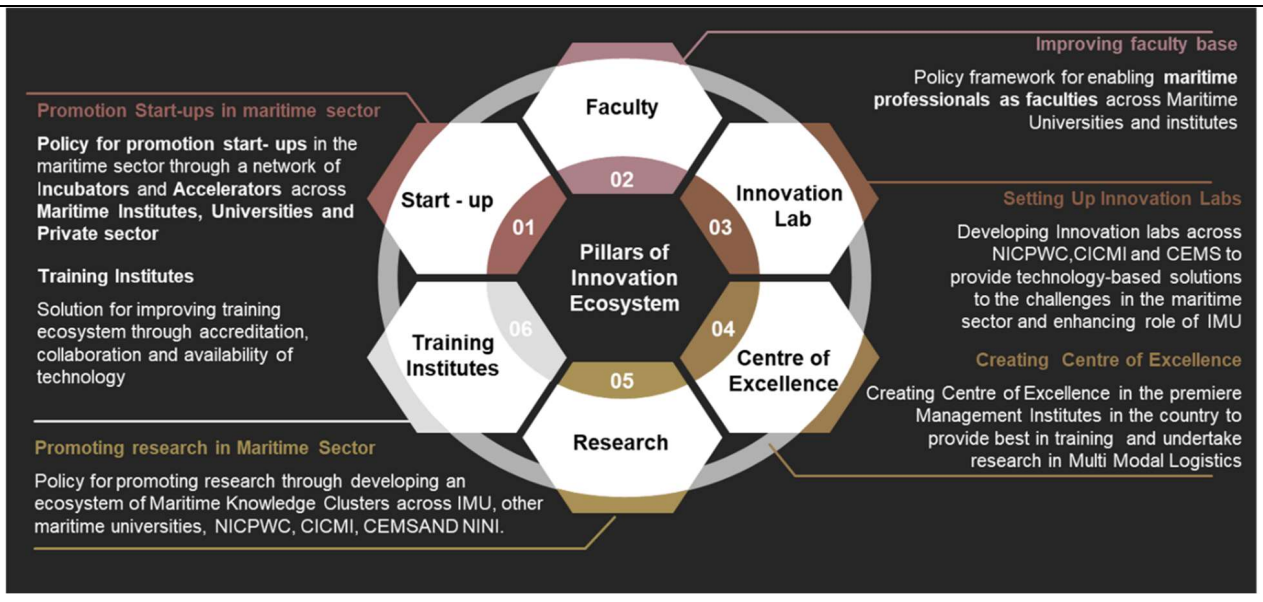
Figure 150 Case Study: Singapore Maritime Innovation Ecosystem



The maritime innovation ecosystem has helped Singapore attain rank 8th in the category of Maritime Technology amongst 30 largest maritime cities in the world in 2019. This ranking is as per Menon Economics and DNV-GL report titled "The leading maritime capitals of the World 2019".

To increase the innovation in the maritime sector in the country, a Maritime Innovation Ecosystem is proposed to be developed. The following provides pillars of Maritime Innovation Ecosystem:

Figure 151 Pillars of India's Maritime Innovation Ecosystem



There are challenges which need to be addressed and the respective interventions across the pillars of innovation ecosystem which are discussed in the subsequent sections.

CHALLENGES

The following sections provides the challenges in the maritime sector across the pillars of innovation eco-system:

START-UPS IN MARITIME SECTOR

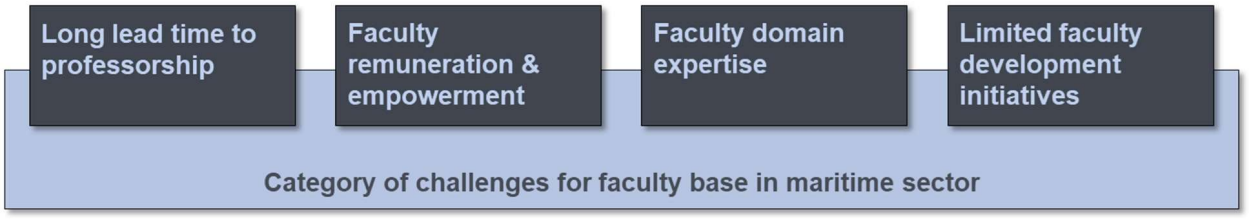
In the last 5 to 6 years, especially after the launch of Startup India campaign, there has been a continuous boom of startups in all industries, especially Road transportation-logistics, agriculture, fashion, medical e-commerce, food industry through Digital or Mobile App based technology as aggregation platform. The following factors call for a policy framework for the start-ups in the maritime sector in the country:

- Many challenges faced by Maritime Startups in the past arise from lack of shipping specific ecosystem and industry coordination
- Maritime Startups are often Hardware startups, rather than generally found software or app-based startups, and such hardware-based innovations require much higher financial support over time. This, combined with lack of sectoral private funding, are impediments for generating and deploying new ideas and creation of possible jobs
- There is a need to enhance visibility of startups and interaction with companies for market creation, if not at institute level, then at Centre Level
- There is little information on various port and maritime sector processes and priority areas. Hence, there is a need for dissemination of this information through Ministry's website, through incubators and various other stakeholders
- There is a need to create an ideation-stage seed fund and to bring shipping professionals into Angel Investor's Pool to bring funding in the Initial Stages
- Mentorship from various shipping Associations, successful entrepreneurs and industrialists is a must

- Top-to-down order support from Government entities for fast tracking the project activities related to startups is needed
- Networking beyond country boundaries and participation in International Projects can benefit startups in the sector
- Ancillary industry network or contact for prototyping and pilot project detailing needs to be instituted

FACULTY IN MARITIME EDUCATION

The availability of faculty with relevant industry knowledge is critical for driving the innovation agenda in the maritime sector. In addition, strengthening of faculty base is critical to improve the visibility of Maritime Institutes globally. However, there are certain challenges which need to be addressed for improving the faculty base. These challenges can be classified intro four broad categories:



1. Long lead time to Professorship: To become an Assistant Professor in maritime disciplines, one must have Certificate of Competency as Master (FG) or MEO Class I, which typically takes about 8 years after graduation [B.Sc. (Nautical Science) or B.Tech (Marine Engineering)]. That means a mariner can become Assistant Professor only at the age of 30 years, whereas in non-marine disciplines, a 23-24 year old M.Tech graduate can become Assistant Professor
2. Faculty remuneration and empowerment:
   a. Huge difference in pay between merchant navy and MTIs. This discourages maritime professionals to turn to teaching
   b. Limited independence of faculty for research and industrial consulting assignments unlike IITs
3. Faculty Domain Expertise:
   a. Senior Maritime professionals unable to join as faculty owing to qualification criteria for Professors
   b. Limited availability of faculty with domain expertise
4. Limited faculty development initiatives: Key to up-skilling the faculty and keeping them relevant with changing landscape of shipping industry

INNOVATION LABS

The following provides the challenges being faced by the IMU and Center of Excellence such as Centre for Inland and Coastal Maritime Technology (CICMT) at IIT Kharagpur, The National Technology Centre for Ports, Waterways & Coasts (NTCPWC) at IIT Madras and Center of Excellence in Maritime & Shipbuilding (CEMS):

1. The institutions in maritime sector in India such as IMU, NTCPWC, CEMS and CICMT have been working on engineering and technology aspects of the maritime sector. There is a need for the institutions to work in the field of emerging technologies.
2. There is lack of facility for testing of inland water vessels in shallow water which is currently being performed abroad.
3. Facilities are required for development and testing for marine fuel, lubricants, alternate / renewable fuel.
4. Autonomous ships s an emerging area that requires facilities for development and testing that spans machinery, manufacturing, algorithm developments, sensors, simulation, training aspects
5. With the advent of latest state-of-the-art technology sensors and instrumentation such as IoT, AI, ML etc., it is possible to simulate the performance of instruments that are used in automation and to study the productivity through introduction of such systems. The use of such technology is limited in ports and is required for improving the ports' productivity.

6. 6.The requirement to assess the impact of port operations on Climate Change is of paramount importance. There is limited availability of such studies with primary focus on ports and shipping sector in the country which can help in developing sustainable solutions.
7. There is a need to bridge the knowledge gap in dredging planning and execution, capacity building for dredging evaluation, development of dredging manpower and real time dredging monitoring.
8. The data being generated on Civil structures, Dredging, Geotechnical, Hydrography etc. needs to be maintained as a digital repository. Such data is currently not being maintained in a form which can help in analytics as well as in planning and management for ports.
9. At present, ports and waterways are heavily dependent on the solutions that are provided by overseas companies in terms of digitalization, sensing, VTS and other Port Systems solutions. It is difficult to integrate the systems due to lack of interoperability and expensive third-party solutions. Ports need to develop and migrate to indigenous systems that will be cost effective and ease of use as well as to reduce the dependency on expensive third-party solutions.

CENTER OF EXCELLENCE

With 12 major and 200+ non-major ports located along its 7500 km long coastline and a wide network of navigable waterways; India has a sizable marine sector. The country's maritime sector is critical to its commerce and economic growth as the maritime transport accounts for about 95 percent of the country's trade volume and 65 percent of the trade value.

Government of India has prepared a National Master Plan depicting the economic zones and the infrastructure linkages required to support them with an objective to integrate all the multimodal connectivity projects and remove gaps, thereby allowing seamless movement of people, goods & services. This will lead to holistically integrate the existing/planned initiatives of the various Ministries/Departments.

RESEARCH IN MARITIME SECTOR

Maritime sector advancement, today, is driven by advanced technologies across various dimensions – ports operation and management, navigation and traffic management, ship design technology, deep ocean maneuvers, maritime finance and governance. India has advanced capabilities in few of these areas while some early-stage work is ongoing in key areas. The following provides the issues for which there is a need to promote research in the maritime sector:

1. India has 42 research citations per million inhabitants compared to leading maritime nations who have over 2000 citations related to Maritime topics per million inhabitants. Indian Maritime Education institutes do not feature among the top 25 institutes for ocean studies.
2. At present, the ports have limited green energy usage (<10%), India's share in ship building (<1%) and ship repair (<1-2%) is way below the share of top maritime nations (70-80%) and the research ecosystem is fragmented which calls for planned efforts to boost Research & Development in the maritime sector.
3. The infancy of research capabilities in the emerging areas may be attributed to administrative, financial, human resource, regulatory challenges that the current research ecosystem in the maritime sector faces. For instance, emerging technologies such as Digital Twin for ports modernization and optimization, e-navigation/ Night navigation, Marine Robotics and Autonomous Systems suffer from lack of clear guidelines while existing technologies such as Virtual simulation and modelling systems for Hydro Met-Ocean, Real Time Under Water Keel Clearance (RTUKC), Ocean / Port system analytics (AI, ML and Big Data) etc. suffer from lack of adaptation, funding and human capital.
4. The co-ordination and collaboration within the maritime universities/centers/institutes and with industry is fragmented and low – less than 20% of research is carried out in industry collaboration.

MARITIME TRAINING INSTITUTES

The following are the challenges faced by the Maritime Training Institutes in the country:

1. Limited Maritime Training Institutes in the country have government accreditation
2. There is limited or no collaboration with international institutes

CHALLENGES IN OTHER AREAS OF MARITIME SECTOR

The cruise industry is in a growth phase in the country. Both river and sea cruise industry have witnessed private sector players operating vessels. The following challenges need to be addressed for development of skills of cruise crew:

1. Availability of training institutes providing quality cruise crew training is critical
2. Hospitality is a major component of cruise. Therefore, it is critical to have a holistic training of cruise crew by also considering hospitality management

KEY INITIATIVES

POLICY & REGULATORY INITIATIVES

START-UP POLICY FRAMEWORK

PROMOTE START-UPS IN THE MARITIME SECTOR THROUGH POLICY FRAMEWORK

The promotion of start-ups in the maritime sector would require implementation through a framework. The following provides the major functions that would be performed under the framework:

1. Two options are considered for operationalizing the framework for promoting startups in the maritime sector

a. Option 1 - Forming an SPV with Major Ports and SDCL as the nodal agency

b. Option 2 - Forming a single accelerator called “National Marine Startup Acceleration Center (NMSAC)” as section 8 Not-for-Profit SPV with joint efforts of IMU--MoPSW/SDCL to form Joint Industry Projects for helping startups 360 degree from regulatory, financial and marketing point of view during ideation to commercialization stages.

2. Screening of Incubators and in the maritime sector, which will provide all the necessary support to the startups.

3. Screening of startups to get the required funding support from incubators or accelerators in the maritime sector

4. Apart from funding, provide other necessary support in the maritime sector which may include marketing support, Annual Startup Awards, hackathons etc.

The following sub-sections discusses in detail the functions to be undertaken under the framework for promoting startups in the maritime sector:

Option 1 - Formation of an SPV for Nodal team

The implementation of the framework for promoting startups in the maritime sector would comprise of an SPV. This SPV will be formed through equity contribution from the Major Ports and SDCL. The following provides the roles and responsibilities of the SPV for promoting startups in the maritime sector:

1. It will focus on operationalizing the policy framework for promoting startups in the maritime sector

2. It will help in driving all the necessary approvals and funding support required under the policy for the startups

3. To mobilize the stakeholders, investors, mentors, State Govt bodies etc. and resources (including funding) for shipping startups

4. Regular identification of bottlenecks in ecosystem and resolving these bottlenecks

5. Monitoring the progress of the shipping innovation ecosystem across the country

6. Selection of Incubators and accelerators and providing necessary approvals

7. Ensuring the flow of funds to all the Accelerators and Incubators

The creation of the SPV is critical as it will be nodal body for promoting start-ups and ensuring funding is provided to the start-ups for developing innovative products.

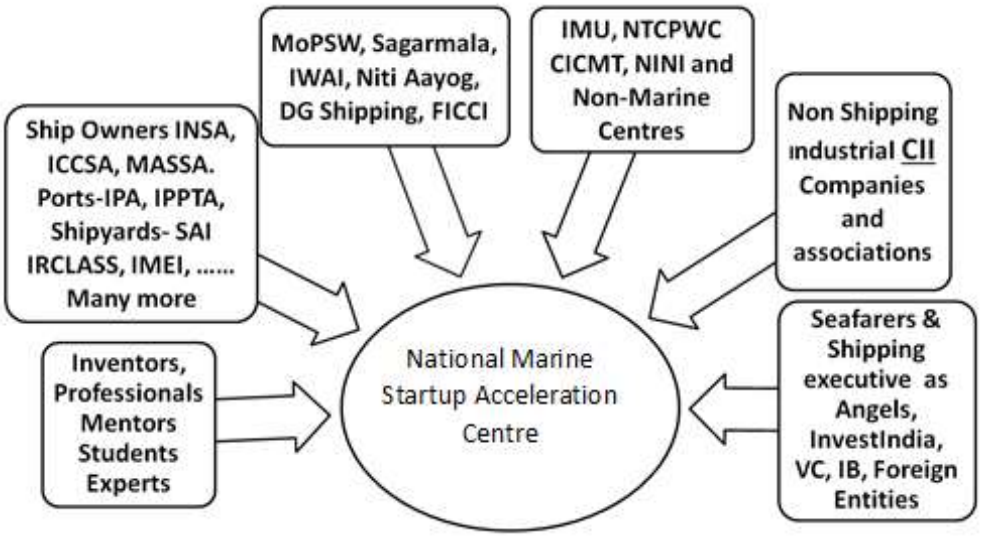
Option 2 - Formation of Single National Marine Startup Acceleration Center (NMSAC) and Network of Incubation centers

Section 10.2.4. in MIV 2030 talks about establishment of National Marine Incubation Centre -a further step to existing incubators as a National Marketplace of Research Institutes, Startups, VC Firms and industry to encourage collaborative approach. For this a single center is required for better control and as single contact point for other industry stakeholders like shipyards, Ship owners, Design consultants, Regulatory bodies.

This new center should work more like an accelerator to help startups 360 degree from regulatory, financial and marketing point of view covering broad Blue economy via integration of stakeholders at country level based on the Vision 2030 mandate. The centre will have three-layer board consisting of Apex, Steering and Operational committee. This center will help implement the Sagarmala Startup and Innovation Initiative- S212 Policy of Ministry of Shipping on ground, along with other stakeholders of the Shipping ecosystem by forming Joint Industry Project consortiums.

Center will be a Special Purpose vehicle (SPV) Section 8 Not for Profit Company to be formed by joint initiative of IMU-HO, MoPSW-SDCL. With three levels of board i.e. Apex, Steering and Operational committee.

Formation of the Section 8 Company as SPV is critical as it will help it- not only to self-sustain by earning money but also to become a platform to bring various stakeholders together for realizing Aatmanirbhar Bharat goals as follows

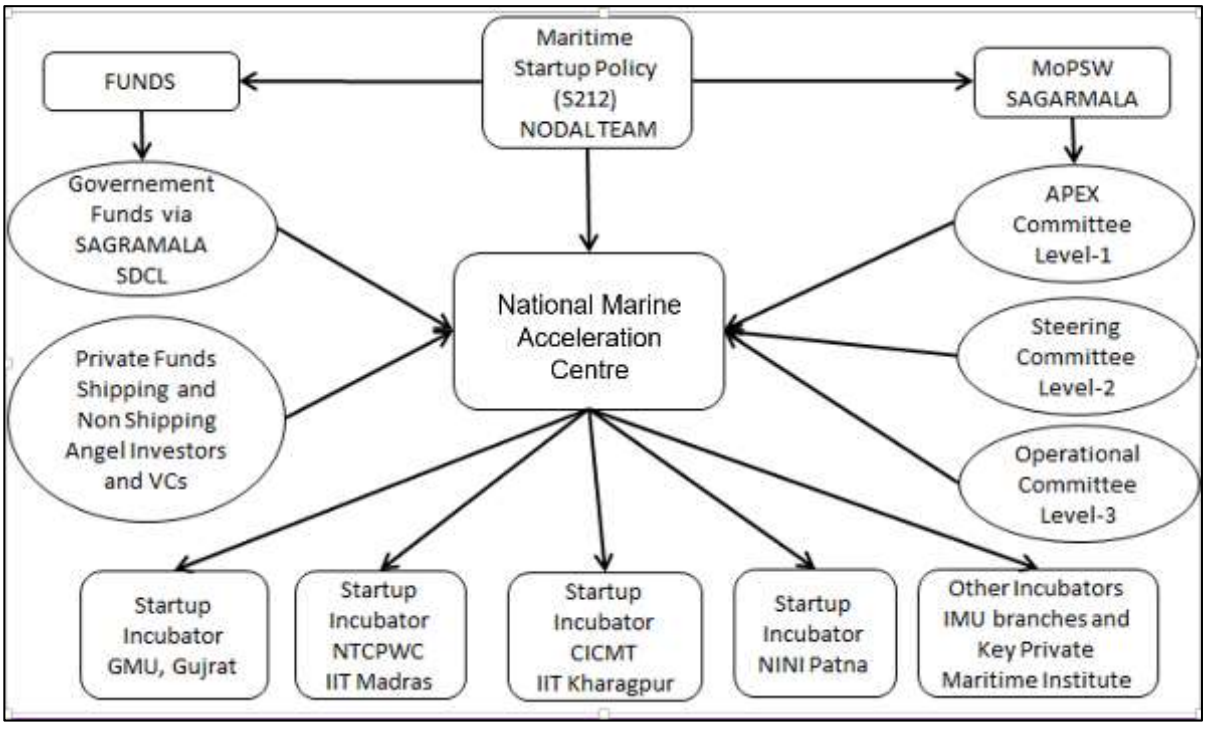


Scope of work for National Marine Startup Acceleration Center (NMSAC) - Helping Startups 360 degree right from Ideation to Exit for Regulatory, Finance, Marketing

- To design and operate a Virtual Platform specially designed to convey, implement and monitor Startup Framework and Policy. Platform will connect all incubators to avoid duplication and effectively implement Joint Industry Projects.
- Preparation of Feasibility report- Minor technical works like Technical or Business animations, modelling, and data analysis etc.
- Helping idea proposer to get help from incubators, institutes, industry and individuals for technical work by forming joint Industry projects
- Parallelly working with DG Shipping and Indian Register of Shipping for getting In Principle Approvals
- Talking to Shipping companies for onboard Pilot Project testing in real waters and at commercial scale
- Shipping Exhibitions and International events for possible customers and scale ups.
- Participate and disseminate information from IMO-DG Shipping related International projects e.g. Green voyage 2050 for team work with incubators and institutes.
- Participating in projects formed by other relevant Initiatives as per Vision 2030 plan from Startup angle
- Also providing space to Startups reaching TRL-3-Scaled Pilot Project or BRL-3-Initial Customers.
- Tie ups with International Marine Accelerators, Technology centers, Companies and Venture funds for Scaling up Startups e.g. Port XL, Liquid Grid, Rainmaking, Maersk-Centre for Zero Carbon Shipping
- Providing legal and accountancy back up to startups for IP-Patent filing, Company registration, annual Filings and Closures.
- Organizational Architecture to develop Startup Ecosystem in India:

The following are the blocks for promoting start-ups in the maritime sector based on Hub and Spoke Model:

Figure 152 Organizational architecture to develop start-up ecosystem in India



Network of Incubators - NTCPWC (IIT, Madras- Port, Ocean and Waterways) & CICMT (IIT, Kharagpur-Ship Design), GMU (Maritime Law) and NINI (Inland Waterways) are the existing four incubators listed by Sagarmala (https://www.sagarmala.gov.in/s2i2). It is expected that in near future, incubation cells will come up in all IMU branches and other major maritime institutes which will work with NMSAC based on hub and spoke model. The main functions of these incubators and future incubation cells will be to support the startup from Technology Readiness level for the following offerings:

- In depth calculations, study, design, data analysis, help for software related to Simulations &, hardware resources related to experiments, prototyping and product development if possible
- Provide working space, mentorship, business plan assistance, support in finance/admin/HR/legal functions, etc. for startups which may not be even registered as companies
- Provide UG and PG Students with Startup projects and related guidance
- Any other functions as decided by the SPV

The guidelines for Screening of future Incubators and by the SPV and three-layer board of NMSAC and the guidelines for screening of startups by the Incubators and is provided in the Annexure.

Funding Support: The following are the types of the funding support that may be provided by the incubators and accelerators as part of the framework for promoting startups:

- Funding support to be provided by the Incubators:
    - Seed Fund Grant: Upto INR 25L will be provided to the startups selected by Incubators. The amount to be disbursed as Grant-in-aid and to help startups for developing a Minimum Viable Product, Support for Fee towards IP Fillings, Operational Expenses of Startups etc.
    - Tech Pilot Grant: Upto INR 50L will be provided to Startups selected by Incubators. The amount will help the startups develop Proof of Concepts and Proof of Value depending upon the development stage of Technology

- Funding Support to Accelerator: Grant of upto INR 50L will be provided to the Startups under Accelerators. This will provide the necessary incentive for the private companies to house Accelerators to promote innovation in maritime sector

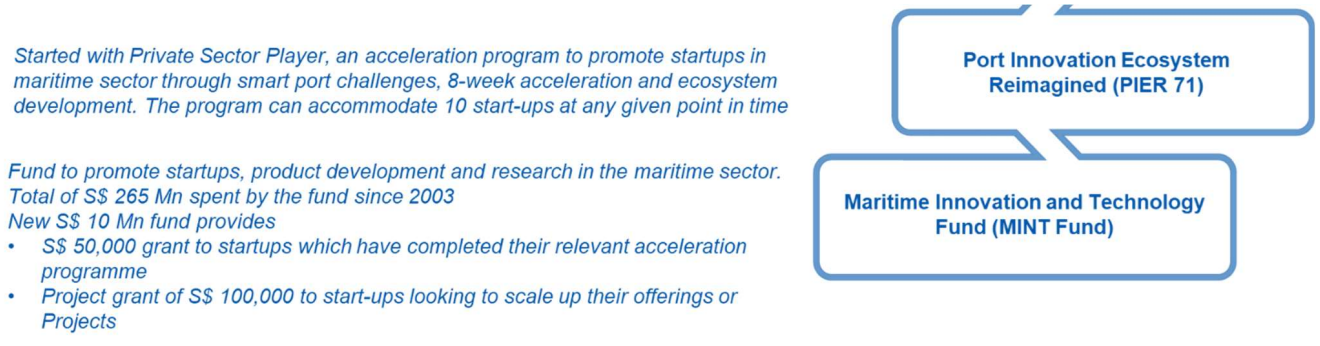
- Matching Venture Capital (VC) Funding: SDCL to co-invest upto INR 70L along with VCs for startups in incubators. This will help in bringing the required stimulus for investors in the maritime sector

Seafarers as Angel Investors - There is critical need for facilitating the creation of a Shipping and Port specific angel investor pool as industry angel investors from other sectors don't understand Shipping terminology, business prospects and hence don't take interest in startups in this space.

As a solution, India can leverage on its large seafarer community. In 2019, these were 234,886 (Ref: https://www.statista.com/statistics/1189238/india-number-of-seafarers-employed//). Out of these, around 45-50% are officer levels with good financial standing and employed worldwide. This number is in addition to the thousands of shore-based shipping executives in major maritime hubs like Singapore, Hong Kong, Dubai, London, Washington, Europe, besides in India.

The funding support provided to startups help in the much-needed incentivization for developing technology driven products. Major maritime countries such as Singapore have developed funds under their innovation ecosystem to promote startups. The following provides the funding provided by Singapore for the startups:

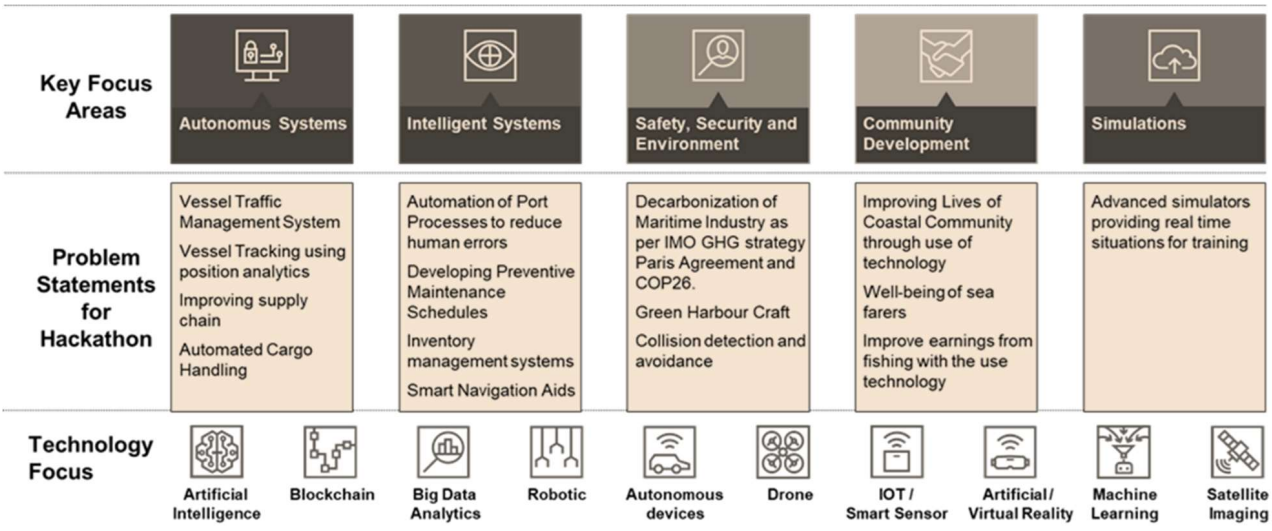
Figure 153 Case Study: Funding support provided by Singapore to Start-ups



ORGANIZING HACKATHONS FOR MARITIME SECTOR

The SPV, NMSAC and Incubators will organize hackathons together which will help in developing solutions for the problems in the maritime sector. The solutioning for the problem statements will focus on key technology areas. The hackathons can be conducted every year for promoting startups in the maritime sector and monetary rewards can be provided to the winning startups. The following provides the key focus areas and the problem statements.

Figure 154 Focus areas that can be considered to conduct Hackathons for promoting innovation in the maritime sector



The long list of probable initiatives on Smart and Innovative Ideas for startups that can be considered further for hackathons is provided in the Annexure. These ideas can help provide the innovative and sustainable solutions to the challenges in the maritime sector.

Illustrative Problem Statement for smart port Hackathons

Problem Statement 1: Automation of port processes to improve port handling efficiency and reduce errors

Automation of ports in the country can be a critical lever in improving ease of doing business and port efficiency that ultimately reduces logistics cost. The issue of automation can be looked at in two parts- (i) reduction of manual documentation through automation of systems & (ii) automation of process/ equipment etc. In order to reduce manual documentation and streamline systems, Ministry of Ports, Shipping and Waterways has developed a platform - Port Community System (PCS) and is now developing this further in National Logistics Portal-Marine (NLP-Marine).

Innovative solution that can further streamline documentation, reduce multiple submissions across agencies and reduce issues in the port processes include port congestion, customs clearance, shipping line issues & charges, documentation & paperwork and regulatory clearances can be potential areas for addressal and incorporation in new systems being proposed by MoPSW.

Further on process /equipment automation, there are other technologies which can help further improve efficiencies and capacities at ports. The Port of Singapore has tested the use of driverless trucks while Hutchinson Port, Thailand has implemented autonomous trucks. The autonomous electric vehicles being implemented help in introducing the sustainable solutions.

On the similar lines innovative solution for the automation of processes with introduction of autonomous vehicles, yard management, custom processes etc. can be undertaken to help improve efficiencies.

Problem Statement 2: Advanced simulators for providing real-time situations training

Simulators play a crucial role in the training of the manpower at ports which operate cranes, port crafts & vehicles, manage storage yards etc. The Simulators provide the much-needed real time situations to the trainees. In the country currently there are limited simulators available to help provide the port manpower with the technology driven training simulation.

- Vessel maneuverability through towage and pilotage The Port of Rotterdam has implemented simulators which provide the maneuverability for larger vessels under various situations. The simulators also help in providing solutions to optimize dredging requirement through creating models for operating vessels in shallow waters, tidal variations and current variations.

- **Operations of Port Machines such as cranes and reach stackers:** The Port Gdańsk in Poland has implemented Virtual Realty (VR) based simulators for different port machines. These simulators can be configured to provide training across rubber tyre gantry crane, ship to shore crane, and reachstackers. These allow for training of port staff without using port machinery with combination of different weather & related conditions.
  Potential simulation software's that can be developed and piloted for implementation for providing the required training to the manpower at the ports for vessel maneuverability and port machine operations. These can be helped through developing curated models to provide solutions to challenges in port operations.

- **Vessel Operations in Inland Waterways:** The vessel operations in inland waterways require skills which can be enhanced through use of such simulators. The Inland Waterway Authority of India has established a simulator at its National Inland Navigation Institute (NINI) in Patna. However, advanced simulation technology such as the one being implemented by City of Duisburg, Germany. The Simulator will consist of seven bridges which will be established at different locations. These bridges will be interconnected through universal hardware to assess the skills of the vessel operator across different conditions.

The changes in the simulation technology and vessel technology requires for implementation in the country as well. The implementation of inland waterway simulator can help in the R&D of vessels in the country along with improving the skills of vessel operators under difference conditions.

Summary of Proposed Initiatives for Promoting Startups

1. **Establish incubators and accelerator(s) for promoting startups with following two options**
   - **Option 1: Network of incubators & accelerators across NTCPWC, CICMT, NINI, GMU and IMU & private sector with implementation through SPV**
   - **Option 2: Single National Maritime Startup Acceleration Center and network of incubators in NTCPWC, CICMT, NINI and IMUs**
2. **Organize Hackathons to allow startup ideas to be generated providing solutions to the challenges in the maritime sector**

IMPROVING FACULTY IN MARITIME INSTITUTE

ATTRACTING SEAFARERS AS FACULTY

In the previous section, the challenges pertaining to attracting seafarers as faculty in the maritime institutes and universities in the country were discussed. The following provides the solutions proposed for improving the faculty base in the country:

1. Reducing the lead time to professorship:
   a. Mariners with Master (FG)/MEO (Class I) CoC with 2 years sailing experience at management level can be appointed as Associate Professors. After completion of Ph.D., they can be promoted as Professors
   b. Promoting Assistant Professor to Professor post completion of PhD
2. Improving faculty remuneration and empowerment:
   a. Faculty can be allowed to sail for 6 months after some years of teaching (e.g. 3-4 years) which will aid as financial incentive.
   b. Empowering the faculty to conduct innovative teaching, research, and incentivize industrial collaboration.
   c. Seed Grant of INR 30L can be made available to faculty to start research work

3. Improving faculty domain expertise: Senior maritime professionals with high level of domain knowledge and with or without Ph.D. can be engaged as Professors of Practice/ Associate Professor of Practice or as visiting faculty. They can help build linkages with industry for curricula development, undertake consulting/research projects and guide research scholars

4. Introducing more faculty development initiatives:

    a. Customize upfront training for faculty in partnership with NITTTR Chennai and Teacher Training facility at IIT Chennai

    b. Institutionalize short-term Professional Development / Certifications for upskilling faculty

    c. Cumulative Professional Development Assistance (CPDA) should be made available to Faculty in MTIs

Summary of Proposed Initiatives for attracting seafarers as faculties

1. **Maritime Institutes to allow flexibility to its faculty for working in the industry and allow faculty members to undertake independent research projects**
2. **Maritime institutes to allow mariners as Associate Professors and Professors depending upon their qualification and competency certifications**
3. **Senior Maritime professionals can be appointed as permanent faculty or visiting faculty**
4. **Faculty development initiatives to be introduced by providing trainings, upskilling certifications etc.**

KEY INSTITUTIONAL INITIATIVES

ESTABLISH INNOVATION LABS AND CENTER OF EXCELLENCE

CREATION OF INNOVATION LABS

Along with Indian Maritime University, Centers of excellence such as Centre for Inland and Coastal Maritime Technology (CICMT) at IIT Kharagpur and The National Technology Centre for Ports, Waterways & Coasts (NTCPWC) at IIT Madras have been established as technology arms by the Ministry of Ports, Shipping and Waterways (MoPSW). In addition, Center of Excellence in Maritime & Shipbuilding (CEMS) was established by MoPSW along with Siemens and Indian Registrar of Shipping.

IMU is engaged in Marine Engineering, Nautical Studies, Naval Architecture, Ocean Engineering and Maritime Mnagement. The remaining three institutes are centers of excellence in one key area of maritime sector. While NTCPWC is the center for excellence for undertaking research on emerging technologies (but the introductory paragraphs states that there is no research on emerging technologies!!), CICMT is the center for excellence on engineering in the maritime sector while CEMS focusses on use of technology in the designing and manufacturing process in the maritime sector. These institutes are expected to play a pivotal role in driving the innovation agenda in the maritime sector. Therefore, it is proposed to set up maritime innovation labs in these institutes and in IMU to enhance their capabilities and drive research & innovation in the maritime sector.

Creation of Innovation Labs in Indian Maritime University

(i) Marine Fuel and Lubricant Research Laboratory – Tie up with private industry, for testing and design of marine fuel and lube, alternate fuel and engine design. This will help to indigenize this important aspect of marine engineering such as alternate fuel, hydrogen, ammonia, LNG, etc. This can be a self-sustaining test facility for which there is a huge scope in India.

(ii) Laboratory for Marine Geosciences – Required for exploration and exploitation of Marine resources, characterization and mitigation of coastal hazards like erosion. Study the degradation caused by anthropogenic activities like coastal and offshore installations. Capacity building in marine geology, geophysics, geomorphology and geotechnical engineering.

(iii) Laboratory for Hydro-sciences – collaboration with leading universities (Delft, etc) along with stakeholders (IWAI, Ports) to develop a comprehensive simulation and experimental facility for marine hydrodynamics, water quality studies, sediment management, surveys, dynamics of marine structures and autonomous vehicles. This will enhance computing, testing and training capability with state-of-the-art simulation packages and physical model facilities.

(iv) Policy Study Center – to act as maritime repository and think tank to support the Government on maritime policy issues (IMO, Trade, commerce, maritime trade and logistics, ocean governance. With the implementation of Port Community System, various data gathering institutions (INCOIS, NRSA, etc.) enormous information is being gathered, but a commensurate repository and research framework for policy studies is yet to be formulated. This is a long-felt need for the Government and industry where an unbiased study and recommendations will help in policy formulation.

(v) Center for Advanced Nautical Studies – With the advent of new technologies in navigation (autonomous, underwater, Instrumentation), there is a need to create facilities for technology adaptation, education and training. The facilities for research and training in domains like pilotage, navigation, specialized carriers, containerization, tracking, cyber security will be created.

(vi) Maritime Environmental Laboratory – Facilities to create permanent port monitoring network along with communication and data process will be created. This will help monitoring the port operation and coastal pollution in air, water & underwater noise. The regulatory / mitigation components will be refined to improve the pollution control in maritime transport.

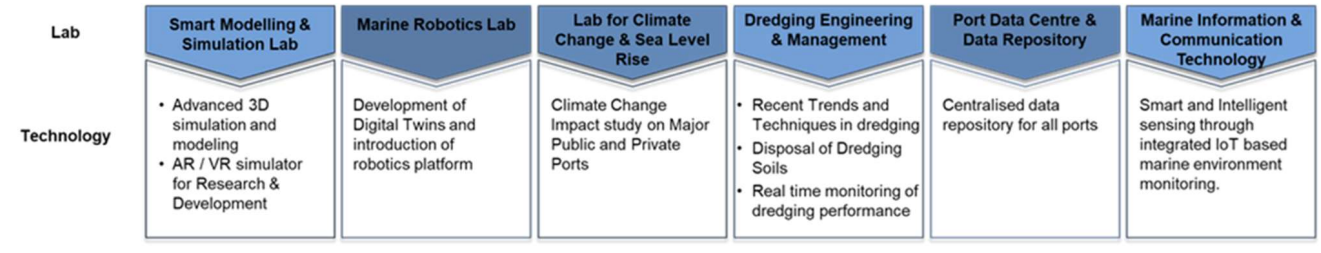
(vii) Ship Design and Research Center – Will contain the latest software for design and simulation related to ship building / breaking / recycling. This will also host Software – as – Service to Indian Marine Designers and consultancy services.

(viii) Advanced Maritime Training Center – to cater to maritime manpower development in special domains – simulators, software and physical model facilities for dredging, Inland water transport, hydrography, seabed engineering investigations, port, offshore and underwater engineering, This will also cater to allied domains like Maritime Management, Logistics, Inter-modal Transport, Marine Insurance and Arbitration.

Creation of Innovation Labs in NTCPWC

The following are the innovation labs proposed for NTCPWC to enhance its role of providing innovative solutions for the challenges in the Maritime Sector:

Figure 155 Innovation labs proposed for NTCPWC



1. **<u>Smart Modelling & Simulation Lab:</u>** The lab will undertake development of comprehensive 3D simulation model setup with indigenous development of navigation simulation software with custom Met-Ocean and Hydrodynamic models to conduct navigation studies for all major ports. The development will also include AR/VR simulation setup for Port basin and Waterway systems to conduct 360-degree navigational simulation at different environmental conditions.

For the lab, the collaboration may be undertaken with RWTH Aachen University, Aachen, Germany Swansea University, UK Port of Antwerp International, Belgium

2. **Marine Robotics Lab:** The lab will undertake development of robotic platforms for autonomous unmanned operations greatly help in reducing the human efforts and errors and on the deployment and recovery effort and time as well as provide real time transmission of data. The use digital twin approach is a new and innovative technology that can digitally duplicate the working version of the port systems that can help in end-to-end automation, optimization and increasing key stakeholders' situational awareness.

   For the lab, the collaboration may be undertaken with Nanyang Technological University, Singapore. Norwegian University of Science and Technology, Port of Antwerp International, Belgium, PSA Singapore

3. **Advanced center for impact and adaptation of Climate Change and Sea Level Rise on Port infrastructure:** The lab will undertake studies on the Vulnerability and Risk assessment on the existing structures of the Ports, Port operations and Profiling of existing structures / facilities and development of adaptation strategies over period of time including impacts of combined extreme events.

   For the lab, the collaboration may be undertaken with Tyndall Centre for Climate Change Research, UK, Building Construction Authority, Singapore, DLR German Space Agency

4. **National Centre for Excellence Dredging Engineering & Management:** The lab will undertake development of dredging labs and dredging software, technologies for reuse of dredged material, development of dredging training programs, real time remote monitoring of dredging performance. expert advice and consultancy services.

   For the lab, the collaboration may be undertaken with Tudelft, the Netherlands, Port of Antwerp International, Belgium

5. **National Port Data Center & Data Repository:** The lab will undertake development of centralized data repository services to all ports with comprehensive database design, interactive and interoperable software and data translation tools to accommodate multi-dimensional data such as Dredging production, Geotechnical data, Bathymetry, Met-ocean data etc.

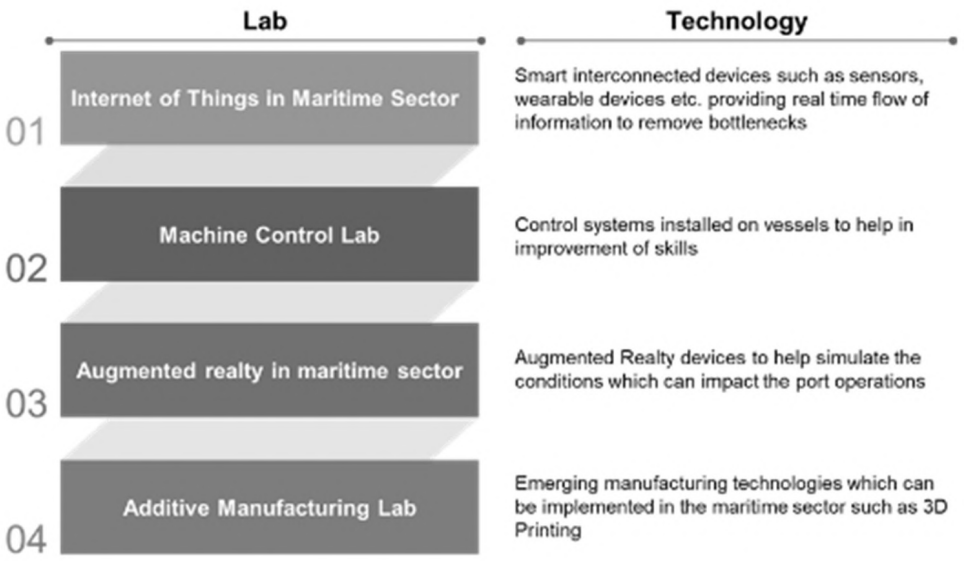
6. **Marine Information and Communication Technology Lab:** The lab will undertake Digitalization and Indigenous Next generation VTS & VTMS development as part of the Atmanirbhar Bharath program. The introduction of the indigenous system in our ports will reduce largely the cost being spent on annual maintenance and on other associated costs. In addition, development of Smart and Intelligent sensing through integrated IoT-based marine environment monitoring with advanced Ocean Analytics (AI & ML) with complete mapping, monitoring and modelling, of the waters, and coordinated networked operations.

   For the lab, the collaboration may be undertaken with Technical University of Munich, Germany and DLR German Space Agency.

Creation of Innovation Labs in CEMS

The following are the innovation labs proposed for CEMS to enhance its role of providing innovative solutions for the challenges in the Maritime Sector:

Figure 156 Innovation labs proposed for CEMS



1. **Lab on considering the use of Internet of Things in the maritime sector:** Advanced with Industry 4.0 compliant devices connected through IOT to further enhance the use of technology enabled devised in the maritime sector.

2. **Machinery Controls Labs:** Skills lab offering training in basics and working knowledge on operation and maintenance of Control systems installed onboard ships

3. **Lab on Augmented Reality:** The lab will develop technology focusing on Recent trends in developing AR systems for understanding operation and maintenance of marine machinery

4. **Additive Manufacturing Lab:** The lab will work on the implementation of emerging manufacturing technologies in the maritime sector such as Recent trends in additive manufacturing and 3D Printing for prototype development using Digital Twins technology

Creation of Innovation Labs in CICMT

The following are the innovation labs proposed in CICMT:

1. **Deep and Shallow Water Seakeeping and Maneuvering Basin Lab:** Comprises of Unique Double-Tank Structure with reduced wall load and is useful in Development of Structural Drawings in the maritime sector

2. **Combined Wave and Current Flume laboratory:** The lab will help in undertaking research on the development of wave patterns and their impact on the marine structure. This will further help in developing efficient designs with reduced cost.

3. **Laboratory for studying sloshing characteristics in LNG tanks:** The lab will focus on designing and developing efficient LNG tanks which could further help in using LNG as fuel in the vessels.

ENHANCING SCOPE OF IMU

The following provides the solutions to the above-mentioned challenges for enhancing the role of IMU:

1. Collaborate with IITs to develop courses related to emerging technologies
2. Develop short term courses for skill development for working professionals in maritime sector
3. Creation of modular courses for distance learning and joining the NPTEL platform developed by IITs

4. Ink MoUs with leading Maritime Institutes such as World Maritime University, Norway; Singapore Maritime institute etc.
5. Establish Industry Relations Cell within IMU and its centers to foster relations with industry players

Summary of Proposed Initiatives in relation to creation of innovation labs and enhancing scope of IMU

1. **To enhance the research and innovation in the maritime sector innovation labs are proposed to be developed in the maritime sector. These innovation labs to be established across IMU, CICMT, NTCPWC and CEMS**
2. **IMU to collaborate with insitutions in the country, develop short-term courses and institute distance learning platform for technical education currently present in the country**
3. **IMU to start collaborating with national and international institute along with expanding its industry players**

SETTING UP CENTER OF EXCELLENCE FOR MULTIMODAL LOGISTICS

A center of excellence will be established within the premises of a world class management Institute which will act as a Centre of Excellence for Multimodal logistics (MML). The following activities will be undertaken by the Centre of Excellence for promoting research and training in the maritime sector:

1. Promote in developing world class best practices in MML research and training, and aid in the development of Multi Modal Logistics infrastructure to the Industry and Government.

2. Centre of Excellence will also adhere into areas like supply chain optimization, Application of Infrastructure based technology, and will work with MoPSW to provide the necessary technology support, including direct involvement in vision-based investigations as well as technical support services to the maritime sector and other institutions under Ministry's umbrella.

3. Centre of Excellence will also provide valuable maritime transportation education, applied research, and technology transfer at the local, regional, national, and international levels. Furthermore, the human potential in the port sector will be developed in the academic institute based on demand.

4. The institute faculty will seek to gain a thorough grasp of the techno- commercial elements of maritime trade for MoPSW and their associates to make effective recommendations and direct their research and development activities toward long-term goals as needed and dictated by day-to-day problems.

5. The institutions will work with all ports, inland waterways, and maritime governments to better understand their issues and provide solutions based on well-established and respected scientific techniques.

6. It will also investigate policies, laws and techno-commercial elements of MML recommending policies, conducting feasibility and business studies in Trade enhancement for EXIM, and well as for Inland, Coastal and Land based Trade movements and liaise with State and Central agencies for techno commercial support.

The following centers are already facilitating cutting-edge research in transportation, logistics and allied areas, and thereby contribute to scholarship, practice, and policymaking in India and abroad:

a) **Centre for Transportation and Logistics, Indian Institute of Management (IIM), Ahmedabad** addresses critical passenger and freight transportation, and logistics challenges in India through an integrated, multidisciplinary program of research, post-graduate and executive education, technology transfer, and policy advice for enhancing the mobility of people and goods. The objective of CTL is to contribute to improving the efficiency of multi-modal transportation systems and supply chain logistics, thereby promoting economic growth and fostering sustainable development.

b) **Centre for Trade Facilitation and Logistics (CTFL), Indian Institute of Foreign Trade (IIFT), Delhi** aims at helping India's Trade and Logistics expertise by acting as a forum for collaborations on domestic and international fronts to gain competitiveness at a global level. The center is deeply involved in research on

various aspects of the Logistics Landscape. This center also carries practical-oriented applied research and desk-based research on different issues pertaining to logistics.

The said center will be known as '' Centre of excellence in Multimodal logistics '' and will be affiliated with select institutes of excellence in Management and Commerce like IIMs, IIFTs, Maritime Universities and will act as a nodal agency with MoPSW in project management, Project Research and Monitoring of Multi Modal Logistics projects and Projects identified in the GATI Shakti Master plan of the Govt of India. The Centre will be head by a Professional Techno Commercial leader with experience in Research, Consultancy and Project Management in the Infrastructure or Maritime sector who will be able to synergize the academic excellence available in the parent Institutes in delivering qualitative output to the Industry and Government and will be supported by grants from the Ministry of Ports Shipping and waterways.

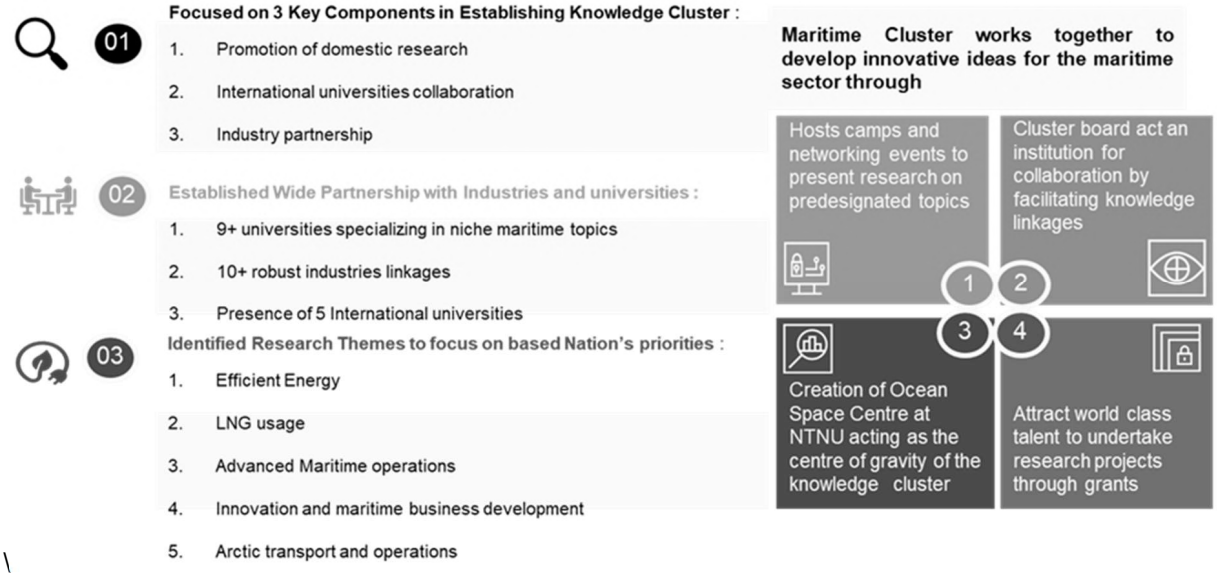
Summary of Proposed Initiatives for setting up Center of Excellence

1. **Centre for Transportation and Logistics, Indian Institute of Management (IIM), Ahmedabad and Centre for Trade Facilitation and Logistics (CTFL), Indian Institute of Foreign Trade (IIFT), Delhi to be developed as Center of Excellence for Multi Modal Logistics**
2. **Appointment of a Professional Techno Commercial leader to drive the research program in both the Centers of Excellence**

INITIATIVES TOWARDS PROMOTING RESEARCH IN THE MARITIME SECTOR

The research in the maritime sector can be further promoted through development of a Maritime Knowledge Cluster through a policy framework. The Maritime Knowledge Cluster has been established in Norway which provides a platform for undertaking research in emerging areas in the maritime sector.

Figure 157 Case Study: Creating Maritime Knowledge Cluster for furthering R&D in Maritime Sector in Norway



The following provides the framework of promoting research in the maritime sector**:**

KEY POLICY AND REGULATORY INITIATIVES

1. **Creation of Maritime Research Fund Pool**: The establishment of MKC will be initially funded by the Government of India through SDCL for a period of 5-7 years before it becomes self-sustainable. The research work funding, however, will be funded by through three mechanisms – a) SDCL to pool funds for the projects requiring R&D in the short-term, b) Joint research and development projects in PPP mode with industry in the mid-term and c) aligning research efforts in government announced dedicated missions such as Deep Ocean Mission and through National Research Foundation. Additionally, a Maritime Innovation Fund should be created by Government of India to fund research in emerging/frontier technology areas with high gestation period.

2. **Incentivizing Human Capital**: IMU in collaboration with Ministry of Shipping, Ports and Waterways, Ministry of Earth Sciences and Ministry of Education will start a Blue Economy Research Fellowships for attracting talented students for PhDs on the lines of Prime Minister Research Fellowship. Industry sponsored (fully or partially) candidates with experience in the maritime sector will be allowed to pursue PhDs in IMUs.

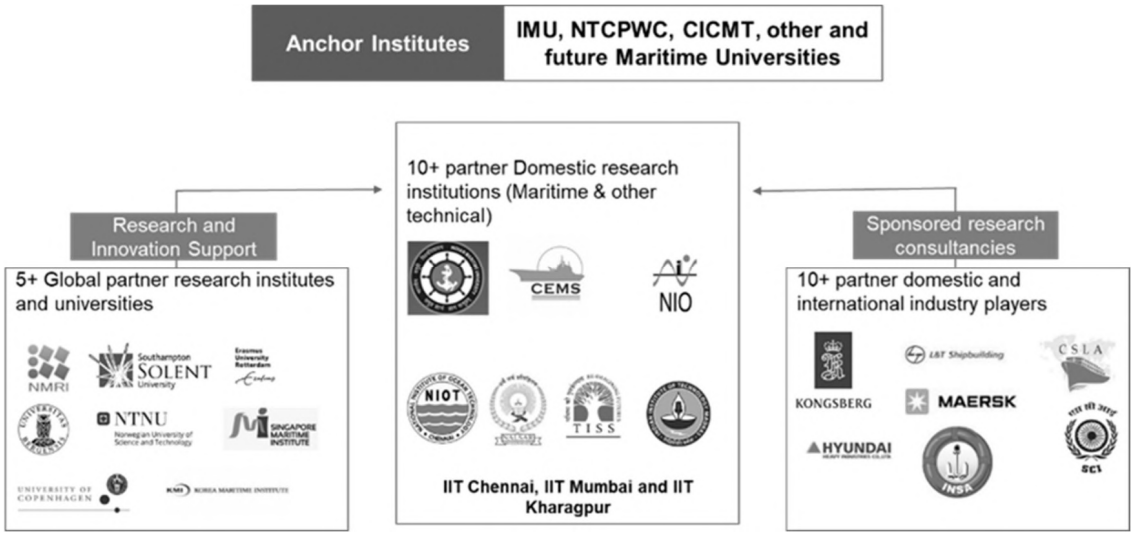
3. **Establishing Research Collaboration with top global/ Indian universities**: The Development Cells in collaboration with research faculty in host institutions will form collaboration with top maritime universities within India and abroad. Joint PhD/MS/MTech programs with foreign universities and with Indian universities should be started for Technology Transfer; Advanced Research Capacity building; Global Research

Collaboration. Joint research projects with leading maritime universities across the globe should also be developed by the Development cell.

KEY INSTITUTIONAL INITIATIVES

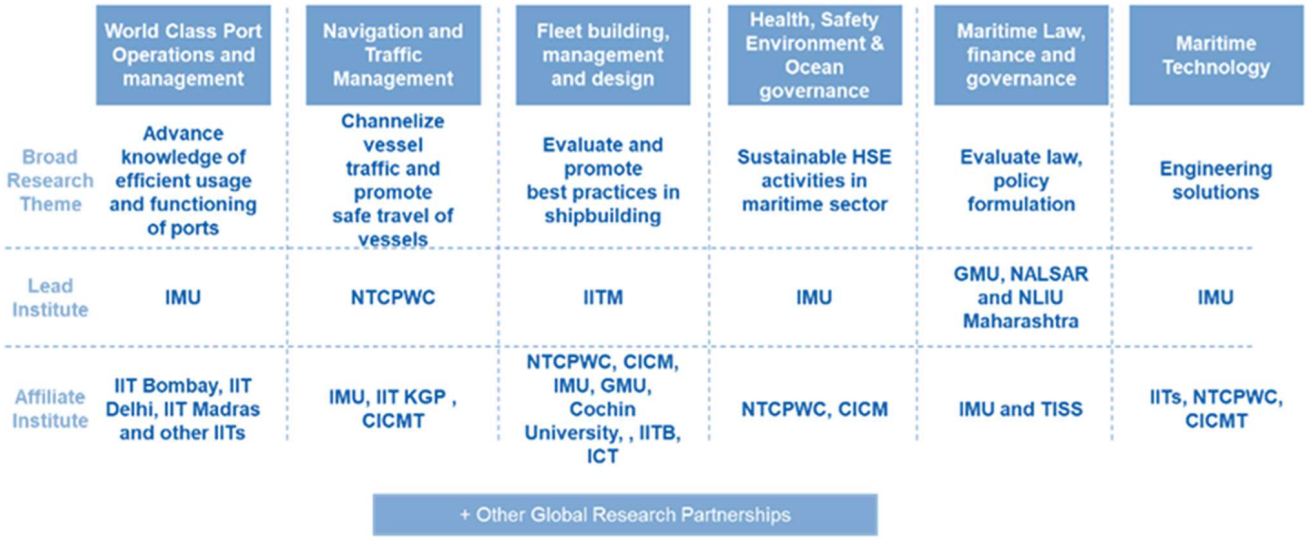
4. **Establishing Maritime Knowledge Clusters (MKCs)**: MKC will be comprise of IMU, other and future MUs, NTCPWC and CICMT. The MKC will collaborate with
   a. CEMS, NINI, leading State Maritime Institutes, foreign universities and industry players
   b. Relevant ministries such as the Ministry of Shipping, Ports and Waterways, Ministry of Earth Sciences etc.

Figure 158 Structure: Maritime Knowledge Cluster



5. **Formulation of Research Problems by MKC:** The MKCs will formulate research problems based on the needs of industry and national importance. All the research problems (barring ones involving national security) will be communicated through a public portal and research proposals will be called from individuals, industry, consortium of academicians and industry, professionals and so on. The proposals will be blind reviewed and will be considered solely based on merit and relevance to the broad national objectives. The research themes will be identified across the key areas of maritime sector which includes, port operations and management, navigation, vessel fleet, health, safety & environment, maritime law and maritime technology. The research in these areas will be taken up by lead institutes which have expertise in the area and will be supported by affiliate institutes. The following provides the research areas that have been identified by MKCs for promoting research in the maritime sector:

Figure 159 Research Areas identified for the Maritime Sector along with Lead and Affiliate Institutes



6. **<u>Establishing Chair Professors and Development Cells</u>**
   a. Chair Professors in each of the MKCs to guide on collaboration amongst Clusters and industry / academia.
   b. Development Cell within MKCs to coordinate with the partner maritime institutes / universities / centers for industry outreach and project development.

KEY POLICY AND REGULATORY INITIATIVES - IMPROVING MARITIME TRAINING INSTITUTES

The following provides the solutions proposed for the above-mentioned challenges towards improving training eco-system in the country:

1. NAAC accreditation for Maritime Training Institutes (MTIs) to help them
   a. Achieve a benchmarked status through an informed review process
   b. Increases potential employment opportunities
   c. Opens funding opportunities for the institute
   d. Standardize the maintenance of the institute
2. MoUs and partnerships with major international institutes to help
   a. Exchange students to get trained in technologies available in other countries
   b. Exchange of expertise to allow Indian students in India gain from international experiences
3. Develop e-Learning platforms which would help in adoption of technology for providing the necessary trainings
4. Enhancing the training equipment with latest technologies to help the students to upskill and stay relevant for the job, on board and ashore in the industry

KEY INITIATIVES - OTHER AREAS

In addition to the innovation ecosystem, there are other areas which would help in promoting maritime education in the country. The requirement of crew on a cruise vessel broadly has two categories of crew, Technical crew and Hospitality crew. While the technical crew undertakes the operations of the vessel, the Hospitality crew is mainly required to serve the needs of the passengers.

Hospitality side of any Cruise Ship requires large number of crew members. There are number of training institutes for basic degree/diploma, etc. for specific ship related learning's candidates to pursue STCW & CCMC Courses which are run by number of institutes licensed by DG (Shipping). The quality of training provided and the present initiatives taken by Indian Maritime Institutes is not at par with the Global Maritime Institutes and insufficient to cater to the demand generated.

Considering the low degree of existing skill levels and training imparted, there is gap between demand and supply of skilled Indian crew members. The share of Indian seafarers employed by Cruise lines is expected to be increased by the year 2030. The institutes need to be categorized, ranked as per infrastructure and facilities to create recognizable performing institutes for students' and employers' benefits.

Therefore, the following are the key interventions that need to be implemented for making Indian cruise crew competitive:

- Develop training institutes at key cruise locations in India such as Mumbai, Goa, Kerala for sea cruise and Kolkata & Guwahati for reiver cruise
- Maritime Training Institutes and IMU can collaborate with Hospitality Management Institutes such as Institute of Hotel Management and Cruise Service Providers to develop training programs
- Seafarers employed at Cruises to be trainers at these institutes
- Setting up of premiere institutes which mainly focusses on cruise crew skill development

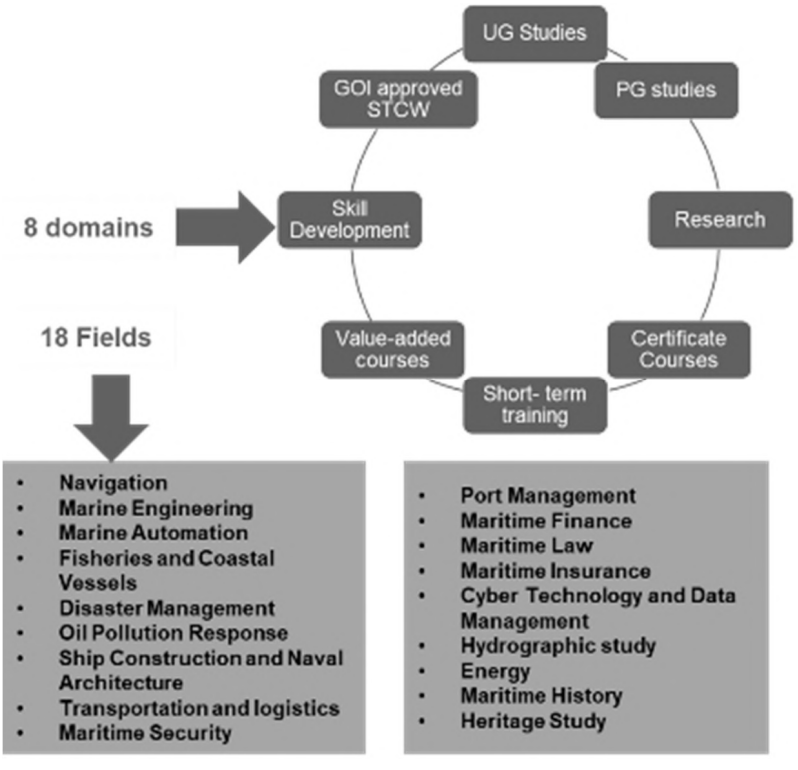
ACADEMIA LED REGIONAL COLLABORATION

CURRENT LANDSCAPE

At present, approximately 194 Maritime Training Institutes (MTIs) are approved by Directorate General of Shipping- Ministry of Ports, Shipping and Waterways which offer Training and Competency courses. Other eminent institutes such as IIT Kharagpur, IIT Madras, National Institute of Hydrography, Goa, Gujarat Maritime University, National Law University, Hyderabad also active in Maritime Education and Training.

MTIs are active in 18 fields, and these activities are spread over 8 domains. For each domain, these institutes possess a maximum of 5 facilities supported by subsidiary facilities.

Figure 160 Domains and fields of Maritime Training Institutes



The 18 fields include Navigation (Nautical Science), Marine engineering, Offshore (DP, offshore marine technology), Fisheries and coastal vessels, Marine Automation (Automation of the future, AIML, Control engineering like hydraulic, pneumatic), Disaster management (Specific to Maritime disaster and their management), Oil pollution response (Marine oil pollution, prevention, and financial implications), the Energy sector (Renewable energy, both on production and utilization, energy efficiency in Maritime sector), Transportation and logistics (Maritime specific), Maritime Security, Cyber technology and Data management (Maritime big data, data handling, data transmission, data analysis), Port management, Maritime Finance, Maritime Law, Marine Insurance, Hydrographic study with marine geoscience, Ship construction and Naval Architecture, Maritime history and heritage studies.

The 8 activities in the aforesaid fields are UG studies, PG studies, research, certificate courses, short-term training, value-added courses, GOI approved STCW courses, and courses of skill development for specific sectors.

These institutes conduct DG shipping administered studies and training along with other major activities such as -UG studies namely B. Sc in Nautical science, B Tech in Marine engineering, B Tech in Naval Architecture, BBA in Maritime Management, BBA in shipping.

Post-graduate courses namely Master's in Marine engineering and management, Master's in Naval Architecture, MBA in International Transportation & Logistics Management, MBA in Port and Shipping Management M. Tech in Dredging, Master in Harbour Engineering, Master in Maritime Law, Master's in international trade, Master in Ocean technology, Master's in marine biotechnology.

Short term training and value-added courses include Hydraulic Course, Course on Safe Operation on-board Tankers & Chemical Carriers, Ship Masters Command & Control Course, Reefer Container Operation & Maintenance Course, Hazard Simulation and Safety Awareness Training, Ship Chief Engineer's Continuous Professional Development course, ME engine control system course, Bulk carrier safety and inspection courses, courses related to MARPOL, courses for soft skill and leadership development in the maritime domain, Course approved by OEMs like RT-FLEX Training, MAN B&W engine courses, Auditor courses, Marine risk assessment and management courses, incident and accident investigation courses, Marine instrumentation and process control course; Simulator courses namely Liquid Cargo Handling Simulator (LCHS), Radar Observer Simulator Course (ROC), Ship Maneuvering Simulator (SMS), Radar, ARPA & Navigation Simulator Course (RANSCO), Engine room simulator.

Neighboring nations (including BIMSTEC member nations, and IORA member states) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator.

KEY INITIATIVES

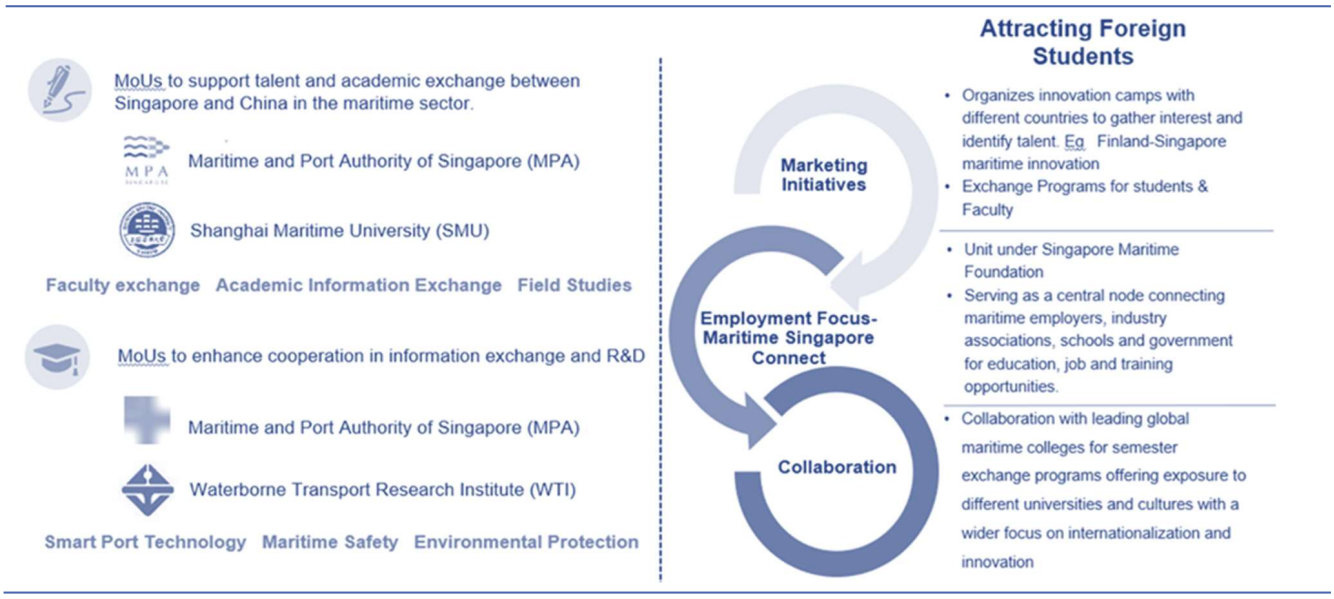
POLICY AND REGULATORY INITIATIVES

EXTENDING FACILITIES OF MARITIME INSTITUTES TO NEIGHBORING MARITIME COUNTRIES INCLUDING BIMSTEC AND IORA NATION

Extending maritime facilities to foreign students requires a holistic approach as adopted by Singapore

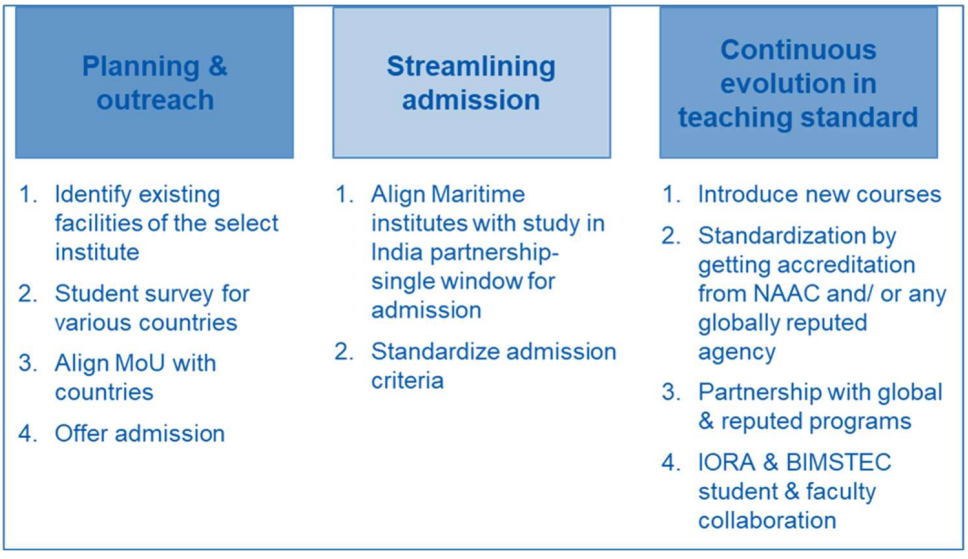
Figure 161 Case Study - Singapore attracting foreign students through multiple bilateral and internal initiatives

Case Study - Singapore attracting foreign students through multiple bilateral and internal initiatives



To extend Indian Maritime facilities to foreign students three key areas need to be aligned

Figure 162 Areas to be aligned to attract foreign students



Planning & outreach

- **Identify existing facilities of the select institute –** Identify all the courses that can be delivered, along with the Institute and its existing facilities.
- **Student survey for various countries –** A study is required to identify the marketable courses and their respective institutes that are going to be offered to foreign students. The details must include the facilities available at those institutes that may yield institutes appealing. These facilities may be -- Courses, faculty, labs, simulators, research activities, training in the 18 fields related to maritime industries. Additionally, surveys to be conducted to find the reasons for preference to U.K and Singapore among the neighboring country students. Also, a survey is required to identify reasons for preference to Ethiopian Institute by African countries
- **Identify courses and reach out to countries –** Based on the feedback received from the survey, reach out to countries with marketable courses on various platforms such as education and employment fairs, international conferences.

- **Align MoU with countries -** Facilitate signing of MoU with Bangladesh, Myanmar, Maldives, Sri Lanka, Mauritius, Seychelles and offer admission at the select institutes. Promote foreign students/ seafarers to undergo training in Indian institutes. E.g.: The French Directorate of Maritime Affairs and MPA inked an MOU to promote collaboration in training & skills development. Exchange programs for student & Faculty. E.g.: MPA and SMU MoU. Research & course collaboration

Streamlining admission

- Align Maritime institutes with Study in India program that has ambitious plan to attract 200,000 foreign students to India by targeting students from countries in South, South-East and West Asia, Africa
- All admission to happen via a single window system
- Standardize Admission criteria
- Marketing teams to be formed to carry out extensive professional marketing, communicate with International Industries to understand their need and find any demand for education, training, and upgrades desired from time to time

Continuous evolution in teaching standard

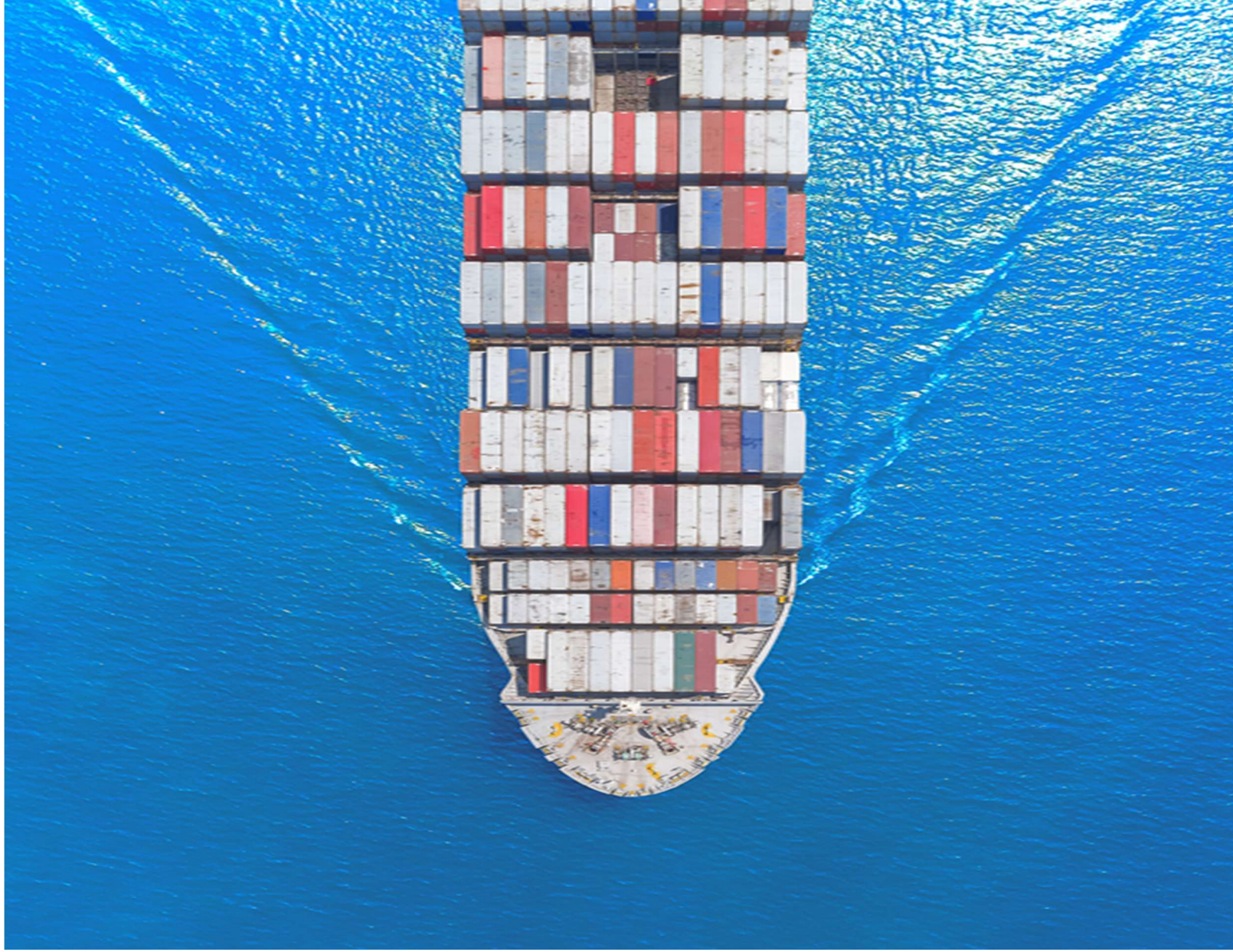
- **New courses** - Introduce and explore new courses in continuously evolving areas like Marine electronics, Oceanography, Marine geology, Maritime law
- **Partnerships -** Partnership with IITs offering course in fields of marine engineering, oceanography. Programmatic collaborations with World Maritime University. Co-certified degrees with affiliate institution like IIT, MIT.
- **IORA & BIMSTEC student & faculty collaboration -** Promote student and faculty exchange programs. Develop Joint E-Learning modules for students and faculty across BIMSTEC institutes. Undertake joining research studies in collaboration with BIMSTEC universities
- **Standardization -** Accreditation from National Assessment and Accreditation Council (NAAC) and globally reputed institutions. Up to date and latest course offering in line with global peers**.** Develop courses by designated and relevant Institutes aligning with market demand.

KEY PERFORMANCE INDICATORS

As part of Action plan, globally benchmarked targets have been defined as mentioned below to enhance education, research and training facilities in maritime sector through building collaborations and partnerships.

Metric	Status (as of 2021)	Target (2030)	Target (2047)
Number of Indian universities in Top 25 global ranking for maritime science	-	3-5	10-11
Number of research papers citations	42	2K+	5k+
Number of maritime start-ups in unicorn club	-	1	10
Percentage of research with industry collaboration	-	>60%	>80%

Theme 8
Strengthen India's global maritime presence



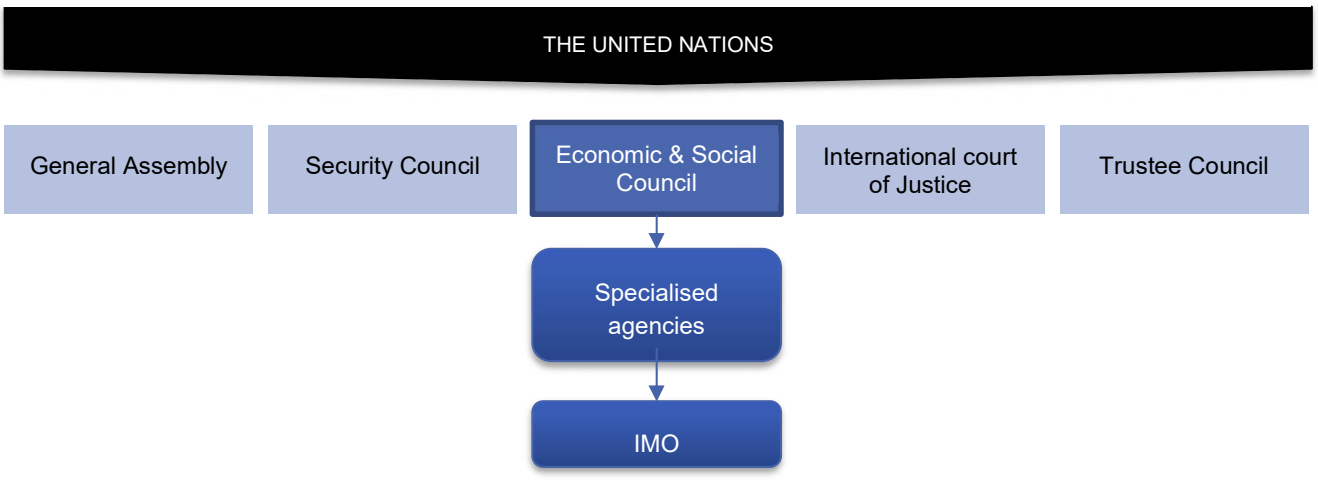
ENHANCE INDIA'S PRESENCE AT IMO

CURRENT LANDSCAPE

STRUCTURE OF IMO

Due to the nature of shipping operations (i.e., in open seas, beyond national boundaries) and the system of ships being registered in nations with open registries, international policy and regulation for the sector is especially important. The International Maritime Organization (IMO), a UN agency, is the main international organization regulating global shipping safety, security and maritime pollution. Rules adopted by the IMO are implemented by states, with member states having to ratify or accede to individual conventions and incorporate

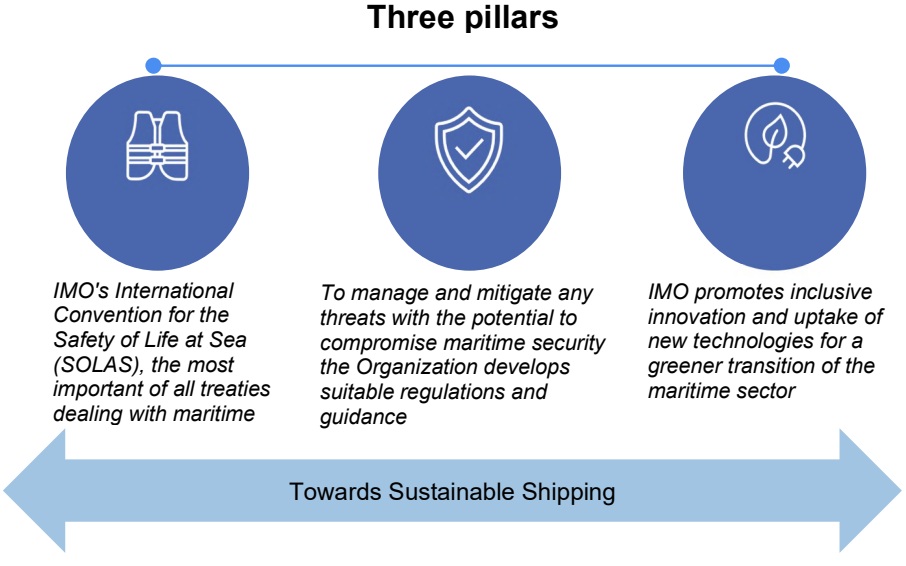
Figure 163 IMO extends United Nations resolutions



them into national law.

"IMO – the International Maritime Organization – is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships. The overall objectives are summed up in the IMO slogan: safe, secure and efficient shipping on clean oceans."

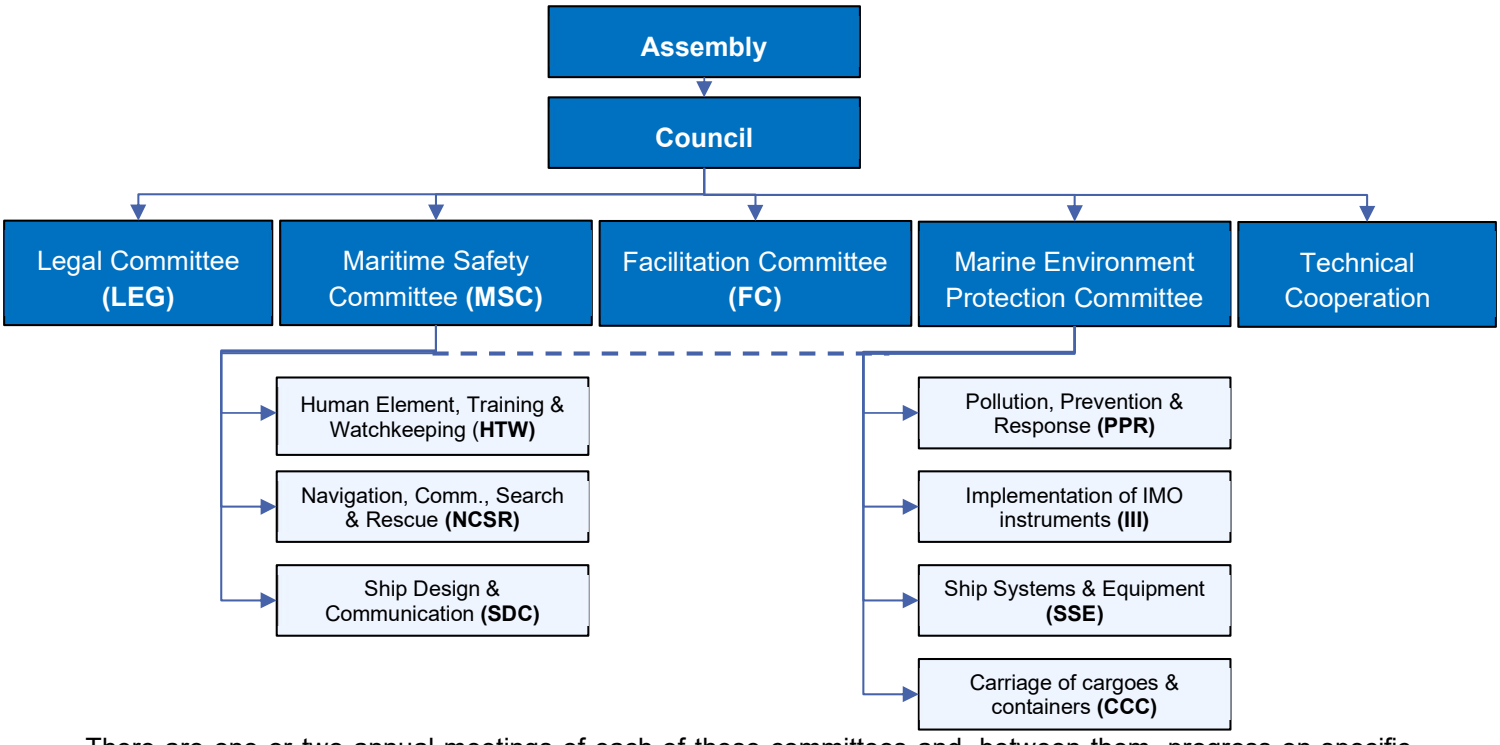
Figure 164 Pillars of IMO: towards sustainable shipping



The IMO currently has 174 member states (countries) and 3 associate members (Faroe Islands, Hong Kong and Macao). Most UN member states are also members of the IMO, except some landlocked countries such as Afghanistan, Botswana, Liechtenstein, Rwanda and others. All major maritime nations are represented at the IMO.

IMO is mainly a technical organization, and most of its work is carried out in a number of committees and sub-committees. IMO consists of an Assembly, a Council and five main Committees: the Maritime Safety Committee; the Marine Environment Protection Committee; the Legal Committee; the Technical Co-operation Committee and the Facilitation Committee and a number of Sub-Committees (Seven in numbers) support the work of the main technical committees.

Figure 165 IMO: Structure of the Organisation



There are one or two annual meetings of each of these committees and, between them, progress on specific matters is also achieved through correspondence groups, participation in which is open to all interested parties, with member states and NGOs being particularly active.

The IMO's highest governing body, the Assembly, consisting of all IMO member states, meets once every 2 years, and in between, the Council, consisting of 40 member governments elected by the Assembly, acts as the IMO's governing body and supervises the work of the IMO.

AGENDA SETTING AT IMO

The IMO Assembly, which meets once every two years, adopts the Strategic Plan (covering a six-year period) and High-level Action Plan (covering the next biennium) for the Organization.

The mission of IMO is to promote safe, secure, environmentally sound, efficient and sustainable shipping through cooperation. The challenges for IMO emanate from the general trends and developments in the shipping industry.

The strategic directions of IMO set out the general responses of the Organization to the challenges it faces and are designed to achieve its mission objectives.

The tools for supporting the IMO's strategic planning process are adopted by the Assembly on a biennial basis, by way of three documents: the strategic plan (SP), the High-Level Action Plan (HLAP) and the Result-Based Budget (RBB).

The strategic plan (SP) covers a 6-year period and establishes:

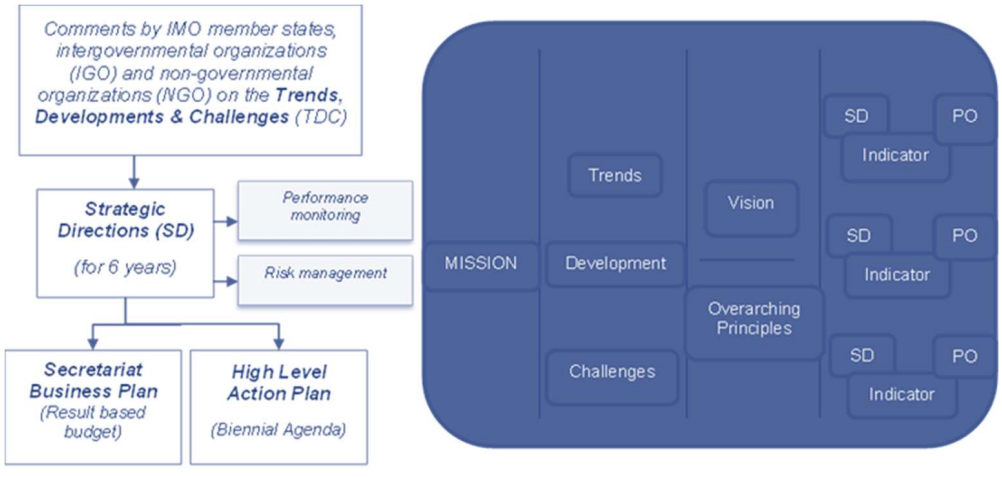
- the outcomes of the analysis of shipping trends and developments, and the consequential challenges
- the strategic directions for enabling IMO to achieve its mission objectives
- the performance indicators related to strategic directions.

The Strategic Plan covers a six-year period and is an expression of the Member States' commitment to ensuring the fulfilment of the Organization's aims and objectives in a uniform manner on a global basis, and to setting clear priorities for the purpose of achieving them.

The High-level Action Plan is developed to enable the Organization to effectively address those strategic directions by identifying high-level actions and so-called planned outputs (PO) that are necessary for the achievement of IMO's objectives and the priorities over a biennium resulting from those identified actions, thereby providing the linkage between the Organization's strategy, the work of the various IMO organs and the biennial budget.

Prior deciding the strategic directions, all IMO member states, intergovernmental organizations (IGO) and non-governmental organizations (NGO) are invited to submit their views on the Trends, Developments and Challenges (TDC) to be included in the new IMO strategy in accordance with IMO Resolution A.909 (20).

Figure 166 IMO: high-level Strategic Action Plan



"Planned output": a product planned in the High-level Action Plan to be delivered by the Organization during a biennium.

"Unplanned output": a product that may be agreed by IMO organs to be delivered during a biennium after the adoption of that biennium's High-level Action Plan;

Figure 167 IMO: Strategic Directions for 2018-2023

"Agenda": a list of planned outputs for discussion at a particular meeting.

PERFORMANCE INDICATORS FOR MONITORING STRATEGIC DIRECTIONS

Each of the strategic directions for every 6 years are monitored through performance indicators. Under each of the strategic directions, planned outputs are listed for each biennium.

These performance indicators include various items, some of which are mentioned below:

- Percentage of audit findings and observations with corrective actions implemented according to the target completion dates
- Number of deficiencies per category of deficiency
- Number of proposals submitted to IMO
- Percentage of technical cooperation activities directed towards the implementation of IMO instruments (article and regulation)
- Number of amendments adopted
- Number and percentage of Member States, IGOs and NGOs attending IMO meetings
- Percentage of vacant posts in general and professional/higher categories
- Percentage of assessments received from member states
- Percentage of technical cooperation and capacity-building activities with effective results for the receiving Member States
- Percentage of the reporting requirements that can be met by electronic means

"India is scheduled to be audited in 2023, which is delayed due to COVID-19 pandemic"

CHALLENGES

INDIA'S PRESENCE IN IMO COMMITTEES/ SUB-COMMITTEES

The sub-committees of IMO are the actual technical committees, where most of the work related to amendments to Convention or new requirements is carried out; while the main committees are policy-making committees for acceptance of proposals put up by sub-committees. The main committees elect their own rule of procedures and

officers in the form of Chairman and Vice Chairman for smooth conduct of the committee. A look at Chairman and Vice Chairman of MSC and MEPC in the last 10 years is important for understanding the role of influencers in adoption and amendments of Conventions.

Table 39 Country statistics: Chairman & Vice Chairman of MSC & MEPC held between 2011-2021

<table>
<tr><th rowspan="2">Year</th><th colspan="2">MEPC</th><th colspan="2">MSC</th></tr>
<tr><th>Nationality of Chairman</th><th>Nationality of Vice-Chairman</th><th>Nationality of Chairman</th><th>Nationality of Vice-Chairman</th></tr>
<tr><td>2011</td><td rowspan="2">Cyprus</td><td rowspan="2">Spain</td><td>Philippines</td><td>Denmark</td></tr>
<tr><td>2012</td><td rowspan="3">Denmark</td><td rowspan="3">Singapore</td></tr>
<tr><td>2013</td><td>Cyprus</td><td>Panama</td></tr>
<tr><td>2014</td><td rowspan="3">Panama</td><td rowspan="2">New Zealand</td></tr>
<tr><td>2015</td><td rowspan="3">Australia</td><td rowspan="3">Argentina</td></tr>
<tr><td>2016</td><td>Japan</td></tr>
<tr><td>2017</td><td>Japan</td></tr>
<tr><td>2018</td><td rowspan="3">Japan</td><td rowspan="3">Liberia</td></tr>
<tr><td>2019</td></tr>
<tr><td>2020</td></tr>
<tr><td>2021</td><td>USA</td><td>Greece</td></tr>
</table>

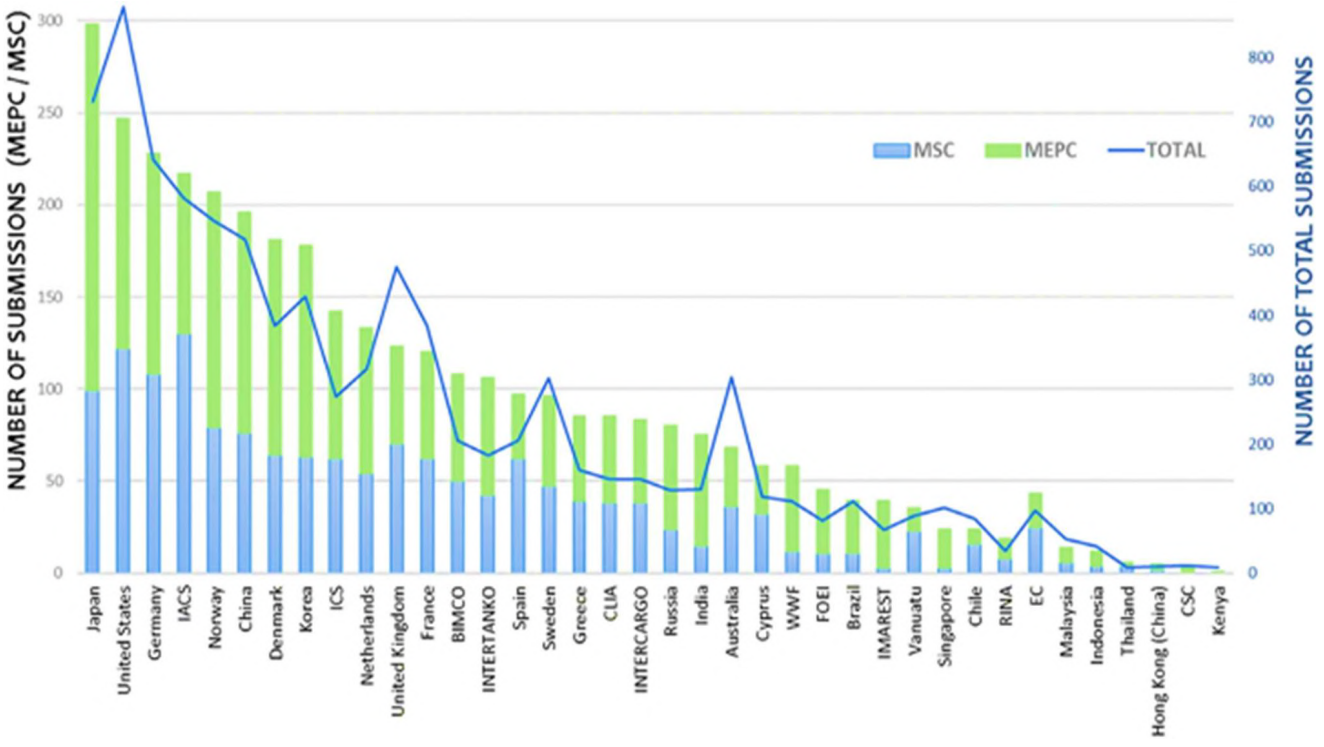
It may be noted that though there are hardly any submissions by flags such as Liberia, Panama and Cyprus (which flag about 16%, 13% and 2% of world dead-weight tonnage respectively and hence gross tonnage), yet one of them has been either Chairman or Vice Chairman of MEPC Committee in each of the year after 2010. However, there has been limited involvement of India in some of sub-committees such as PPR, SDC & NSCR. **Further, India's presence at IMO main committees and sub-committees, especially MEPC & MSC in last 10 years is negligible compared to other leading voices.**

NUMBER OF SUBMISSIONS BY INDIA AT IMO

The number of submissions to the IMO is surely an indicator of influence or power in the sense that, if you do not submit, only by coincidence will someone else submit something that conforms to your interests. A member state that regularly makes several submissions per MEPC (or MSC) meeting has a higher chance of seeing some of its submissions adopted than another member state that sends fewer or no submissions. However, submission does not necessarily guarantee adoption. Persistent submissions along with a mechanism to garner support from countries facing similar issues is likely to deliver results the form of taking into cognizance the issues raised, while developing new conventions or amendments to existing ones.

Some aggregate IMO submission statistics for MEPC and MSC meetings since 2010 are shown below:

Figure 168 Statistics: Country-wise submission to IMO

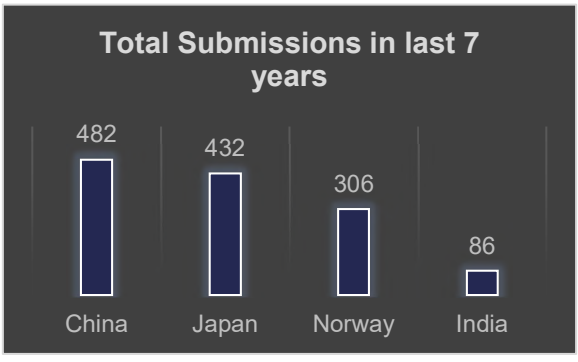


MSC and MEPC (left vertical axis, bar chart) and total IMO submissions including MEPC, MSC & other areas (right vertical axis, solid line) since 2010

It can be observed from above figure that for the period since 2010, the USA, Japan, Germany, IACS Norway and China have been the top six IMO delegations by total number of submissions, while India ranks 21.

India ranks 21 in number of submissions at IMO, its submissions are at-least 3 times less than other leading voices at IMO.

Figure 169 Select maritime nations submission statistics



QUALITY OF SUBMISSIONS

Making a non-trivial submission takes significant resources, possibly involving R&D or studies to support positions, and if these resources are not undertaken or are unavailable or limited, maybe the best strategy is to use them for responding rather than proposing, which is happening at present. This will require involvement of organizations with relevant competencies to develop submissions based on sound research in India. The comments on policy changes on issues such as market-based measures, CII, etc. should be in accordance with the policy of GOI, which should be known to all concerned.

SUPPORT FOR SUBMISSIONS

Since most of the decisions at IMO are based on consensus and thus indirectly on paper submissions, there are two types of support needed for any decision making at IMO in accordance with India's interest:

Table 40 India at IMO: representation & submission status

Support at IMO meetings for the paper through permanent representation	Support in form of co-sponsoring
Prominent maritime nations have their permanent representatives at London (Headquarters) and are supported by a large contingent (of domain experts from their maritime administration, seafarers and industry associations) during the meetings. They ensure that they have representation in every sub-committee, working group and even correspondence groups so that they are aware of the developments. **Countries with permanent representatives protect their interests by influencing decision at IMO**	Most of the European Nations work together in presenting co-sponsored papers. China, Japan, Singapore, Korea and a few others also follow the same pattern ensuring that a large delegation intervenes in meetings for their cause. **This increases influence in acceptance of submission.**
India's representation at IMO meetings is often made through a skeletal delegation ***India's permanent representative post at London has remained vacant for more than 25 years***	Most of solo submissions of India did not get accepted at IMO. There have been few/ no instances where India took lead role in co-sponsoring a paper ***51% submissions of India at IMO since 2014 were solo submissions***

A comparison of India's involvement at IMO in terms of submissions with other selected states since 2014 is shown below:**Table 41 Country statistics: Stand-alone and co-sponsored submissions to IMO**

Committee/ Sub-Committee/ ISWG	Stand-alone submissions				Submissions as co-sponsors			
	India	China	Japan	Norway	India	China	Japan	Norway
MEPC	24	73	81	84	21	27	54	38
MSC	11	73	53	32	1	15	36	36
Legal	2	5	1	1	**0**	3	1	5
FAL	**0**	2	6	3	**0**	2	2	3
CCC	**0**	14	40	13	**0**	4	7	4
PPR	**0**	2	19	39	3	7	7	10
SDC	1	49	60	14	1	3	4	4
SSE	**0**	60	38	16	**0**	1	5	5
III	3	40	1	0	**0**	6	5	1
NCSR	2	6	3	10	4	24	16	13
ISWG-GHG	**0**	10	4	9	11	8	10	9

KEY INITIATIVES FOR ENHANCED PRESENCE IN IMO

SET UP A DEDICATED IMO CELL IN INDIA

India's maritime administration is governed by the Directorate General of Shipping (DG Shipping), Government of India (GoI). Key functions of DG shipping are to ensure the following:

- Indian ships and shipping companies meet high safety- and environmental standards

- Indian seafarers have high qualifications and good working- and living conditions
- Foreign ships in Indian territory and ports meet international rules

However, the organization structure is more aligned to critical administrative works and has limited bandwidth for new technical & R&D efforts.

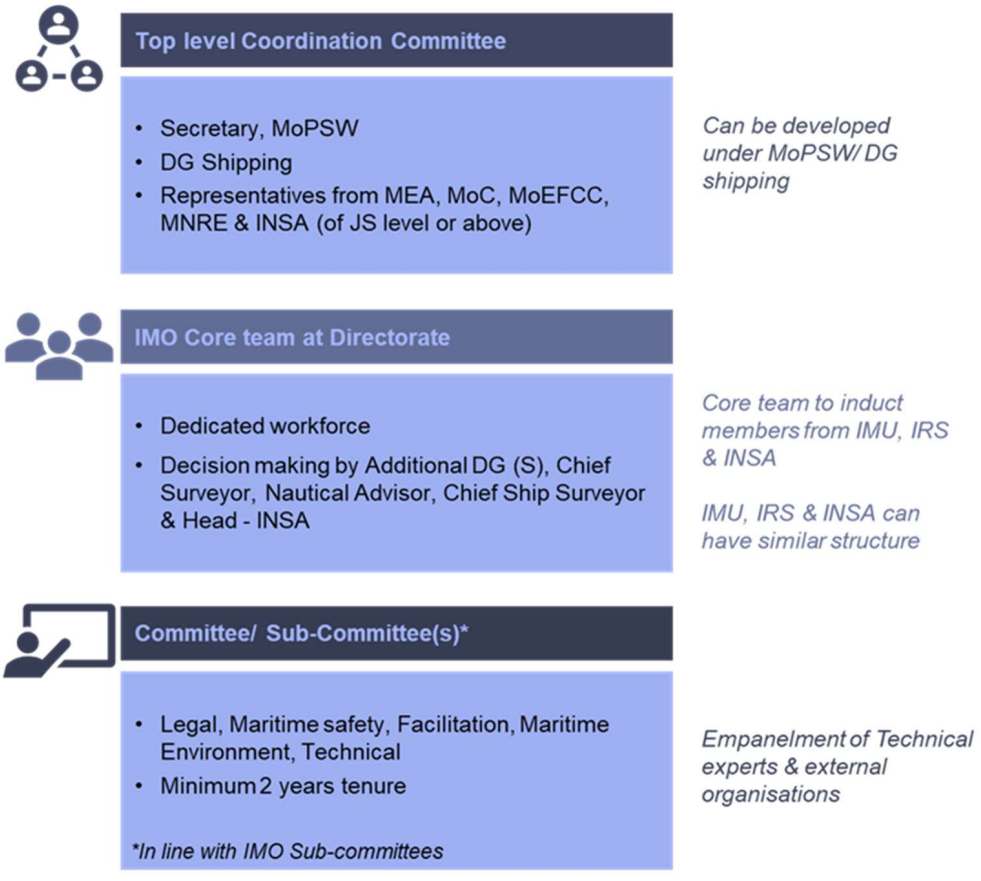
It is suggested that a dedicated **IMO cell** is set up with its offices at Directorate, Indian Maritime University (IMU), Shipping Corporation of India (SCI) and Indian Register of Shipping (IRS).

The IMO cell shall be led by a **Top-level Coordination Committee**. The committee will decide India's position with respect to each of the strategic direction adopted by IMO. Since the strategic directions of IMO are set for a period of 6-years and reviewed every two-years, it is recommended that India's position for each strategic direction of IMO may be pre-decided and approved by the high-level committee. Besides the core functions would be to approve position of India w.r.t each IMO Strategic Direction, approve budget of various sub-committees and review work progress by IMO cell.

The **IMO Core team at Directorate** shall work under high level committee and will coordinate all the technical work done by various members of corresponding Indian committees and sub-committees and work in close cooperation with Indian representative at IMO. The core team should not only coordinate all activities of Indian committees and sub-committees but also ensure that there is wider participation by experts and stakeholders with generation of ideas, resolution of apprehensions, etc.

Under the core team, **corresponding Indian Committees & Sub-Committees** shall be formed. These committees and sub-committees shall take up India's position for each planned output for a biennium decided by IMO members and decide papers to be submitted at IMO, resources for developing such papers and the kind and extent of support needed at IMO based on India's position on each planned output.

Figure 170 Proposed structure of IMO cell in India



The Committees and sub-committees shall also have a **panel of organizations and experts** for each planned output. Active participation of private sector at both Indian level and IMO level shall be required because they end implementers are required to have a say in the developments at IMO. Each Committee and sub-committee

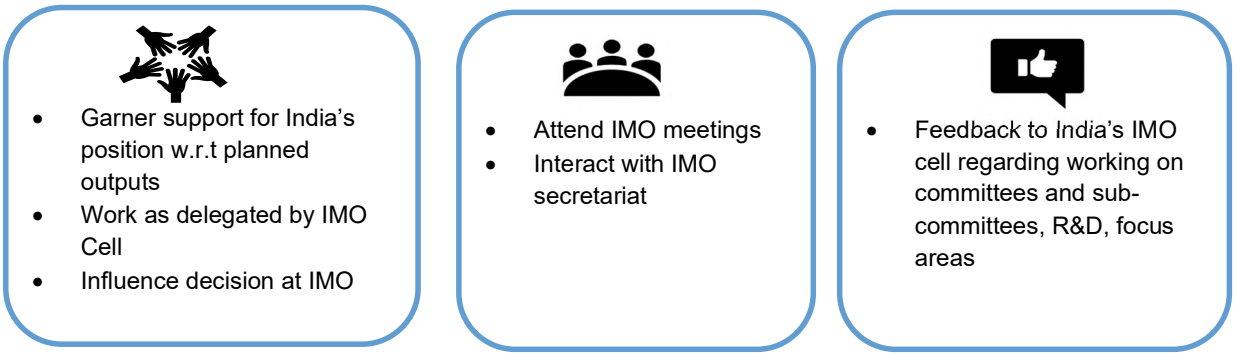
Figure 171 Regional institutions for co-sponsored submissions on topics of common interests towards sustainable shipping

at Indian level shall have participation of industry bodies such as INSA, equipment manufacturers, ship designers, shipyards as well experts/ consultants having expertise in the areas of legal, maritime safety, environment, technical, etc. For co-sponsored papers, IMO cell may collaborate with regional institutions on topics of common interests.

APPOINTMENT OF A PERMANENT REPRESENTATIVE AT IMO HQ, LONDON

A permanent representative having technical background at HCI, London from the Directorate to attend IMO meetings will be useful for effectively intervening and participating in the deliberations. Further, this will help in protecting India's interests by influencing decision at IMO.

Figure 172 Role of permanent representative of India at IMO



DEVELOP INDIVIDUALS TO TAKE UP POSITION OF CHAIRMAN AND VICE CHAIRMAN OF VARIOUS IMO COMMITTEES AND SUB-COMMITTEES, WORKING GROUPS AND CORRESPONDENCE GROUP COORDINATORS

Since India's representation as Chairman and Vice Chairman of various IMO Committees and Sub-Committees is minimal; it is recommended that individuals be identified and developed to take up these positions.

ADDRESSING IMO'S STRATEGIC DIRECTIONS

IMO has identified seven strategic directions for the six years period between 2018 and 2023. The challenges and recommendations for some of the Strategic Directions identified are mentioned below:

SD 1: IMPROVE IMPLEMENTATION

IMO has identified “Improve Implementation” as one of its strategic directions. The important aspects of this improved implementation mainly include 2 areas:

- Adoption/ Ratification of IMO Conventions
- Implementation of conventions widely and effectively

India is signatory to 35 of IMO Conventions, while IMO has developed more than 50 International Conventions until date. Some important conventions to which India is yet to become a signatory are:

- **Ballast Water Management Convention 2004,** which aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments.

  Under the Convention, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. All ships will also have to carry a ballast water record book and an international ballast water management certificate.

  As of 15 July 2021, 86 countries were contracting States to the BWM Convention representing 91.12% of the gross tonnage of the global merchant fleet

- **Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F 95) Convention,** which sets certification and minimum training requirements for crews of seagoing fishing vessels with the aim to promote the safety of life at sea and the protection of the marine environment, considering the unique nature of the fishing industry and the fishing working environment.

  The 1995 STCW-F Convention is a key building block in the promotion of safety of life at sea by setting the necessary framework to ensure the provision of duly skilled personnel in the fisheries sector. Better skilled and trained personnel will decrease the likelihood of fatal accidents and will therefore decrease the loss of lives at sea and improve general safety of fishing operations.

  By 2018, the STCW Convention had 164 Parties, representing 99.2% of world shipping tonnage.

- **International Maritime Satellite Organization Convention (IMSO) amendments 2006 and 2008** that oversees certain public satellite safety and security communication services provided via the Inmarsat satellites.
- **London Convention (LC) 72, also known as The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972** is an agreement to control pollution of the sea by dumping and to encourage regional agreements supplementary to the Convention. It covers the deliberate disposal at sea of wastes or other matter from vessels, aircraft, and platforms.

  As of September 2016, there were 89 Parties to the London Convention (LC) 72.

- **London Convention Protocol 96** reflects the global trend towards precaution and prevention with the parties agreeing to move from controlled dispersal at sea of a variety of land-generated wastes towards

integrated land-based solutions for most, and controlled sea disposal of few, remaining categories of wastes or other matter.

- **Cape Town Agreement 2012** outlines fishing vessel standards and includes other regulations designed to protect the safety of crews and observers and provide a level playing field for industry.
- **Civil Liability for Bunker Oil Pollution Damage (BUNKER Convention) 2001** aims to adopt uniform international rules and procedures for determining questions of liability and providing adequate compensation.

  In the convention, Bunker Oil is the fuel used to power the ship. The convention covers leakage of that oil and requires signatories to the convention to have their ships appropriately insured against such leakages.

As of November 2018, the Civil Liability for Bunker Oil Pollution Damage (BUNKER Convention) 2001 treaty has been ratified by 90 parties.

SD 2: ENHANCE GLOBAL FACILITATION AND SECURITY OF INTERNATIONAL TRADE

Shipping is an integral part of the global/regional/national economy and supply chain and so disruption of shipping can affect supply chains. Continued effort is needed to ensure that ships move from port to port without undue delay, facilitate electronic exchange of information and protect shipping from threats of cyber-security and piracy. With threat on movement of people due to COVID-19, there is also a need to explore new measures for surveys and inspections based on a risk assessment approach.

The surveys are mandatory requirements under various international convention to ensure periodically the compliance to the relevant convention. However, the flag state inspection is a mechanism to ensure quality of surveys (since the surveys are outsourced to the Recognized Organization) and to ensure compliance by ships in-between periodical surveys. The COVID-19 pandemic has forcefully shown the importance of digitization and new technologies within the shipping industry, with the never before need for remote surveys and risk-based flag state inspection periodicity. The Remote surveys are a contentious issue because of reasons such as the following:

- Whether these can provide same level of assurance
- Whether from being a risk management exercise, it does not become an inspection and hence time-consuming exercise
- The fatigue of seafarers who will be involved majorly in carrying out such remote surveys
- The additional training required by a seafarer who is already burdened by a number of training courses to be completed periodically
- Technology requirements for conducting such surveys, and their availability across the world
- The changes required in international conventions for acceptance of such remote surveys

Remote surveys/ audits/ inspection requires procedures through IMO and may be presented at IMO forum prior coming out with any decision to permit Remote surveys, inspections and audits.

SD 3: ENSURE REGULATORY EFFECTIVENESS

The numerous safety and pollution prevention conventions developed by IMO show that there is no shortage of legislation in this domain. Shipping companies have primary responsibility for the safe operation of their ships and welfare of crew. However, the government has a crucial role to play with regard to implementing, enacting important conventions and enforcing their provisions nationally.

The International Conventions are considered effective, if they are able to achieve their primary objective, which for IMO Conventions are safety, pollution prevention and security. Even if Conventions are ratified, rules are framed, if these are not implemented effectively, the desired purpose will not be achieved.

For Indian Administration to be effective, it needs to monitor effectiveness of various players involved in running of ships safely, while ensuring environmental performance (Shipping Companies, RPSL, Individual Ships, Recognized Organizations etc.) and taking corrective actions accordingly.

The key performance indicators for Indian Administration to measure the effectiveness of its enforcement regime on Indian Ships are:

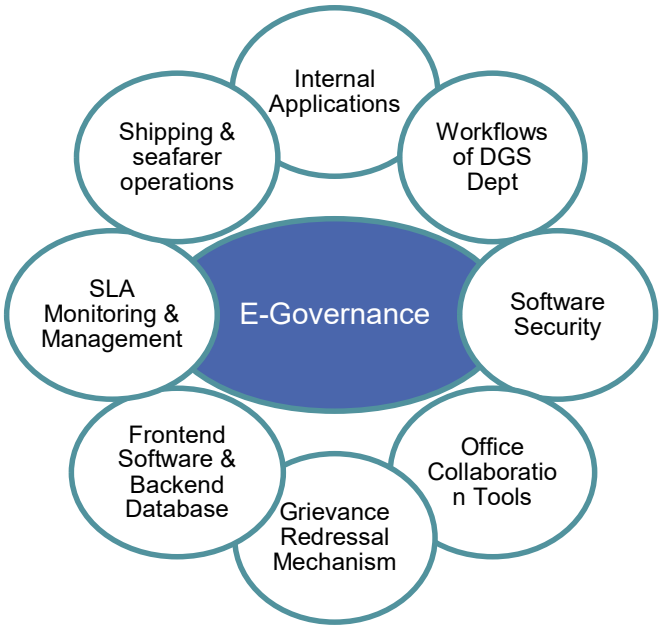
- Number of Indian vessels involved in casualties.
- Number of seafarers who died in accidents on ships.
- Number of vessels detained at foreign ports.
- Number of seafarers abandoned.
- Number of seafarers not paid regular salary.
- Age profile of ships being registered to operate as coastal vessels: Since limits on quantity of pollutants emitted in ship exhaust is related to age of the vessel, because MARPOL Annex VI only progressively tightens this limit, this is an indicator of increase in pollution on Indian coast.
- Number of Oil Pollution incidents.
- Number of extensions/dispensations being given: This is an indicator poor SMS implementation by shipping companies.
- Number of Indian ships involved in piracy incidents.
- Average Survey days: Number of Survey (except those involving dry-docking) days divided by total number of ships surveyed: This is an indicator to indicate the maintenance of ship between surveys. Poorly maintained ships may take a greater number of days to get their ship repaired indicating that the ship delayed the repairs. Though there is no benchmarked value, it can be good indicator while developing the overall performance indicator.
- Performance of RPSL, shipping companies, recognized organizations, etc. as the performance of these entities is directly linked to performance of Indian Administration as a flag state.

The key performance indicators for Indian Administration as a Port State Control Authority in India are:

- Age profile of vessels coming to Indian Ports: It is a known fact that lower the age of a ship, safer and less polluting it is. A downward trend in age profile is a good indicator of effectiveness of port state inspections.
- Number of foreign ships involved in casualties on Indian Coast, which include groundings.
- Number of seafarers abandoned on Indian ports.
- Number of higher energy efficient ships coming to Indian ports.
- Number of IOMOU high-risk ships coming to Indian ports.
- Number of ships with Statutory Certificates issued by non-IACS RO coming to Indian ports.

- Number of ships flagged in countries, which are black/grey listed in TOKYO/Paris PSC MOU or poor performers in USCG

Figure 173 E-governance at DG Shipping for monitoring of Indian Administration



For performance assessment, it is important to develop an electronic system, that take the inputs from important sources such as the port state control data, inspection data, accident data, casualty data, incident reports, exemptions issued, certificates revoked and all the other factors that provide clues as to how well any ship is performing.

The e-governance portal of DG shipping currently being developed and planned to be operational may be used to monitor these KPIs. Efforts to also be made for transferring of relevant information to IMOs Global Integrated Shipping Information System (GISIS) platform.

Figure 174 European Marine Casualty Information Platform, EMCIP connected to the GISIS (IMO)

SD 4: ENGAGE IN OCEAN GOVERNANCE

The use of the world's oceans is intensifying as a result of both the continuing increase in the exploration and use of marine resources and opportunities they provide. To ensure the sustainable development of activities in the marine space, such activities have to be balanced with the capacity of the oceans to remain healthy and diverse in the long term. There is a need to ensure that the use of marine spaces does not disproportionately limit the ability of shipping to support and contribute to the global economy, socio-economic progress and development, and assist in the delivery of related aspects of the Sustainable Development Goals (SDGs).

Addressing UN Sustainable Development Goals (SDGs)

Ships transport more than 80% of world trade by volume in the most financially effective and energy-efficient manner and are a critical facilitator for most ocean-based industries. Today, the shipping industry influences both positively and negatively a wide range of the issues that are addressed by the Sustainable Development Goals (SDGs). Maritime transport is important from the social perspective as it creates vast job opportunity for millions of seafarers and even more shore-based personal.

Table 42 Status of actions under SDG initiatives: SD4, Engage in Ocean Governance

UN SDG	Action Areas
UN SDG Goal 14: Conserve & Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development	Since IMO objectives are safe, secure and efficient shipping on clean oceans, the work of IMO therefore relates to most, if not all, of the SDG 14 targets, particularly as regards its environmental conventions. Hence, implementing and enforcing the main conventions that actively address marine pollution is significant. While India is signatory to most of these conventions, the gaps in Indian Maritime Administration relate to: • Ratification of LC/ LP convention • Ensuring effective implementation of these Conventions
SDG 4: Quality Education (Ensure Inclusive and Equitable Quality Education and Promote Learning Opportunities for all) **SDG 5: Gender Equality** (Achieve Gender Equality and Empower All Women and Girls) **SDG 8: Decent Work and Economic Growth** (Promote Inclusive and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All)	The IMO International Convention on Standards of Training, Certification and Watch-keeping for Seafarers (STCW) provides universal standards of competence for seafarers and effective mechanisms for enforcing its provisions. IMO contributes to inclusive and quality education by providing training activities, in particular through its technical cooperation programmes and its two maritime training institutions - the World Maritime University (WMU) and the International Maritime Law Institute (IMLI), both established by IMO. IMO has for many years supported gender equality and the empowerment of women through targeted training opportunities for women in the maritime sector. IMO's programme "Integration of women in the maritime sector" empowers women by promoting their key role in the maritime infrastructure of developing countries. Some courses in which women are being sponsored through payment of tuition fees, stipend and return airfare are: Women in Port Management Course at Galilee International Management Institute (GIMI), Nahalal, Israel; Courses on Women in Port Management, Institute Portaire d'Enseignement et de Recherche (IPER), Le Havre, France and A to N Managers Course, delivered in partnership with International Association of Marine Aids to Navigation and Lighthouse (IALA), IALA WWA, France. India is a signatory to both STCW Convention and Maritime Labour Convention (MLC), Indian seafarer occupies 12% of International Seafaring jobs, and Maritime Vision 2030 recommends this figure to reach 20% by 2030. The effectiveness of implementation of MLC 2006 Convention largely depends upon the approved recruitment and placement agencies and the foreign ship owners association. It is recommended that: • Effective performance indicators be devised and monitored for these organizations. • Devise pre-sea courses such as Computer and Marine Engineering/Nautical Science and Electronic and Marine Engineering/Nautical Sciences. • Changes in post sea training course to ensure that seafarers comply with STCW requirements related to education and training required to get their Certificate of Competence (CoC) in time • Seafarers who want to leave seafaring are given adequate way out through post-graduation degree courses and short-term degree course such as those related to decarbonisation, automation, data collection and database management, etc. • Present paper to IMO to permit digitized Certificate of Competence through amendment in IMO STCW convention. Assess methodology for such issuance ensuring enough security features to prevent use of fake certificates and present a paper to IMO HTW Sub-Committee with necessary recommended amendments to IMO Convention. Take support from other seafarer supplying nations to ensure it is given well-needed support at IMO.

UN SDG	Action Areas

	• Digitize all services to the seafarer and provide pre-departure training to seafarers to use these digitized services
	• Review all post sea training to facilitate for dual mode that is e-mode and classroom mode.
	• Digitize all competence examination. The process is on; however, it is to be ensured that it is carried out for all categories of seafarer such as NCV, foreign going, fishing vessel, dredge grade, etc.
	• Nominate and fund at least one woman every year for MSC in WMU MALMO and one for LLM at WMU IMLI.
	• Nominate and get funding from IMO for the following IMO Sponsored courses:
	  ○ Women in Port Management Course at Galilee International Management Institute (GIMI), Nahalal, Israel.
	  ○ Courses on Women in Port Management, Institute Portaire d'Enseignement et de Recherche (IPER), Le Havre, France and
	  ○ A to N Managers Course, delivered in partnership with International Association of Marine Aids to Navigation and Lighthouse (IALA), IALA WWA, France
	  ○ Nominate at least one woman in Shadow IMO Committee/ Sub-Committee set up in India.
	• Nominate Indian professionals for IMO Goodwill Maritime Ambassador Scheme, Internship and externship schemes

SDG 6: Clean Water and Sanitation **SDG 11: Sustainable Cities and Communities** **SDG 12: Sustainable Consumption and Production Patterns**	IMO has developed a number of important regulations relevant to this cluster of SDGs, in particular the London Convention and Protocol on the prevention of marine pollution by dumping of wastes and other matter at sea (LC/LP), the Hong Kong Ship Recycling Convention, and the International Convention for the Prevention of Pollution from Ships (MARPOL). India has already ratified Hong-Kong Ship Recycling Convention and Ship Recycling Act and Rules have been notified. It is recommended that • These conventions are effectively implemented through KPIs development • Ratification of LC/ LP convention and effective implementation

SD 5: RESPOND TO CLIMATE CHANGE

With the adoption of the UN's 2030 Agenda for sustainable development and the Paris Agreement at COP 21, climate change has been recognized as one of the greatest challenges of our time. Although shipping is one of the most energy-efficient modes of transportation, the shipping industry continues to pursue strategies to reduce emissions worldwide. The IMO's vision is to phase out greenhouse gas (GHG) emissions as soon as possible within the end of this century. The aim is to reduce total emissions from shipping by 50% in 2050, and to reduce the average carbon intensity by 40% in 2030 and 70% in 2050, compared to 2008.

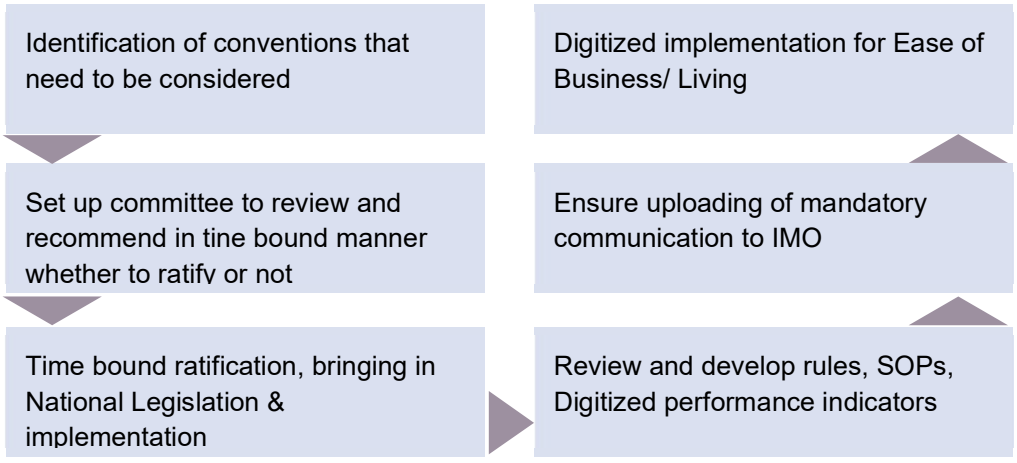
The 50% emission reduction is ambitious and will likely call for widespread uptake of zero-carbon fuels, in addition to other energy efficiency measures. Until the time, alternate fuels are developed, there is a need by all stakeholders to apply coherent effort to reduce emissions. Partnership with ports is of special importance for IMO when it comes to the implementation of the 2030 Agenda. An effective ship-port interface is crucial to the building of resilient infrastructure. IMO has invited Member States to encourage voluntary cooperation between the port and shipping sectors to contribute to reducing GHG emissions from ships.

KEY INITIATIVES TOWARDS ADDRESSING STRATEGIC DIRECTIONS

SD1: IMPROVE IMPLEMENTATION

While ratification of a Convention is not enough, implementation of those conventions is required to use them widely and effectively. This has to be done through development of rules, standard operating procedures, digitized performance indicators and their trends related to safety, security and environmental protection, performance indicators and trends for all entities involved in implementation of IMO Conventions and rules framed with a regular feedback mechanism to enhance their performance.

A process is to be developed to decide on what other conventions to be ratified.



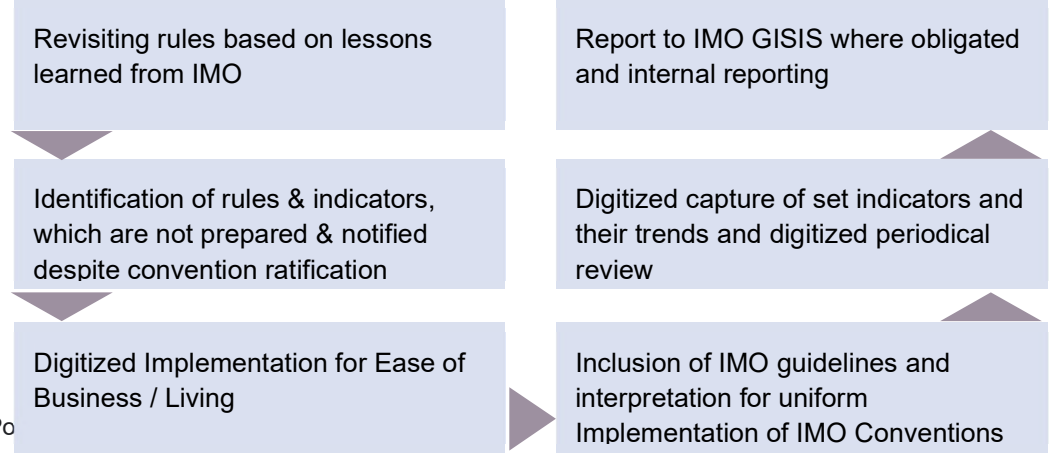
Ratification of the following conventions are envisaged:

- Ballast Water Convention 2004
- STCW-F 95 Convention
- IMSO amendments 2006 & 2008
- London Convention72, London Convention Protocol 96 (LC/ LP)
- Cape Town Agreement 2012
- Civil Liability for Bunker Oil Pollution Damage (BUNKER Convention) 2001
- High Seas in cases of Oil Pollution Casualties 1969 (Intervention 1969)

Further, for some of the conventions that India is part of, the rules for implementation have been framed years ago as can be seen from some examples below:

- Merchant Shipping Cargo Ships Construction and Survey Rules 1991
- Merchant Shipping Carriage of Cargo Rules 1995
- Merchant Shipping Construction and Survey of Passenger Ship Rules 1981
- Merchant Shipping Life Saving Appliances Rules 1995
- Merchant Shipping Load Line Amendments Rules 2001
- Merchant Shipping Management of Safe Operation of Ships Rules 2014
- Merchant Shipping Prevention of Pollution by Sewage from Ships Rules 2010

Figure 175: Process to review and update the rules



SD2: ENHANCE GLOBAL FACILITATION AND SECURITY OF INTERNATIONAL TRADE

The proposed initiatives to enhance global facilitation and security of international trade are as follows:

- **Digitized certification**

It is recommended to ensure digitization of certificates and process for the following:

  - Dredge engineer/ master certification
  - ISM Certification
  - Bunker delivery receipt
  - Port reception facility receipts
  - Petroleum license
  - MARPOL Certificates
  - Preliminary Casualty report preparation and approval
  - SMC/ISPS/DOC Audit reporting
  - MLC Inspection reporting
  - Exemptions and dispensations
  - Ships statutory certificates
  - Safe manning document

- **Piracy and cyber security of common networks**

The vulnerability in Cyber security can affect the safety of crew, vessel, and cargo and even ports. It can cause a disruption in various digitized processes causing breakdown in business continuity and digitized system can become prone to unauthorized access, manipulation and disruption.

It is recommended to standardize the processes in relation to cyber and information security management. **It is also suggested to devise standard procedures for robust cyber and information security emergency response in the maritime sector and conduct yearly drills.**

- **Remote Inspections/ Surveys/ Audits of Ships**
  - Remote surveys/ audits/ inspection requires procedures through IMO.
  - A paper may be presented at IMO forum to permit remote surveys, inspections and audits with proposed procedures

SD3: ENSURE REGULATORY EFFECTIVENESS

The proposed initiatives to engage to ensure regulatory effectiveness are as follows:

- Effective monitoring:
  - Monitor performance of Indian ships, shipping companies and other entities through KPIs
  - Monitor effectiveness of port state inspections in India through KPIs

- An integrated database system through e-governance platform to capture data on KPIs contributing to shipping performance

- Reporting:
  - Ensure regular updation of KPIs and reporting on e-governance portal being developed
  - Identify what information has to be uploaded on IMO GISIS and create digitized mechanism for uploading such information on IMO GISIS.

- Performance Assessment:
  - Electronic dashboarding that take inputs from monitored KPIs and display important statistics
  - Develop operational feedback mechanism for rules/sop changes based on above data

SD4: ENGAGE IN OCEAN GOVERNANCE

The proposed initiatives to engage in Ocean Governance are as follows:

- Ratifications:
  - Ratification of LC/ LP convention
  - Effective implementation and monitoring of all conventions through KPIs
- Training & capacity building
  - Devise pre-sea courses
  - Changes in post sea training course to comply with STCW requirements
  - Exit courses for Seafarers through post-graduation degree courses
  - Paper to IMO to permit digitized Certificate of Competence through amendment in IMO STCW convention.
- Nomination to IMO partnered institutes
  - Nominate and fund at-least one woman every year for MSC in WMU MALMO and one for LLM at WMU IMLI.
  - Nominate and get funding from IMO for IMO Sponsored courses
  - Nominate Indian professionals for IMO Goodwill Maritime Ambassador Scheme, Internship and externship schemes

Apart from various trainings already covered in section above, various other areas may be explored to enhance implementation of IMO priority areas.

Figure 177 Proposed capacity building initiatives, India

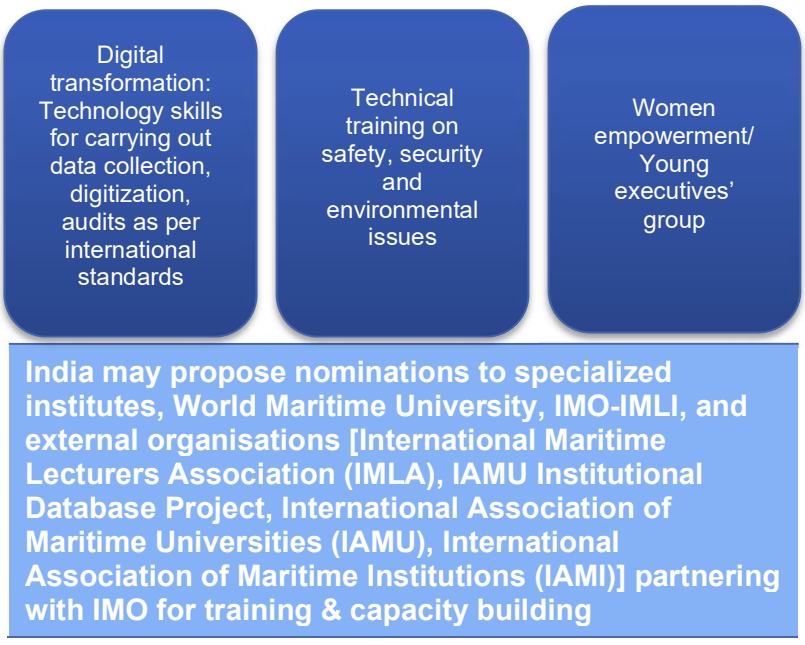


Figure 176 Case Study: Training Programmes through Maritime Ports Association, MPA Singapore

Maritime Ports Authority, Singapore implements training programmes through Maritime Ports Association

Trainings & support provided to maritime professionals under various themes

Funds for the programmes that are provided by MPA & Singapore Maritime Cluster Fund (MCF)

Themes include Digital Transformation; Legal & Insurance; Technical: Safety, Security & Environmental, Young Executives Group, etc.

SD5: RESPOND TO CLIMATE CHANGE

In order to facilitate ships and help Indian ports to create an efficient, effective and transparent port reception service delivery, DG shipping, India has developed an online portal known as 'Swachh Sagar'. All Indian flagged ships registered under Merchant Shipping Act 1958 and all foreign ships during each visit to any Indian port, anchorage, roadstead, etc. are required to comply with the requirements of the circular.

- **Swachh Sagar: It is to be ensured that the portal is implemented at all IV and non-major ports as well.**

New mandatory measures to cut the carbon intensity of international shipping have been adopted by the International Maritime Organization (IMO), setting shipping on a course to meet greenhouse gas reduction targets established in the 2018 Initial IMO Strategy for Reducing GHG Emissions from Ships. The new measures will require all ships to calculate their Energy Efficiency Existing Ship Index (EEXI) following technical means to improve their energy efficiency and to establish their annual operational carbon intensity indicator (CII) and CII rating. Carbon intensity links the GHG emissions to the amount of cargo carried over distance travelled. CII applies to all ships above 5,000 GT.

Under IMO regulation, CII is an operational indicator and will be assessed annually from 2023 with yearly stricter emission limits

- **India may take a lead in CII R&D in regional forum for further promotion of regulations & periodicity in Port State Control inspections**

- **India may suggest including CII rating in Indian Ocean MOU, IOMOU (Memorandum of Understanding on Port State Control for the Indian Ocean Region) risk calculation methodology in line with the new CO_2 regulations, beginning 2023.**

LEADERSHIP POSITION IN REGIONAL FORUMS (BIMSTEC AND IORA)

CURRENT LANDSCAPE

Building partnership and enhancing maritime cooperation with Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) and Indian Ocean Rim Association (IORA) member states is one of the important steps for India to grow its global stature as a maritime power.

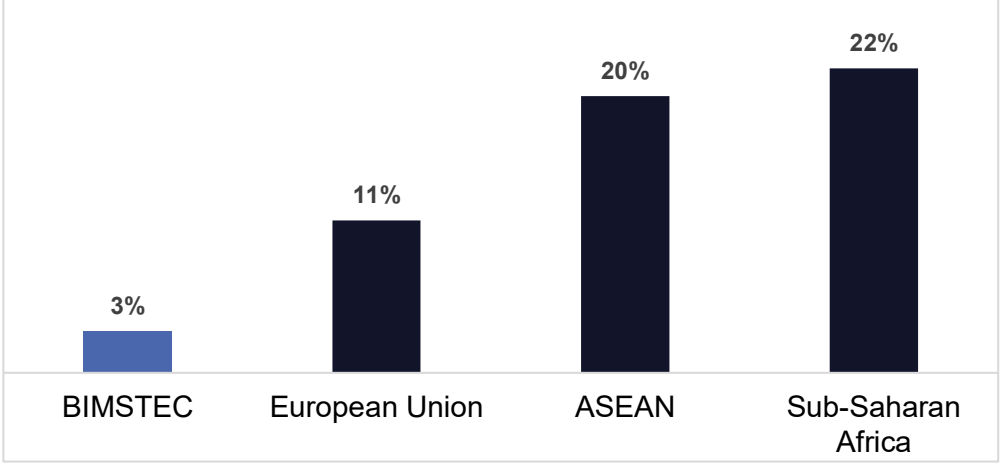
Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)[38]

BIMSTEC is a regional organization comprising seven countries (member states) lying in the littoral and adjacent areas of the Bay of Bengal constituting a contiguous regional unity. The member states include Bangladesh, Bhutan, India, Nepal, and Sri Lanka from South Asia, and Myanmar and Thailand from the South East Asia. The objective of BIMSTEC is to enhance regional cooperation in mutual areas of interest such as trade growth and connectivity in order to utilize regional resources and geographical advantages for accelerated growth.

Figure 178 BIMSTEC Countries

Intra-regional trade in BIMSTEC region is low as compared to other regional groupings - Traditionally, trade and investments among BIMSTEC countries are mostly linked with non-member countries. The regional trade between BIMSTEC nations is low at just 3 %, in 2018[39], of the US$ 1,500 Billion of total export-import (EXIM) trade by the member states on a global scale.

Figure 179 Intra-regional trade as a percentage of total EXIM trade of the region[40]



[38] Note: This map is not to scale. It is an indicative outline intended for general reference use only.

[39] Source: ITC Trade map

[40] **Note - EU – European Union, SSA - Sub-Saharan Africa, BIMSTEC - Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation; Source – ITC trade map*

BIMSTEC countries have a great potential to play a key role in international trade and development. However, issues including poor physical connectivity, struggling trade & tourism, an underdeveloped financial framework need to be addressed to make this association successful.

Indian Ocean Rim Association (IORA)

IORA is a dynamic inter-governmental organisation aimed at strengthening regional cooperation and sustainable development within the Indian Ocean region through its 23 Member States and 10 Dialogue Partners. Priority and focus areas include Maritime safety & security, trade & investment facilitation, fisheries management, disaster risk management, tourism & cultural exchanges, academic, science & technological cooperation, blue economy, women's economic empowerment.

IORA is expected to become a dominant economic force by 2030. However, issues like infrastructure, skill development, energy demands, and human needs pose constraints in the growth prospects of IORA Countries.

Figure 180 Geographical location of IORA member countries[41]

Maritime Security

Maritime security is one of the most critical aspects for any nation in the world. Hence, in order to address maritime security challenges in the IOR, and promote regional collaboration, the Information Fusion Centre-Indian Ocean Region **(IFC-IOR)**[42] has been setup at Gurugram under the aegis of the Indian Navy. The centre has been at the forefront to strengthen maritime security in the region and beyond, by building a common coherent maritime situation picture and acting as a maritime security information sharing hub for the region. To enable better correlation, compressed information cycles and timely inputs, the centre also hosts International Liaison Officers (ILOs] from partner nations (like Australia UK, USA, France, Japan, Maldives, Mauritius, Myanmar, Seychelles, Singapore, etc.)

CHALLENGES

[41] *Note: This map is not to scale. It is an indicative outline intended for general reference use only*

[42] Inputs provided by Indian Navy

INFRASTRUCTURAL CONSTRAINTS IN ROAD AND RAIL TRANSPORT NETWORK IN BIMSTEC REGION

To improve regional trade, an assessment of transport infrastructure connectivity (road, and rail) across key routes have been carried out. Road is a dominant mode of land-based cargo transportation between India and its neighboring countries followed by rail. An assessment has been conducted to understand challenges across following key routes:

India-Bangladesh trade including transit cargo for India

Road connectivity - North Eastern Region (NER) of India is currently using Siliguri Corridor as a preferred route for cargo movement to and from rest of India. The network of National Highways (NH), NH-8, NH-27, NH-12, and NH-19 connects the North-Eastern states to the rest of India. The eastern and southern regions of India is connected through NH12 and NH-19 passing through Kolkata (Route 1 in figure) whereas, the western and northern regions are connected through NH-27 passing through Bihar (Route 2 in figure).

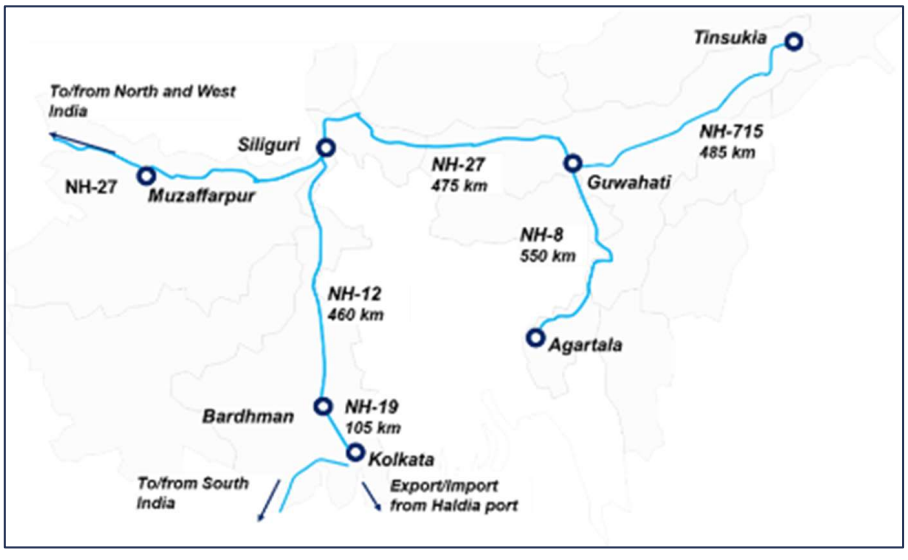
It takes about 8-10 days for cargo to reach Guwahati from Kolkata through road. The road network is plagued with multiple challenges which causes frequent delays in the transportation of cargo to Guwahati and other regions. One of the key reasons for the longer transit time is hilly terrain in the region. Additionally, landslide incidents in the rainy season hampers the transportation of goods. Also, the roads are not suitable for transportation of heavy cargo such as project equipment as the strength and design of the road is not sufficient to handle the weight and size of the cargo. The movement of heavy and oversized cargo through road is very limited in the region

Road is the preferred mode of cross border trade between India and Bangladesh. Traditionally Petrapole-Benapole border route has been the preferred means for cargo movement, but overdependence on this route causes high pilferage, congestion, and long delays at border.

Figure 181 Road connectivity of North-East India to rest of India

Two key road routes connecting the rest of India to North-East

- Guwahati-Siliguri-Muzaffarpur-North/West India
- Guwahati-Siliguri-Kolkata-South India



Rail Connectivity- The railway goods sheds and Inland Container Depot Amingaon in Guwahati are the key origin and destination points in the North-East region for the movement of cargo through rail transportation. The cargo is then distributed to other states in the region primarily through road transportation. Like road the rail connectivity to North-East India is mainly through two rail corridors –

- ***Passing through Kolkata*** – The rail corridor passing through Kolkata is used for the movement of EXIM cargo to/from North-East. Also, the cargo movement between eastern parts of India happens through this route.
- ***Passing through state of Bihar*** – The northern and western region of India is connected with the corridor passing through Bihar. One of the key commodities moving on this route is food grains supplied from northern states to zonal distribution hub in Guwahati.

The typical time taken for cargo transportation from Kolkata to Guwahati through rail network is about 2-3 days. The rail network has higher reliability in terms of transit time as compared to road

The cargo movement between India and Bangladesh through rail is very limited due to infrastructural challenges. The commodities being transported on rail are construction material (stone) and coal. The rail network of Bangladesh mainly consists of Meter Gauge which creates compatibility issues with the Broad-Gauge network of India. The load carrying capacity of Jamuna Bridge connecting the western and eastern rail network of Bangladesh is the major barrier for the rail transportation

Figure 182 Rail connectivity of North-East to rest of India

Two key rail routes connecting the rest of India to North-East

- Guwahati-Siliguri-Patna-North/West India
- Guwahati-Siliguri-Kolkata-South India

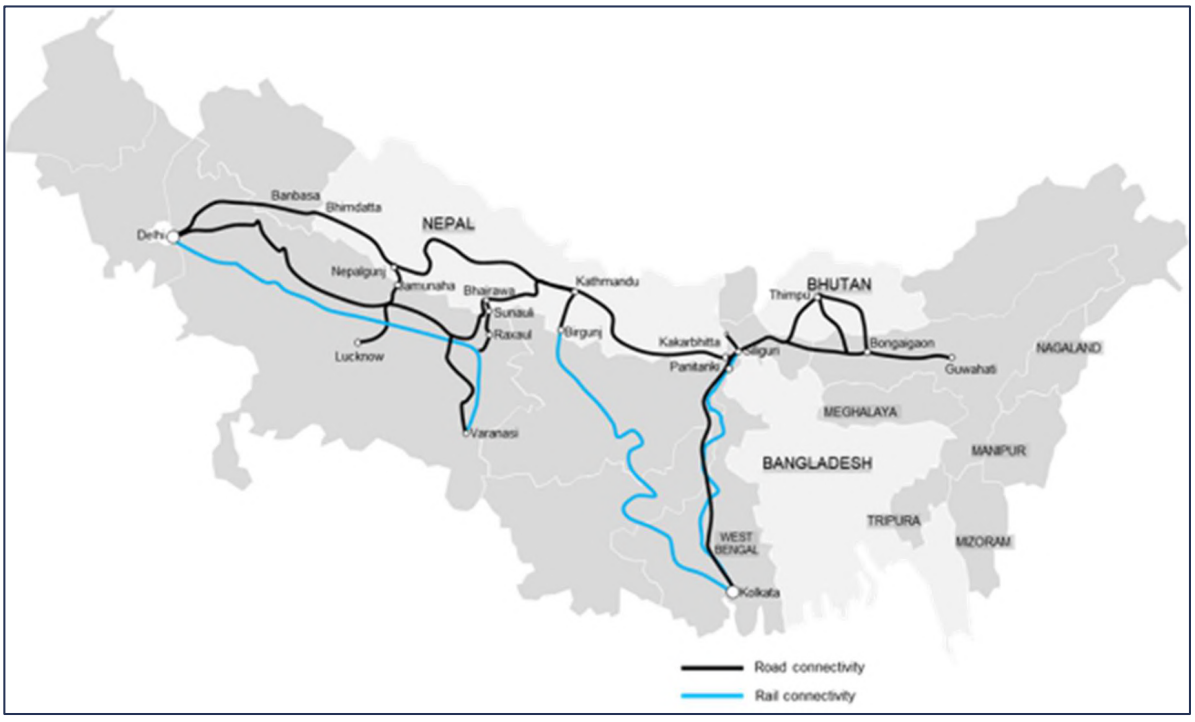
Nepal and Bhutan trade with India

Nepal and Bhutan lack an internal maritime gateway and depend on India for third-party access via Kolkata, Haldia, and Vishakhapatnam ports. These are mountainous landlocked countries sharing borders with India in the east, west, and south and the People's Republic of China (PRC) in the north. The transport of goods and people in Nepal and Bhutan is mainly by road and rail

Nepal is connected with India at multiple points across the border with major corridors at Birgunj and Siliguri for EXIM cargo movement through road as well as rail. The EXIM cargo is majorly handled at Kolkata and Haldia port which have both road and rail connectivity. The roads are not suitable for transportation of heavy cargo such as project equipment as the strength and design of the road is not sufficient to handle the weight and size of the cargo.

Bhutan has no Rail connectivity with India. Current movements are all primarily road based between Kolkata – Thimpu via Phuentsholing. Nearest railhead is around 17.5 km away from its border point, in India at Hashimara in Lumding division of NEF Railway from where both bilateral and third country trade cargo can be transshipped for road carriage via Jaigon (India) – Phuentsholing (Bhutan) border post till Thimphu. The road connectivity to India is through mountainous terrain which pose considerable challenge for cargo movement

Figure 183 Road and Rail Connectivity of India with Nepal and Bhutan



India-Myanmar trade including transit cargo for India

The road connectivity between India and Myanmar is severely challenged due to uneven terrain with only one corridor from Digboi as the major road route. There is no rail connectivity between India and Myanmar. All existing railheads in Myanmar are long distance from the borders with India.

To enhance trade and reduce logistics cost, India has planned to construct Sittwe port in Myanmar to handle EXIM cargo as well as open up a short sea shipping route for NE India cargo. The port is also expected to handle the hinterland of Mandalay, as the present ports at Yangon and Thilawa face draft issues. All these ports are equidistant to the hinterland of Mandalay with a first/last mile distance of ~750 kms.

LIMITED REGIONAL COORDINATION AMONGST BIMSTEC MEMBER COUNTRIES CONTRIBUTING TO PROJECT DELAYS OF ~ 10-12 YEARS

In the BIMSTEC region, limited coordination amongst countries to implement regional projects seems to be a dominant issue. Amongst BIMSTEC nations, many high-level meetings have been conducted centered around regional connectivity, but during implementation, the same spirit could not be reflected.

BIMSTEC regional institutions have been compared with other regional institutions such as Greater Mekong Subregion, European Commission, ASEAN to arrive at the gaps. As shown in the below figure, BIMSTEC would require adequate governance mechanisms and empowerment to ensure regional projects are implemented in a coordinated and timely manner. Detail comparative assessment has been presented in the annexure.

Figure 184 Comparison between various regional groups

	European Commission	ASEAN	GMS	BIMSTEC
1 Legal instrument/ Binding Agreement (delineating roles & responsibilities of governing bodies/ operational bodies)	✓	✓	X*	X
2 Well defined and documented decision- making process	✓	✓	✓	X
3 Ministerial level involvement in policy making and decision-making process	✓	✓	✓	✓
4 Availability of national inter-ministerial committee coordinating activities in each countries	✓	✓	✓	X
5 Duration of highest-level meeting	At least once/week	Twice per year	Every three years	4 meetings happened since inception
6 Institutional arrangement for operationalizing Master plan	✓	✓	✓	X

** Note: GMS leaders' summit, culminates in a **joint statement signed** by the heads of government of member countries*

Source – Regional groups website

CHALLENGES IN OTHER STRATEGIC REGIONS (CHAHBAHAR PORT)

Chabahar port is located at a very strategic location, connecting India to Afghanistan and Central Asian countries, with the potential of being the largest trade hub in Asia. With an agreement between India and Iran executed in 2016, India has taken a lead role towards the development of Chabahar Port. A short lease agreement signed in 2018 for operation via Iranian SPV - India Ports Global Chabahar Free Zone (IPGCFZ). The Chabahar port was established with two terminals for 10 years in Phase I and India have invested about US $ 85 million for the purchase of equipment. IPGCFZ has completed 28 months of operation till April 2021 and handled 134 vessels. The total volume of 14,258 TEUs of containers and more than 2.08 million metric tons of bulk and general cargo has been handled till April 21. However, to make Chabahar port fully operational and en-route cargo of CIS countries following challenges needs to be addressed.

- Absence of regular Weekly Vessel Call at Chabahar (Shahid Beheshti Terminal).
- No mainline vessels calling at Iranian ports.
- Bandar Abbas is closer to Dubai/Jebel Ali as almost all cargoes are offloaded there. The frequency and trade interests prefer Bandar Abbas due to geographic proximity.
- USA sanctions on Iran have a detrimental effect on the following areas for Chabahar Port:
    - Procurement of Equipment
    - Banking challenges and unavailability of credit facilities
    - P&I insurance and transit cargo cover
- No rail connectivity to Chabahar Port
- Limited volumes of cargo with high cost.

KEY INITIATIVES

INFRASTRUCTURE INITIATIVE

IMPLEMENTATION OF THE BIMSTEC MASTERPLAN

BIMSTEC Masterplan has already been prepared and identified key projects to improve regional connectivity in BIMSTEC *(e.g., Two-laning from the Assam / Meghalaya border, Dudhanai to Dalu, via Bagmara, NH 62).* Member countries to implement the BIMSTEC Masterplan and accord projects that are economically beneficial for more than one country.

INSTITUTIONAL INITIATIVE

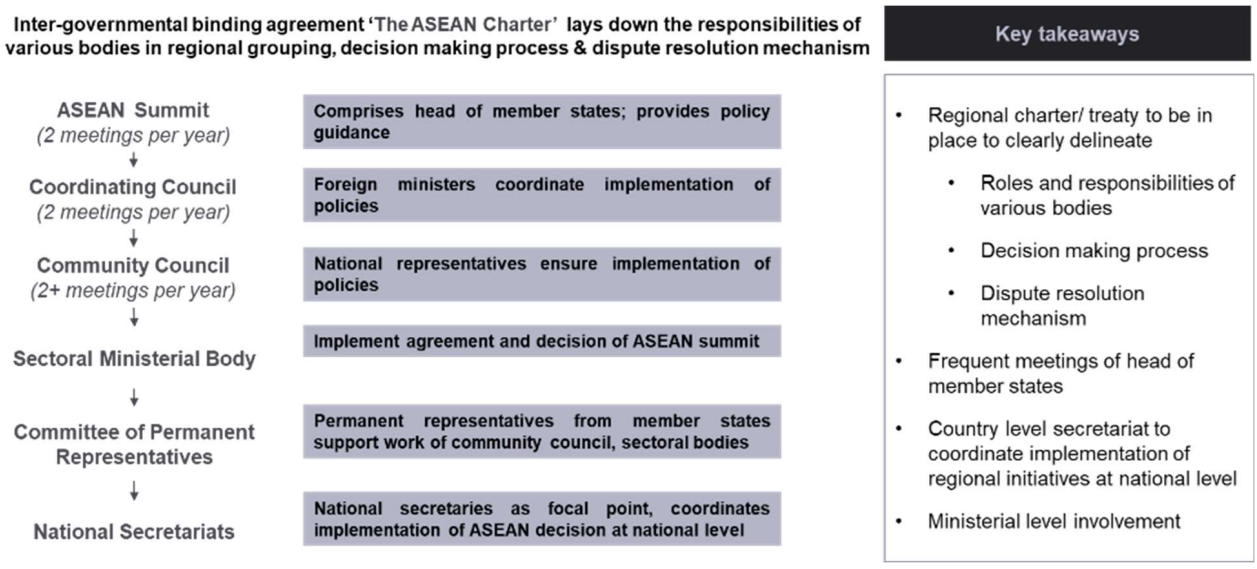
CREATING A ROBUST BIMSTEC INSTITUTIONAL STRUCTURE TO ENSURE IMPLEMENTATION OF REGIONAL PROJECTS IN A COORDINATED & TIMELY MANNER

Below are the interventions required for creating a robust institutional structure which may result in timely execution of projects

- Formulation of regional charter/ treaty clearly delineating roles and responsibilities of various bodies, decision making process *(e.g., EU treaty under European Commission, ASEAN Charter under ASEAN)*
- Availability of National inter-ministerial committee coordinating activities in each country (*e.g. European commission, ASEAN, GMS all have National inter-ministerial committee)*
- Sector-specific working groups consisting of line agency officials to conduct meeting at regular intervals
- Conduct meeting at least twice per year at highest level (Head of Governments) for reviewing the overall progress of ongoing programs, approving other programs to be implemented in future and providing strategic directions (*e.g., ASEAN, European Commission, GMS conduct regular meetings at highest level)*
- Institutional arrangement for the operational plan of transport projects would need to be strengthened *(e.g., TEN-T policy of European Commission, The Master Plan on ASEAN Connectivity, Transport Sector Strategy (TSS) of GMS are all transport sector specific strategic documents/ plans and have proper institutional arrangement in place to periodically monitor implementation of projects under the plan)*
- At National level, country-level implementing agencies to drive implementation which is monitored by National Coordinators/ Focal points
- At Regional Level, sectoral implementing body to drive implementation and to provide semi-annual review to BIMSTEC Secretariat on each strategic area which in turn to provide overall semi-annual review to BIMSTEC ministerial meeting
- Set up a BIMSTEC coordination desk to enhance cooperation in the areas on maritime activities & transport connectivity. Key activities are as follows:
    - Coordinate with BIMSTEC organization and with different ministries MoS, MEA, MOF, Trade and commerce, Tourism etc.
    - Focus on issues and development of maritime activities in BIMSTEC region specifically
    - Common digital platform for BIMSTEC to provide information on trade, shipping lines, ports, Maritime institutes, trade shows, MoUs, Best practices etc.
    - Act as a promotion house to collaborate with foreign powers such as Japan, Aus., EU, etc.
    - Ensure ratification of mutual agreements such as BBIN MVA to facilitate intra-BIMSTEC trade
    - Engage with trade associations/ councils focusing on promotion of trade in BIMSTEC region - India BIMSTEC promotion council by ASSOCHAM
    - Human resource training and development

Figure 185 Case Study – The ASEAN Charter defines institutional structure and all the process related to operation of the ASEAN

Case Study – The ASEAN Charter defines institutional structure and all the process related to operation of the ASEAN



KEY CAPACITY BUILDING INITIATIVES

EXTENDING LRIT SERVICES TO NEIGHBORING MARITIME COUNTRIES INCLUDING BIMSTEC AND IORA NATION

Long Range Identification and Tracking (LRIT) of ships were established as an international system on 19 May 2006 by IMO as resolution MSC.202(81). LRIT, which tracks vessels globally, is also useful for tracking and monitoring ships in coastal areas. LRIT system architecture offers governments choices ranging from:

- Creation of a National LRIT Data Centre - e.g., Canada, India
- Participation in a Regional or Cooperative Data Centre (CDC) – e.g., European Union
- Reliance on an International Data Centre

Figure 186 Availability of LRIT in IORA and BIMSTEC countries

IORA & BIMSTEC countries	Own LRIT Data center	IORA & BIMSTEC countries	Own LRIT Data center
Australia	✓	Mozambique	×
Bangladesh	✓	Myanmar	✓
Bhutan	×	Nepal	×
Comoros	✓	Oman	×
France	×	Seychelles	×
India	✓	Singapore	✓
Indonesia	✓	Somalia	×
Iran	✓	South Africa	✓
Kenya	✓	Sri Lanka	×
Madagascar	×	Tanzania	✓
Malaysia	✓	Thailand	✓
Maldives	×	United Arab Emirates	×
Mauritius	✓	Yemen	✓

The Indian National Data Centre for LRIT was set up & made operational at Directorate General of Shipping (DGS) Mumbai in July 2009.

So far, India has obtained approval for providing services to Sri Lanka and Maldives from IMSO (International Mobile Satellite Organization). While India continues to offer the service, it is for respective countries to decide whether they would like to use the services of Indian LRIT or continue with their existing service provider. The mechanism for providing the said LRIT Services are in place, and it can be extended to the neighbouring countries, upon their request. However, the commercial aspects would need to be considered

Further, India can expand the trilateral mechanism to include more littoral countries in the region like Mauritius, Madagascar, Myanmar. The target nations for providing LRIT services may be identified based on the factors such as common lingual connect, political consonance, cultural similarity shared past, common security issues, and interest in the broader sphere of Indian Ocean Region.

Figure 187 Case Study - European Union has set up LRIT co-operative data centre managed by the EC, through European Maritime Safety Agency (EMSA)

Case Study - European Union has set up LRIT co-operative data centre managed by the EC, through European Maritime Safety Agency (EMSA)

Main purpose of LRIT ship position reports is to enable a contracting Government to obtain ship identity and location information in sufficient time to evaluate the security risk posed by a ship off its coast and to respond and reduce any risks.

How it works

- Participating state* has appointed a National Competent Authority (NCA) for LRIT
- LRIT NCA group grants EMSA the right to receive, store, retrieve, exchange LRIT information and charge for LRIT data
- LRIT NCA manages LRIT DC users, their access rights, reviews the performance of the EU CDC and provides feedback on modifications and updates to the system
- LRIT NCA access the system through the web interface of the EU LRIT Cooperative Data Centre
- On an operational level, EMSA provides a 24/7 helpdesk for EU CDC users through its Maritime Support Services (MSS)

Financial provisions

- EMSA covers all costs (through EMSA budget) associated upto four daily mandatory LRIT reports
- EMSA further provides LRIT NCA/ its national LRIT DC Users with data free of charge for SAR purposes
- LRIT NCA is responsible for the payment of LRIT messages (> 4 message per vessel-day)
- One-time fixed amount ~3k euros for Coastal States or 1k euros for land-locked States is paid by LRIT NCA as membership fee and monthly invoices based on amount of usage of LRIT data

EU LRIT CDC tracks 8500+ ships, which generate 200k+ position reports per week.
At present, there are 37 member countries, EEA countries and Overseas Territories participating in the EU CDC

EEA - European Economic Area; SAR -Search and Rescue

Participating States means European Union Member States as well as the EEA countries Norway and Iceland

LRIT DC User means any user of the EU LRIT system which is entitled by the LRIT NCA in accordance with SOLAS regulation V/19-1 to receive LRIT information through the EU LRIT Data Centre

PROPOSED OPERATIONS FRAMEWORK FOR RECOGNITION OF COC FOREIGN SEAFARERS

Legal provisions are present under MSA Act 1958 and STCW convention for recognition of certificate of competency (CoC) of foreign seafarers. Documents to comply for recognition of CoC are as follows:

Merchant Shipping Act (MSA), 1958 - Section 86 of the act was amended to recognize CoC granted in other countries if standards of competency in a particular country are not lower than those under MSA and other countries recognized the certificates granted under MSA. Draft Merchant Shipping Bill, 2020 has same provisions for recognition of certificate of competency granted in another country.

Standards of Training, Certification and Watchkeeping for Seafarers (or STCW) - IMO has amended the Rule 13 of STCW regulations to recognize CoC issued by foreign countries if:

- DGS confirms, through evaluation (include inspection of facilities and procedure) of that Party, that standards of competence, training and certification and quality standards are fully complied with requirements of the STCW Convention
- Undertaking with other countries regarding prompt notification to DGS in case of significant changes in training & certification in compliance with the Convention
- Candidates who present, certificates at the management level complete an approved training course to have an appropriate knowledge of the Indian maritime legislation relevant to the functions

Exchange relevant information on the connected legislations - Interested country who desire's that their seafarer's CoC be recognized to forward all relevant connected legislation for review whether the provision in that country is equivalent to our country legislation as referred in M.S STCW Rules 2014.

Considering the above, following operational framework is proposed for recognition of CoC foreign seafarers"

- **Infrastructure Verification -** Infrastructure facilities can be visited by examiners/ officers from Indian Maritime Administrations for physical verification of maritime training examination & certification system
- **Signing MOU** while taking cognizance of – a) Validity period b) Mutual commitment from that country for the guaranteed minimum trainee to be sent to India for maritime training and c) Priority in providing their available infrastructures like drydock or any other facility as required to Indian vessels or seafarers
- **Periodical evaluation** to be carried out to ensure that provisions of STCW 1978 code, maritime training examination & certification system which are established are implemented continuously

Figure 188 Case Study - Process adopted by European Union for recognizing of CoC of foreign seafarers

Case Study - Process adopted by European Union for recognizing of CoC of foreign seafarers

- IMO's STCW convention gives countries the ability to verify how countries providing seafarers implement the internationally agreed standards
- EU legislation issued a procedure for assessment of compliance of IMO's STCW Convention by non-EU countries
- Member State which intends to recognize CoC issued by a third country shall submit a request to the EC, accompanied by a **preliminary analysis** of the third country's compliance with STCW Convention
- European Commission through EMSA conduct inspections for a wider recognition of their certificates of competency by EU Member States
- EMSA inspectors conduct a detailed analysis of the relevant national provisions adopted to implement the STCW Convention or the above-mentioned Directive **once every five years****
    - Involves visits to different parts of the national administrations responsible for setting-up and maintaining the maritime education, training and certification system of seafarers
- Commission shall submit evaluation report to the European Parliament and to the Council, including suggestions for follow up/ corrective actions to be taken in the light of that evaluation
- Based on evaluation, **timeframe of 18 months -36 months** is given to third countries for **corrective actions and undertake legal changes in its system** in order to comply with the requirements of the STCW

~ 75% of seafarers on EU registered ships originate from non-EU countries and obtain their qualifications in non-EU training institutions in over 50 countries

Note - STCW - Standards of Training, Certification and Watchkeeping for Seafarers; EC – European Commission

Source: European Maritime Safety Agency (EMSA) Brochure; Directive (Eu) 2019/1159 Of the European Parliament and of The Council of 20 June 2019

***In order to further increase the efficiency of the centralised system for the recognition of third countries, the reassessment of third countries which provide a low number of seafarers to ships flying the flags of Member States should be performed at longer intervals which should be increased to ten years*

Critical success factors

- The requesting country to guarantee a minimum number of candidates for Indian Maritime Training Institutes, concerning post-sea training in India
- The requesting country to sanction priority in providing their available infrastructures like berth, drydock or any other facility as required to Indian vessels or seafarers
    - Example: Sri Lanka has one of the largest drydock and repair yards for ships—these facilities can be provided to Indian ships

IMPACT STUDY ON MARKETABILITY OF INDIAN SEAFARERS IN FOREIGN FLAGSHIPS— POST RECOGNITION OF COCS BILATERALLY

Training of foreign candidates in Indian Maritime Training Institutes may increase the number of seafarers and affect the employability of Indian seafarers. To mitigate the impact on Indian seafarers, study can be undertaken to review the impact on employability of Indian seafarers after bilateral agreement being in operation for 3 years.

INITIATIVES TOWARDS OPERATIONALIZING CHABAHAR PORT

Chabahar port is a key strategic asset for India. Based on the challenges identified in the earlier section, following three key levers are identified to make the port fully operational and globally competitive:

Figure 189 Three levers to make the Chabahar port fully operational and globally competitive

DEVELOPING CORE AND SUPPORT INFRASTRUCTURE FOR FULLY OPERATIONALIZING CHABAHAR PORT

Infrastructure Interventions are required across following four areas for fully operationalizing Chabahar Port

- *Core Equipment* - Procurement of cargo handling equipment for container terminal and credit facilities for purchase
- *Support Infrastructure* – Establishment of support infrastructure like CFS, Container yard, establishment of Indian bank branch and Support from US in Extension waivers of Sections 212 and 213 of the Iran Threat Reduction and Syria Human Rights Act to support trade
- *Digital Infrastructure* - Inclusion of Shahid Beheshti Terminal in Indian Customs EDI Gateway
- *Rail/ Rail Connectivity* - Establishment/ improvement of road /rail connectivity to connect Chabahar to Zahedan in Iran

SIGNING AGREEMENTS AND MOUS

- Activating 10-year agreement would be a critical first step which would require multi facet approach

Table 43 Agreements and MoUs

Focus Area	Interventions
Financial Lever	• Clarity on timelines of disbursement of USD 150 Mn credit line, acquisition & deployment of rail mounted cranes to ensure phase 1 capacity is established • Negotiation and clarity on sanctions-waiver given by the US to the port project to ensure foreign banks open letter of credit (LC) that assures payment to the supplier
Operating Leverage	• Positioning of dedicated manpower from India on terminal

	• Skilling and training of local staff to increase localization

Packaging of multiple initiatives	• Extension to 30-year agreement can be linked to allied commitments for India in
	  • Planning & Development of Indian Zone in Chabahar Free Zone
	  • Agreement on Chabahar – Zarang rail link

- Inclusion in Regional Trade Corridor - Ratify India's proposal for inclusion of Chabahar Port to International North-South Trade Corridor
- Regional Cooperation - Formulate plan for joint use of Uzbekistan-Iran-Afghanistan Quadrilateral Working Group

Figure 190 Global Case Study | Constructing and funding end to end infrastructure projects is a key strategy adopted by countries like China to fast track development

Global Case Study | Constructing and funding end to end infrastructure projects is a key strategy adopted by countries like China to fast track development

Objective: The Saudi Landbridge Rail Network (SLRN) aims to connect the largest ports and strategic economic centers in Kingdom of Saudi Arabia (KSA) through railway infrastructure and to develop the required intermodal facilities and logistics centers.

A MoU has been signed between the Transport General Authority (TGA) and China Civil Engineering Construction Corporation (CCECC) for development of the railway line connecting Jubail on the east coast to Yanbu on the west coast of KSA.

TRADE ACTIVATION

Following Marketing and tariff interventions are required to activate trade:

Table 44 Trade Activation

Focus Area	Interventions
Trade of Non-Sanctioned Cargo	Explore trade of medicines/ vaccines/ medical devices/ agricultural commodities which are exempt from sanctions
Promoting Liner Calls	• Continue existing tariff discount on VRC and cargo handling for transit container to & from DPT and JNPT for near term *(such as 80% discount on port dues for first 3 months)* • Align incentives for export cargo from Iranian Government as well as for Free Trade Zone

Trade promotion through Free Zone	• Marketing of port and proposed free zone- road shows • Dedicated Indian Zone /Incentive schemes for Indian players to establish linkage

Critical success factors

The sustainability of the Chabahar Port hinges on the success of the INSTC corridor since another Iranian port (Bandar Abbas) has a competitive advantage compared to Shahid Beheshti Terminal. The Ministry of External Affairs (MEA) should activate the INSTC corridor at the earliest & have a mechanism to keep CIS countries engaged. Cargo interest requires that there is a regular ship calling at port especially for the container carriers, whereas the shipping lines require cargo volumes for ensuring the viability of the service. However, in the absence of any weekly feeder vessel call despite some relaxations being provided in Vessel Handling Charges (VHC) and Terminal Handling Charges (THC), Chabahar Port is unable to attract liner operators. To accelerate trade progress, interested shipping services that are ready to call on Chabahar Port can be subsidized through IPGL. For this purpose, extra funds can be sought through an empowered committee of Government.

OTHER STRATEGIC KEY INVESTMENTS AS PART OF SAGAR INITIATIVE

In 2015, India unveiled its strategic vision for the Indian Ocean i.e., Security and Growth for All in the Region (SAGAR). Through SAGAR, India seeks to deepen **economic and security cooperation** with its maritime neighbours and assist in building their maritime security capabilities

Key initiatives to be undertaken in India's strategic neighborhood

1. Bangladesh Payra deepwater port project
2. Kyaukpyu and Dawei ports in Myanmar
3. India can actively promote the petrochemical complex at Trincomalee (Sri Lanka) one of the best natural harbours in the world
4. Strategic maritime investment in Maldives
5. Oman's Duqm port on the Arabian Sea Coast
6. Sittwe port, Myanmar

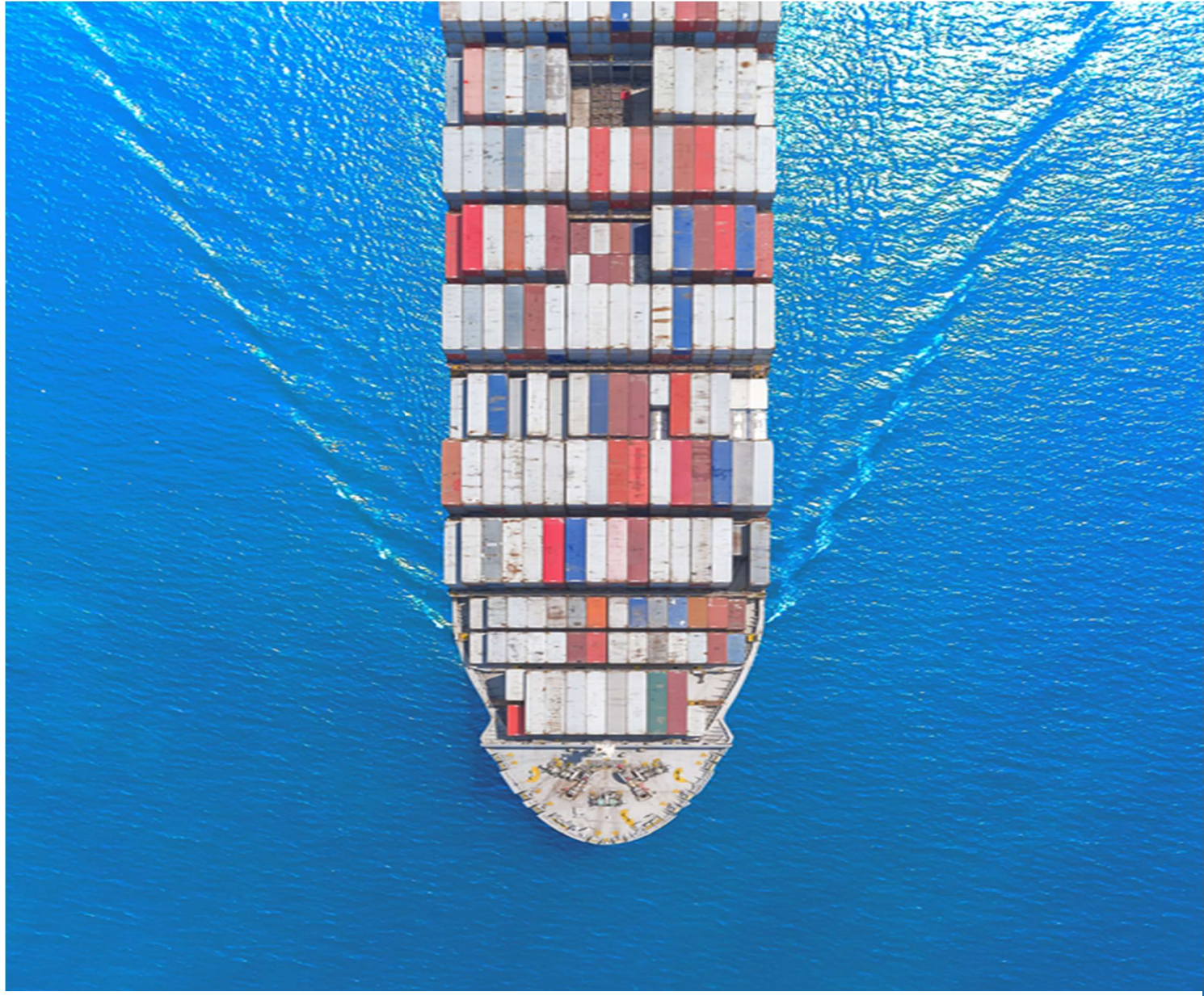
Figure 191 Strategic neighborhoods

KEY PERFORMANCE INDICATORS

As part of action plan, following targets have been defined to make India global maritime leader through active participation in maritime activities & cooperation with other maritime nations.

Metric	Status (as of 2021)	Target (2030)	Target (2047)
BIMSTEC intra-regional trade as % of total EXIM trade of the region	3%	8%	15%
Extending LRIT services to neighbouring countries		5	10
Enhance global partnerships with leading maritime nations through MoUs and active on ground collaboration		>10	>20

Theme 9
Develop world class next generation ports



DEVELOP WORLD CLASS NEXT GENERATION PORTS

CURRENT LANDSCAPE

India has 12 major ports and over 200 notified non-major ports[43] along its 7,500+ Km[44] long coastline and sea islands. The ports are critical to Indian economy as they facilitate EXIM and coastal trade. The current cargo handling capacity of all the major ports in India is around 1,500 MMTPA and of Non-Major ports is around 1,000 MMTPA. The total cargo handled at Indian Ports (major and non-major) increased to 1319.97 million tonnes in 2019-20 from 1281.78 million tonnes in 2018-19 reflecting an increase of 3.0% during 2019-20[45]. India's major ports handled around 53.4% of the cargo handled at Indian ports.

Figure 192 Geographical location of major and key non-major ports in India

Ports around the globe are increasing their handling capacity to cater to increase in traffic. Seven of the top 10 ports in the world (by container through put) are Chinese ports. Only two Indian ports (Mundra and JNPT) appear within top 40 ports in 2020.[46] This indicates that there is a significant potential to strengthen India's capability in the domain of port logistics and become competitive with other leading maritime nations such as China, Netherlands and other South-East Asian regions to drive a greater share of global EXIM trade.

The shipping industry is moving towards mega size vessels which would require higher draft at ports.

Considering the evolving shipping market, ship sizes, and cargo profile, it is essential for the Indian Ports to further strengthen port infrastructure and drive a greater share of global EXIM trade. Three key themes have been identified to strengthen India's capability in the domain of port logistics – a) Best-in-class port infrastructure b) Investment attractiveness and c) Ease of doing business

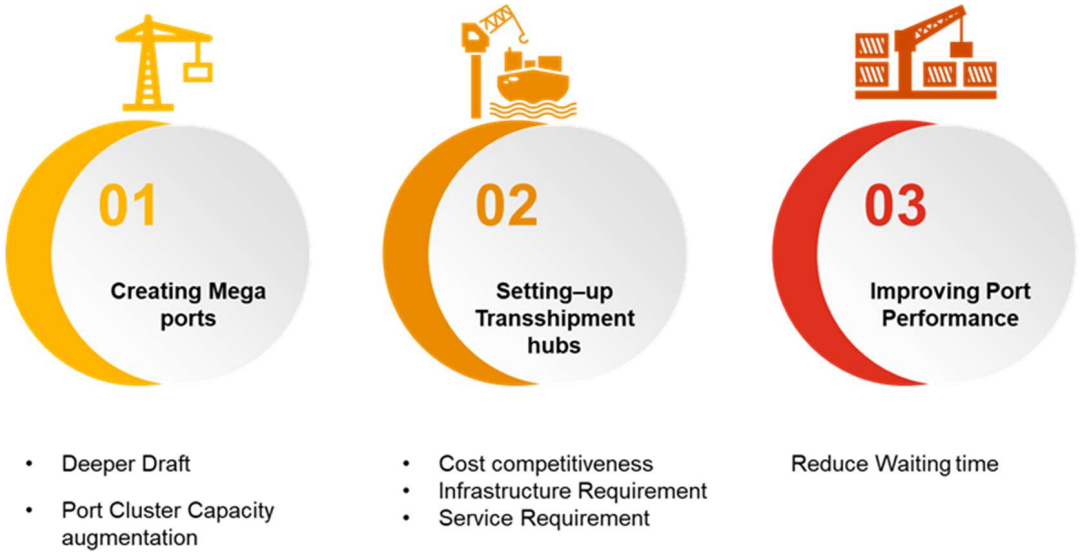
BEST-IN-CLASS PORT INFRASTRUCTURE

This theme is further sub-divided into three areas to enable best-in-class infrastructure – a) Creating Mega ports to cater to increase in cargo traffic b) Enhancing India's transshipment business by identifying suitable location

[43] Indian Ports Association
[44] Basic Port Statistics of India 2019-20, Ministry of Ports, Shipping and Waterways
[45] Basic Port Statistics of India 2019-20, Ministry of Ports, Shipping and Waterways
[46] World Shipping Council

for creating transshipment ports and identifying ways to become cost competitive with respect to other major transshipment ports and c) Improving port performance by identifying ways to reduce turn-around time/ waiting time.

Figure 193 Three key focus areas to enable Best-in-class port infrastructure



CREATING MEGA PORTS

Port of Yangshan (Shanghai), Port of Singapore, Port of Busan (South Korea), Port of Rotterdam (Netherland) are some of the largest container handling ports in the world. Annual container traffic handled by these ports ranges from 20 Mn TEUs to 43 Mn TEUs. These ports invested heavily on upgradation of port infrastructure and increasing draft to handle mega vessels. This in turn increased the ability of these ports to handle high volume of traffic. Tuas Mega Port in Singapore, which is currently under development, is expected to have a draft of ~23 m and would be able to handle up to 24,000 TEU vessels. It is expected all the existing Singaporean container terminals will be merged and relocated with the Tuas terminal. The Tuas mega port will run at full capacity (65 million TEUs) by 2040.

Table 45 Comparison with Best-in-class Mega Ports[47]

Parameter	**Port of Yangshan, Shanghai**	**Port of Singapore[48]**	**Port of Busan, South Korea**	**Port of Rotterdam, Netherland**	**Port of Colombo, Sri Lanka**	**Jawaharlal Nehru Port Authority, India**
Volume 2020 *(Million TEUs)*	43.5	36.8	21.8	14.4	6.85	4.5

[47] Source – Lloyd's list – One Hundred Ports 2021

[48] Note – Port of Singapore has 6 terminals. PSA International is currently operating five terminals: Brani, Keppel, Pasir Panjang Terminal, Sembawang and Tanjong Pagar. One terminal, Jurong, is operated by Jurong Port. Tuas port is currently under development and will run at full capacity (65 million TEUs) by 2040. All the existing Singaporean container terminals will be merged and relocated with the Tuas terminal, upon its completion. Maximum draft in Tuas port will be 23 m which will be capable of handling 24,000 TEU capacity vessel

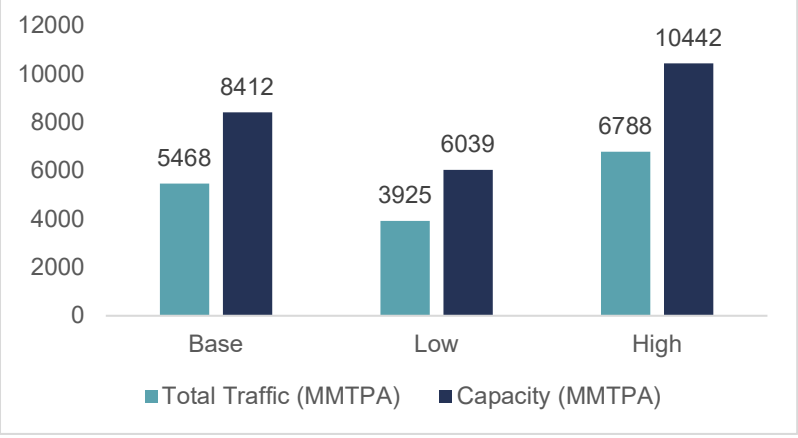
Draft availability	~20 m	~18 m	~20 m	~24 m	~18 m	~15 m
Vessel Size *(TEUs)*	19,000	18,000	19,000	24,000	18,000	12,500

Currently, no Indian ports come under top 10 ports in terms of annual container volume. However, cargo traffic handled at ports is expected to increase significantly on account of economic growth, increase in modal share of cargo in coastal and inland waterways and development of industrial clusters at ports.

Cargo traffic has been projected in below figure under base, low and high case (refer annexure for detail on methodology). The bulk cargo is expected to increase to ~3,500 MMTPA whereas the container traffic is expected to reach ~240 Mn TEUs[49] by 2047 making the total expected cargo traffic at Indian ports to be ~7,000 MMTPA (*High case*) by 2047.

Considering 65% utilization levels of a port, a cargo handling capacity of ~10,000+ MMTPA (*High case*) would be required at the Indian major and non-major ports to cater to the projected traffic in 2047.

Figure 194: Cargo traffic and capacity projection



The data received from the major ports in India suggests a capacity expansion plan of ~3,000 MMTPA (refer below table) which also includes the capacity developed by addition of **2 new major ports**

[49] A conversion factor of 1 TEU = 14.7 Tons has been considered

Table 46: Capacity and expansion plans of Major Ports

Name of Major Port	Capacity 2020-21 (MTPA)	Capacity 2047 (MTPA)
Syama Prasad Mookerjee Port, Kolkata	**91**	**123**
Paradip Port	**259**	**600**
Visakhapatnam Port	**134**	**179**
Kamarajar Port	**91**	**171**
Chennai Port	**135**	**135**
V.O. Chidambaranar Port	**111**	**249**
Cochin Port	**79**	**150**
New Mangalore Port	**105**	**108**
Mormugao Port	**63**	**63**
Mumbai Port	**84**	**96**
Jawaharlal Nehru Port	**141**	**160**
Deendayal Port	**267**	**500**
Sub-Total (Major Port Capacity)	**1,561**	**2,534**
New Major port- Vadhavan	**-**	**300**
New Major port- Galathea Bay[50]	**-**	**240**

The remaining capacity will be added by the non-major ports. Currently, there are 68 operational non-major ports having a total capacity of 1,000 MMTPA. Hence, a port capacity of 6,235 to be added by the non-major ports. Further, there are 21 green field port projects under various stages of development (refer annexure) that will also add to the cargo handling capacity of the non-major ports.

While both major and non-major ports augment their existing infrastructural capacity to meet projected demand by 2047, the development of good hinterland connectivity and availability of multi-modal logistics will be critical elements contributing to it.

CHALLENGES

India has a significant potential to set-up mega ports and compete with global ports. However, there are certain challenges which need to be addressed:

- Low draft at major ports as compared to global ports – Globally, mega ports have high draft to accommodate large vessels. For instance, Port of Rotterdam has a draft of 24m which handles 24,000 TEUs capacity vessel. Whereas draft at major ports varies widely from 7m to 18m[51] which limits the handling of large mainline vessels.
- Capacity expansion limitation at major ports due to geographical and regulatory constraints – The capacity expansion at a port is dependent on various factors – marine infrastructure (waterfront draft, tidal ranges, navigation channel etc.), port infrastructure (Land availability, equipment etc.), hinterland connectivity infrastructure (road, rail and inland waterways) and regulation (coastal regulation zone). The current infrastructure at landside and seaside and the regulation governing Major Ports limit capacity expansion, thereby limiting any increase in throughput.
- Inadequate hinterland connectivity – Access to the hinterland and multimodal connectivity are elements critical to transportation chain of a seaport and remain to be a challenge for many ports. Developing multimodal transport infrastructure with strong hinterland connectivity could help reduce time & cost for first and last mile transportation.

[50] Port Capacity of Galathea Bay basis the PIB release on 27th Jan 2023 has not been included in the calculations
[51] PorttoPort.in

KEY INITIATIVES

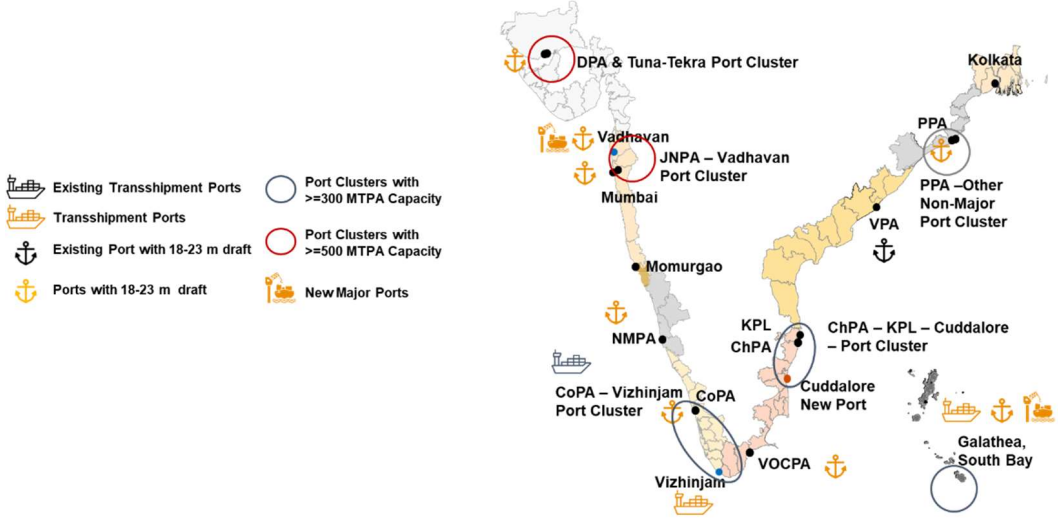
INFRASTRUCTURE INITIATIVES

DEVELOP 4 PORT CLUSTERS WITH CAPACITY >=300 MTPA AND 2 PORT CLUSTERS WITH CAPACITY >=500 MTPA

Considering the capacity constraints at major ports due to geographical and regulatory restrictions, capacity expansion can take place at port cluster level. Port clusters consists of geographically concentrated network of ports around a maritime range.

Following figure provides the locations of port clusters along with their target capacity by 2047.

Figure 195 Potential Mega Ports



To develop above mentioned port clusters, comprehensive master plan to be created for each port cluster covering following aspects – demarcation of port cluster area, Land availability for capacity expansion, project identification (capacity augmentation, hinterland connectivity, dredging for deeper draft, berth mechanization) & prioritization in line with AMP, NMP & NLP, financing plan, and project monitoring framework.

PRIORITIZE HINTERLAND CONNECTIVITY & MULTIMODAL CONNECTIVITY PROJECTS AT THE PORTS IN LINE WITH NLP AND PM-GSMP

The Major Ports and the respective State Governments need to align and work towards identification and prioritization of projects targeting good hinterland connectivity and multimodal connectivity at the ports by leveraging the recently developed National Logistics Policy (NLP) and the PM Gati Shakti National Master Plan (PMGS-NMP)

PM Gati Shakti – National Master Plan (NMP)[52] – Prime Minister launched PM Gati Shakti - National Master Plan for Multi-modal Connectivity. The NMP is a digital platform which brings 16 Ministries including Ministry of Ports, Shipping and Waterways together for integrated planning and coordinated implementation of infrastructure connectivity projects. The multi-modal connectivity will provide integrated and seamless connectivity for movement of people, goods and services from one mode of transport to another.

[52] Please refer section 9.7.1.1 for further details on NMP

National Logistics Policy (NLP) - The recent development of National Logistics Policy is the next step for NMP. It will provide a comprehensive agenda for development of entire logistics ecosystem. The vision of the National Logistics Policy is "To develop a technologically enabled, integrated, cost efficient, resilient, sustainable and trusted logistics ecosystem in the country for accelerated and inclusive growth".

Targets for achieving the vision of the National Logistics Policy are to:

- Reduce cost of logistics in India to be comparable to global benchmarks by 2030
- Improve the Logistics Performance Index ranking - endeavor is to be among top 25 countries by 2030
- Create data driven decision support mechanism for an efficient logistics ecosystem

Multi-modal integration is one of the key focus areas of the **NLP** which will improve the hinterland connectivity to the ports and will further boost and compliment the previously launched **PMGS-MP**. Therefore, the States need to develop an implementation plan in consultation with the Major Ports by prioritizing the projects which are in line with the NLP and PMGS-MP.

DEVELOP 2 NEW MAJOR PORTS - VADHAVAN AND GALATHEA BAY PORT

In addition to creating port clusters around the existing major ports, 2 new major ports – Vadhavan and Galathea Bay port are envisaged to be developed (refer above figure). Vadhavan has a natural draft of about 20 meter[53] and is therefore well suited for accommodating larger ships. Development of this port will enable cargo container vessels of 16,000-25,000 TEUs capacity. Similarly, Galathea Bay port, due to strategic location in proximity to the East-West world shipping corridor, is suitable to attract both gateway and transshipped cargo.

INCREASE DRAFTS OF 8 PORTS TO 18-23M FOR HANDLING MAINLINE AND CAPSIZE VESSELS

Ports in the country would also need to have higher draft available to accommodate larger vessels. As shown in the above figure, 8 ports of which 5 ports DPA, Vadhavan, VoCPA, Glathea Bay and PPA to have draft in the range of 18 meters to 23 meters by 2030. Further, 3 ports NMPA, CoPA and JNPA would have draft in the range of 20 meters to 23 meters by 2047 in order to align with global standards.

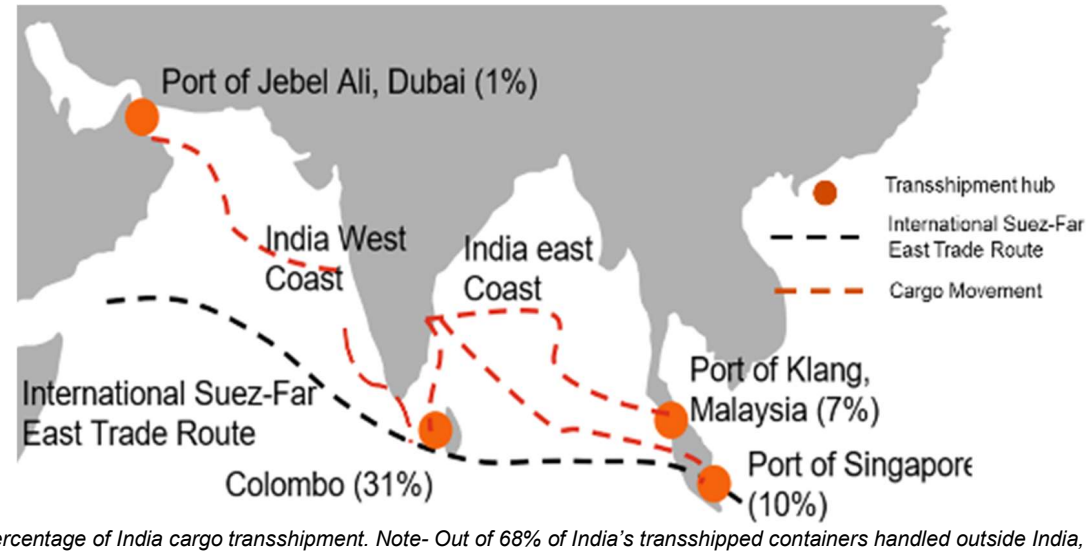
In countries such as US and Sri Lanka, dredging cost is partly borne by National Government. On similar lines, dredging cost would need to be partly borne by Government in order to make Indian ports globally competitive.

ENHANCING TRANSSHIPMENT BUSINESS IN INDIA

Indian Ports handled 17.23 million TEUs of containers in 2019-20[54], out of which 4.30 million TEUs (25%) of the Indian origin and destined containers were transshipped. Out of 4.3 million TEUs India's transshipped containers, 2.93 million TEUs (~ 68%) are handled outside India, at hubs such as Colombo, Singapore and Port Kelang. Out of 68% of India's transshipped containers handled outside India, 49% of the share are handled by 4 major transshipment hubs namely, Colombo, Klang, Singapore and Jebel Ali ports and remaining 19% of the share by other ports. The feeder volumes from/to Indian major ports transshipped at foreign hubs reveals the lost opportunity.

[53] Domain-b.com; article titled "Vadhavan to be developed as India's 13th major port"
[54] Basic Port Statistics of India, 2019-20

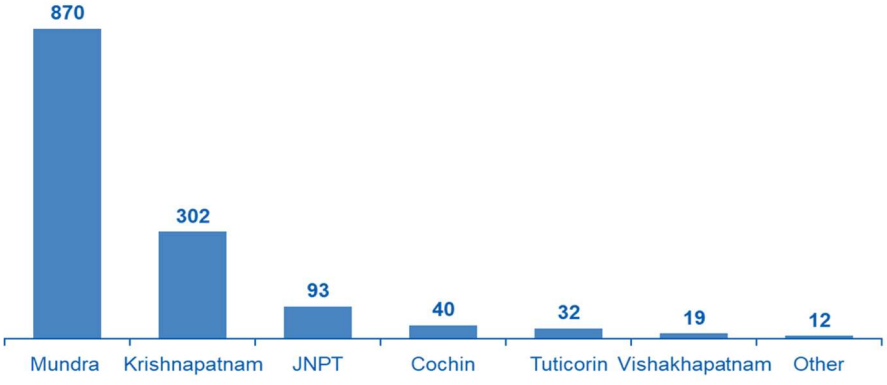
Figure 196 Geographical distribution - % of Indian transshipped containers handled outside India



XX % - percentage of India cargo transshipment. Note- Out of 68% of India's transshipped containers handled outside India, 49% are handled by 4 major transshipment hub namely, Colombo, Klang, Singapore and Jebel Ali ports and remaining 19% by other ports

Indian ports handled 1.37 million TEUs of transshipment cargo in 2019, which is about 8.5% of the total container traffic at Indian ports in 2019. The volume is dominated by Mundra Port, which alone handles more than 60% of India's transshipment container traffic. The port-wise breakup of transshipment volumes is as under:

Figure 197 Transshipment at Indian Ports ('000 TEUs)



Indian Ports lose up to $200-220 Million[55] of potential revenue each year on transshipment of Indian origin and destined containers at foreign ports. There is also the lost opportunity in handling transshipment of non-India related cargo due to the absence of an Indian Hub. As most of the transshipment of Indian containers happens between South Indian ports and the foreign bubs of Singapore, Port Kelang and Colombo, with the major exception of Kolkata which transships substantial volumes from/to these foreign hubs, a large segment of India's EXIM industry located in South India is adversely affected. Given the extra port handling charges incurred at the transshipment hubs, transshipment results in logistic cost inefficiencies for Indian industry in terms of additional port handling cost of about US$ 80 to US$100 per TEU[56], which could be saved if these containers were handled as gateway cargo.

Figure 198 Case Study - Developing Tanjung Pelepas (PTP), in competition to Singapore port

Developing Tanjung Pelepas (PTP), in competition to Singapore port

[55] Assuming $60 to $70 port charges basis current VoCPT and Colombo port rate ranges
[56] Illustration for a cargo movement from Madurai using trans-shipment in Colombo and shipping to Antwerp in Europe

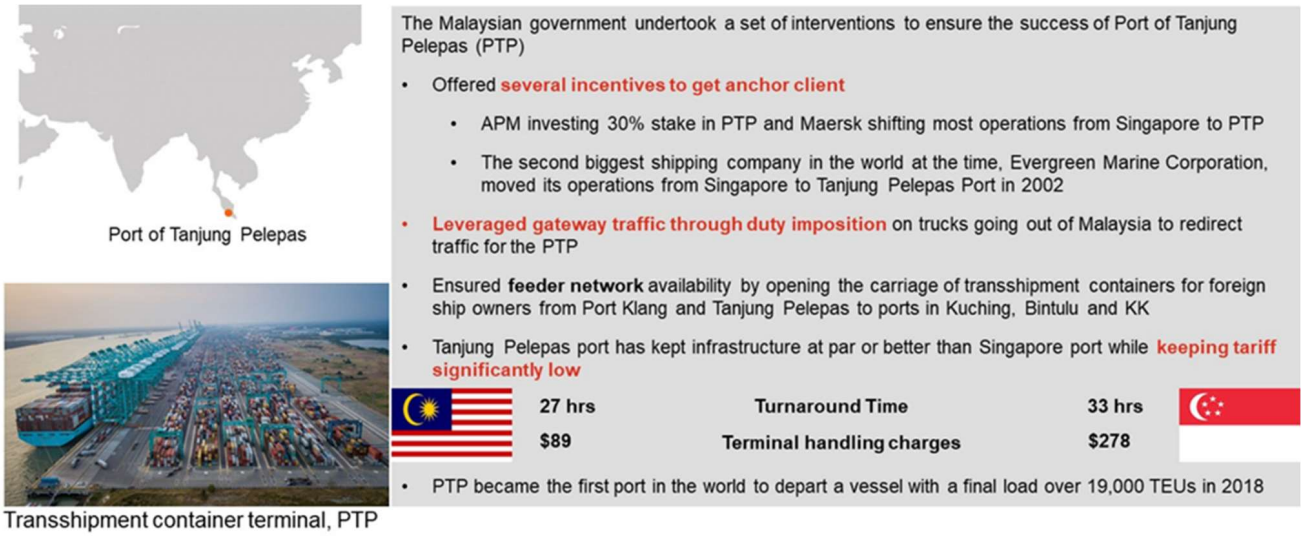
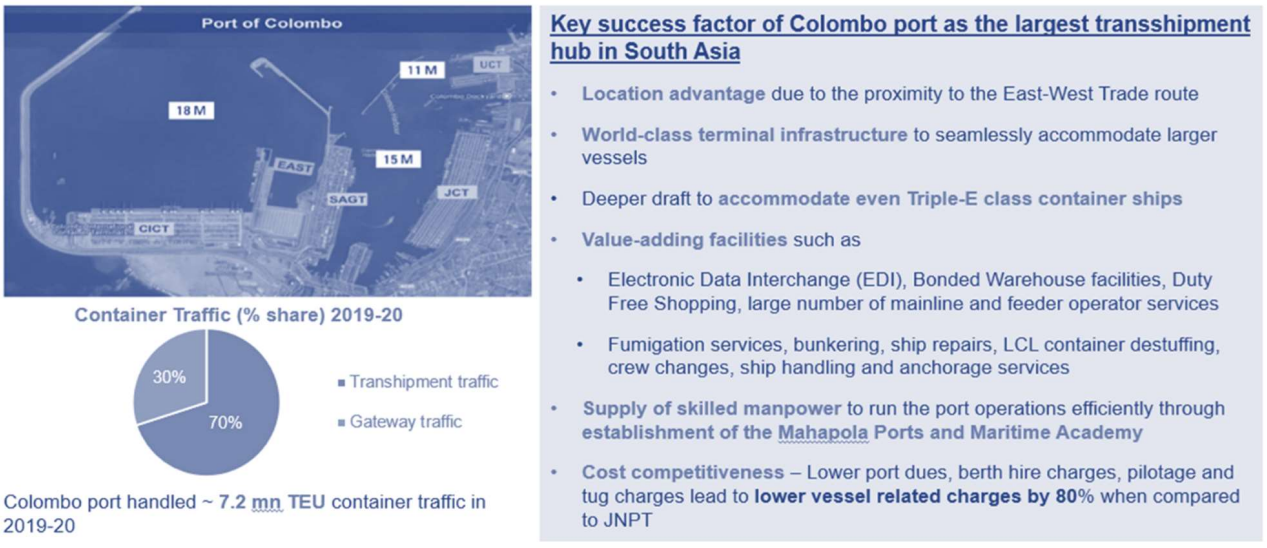


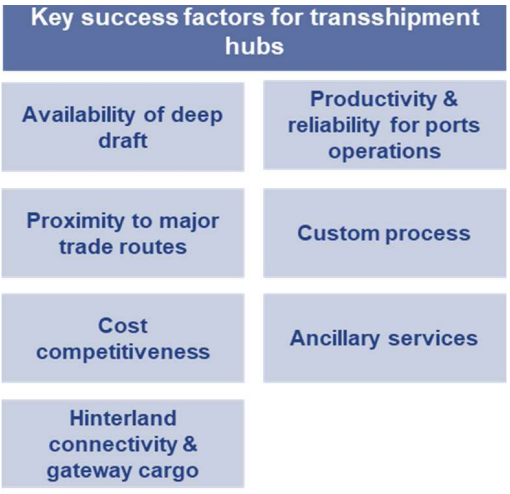
Figure 199 Case Study | Key success factors of the largest transshipment hub in South Asia - Port of Colombo

Case Study | Key success factors of the largest transshipment hub in South Asia - Port of Colombo



Building a transshipment port helps the national economy with significant benefits in terms of manufacturing growth and employment generation. A transshipment terminal is therefore a National Investment priority. It is helpful to be clear on the conditions for a good transshipment hub. While Shipping Lines are the key decision makers over a choice of ports, the following parameters are of high significance.

Figure 200 Key success factors for transshipment hubs



- Availability of deep drafts - Global vessel sizes have significantly increased in the last decade, and most mainliners typically prefer calling at ports with at least 18m draft. To that end, the availability of adequate draft has become a crucial factor in attracting shipping lines.
- Proximity to major trade routes - Liners prefer minimum deviation from their courses when selecting a transshipment port. East–West trade route (Far East to Europe and US via Malacca Straits and Suez Canal) are the global trade route.
- Cost competitiveness - For Indian transshipment hub to be successful in attracting traffic, it is critical to match the port charges with competing ports, especially Colombo Port.
- Hinterland connectivity and gateway cargo - A large volume of EXIM cargo alleviates the risk of business loss. The presence of significant assured gateway cargo is often a big factor in liners' decision to move to a new location since it brings down the volume risk
- Productivity and reliability for ports operations - Container handling speeds, reliable windows and operations are critical for mainliners to minimize vessel turnaround time.
- Custom process - Ease of custom process for gateway cargo and no customs involvement in transshipment
- Infrastructure suitable for large mainline ships. In addition to infrastructure and reduced costs, support services also play a crucial role in attracting and retaining mainliner ships

Shipping Lines may also look for:

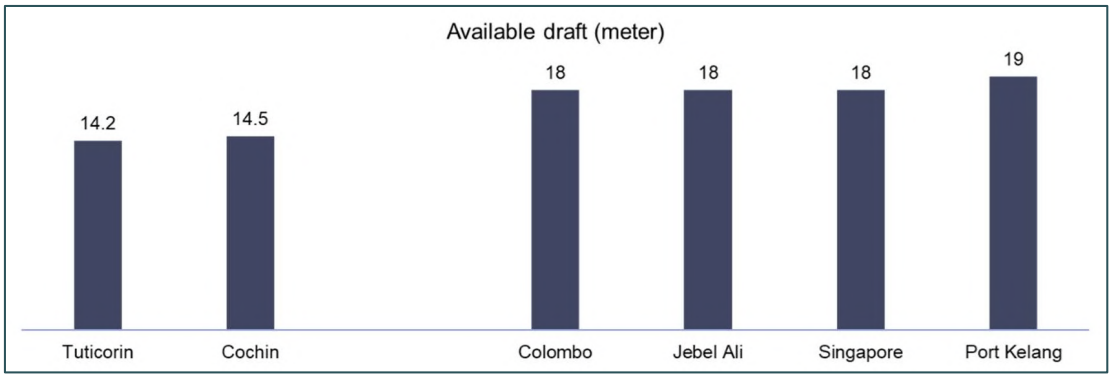
- Dedicated terminals, as opposed to common user terminals – either through a direct investment and operation of their own facilities or via 'virtual terminal' arrangements.
- Full reform in Cabotage restrictions that helps facilitate international lines in developing hub and feeder operations for domestic cargo.

CHALLENGES

INSUFFICIENT DRAFTS

The current ports in southern India – such as Cochin and V.O. Chidambaranar – have insufficient drafts of 14.5m and 14.2m respectively whereas major transshipment hubs across the world have at least 18-meter draft which helps in attracting large size vessels.

Figure 201 Average draft (meter)[57]



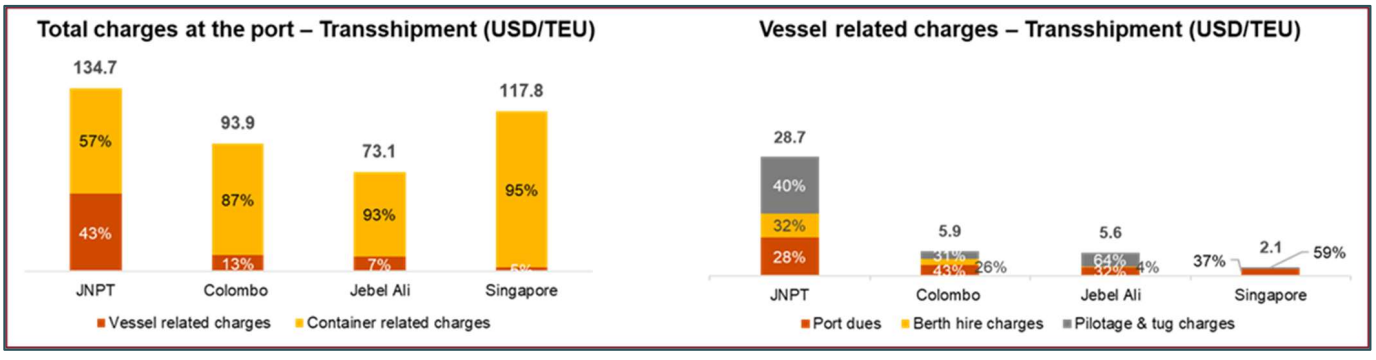
FAR DISTANCE TO INTERNATIONAL MARITIME TRADE ROUTE

All current ports on the East and West coasts of India are at a distance of greater than 5 hours of voyage from the international shipping route, which makes these locations unattractive for transshipment as compared to Colombo which is at 0.5-1 hours of voyage from the shipping route.

COST COMPETITIVENESS

Total transshipment charges at Indian ports such as JNPT are 43% higher as compared to Colombo port mainly on account of vessel related charges. Vessel related charges (VRC) at JNPT are significantly higher than major transshipment hubs. The main contributors to this high cost are berth hire charges, which are more than 3.7 times and pilotage and tug charges, which are more than 5 times on an average when compared to the global ports

Figure 202 Comparison of transshipment charges

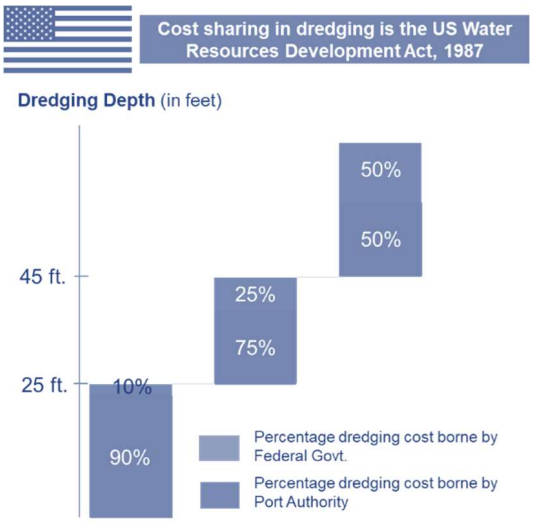


Source – JNPT port tariff, Tariff documents of global ports, Study team Analysis, Sri Lanka Port Authority

Figure 203 Cost sharing in dredging is the US Water Resources Development Act, 1987

[57] Source - IPA's Port Statistics report, IHG International database, Drewry database

Assumptions: Vessel related charges and handling charges have been considered twice to arrive at the total costs at the port; Storage charges for the ports are zero because of the free storage period at these ports; Average stay period for Singapore is taken to be equally likely between 1 to 10 days; Port dues in Singapore are charged on per 100 GT basis but is converted to per TEU basis taking 1GT=11.95 TEU; Pilotage fee for 1st hour for vessel up to 6000 GT (631 TEU) is $227



CUSTOM PROCESS

Customs clearance process in Indian ports is perceived to be more complex and time-consuming than global ports which leads to a high turnaround time and cargo lead times

KEY INITIATIVES

INFRASTRUCTURE INITIATIVES

DEVELOP TRANSSHIPMENT PORT AT VIZHINJAM AND GALATHEA BAY WITH AT LEAST 18M DRAFT, WORLD CLASS INFRASTRUCTURE AND SEAMLESS HINTERLAND CONNECTIVITY FOR GATEWAY CARGO

Establishment of a transshipment hub in India would also involve infrastructure development to match the requirements of shippers and vessel operators. An assessment has been conducted across key parameters – availability of draft, proximity to maritime routes and hinterland connectivity to identify ports which have the potential to act as a transshipment port for India.

Table 47 Ports across key parameters for transshipment

Parameters	Galathea Bay, Greater Nicobar	Vizhinjam	V.O. Chidambaranar	Cochin
Availability of deep draft	~20 m depth	~20 m depth	~14.2m depth; can be increased up to 16m	~14.5m depth; can be increased up to ~18m
Proximity to maritime routes (Suez-far trade route)	~0.2-0.3 hours voyage time	~0.5-1 hours voyage time	6-8 hours voyage time	4-6 hours voyage time
Hinterland connectivity	Key concern – last mile road & rail connectivity	Key concern –last mile road & rail connectivity	Good connectivity to clusters like Madurai, Chennai, etc.	Connected to key hinterland market of ~6.5 Lakh TEUs

Availability of draft - Most mainliners prefer calling at ports with at least 18m draft. Vizhinjham and Galathea Bay have deep draft potential of ~20m.

Proximity to maritime route - Liners prefer minimum deviation from their courses when selecting a transshipment port. East–West trade route (Far East to Europe and US via Malacca Straits and Suez Canal) is relevant for India. Vizinjham and Galathea Bay are promising locations given their position at ~6-10 Nautical Miles deviation (0.2-1 hours) from the Suez route

World class infrastructure and Hinterland connectivity - Global transshipment ports (e.g. Colombo, Singapore) have built mega structures to accommodate large mainline vessels. In line with global ports, India also needs to develop world-class infrastructure and dedicated superstructure (up to 6 cranes may be required for a ship towards ensuring international standards in productivity of about 200 moves per hour). Further, superior, first and last-mile road and rail connectivity need to be ensured with the port for Gateway cargo.

As per the above assessment, Vizhinjam and Galathea Bay are strong contenders for a Transshipment hub. Further, following development model is suggested

Development model - Major transshipment hubs across the globe are shifting towards landlord port model and JVs for development and operation of ports. For example - Port of Singapore, the busiest container transshipment hub that transship ~80% of the containers that arrive in Singapore to other ports, shifted to landlord port model since 1997. PSA International operates the major terminals in the port through its flagship terminal PSA Singapore Terminals. The Maritime Port Authority of Singapore looks after the regulatory functions. Yantian Port, Shenzen is a preferred port of call for mega-vessels in South China. Yantian International Container Terminals (YICT), a joint venture established by Hutchison Port Holdings (HPH) and Shenzhen Yantian Port Group (YPG), is responsible for operating and managing phases I and II of the port.

PROMOTING ANCILLARY SERVICES

Successful Hubs such as Colombo, Singapore, Port Kelang, etc. ensure a robust maritime ecosystem that is conducive to growth in traffic. Provision of package services / ancillary services / value-adding facilities listed below is critical for success.

- Supply of bunkers to ships at competitive rates – In India, the GST of 5% on supply of bunkers is a major deterrent. There is no tax on bunkers supplied to ships at Colombo. Crew Change Services, Ship handling, Dry Docking / Ship Repair etc.
- Crew Change Services at Port and OPL
- Ship Chandelling
- Dry Docking / Ship Repair

POLICY AND REGULATORY INITIATIVES

Apart from establishing the required world-class infrastructure and providing the ancillary services at transshipment ports, the other key aspect to consider is to make port and other related charges competitive as compared to other major transshipment hubs. Port charges can be made competitive by adopting following initiatives – Removing full-cost recovery model and outsourcing of select services.

REMOVING FULL COST-RECOVERY MODEL

The rejection of the concept of full cost recovery from direct users/beneficiaries seems to have been widely accepted by Canada, Japan and most West European countries. Internationally, and specially in developed economies, port channels are used as a national asset and dredging projects are funded by local municipalities or the government, and not by the ports themselves.

One of the most comprehensive legislations on cost sharing in dredging is the US Water Resources Development Act, 1987, under which, the Federal Government meets 90% of the dredging costs and 10% is met by the local port authority for a depth up to 20 ft. For a depth up to 45 feet, about 75% of the incremental maintenance dredging costs is met by the Federal Government and 25% by the local port authority. For depth exceeding 45 feet, the incremental cost of dredging is to be borne by the Federal Government and the local port authority on a 50:50 basis. Similarly, in Colombo port, Dredging is the responsibility of the National Government at Colombo.

OUTSOURCING OF SERVICES

Ports may also consider outsourcing of services such as pilotage and towage to third party service providers. Major ports being a government body have to operate under certain restrictions which may limit the operational performance and efficiency. Outsourcing may lead to better operational efficiencies thus reducing the cost of providing the services. Some of the key global ports such as Port of Singapore, Jebel Ali port etc. outsource these services to third party operators.

SIMPLIFY CUSTOMS PROCESS

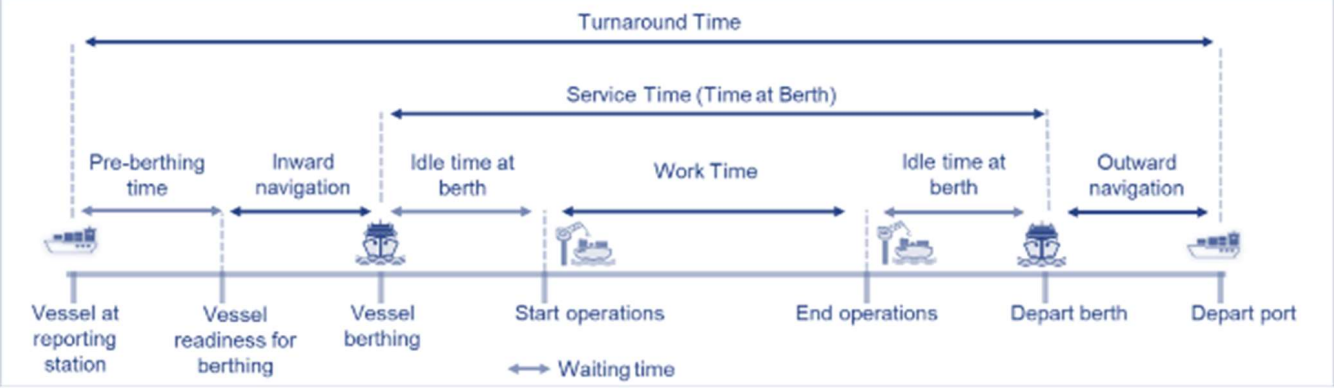
To promote ease of doing business, customs processes need to be digitized for Gateway Cargo. Further, there should be no customs involvement for transshipment cargo.

PORT PERFORMANCE - INFRASTRUCTURE PLANNING TO ENSURE ZERO WAITING TIME FOR VESSELS ON PORTS

Maritime transportation is considered as the main mode of transportation in international trade due to its ability in facilitating high-volume low-cost transportation. In India, maritime transportation accounts for 95% of EXIM trade by volume and 65% by value. Number of container moves handled per hour is used as a measure of calculating productivity at terminals which in turn depends on vessel turnaround time. In general scenario, higher the productivity – lesser the vessel turnaround time. Vessel turnaround time is the total time spent by a vessel at the port from its arrival at reporting station till its departure from the reporting station. Thus, it is a summation of all waiting times, idle times and container handling times at ports.

Waiting time comprises of pre-berthing time and the idle time at berths. Pre-berthing time is the time the ship or the vessel needed to wait before it could be tied to the berth. This time excludes Navigation time for inward movement. Idle time is the time when berthed vessel is not involved in cargo loading and unloading operation.

Figure 204 Break-up of vessel turnaround time



Below case study depicts activities / processes undertaken by JNPT to reduce pre-Berthing waiting time and improve vessel turnaround time.

Figure 205 Case Study - JNPT's initiatives to reduce pre-berthing waiting time and vessel turnaround time

JNPT has adopted slew of measures across infrastructure development, process simplification and digitization to reduce pre-berthing time and vessel turnaround time.

Infrastructure Development

- Development of Integrated Centralized Parking Zone for parking of tractor trailers has reduced delay of export shipments arriving from hinterland.
- Development of 4th Container Terminal in two Phases (Total capacity added - 4.8 million TEUs). Capacity addition increased number of 'Port of Call' and reduced pre-berthing time in JN port terminals. During the year 2019-20, total 1773 container vessels were handled at JN Port Terminals with 0.34 hours pre berthing time on port account and 3.88 hours pre berthing time on non-port account.
- Commissioning/Replacement of RMQCs at NSICT, JNPCT and APMT has increased terminal operational efficiency.
- Development of coastal berth and allotment of land for storage of bulk cement behind Coastal Berth is likely to ensure faster turnaround time of cement vessels.

- Widening of roads connecting port/ terminals coupled with strict traffic regulation will lead to zero congestion, thus effecting quick clearance.
- Deepening of navigational channel has ensured acceptance of deeper drafted vessels and ease of navigation. Currently, vessels up to 12,500 TEUs, can be handled by using tidal window.
- Construction of Business Facilitation Centre to get all PGA's at one place. Further, requisite laboratories in proximity of the port are underway.
- Development of port based SEZ to increase captive cargo (best conduit to the industrial hubs of Maharashtra and to the extended hinterland)
- Development of additional twin liquid cargo berth of 300 m length and 15 m draft will add additional capacity of 4.5 MT. In the financial year 2019-20, total 576 vessels were handled with pre-berthing time of 23.56 hours on port account and 43.09 hours on non-port account. Pre-berthing time will be reduced further subsequent to commissioning of this additional facility.

Process Simplification

- Inter terminal transfer of Tractor Trailers - This has helped in reduction of at least 7.5 kms distance of trailer movement on road, turnaround time of trucks, fuel use, pollution, cost of handling and enabled optimum utilization of trailers.
- Direct Port Delivery (DPD) – DPD service eliminated the need for CFS storage for OOC documents. Currently, Out of Charge is provided within port by customs to DPD customers (This has resulted in saving of ~ 150 hrs. of time and USD~90-300 per TEU cost in trade)
- Direct Port Entry (DPE) – Let Export Order (LEO) are being issued in Central parking Plaza with nominal charge of US$ 1. Earlier, movement of exports shipment to buffer yard/CFSs for examination and then to respective Terminals was time consuming and had more financial burden.
- Inter Terminal Rail Handling Operations (ITRHO) Agreement - With this new agreement between the terminals, movement of rail containers between the terminals is streamlined.
- E-Marketplace Transport solution for JNPT enabled optimum utilization of trailers thereby saving fuel and reducing pollution.

Digitization of activities

- Introduction of E-form 13/Form 11 provided convenience in accessibility and ease in functionality for customers.
- RFID Based Terminal Gate transaction: RFID based port entry of containers has reduced truck processing time at terminal gates to 1 minute from 5 minutes which minimizes formation of queues in front of terminal gates
- E Delivery Orders - Documentation clearance time has reduced significantly.
- Upgradation of PCS System ensured online transactions

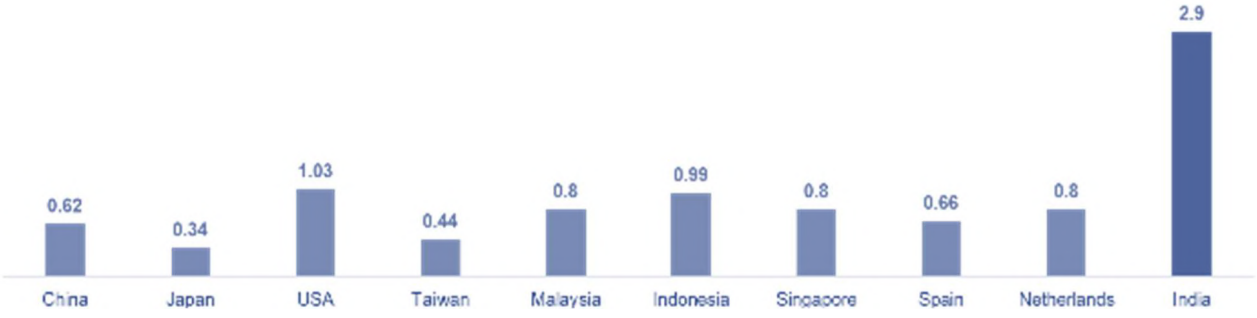
CHALLENGE

HIGH WAITING TIME LEADING TO HIGH VESSEL TURNAROUND TIME

Leading maritime nations have vessel turnaround time of less than a day whereas Indian ports have vessel turnaround time of 2.9 days which is comparatively higher than other leading maritime nations. Waiting time leads

to vessel idling which increases the cost of operations for shippers due to additional ship-day cost (longer ship hiring period), bunker cost and other ancillaries which are ultimately passed on to customers. Further, high vessel turnaround time at a port leads to opportunity cost loss (loss of cargo pick up from another port) for the vessel operators.

Figure 206 Median vessel turnaround time (days) (2020)[58]



High waiting time and vessel turnaround time can be due to port account and non-port account factors as mentioned below:

Port account factors

- Unavailability of berths - Berth may not be vacant as it might be occupied by a vessel that arrived earlier.
- Irregular maintenance dredging would lead to draft restriction which can ultimately limit berthing of larger size vessels.
- Non-availability/ break down of shore equipment for vessels at berth may lead to longer vessel turnaround time.
- Absence of night navigation facility would restrict berthing access for vessels during night-time and may lead to increase in waiting time/ turnaround time of the vessel.

Non-port account factors

- Vessel reported before schedule time may lead to increase in pre-berthing waiting time.
- Delay in custom clearance/PHO clearance due to factors such as incomplete documents.
- Any unanticipated problems in machinery may lead to non-readiness of vessels and thus impact service time of vessels.
- Unavailability of tank farm in liquid cargo terminal may impact the working time of the vessel and can increase the overall waiting time and turnaround time of the vessel.
- Weather constraints – There may be instances where delay in berthing the vessels is caused due to tidal restrictions & high-water current.
- Waiting time may also be increased due to pigging operation which are used to remove and scrap debris from pipelines

A quantitative assessment is also conducted to identify contribution of port and non-port account factors on pre-berthing time and vessel turnaround time and below are the results:

[58] Source: Report titled “Review of Maritime Transport” UNCTAD

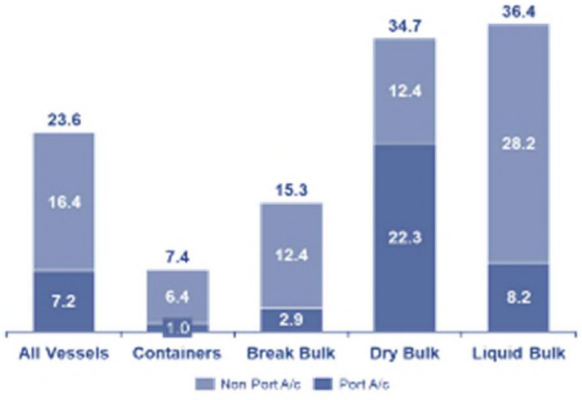
*Note: India figure is for the financial year 2019-20 whereas other country figures are for calendar year

India figure has been calculated for major ports

Pre-berthing waiting Time

Average pre-berthing delay for all vessels at major ports was 23.67 hrs.[59] in FY 2019-20, wherein port account factors contributed to 31% of the pre-berthing time (which computes to 7.2 hours) and non-port account contributed to 69% of the pre-berthing time (which computes to 16.4 hours). Non-port account is a major cause of pre-berthing delays for containers, Break-bulk and liquid-bulk contributing to 86%, 81% and 78% of pre-berth time respectively.

Figure 207 Pre-Berthing Waiting Times (hrs.) at Major ports commodity wise (2019-20)



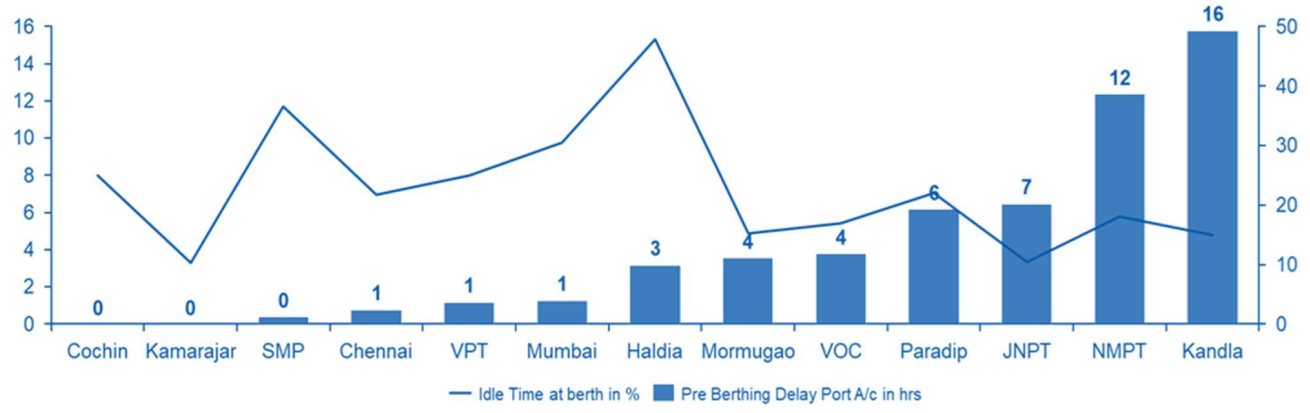
Over the past 10 years, a decreasing trend in pre-berth waiting time has been observed at Major Ports with a net decrease in pre-berthing time by ~50%. Port account related pre-berth waiting time showed a reduction of 62% from 2011 to 2019 and non-port account related pre-berth waiting time reduced by ~ 167%.

Figure 208 Pre-Berthing Waiting Times (hrs) at Major ports (2019-20)

A closer look at port-wise pre-berthing waiting time indicates that some of the ports have already made appropriate measures to reduce pre-berthing time. As shown in the below figure, Kamarajar port and Cochin port have reduced their pre-berthing time on port account to zero. However, there are some ports such as Kandla, New Mangalore Port Authority (NMPA) which have considerably higher pre-berthing time on port account.

[59] Note - The average pre-berthing waiting time obtained by dividing the total pre-berthing waiting time of all cargo vessels sailed from the port during a period by the number of cargo vessels sailed during that period.

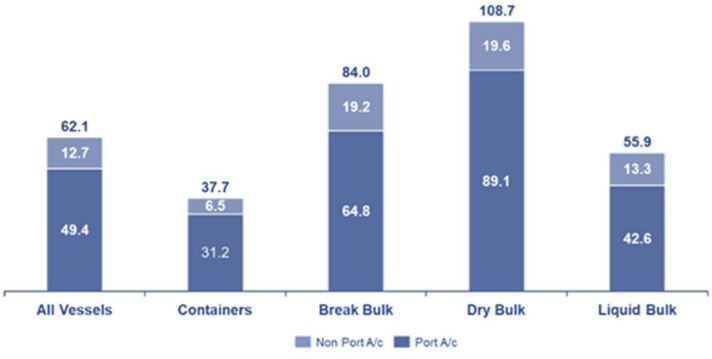
Figure 209 Pre-berthing time and idle time at major ports: on port account (FY 2020-21)



Vessel turnaround time

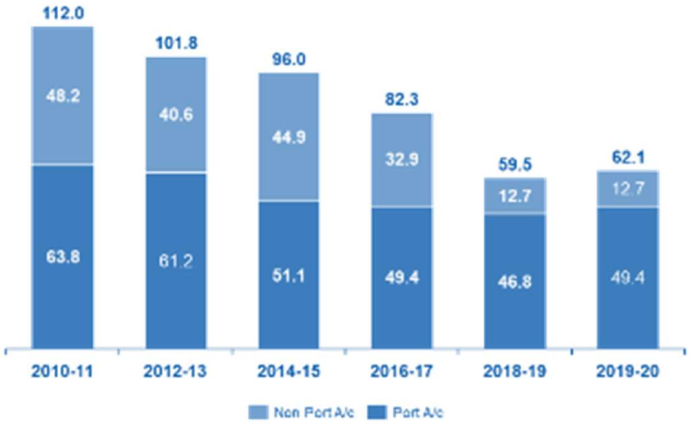
Average vessel turnaround time for all vessels at major ports was 62.1 hrs. in FY 2019-20. In contrary to pre-berthing time, port account factors contribution to vessel turnaround time is higher than non-port account factors. Port account factors contributed to 80% of vessel turnaround time (which computes to 49 hours) and non-port account factors contributed to 20% of vessel turnaround time (which computes to ~13 hours).

Figure 210 Average Vessel Turnaround Time at Major ports Commodity-wise (2019-20)



A decreasing trend in avg vessel turnaround time has been observed at Major Ports with a net decrease in TRT by ~100% over the past 10 years. Port account related average vessel turnaround time showed a marginal decreasing trend by reducing 27% during the period 2011-20 indicating a further scope for reduction whereas non-port account related average vessel turnaround time showed a considerable decline by reducing 82% during the same period.

Figure 211 Vessel Turnaround Time (hrs.) at Major ports (2019-20)



KEY INITIATIVES

As shown above, factors related to port account and non-port account contribute to high waiting time at major ports. Therefore, multipronged approach is needed for improving current efficiency parameters to achieve zero waiting time. Measures and suggestions to reduce waiting time are categorized in four areas – optimizing marine operations, optimizing terminal operations, faster custom/PHO clearance.

Optimizing marine operations

Marine operations include pilotage, mooring, maintenance of aids to navigation, tug services, bunkering, tidal information etc. Optimizing marine operations will help reduce pilot boarding time, navigation period and mooring time while berthing and sailing. Following suggested measures may be pursued to optimize marine operations:

CAPACITY BUILDING INITIATIVES

- Maintaining adequate number of pilots and pilot launches- Pilots are professionally licensed mariners whose role is to board and assume the conduct of a vessel and guide it along the safest route to its port of call. Maintaining sufficient number of pilots at ports will increase availability of pilots at given point in time for pilotage and vessels may not have to wait for long at the anchorage station. This will help in reducing pre-berthing time of vessels. Port authorities need to recruit/ deploy pilots on contract basis to maintain sufficient strength for pilotage. Further, ports may also explore possibility of retrofitting the existing pilot launches with new engines or may resort to hiring of launches.
- Maintaining adequate number of tugs– Tugs help in mooring or berthing operation of a ship by either towing or pushing a vessel towards the port. If there are more tugs available at a given point in time, ports will be able to service more vessels subject to availability of berth. Ports should ensure sufficient tugs/ port crafts with minimum speed of 20 knots.
- Maintaining/ adding night navigation facilities – Ports should ensure adequate navigational buoys and other related facilities at berth for seamless movement of ships during night-time.
- Mooring Operations - Ports should maintain adequate skilled mooring gangs round the clock for faster mooring operations. Further, mooring operation can be automated by utilising quick release mooring hooks (QRHs). It allows to quickly secure a vessel to a dock with minimum effort, and to release it quickly and easily, both in normal and in emergency operations.
- Advance notice for pilot booking - In case of berthing of any vessels, an advance notice of 2.5 hrs to be given in order to give ample time to anchored vessels to remove anchoring and to reach pilot station. This will help in simultaneous piloting in multiple docks.

TECHNOLOGICAL INITIATIVES

- Fast communication to signal station - Marine department of the port / head of marine operations to use common Very High Frequency (VHF) channels for different activities such as marine navigation and traffic control, summoning rescue services and communicating with harbors, locks, bridges and marinas. The frequency range between 30 and 300 MHz, inclusive. The International Telecommunication Union (ITU) has allocated various bands of frequencies throughout the radio frequency spectrum to the maritime mobile service and the maritime mobile satellite service. As per ITU Radio Regulation 2016, Appendix 18, a total 68 VHF channels are available for port operations, ship movement and public correspondence. Some of the key channels and their usage are mentioned below:

Table 48 Key VHF channels and their usage[60]

Key Channels	Ship Transmit MHz	Ship Receive MHz	Use
6	156.050	156.050	May be employed for communication between ship stations and aircraft stations engaged in coordinated SAR operations. Ship stations should avoid interference on this channel Channel 06 is also used in Australia and other countries for port operations, pilotage, tugs, and VTS
13	156.650	156.650	Designated worldwide as a navigation safety communication channel primarily for inter-ship navigation safety communications
16	156.800	156.800	May only be employed for distress, urgency, safety and calling
70	156.525	156.525	Used for Digital Selective Calling (DSC) for distress, safety and calling.

- Advance submission of berthing application – Advance planning of berthing of vessels yields very good results in terms of elimination of manual submission. All documents in respect of vessels, requirement of berth might be submitted on-line. Use of updated PCS vessel message specifications (e.g., BERMAN/VESPRO) might be used to reduce time and manual involvement.

Optimizing terminal operations

Terminal operations involves activities related to vessel handling, cargo handling and storage. Optimizing terminal operations will help reduce pre-berthing time and idle time at berth. Following suggestion may be adopted to optimize terminal operation:

INFRASTRUCTURE INITIATIVES

Following are the initiatives towards equipment upgradation and augmentation:

- Maximize twin lift operations using twin lift cranes
- Explore usage of Tandem Spreader and maximize twin lift operations (minimum capacity of 60 Tons)
    - Tandem Quattro offers a high capacity and flexibility, including the ability to handle four 20´ containers at a time – two 20´containers under each spreader – but at a low spreader weight

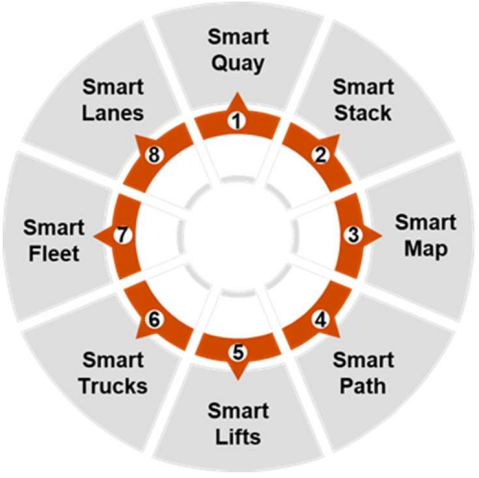
TECHNOLOGICAL INITIATIVES

Port should automate port operations by adopting following units:

[60] *Source: United States Coast Guard, U.S. Department of Homeland Security; Australian Maritime Safety Authority (AMSA), International Telecommunication Union*

- Smart Quay improves productivity during vessel operations. The system automates the mechanism to capture data of container movements, builds ship plans, and provides tools for managing traffic at the quay.
- *s*Smart Stack provides a real-time, accurate inventory of the terminal's containers. This ensures that the terminal will operate as efficiently as possible. For instance, stacking imports category wise like CFS, ICD, DPD, hazardous and empty which reduce unproductive shifting.
- Smart Map provides real time location and status of all equipment on the terminal which reduces the time to find the right equipment as per the requirement.
- Smart Path helps to optimize the route of terminal tractors and RTGCs with job status updates. Allows terminal operators to better utilize their assets.
- Smart Lifts improves operations between container handling equipment and truck via job list optimization and automated job selection ensure that handling equipment is used as efficiently as possible obviating the need for picking jobs manually.

Figure 212 Smart Initiatives



- Smart Trucks manages trucks in yard operations; provides real-time visibility of their movements and automatic updates for all their work.
- Smart Fleet helps maintenance operations to more effectively support terminal equipment. The solution captures key information from all equipment, making it available remotely to supervisors, who will be able to maintain the equipment more quickly and more efficiently.
- Smart Lanes increases the throughput and utilization of a terminal's gate operations by optimizing the gate traffic flow.
- Further, there are other technological initiatives which can be adopted such as use of vehicle booking system (VBS) which will ensure effective utilization of trailers carrying export/ import to/ from port.

The following provides the detailed international examples of smart initiatives:

Figure 213 International case examples of smart initiatives

Smart Quay Walls in the Port of Rotterdam[61]

- Smart quay walls and sensor-equipped buoys generate real-time data on water and weather conditions which is analyzed by IBM's cloud-based IoT technologies and turned into information
- Theseinformation are used by port operators to determine optimal time for ships to dock and load/unload

Impact

- Enable a new wave of safer and more efficient traffic management at the port
- Save shipping companies and the port up to one hour in berthing time, the equivalent of US$80,000

[61] Source: Econocom

Key Takeaway - Such innovation can be used by port authorities to identify best time to dock a particular ship which will reduce waiting time of the ship and will generate substantial cost savings for the shipping company

Case study -Smart Stack in Durban Container Terminal (DCT) in South Africa[62]

- DCT implemented the Kalmar Smart Stack solution for real-time container inventory reporting and management.
- Every time a container is moved, Smart Stack triggers a message to terminal operating system (TOS), based on inputs from location devices, sensors and Programmable Logic Controller (PLCs)

Impact - Efficient equipment utilization; Reduce manual stack inventory updating in the terminal yard; Real time container positioning

Key Takeaway - Smart Stack can be used by terminal operators to optimize container terminal operations and reduce turnaround time for ships

Case study - Smart Path in the Malta Freeport [63]

- Kalmar Smart Path wirelessly transmits the equipment's location to the terminal operating system (TOS)
- TOS optimizes job assignment for each piece of equipment based on its location
- Additionally, an automated job stepping feature is available that allocates the next job to the drivers in advance to reduce unproductive time

Impact – Kalmar smart path in combination with "Navis prime route", optimizes real-time routing, dispatching and monitoring of straddle carriers, terminal tractors and other internal transportation vehicles within the container terminal.

Key Takeaway - Smart Path cuts operational costs and helps Malta Freeport accommodate higher volumes by boosting equipment efficiency

Case study -Smart Truck in the Port of Savannah[64]

- Port of Savannah has applied process automation technology in its operations, after having installed the automated terminal asset management system (ATAMS).
- Garden city terminal in the port has installed RFID tags in street trucks, which allows tracking trucks in real-time
- Automated terminal asset management system (ATAMS) has improved the container hand-off process that occurs between yard cranes and street trucks

Impact - Primary benefits of ATAMS included improved worker safety, quicker turnaround times and increased crane productivity

Key Takeaway – This innovation can be used by ports to automate tracking of trucks within the terminal

Case study -Smart Fleet in the Port Otago in New Zealand[65]

- Port Otago in New Zealand has purchased Kalmar Smart Fleet - a system that helps maintenance operations more effectively support terminal equipment
- Equipment telemetry data is sent to the Smart Fleet software via the equipment's onboard computer

[62] Source: Cargotec Corporation
[63] Source: Port Equipment Manufacturers Association
[64] Source: Kalmar USA
[65] *Source: Kalmar USA*

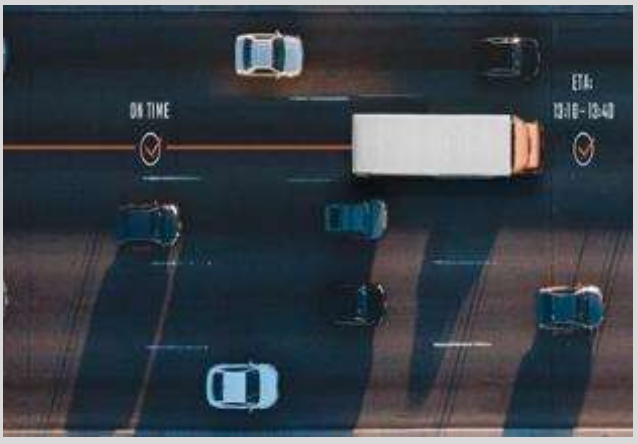
- Using the monitoring module's terminal operators can drill down to find the information needed to plan maintenance operations in advance

Impact - Kalmar Smart Fleet enables increased equipment uptime, improved maintenance and repair efficiencies thus reducing downtime

Key Takeaway – Can be utilized by ports to improve maintenance and repair efficiencies and avoid any sudden breakdown of equipment

Case study –Smart Lanes in Port of Liverpool[66]

- Smart Lane can automatically capture information from all trucks and containers entering and exiting your terminal
- The radio frequency identification (RFID) tag of a truck allows the driver's information to be captured, while optical character recognition (OCR) cameras can capture the truck registration and container IDs
- Smart Lane combines this information with the appointment information and makes remote inspection and exception management possible



I**mpact** - Smart Lane reduces queuing and congestion at gates

Key Takeaway - With the ability to process more trucks per lane per hour, Smart Lane increases throughput of the port

Case study -Smart Map in the Port of Houston

Kalmar Smart Map provides real-time and historical visualization of equipment location and container routing in the yard

Impact - In sync with other smart technologies, it will help to reduce congestion, improve security and optimize terminal operations

Key Takeaway - Optimized terminal operations would lead to lower waiting times

Case study –Smart Lifts in Total Terminals International[67]

- Enables automated handoff between container handling equipment and trucks
- Job promotion with appropriate jobs are identified using RFID tags and position of equipment and closest job is highlighted

Impact - Enables job promotion which increases efficiency and accuracy of process for the driver

Key Takeaway - Reduced truck turnaround time and improved operator efficiency

Further, following initiatives need to be adopted towards process simplification and skill development:

- Adopt fixed berthing window schedule for container terminals - Vessels should report to pilot station just two hours before its window schedule. This would reduce pre-berthing delay, and vessels would run at economical speed thereby saving bunkering cost. This has been followed in all JNPT terminals effectively

[66] *Source: Kalmar USA, GlobeNewswire*
[67] *Source: Kalmar USA*

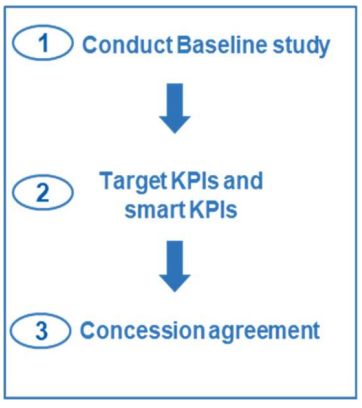
- Lashing/unlashing of container/cargo may be carried out simultaneously while loading/unloading is in progress to ensure there will be no additional time required for sailing after completion of vessel operations.
- Simulator training to be arranged for operators from time to time to enhance the skills of crane operators

Implementation framework to adopt smart initiatives in terminal operations – Implementation framework for smart initiatives have tailor-made according to the type of terminal (new or existing).

New Terminals – There are three key steps to be followed for implementing smart initiatives in new terminals which are as follows:

- Initially, project authorities would need to conduct baseline study on select operational terminals across parameters such as Gross Berth Output; Transit Storage Dwell Time; Turnaround Time for receipt/ delivery operation; Vessel turnaround Time on the basis of last 3-year performance of the terminals.
- Post base line study, project authorities would need to define/ revise target KPIs (existing/ new) and introduce smart KPIs across all the parameters
- Finally, the identified KPIs and smart KPIs would need to be accordingly included in concession agreement

Figure 214 Implementation framework to adopt smart initiatives in new terminals



Bidders would include the cost incurred in adopting smart initiatives in the quotation. Further, port authority would provide incentives to operators for going beyond 15% efficiency on smart KPI in any year.

Existing terminals – There are five key steps to be followed for implementing smart initiatives in existing terminals which are as follows

- Step 1 - Project Authorities would need to conduct baseline study basis last 3-year performance of the terminal and minimum standards in concession agreement across the key parameters. If Base lining study is prepared by PPP project operator, then it shall be vetted and approved by an independent third party
- Step 2 - Based on base lining study, project authority would need to define/ revise target KPIs (existing/ new) and introduce smart KPIs across all the parameters
- Step 3 - PPP Port Operators/ Project Authority would need to submit an action plan proposing multiple smart projects/intervention to the MoPSW/ State Maritime Boards for approval
- Step 4 - PPP Port operators/ Project Authorities would need to prepare an impact assessment report, estimating upfront capital cost, technical changes, improvement in efficiency, increase in operating cost for terminal, impact on ship and cargo turnaround time
- Step 5 - MOPSW/ State Maritime Boards may employ independent agencies to vet and approve the funding requirement, targeted outcomes of the proposed projects/interventions

Figure 215 Implementation framework to adopt smart initiatives in existing terminals

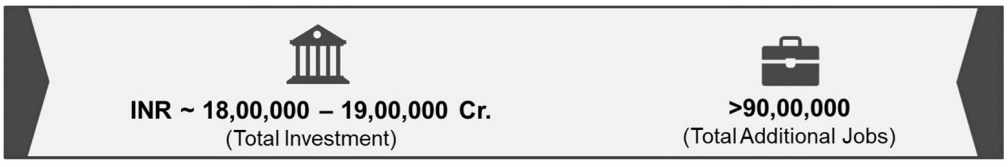
Port/ terminal operators to calculate additional capital expenditure and operating and maintenance cost required to implement smart initiatives/ projects and define the total amount required to attain cost neutrality to project authority. Post defining the amount, port authority/ MoPSW may cover 50% of the said amount in the form of viability gap funding or discount on revenue share. The remaining 50% would need to bear by port/ terminal operator. However, on achievement of target smart KPIs, remaining 50% of the amount will be reimbursed to port/ terminal operators. Further, port authority would provide incentives to operators for going beyond 15% efficiency on smart KPI in any year.

Faster Custom/PHO Clearance

Following initiatives to be adopted to expedite customs/ PHO clearances:

- Offices of PGA labs and other statutory establishments to be brought near port to minimize the clearing time of cargo. In respect of this, land/space allotment to these agencies may be provided by Ports. Further, PGA's communication should be mandatorily by digital format only.
- Submission of documents in respect of Port Health Department, Customs and Immigration to be made in advance through email/ or any soft forms to the concerned authority. Further, approval for inward entry, PHO and Immigration may be given in advance i.e., before the pilot boards the vessel for bringing the vessels to berth. This will reduce clearance time for PHO /Customs/Immigration officials when vessel is berthed.

Total investment required and potential job opportunities



INVESTMENT ATTRACTIVENESS

This theme explores sectors/ areas in the maritime sector where private investment can be invited. Further, structures/ mechanisms are suggested to facilitate private investment and improve investment scenario in the maritime sector.

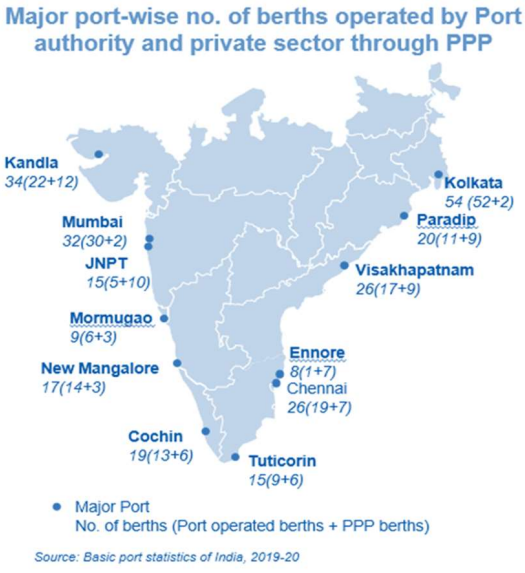
PUBLIC-PRIVATE PARTNERSHIP (PPP) IN MARITIME SECTOR

The port PPP Program was flagged of in India in 1997, which saw the beginning of the participation of private players including foreign players in port and terminal development, operation and maintenance. The number of projects under public private partnerships (PPP) in India have increased gradually re-defining performance through capacity augmentation, efficiency and productivity enhancement as well as increased competition.

Major ports currently have 275 berths operating across Indian coastline. Out of 275 operating berths, 76 berths (28% of total major ports berth) are operated under PPP mode which handle 51% of the total cargo across 12 major ports in India.

There are over 200 notified non-major ports. Out of which, ~31% of non-major ports handle cargo. Non-Major ports have also witnessed traction from private players through PPP to develop and/or operate & maintain berths.

Figure 216 Number of berths at major ports



In order to improve governance and functioning of Major ports, so that the overall ecosystem for private sector participation in port sector improves, some major steps have been taken recently as mentioned below:

- Revision of Model Concession Agreement for Major Ports, 2021 considering the change in policy environment due to enactment of Major Port Authorities Act, 2021, best practices followed across the globe and sectors, and exploring provision for further flexibility to respond to dynamic market and regulatory condition based on extensive deliberations and analysis of PPP projects under dispute.
- Enactment of Major Port Authorities Act, 2021 providing for abolition of Tariff Authority for Major Ports (TAMP)
- Setting up of an Adjudicatory Board, giving more autonomy to Port Authorities
- Setting up of SAROD PORTS for affordable arbitration
- Setting up of Conciliation and Settlement Committees
- Proposing new legislation replacing Indian Ports Act, 1908

CHALLENGES

LIMITED LONG-TERM, LOW-COST FINANCING FACILITY

Limited long-term, low-cost financing facility - Infrastructure projects in the maritime sector *(e.g. terminal development, shipyards)* are capital intensive with large financing requirement. With an upfront high capital expenditure, such projects have a longer breakeven period and thus require longer debt repayment period. However, there is a limited availability of long-term capital in the market. Additionally, cost of financing projects in India is comparatively higher than other advanced nations which impact competitiveness.

LIMITED PRIVATE PARTICIPATION IN OTHER SERVICES

Private sector participation through PPP mode is predominantly in terminal development and/or operation and maintenance. Private participation negligible in other services offered and assets operated by the ports.

EXISTING WEB PORTALS CONTAIN GENERIC INFORMATION ABOUT THE SECTOR AND DO NOT CATER TO INVESTOR SPECIFIC QUERIES/ INFORMATION

Investment based portals - The investors are spatially distributed, either in the subcontinent or globally. Thus, they have to depend much on the internet / web resources. However, web portals such as Foreign Investment Facilitation Portal (FIFP), Invest India Portal, MoPSW Portal provide general information on several sectors, including Ports/ Maritime Sector. The portals cover information such as Govt. policies, projects in pipeline, India opportunity, India Maritime Advantages, etc. For the maritime sector, the portals are primarily directed towards information dissemination w.r.t FDI in port Infrastructure involving greenfield ports, capacity augmentation (new berths) / modernization at existing ports, sagarmala project, connectivity projects.

Port specific portals - There is no web-based interface, w.r.t ports, that exclusively targets investors. *e.g. web pages of individual ports, DGS, IPA.*

Other sector portals - Web pages pertaining to other sectors/ Govt. bodies (who could be intrinsically connected to port investments / infrastructure) also provide broad generic information, links to policy documents etc., but may not be an appropriate guidepost e.g. Only names, designation, address, contact details of nodal officials are provided on Investment Facilitation link on websites of Ministry of Steel, Department of Telecom, Department of Agriculture, Ministry of Mines.

MARITIME DECISION INPUTS ARE PROVIDED IN A FRAGMENTED MANNER

Any policy and strategic decisions should be holistic in approach considering all the factors affecting the sector. Currently, maritime decision inputs are provided in a fragmented manner by institutes and professional bodies

such as Indian Ports Association (IPA), Indian Maritime University (IMU), and the Indian Institute of Foreign Trade (IIFT)s addressing specific issues to port planners and policy makers. Thus, the holistic decision making remains an eternal challenge.

KEY INITIATIVES

INFRASTRUCTURE INITIATIVES

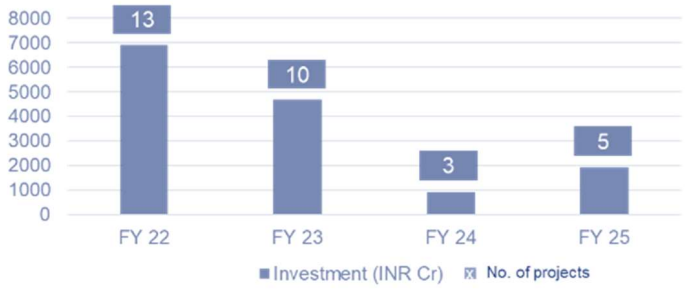
IMPLEMENT PPP PROJECTS RELATED TO TERMINAL DEVELOPMENT UNDER PM GATI SHAKTI – NMP AND ASSET MONETIZATION PLAN

PM Gati Shakti – National Master Plan (NMP) - Prime Minister launched PM Gati Shakti - National Master Plan for Multi-modal Connectivity, essentially a digital platform to bring 16 Ministries including Ministry of Ports, Shipping and Waterways together for integrated planning and coordinated implementation of infrastructure connectivity projects. The multi-modal connectivity will provide integrated and seamless connectivity for movement of people, goods and services from one mode of transport to another.

As per National Master Plan (NMP), 101 port projects are identified for implementation by 2024 with 43 projects are already under implementation whereas remaining 58 projects are yet to be developed. Out of 58 projects to be developed, 29 projects worth ~INR 15,431 Cr. are planned to be implemented under PPP mode.

Asset Monetization Plan (AMP) – The Government of India has recently announced an asset monetization plan wherein existing public assets would be monetized by leasing them out to private operators for fixed terms. The lease proceeds are expected to be used for new infrastructure investment. As per Asset Monetization Plan (AMP), 31 port projects worth INR 14,465 Cr are to be developed under PPP by FY 2025.

Figure 217 Projects under Asset Monetization Plan (AMP)



POLICY AND REGULATORY INITIATIVES

DEVELOP MODEL CONCESSION AGREEMENTS (MCAS) FOR CRUISE TERMINAL

Following key provisions should be included in the MCAs for cruise terminals:

- **MCAs should have flexibility to address changing market dynamics**. For instance, in Model Concession Agreement for Major ports, provisions such as change in cargo under change in law and unforeseen circumstances; change in dredging depths during concession period; investment in additional assets with corresponding additional termination payments were incorporated
- **Concessioning Authority's KPIs reflecting authority's responsibility** - In some sectors like Airport, a regulator regulates functioning of authority. Further, in Road sector, authority has no/limited role in operations phase. However, in port sector, authority plays key roles (e.g. marine services, congestion management, gate management, etc.). Keeping this into perspective, authority's KPIs were included in the MCA for major ports. Additionally, supporting infrastructure to be provided by Authority would be specified with timelines. Similar provisions should also be present in MCA of greenfield ports and cruise terminal
- **Concession duration should be reflective of capex lifecycle, adequacy of returns for Concessionaire and strategic objectives of the Authority** - Provisions like Right of First Refusal (RoFR) can be included giving flexibility to authority and comfort to concessionaire.

- **Risk balancing while ensuring optimisation of cashflows:** In earlier MCA for major ports, authority used to charge lease rentals from date of hand over, which meant concessionaires would need to pump in additional equity to fund lease rentals during construction period. In MCA for major ports 2021, lease rentals have been reduced to Re 1 with no notional loss to authority as there would be higher royalty keeping the returns same for both parties. Further, provision included for deemed performance guarantee for entire duration of concession in line with other sectors. Similar provisions should also be present in MCA of greenfield ports and cruise terminal.

ENCOURAGING PRIVATE PARTICIPATION IN OTHER SERVICES SUCH AS TOWAGE, DREDGING TO UNLOCK EFFICIENCY

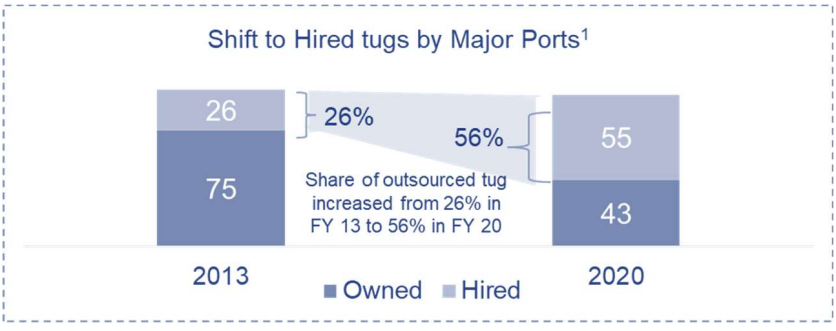
Globally marines' services such as pilotage and towage are provided by private operators/organizations on a long-term participation/PPP basis, however, such arrangements are yet to be seen in India.

Allow private towage companies to offer services to shipowners and charge them directly

Major ports are facing multiple challenges related to captive tugs such as high maintenance costs, low availability of owned tugs, frequent breakdowns due to lack of proper up-keep and maintenance, unionized manpower.

To overcome above challenges, major ports are gradually shifting from maintaining captive tugs to outsourcing the tugs to private players. Ports sign license contracts with towage service operators and operators directly charge vessel owners for the service. Share of outsourced tug increased from 26% in FY 13 to 56% in FY 20. 75% of remaining fleet expected to be over 25 years of age in next 10 years which would be discarded, creating more opportunity for outsourcing to private players.

Figure 218 Shift to hired tugs by Major ports



Indian ports could follow PPP model for dredging

Dredging is another area where PPP can be evaluated to drive efficiencies. Historically, significant expenditure has been incurred by Port Authorities on capital and maintenance dredging activities across Indian ports. Explore PPP in dredging models so that the operator can recover costs linked to traffic in channel.

Globally contract bundling and traffic-linked model leveraged to drive greater private participation. Ports combine capital & maintenance dredging in multi-year contracts as shown in below examples. Port operators are also recovering costs basis traffic flow in channel over 10 years as shown in below examples. Indian Major ports need to explore PPP in dredging models so that the operator can recover costs linked to traffic in channel as well bundling of dredging contracts across Major Ports to ensure a larger contract value and attract international players.

Figure 219 Global examples for PPP in dredging

Ports combine capital & maintenance dredging in multi-year contracts

- *Port of Bahia Blanca, Argentina awarded EUR 90 Mn contract to Boskalis and Jan De Nul – Scope includes capital dredging and 5-year maintenance dredging*
- *Port of Santos, Brazil awarded EUR 110Mn contract to Van Oord for capital & maintenance dredging*

Operators recovering costs basis traffic flow in channel – Forming SPV and recovering dredging cost through channel use charges over 15 -25 years

- *Puerto San Martin river: Jan De Nul & Empera JV charge toll of $1/ NRT on ships over 10-year dredging contract*

INSTITUTIONAL INITIATIVES

SETTING UP A SPECIALIZED INSTITUTION FOR LIBERALIZED AND LONG-TERM FUNDING

The constraints in accessing the low-cost, long-term capital by large segment of the maritime sector in India on the one hand, and the need for large financial resources to meet the investment needs in line with the declared aspirations of the GOI to develop a vibrant maritime sector on the other hand, necessitates the need for a comprehensive approach.

Keeping the aforementioned key financing requirements of maritime sector, a dedicated maritime sector focused institution - Maritime Development fund (MDF) is proposed. It can be either housed under the newly proposed DFI (National Bank for Infrastructure and Development) by Government of India or set up as an independent institution. The different modalities of both the options are discussed in detail in theme – "Offer maritime professional services – maritime finance".

SETTING UP 'INVESTMENT FACILITATION CENTRE: SPC (SINGLE POINT CONTACT) FOR HANDHOLDING TILL IMPLEMENTATION

An Investor Facilitation Centre (IFC) is proposed that becomes an investment enabler besides being a source of information regarding investment opportunities in the Indian Maritime Sector. It will perform the following key functions - Provides real time information, act as a single window of interaction for the sector, advocacy and streamlining within government for removal of obstacles, engages with investors and investees on real time basis for fast closure of investment decisions.

Key objectives of Investment Facilitation Centre

Key objectives of Investment Facilitation Centre are as follows:

- First point of reference for investors looking to invest in the sector
- Policy prescriptions for deployment of investment based on type, return etc.
- Coordination with multilateral bodies, corporate sector, government authorities and ports
- Advocacy and streamlining within government for removal of obstacles
- Building negotiation capacity and channeling ground-level and analytical expertise to negotiators
- Investor servicing or facilitation to help solve problems faced by existing or potential investors
- Targeting or investment generation by actively seeking out investors based on national development plans or other criteria
- Strategic research inputs for actionable insights and deployment of funds

Structure of Investment Facilitation Centre

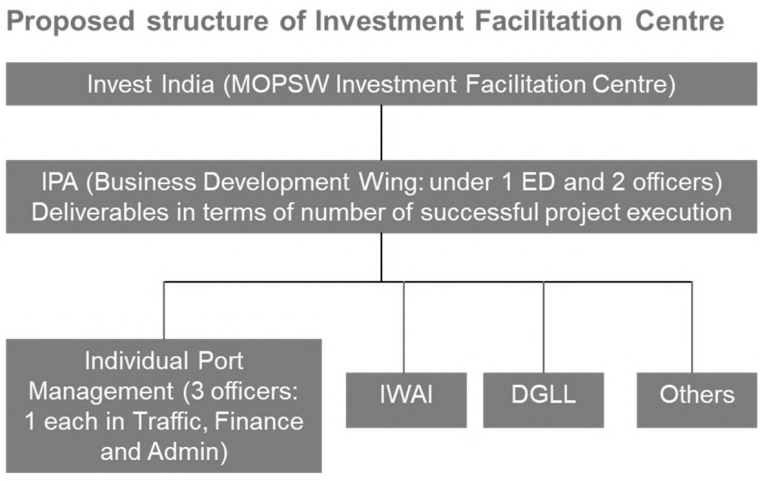
The Proposed IFC would be based on the three-tiered structure with a nodal investment agency at the top and individual ports at the bottom of the structure to relay upward and downward information dissemination.

- **Tier 1 - Integrated MoPSW unit within Invest India**: Over the last few years, Invest India has established itself as a leading organization for investment facilitation in India. Therefore, an integrated MOPSW unit, within Invest India, dedicated to investment in the maritime sector will allow the stakeholders to capitalize on the brand and credibility of Invest India. This essentially would open the door to an actual single-point-of-contact with minimal bottlenecks for potential investors. This unit would be optimally placed to promote maritime activities as a highly lucrative venue for deployment of funds and also increase the visibility of projects in this segment.

- **Tier 2 - Indian Port Association:** A critical linkage to this integration with Invest India would be the Indian Ports Association (IPA). Within IPA, separate unit is proposed which is dedicated to business development, business process improvements and standardization of processes and centralized strategy and research vertical, data and knowledge repository and Centre of Excellence for ports and maritime sector in India

- **Tier 3 – Individual ports:** The foundation of the IFC would be based in the individual ports and other organizations functioning under the ambit of MOPSW. This would allow for quick transmission of information including requirements and utilization of individual projects and proposals underway.

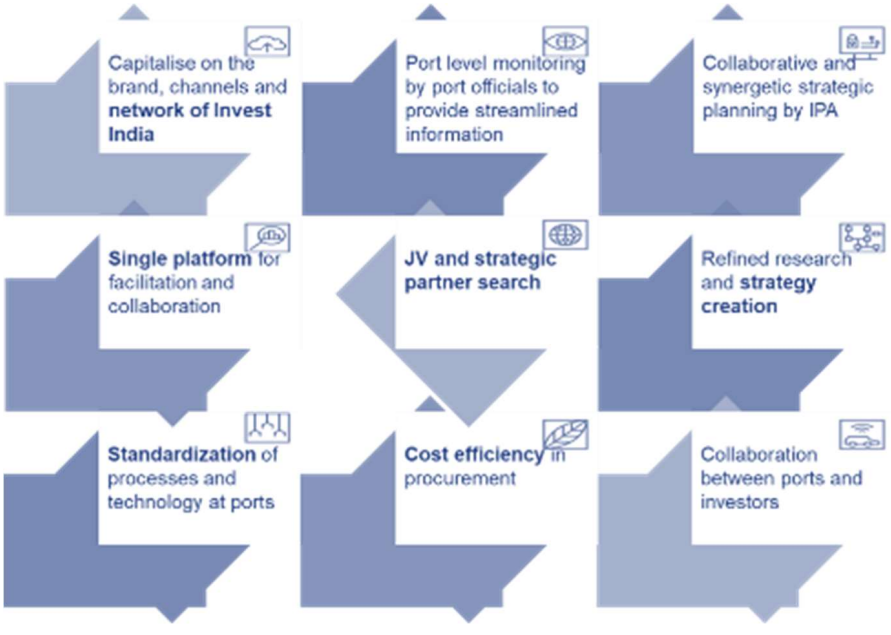
Figure 220 Proposed structure of Investment Facilitation Centre



Above three-tiered structure would allow for quick transmission of information including requirements and utilization of individual projects and proposals underway. Following are the advantage of the proposed structure:

Capitalize on the national and international brand, channels, reach and network of Invest India

Figure 221 Advantages of proposed IFC structure



- Single platform for facilitation and collaboration
- Coordination with other sectors for approvals, regulations, etc.
- Collaborative and synergetic strategic planning by IPA for the overall development of the sector
- Quick upward and downward transmission of inputs / comments / opinions / reports for effective decision making between ports and Invest India
- Port level monitoring by port officials to provide streamlined information
- Refined research and strategy creation by Strategic Investment Research Unit (SIRU) within IPA
- Standardization of processes and technology at ports by centralized procurement and implementation of standard technology solutions at ports
- Cost efficiency in procurement and contracts through benefits of scale

- Higher collaboration between ports and investors through digital integration and intra-sector coordination

INSTITUTIONAL INTERVENTION

SETTING UP MARITIME TRADE FACILITATION CENTER (MTFC)

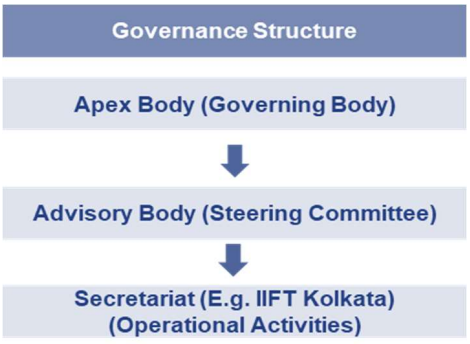
There is a need for a central body – Maritime Trade Facilitation Center (MTFC) that can act as a 'Think Tank' to the port planners

Key functions include the following:

- Analyze current challenges and future needs of India's maritime domain through data analytics, compiling views of stakeholders, evaluating GoI & other schemes, collating news and events from national and international sources
- Provide port-specific inputs including project consulting

Proposed organization structure of Maritime Trade Facilitation Center (MTFC)

Figure 222 Proposed structure of Maritime Trade Facilitation Center



MTFC will be set up as an independent body under an institute (e.g., IIFT Kolkata). MTFC will draw mandate from the Governing Body. Members in the Governing body would include representatives from MoPSW, GoI; NITI Aayog and Ports.

Infrastructure requirements - Space for staff and Data Centre, Hardware (Computer servers & desktops / laptops & allied equipment); Software (OS / Office Suit / Simulation & Analytics / others) and Internet service facility.

Human Resource requirements - Experts with expertise in maritime logistics domain; researchers, interns, post-doctoral fellows, scholarly academicians; Data science professionals and support staff capabilities

Data collection mechanism and sources - Collaboration with leading institutes such as International Maritime Organization (IMO), Indian Ports Association (IPA); Inland Waterways Transport (IWT); National Highway Authority of India (NHAI), GSTN, Concor, etc. to get data and information. Subscription to global knowledge bases such as Bloomberg, Reuter, Drewary, CMIE databases etc.

EASE OF DOING BUSINESS

This theme identifies ways to standardize unit of levy of scale of rates and conditionalities across major and non-major ports and identifies measures to minimize predatory pricing in maritime sector.

STANDARDIZATION OF PORT TARIFF STRUCTURE IN ALL PORTS

Indian ports comprise of major and non-major ports. While the Major Ports are under the administrative control of Ministry of Ports, Shipping and Waterways (MOPSW), the non-major ports are under the jurisdiction of respective State Maritime Boards/ State Government. An assessment has been done to understand tariff structure adopted by major and non-major ports.

CURRENT LANDSCAPE OF TARIFF STRUCTURE - MAJOR PORTS

Major Port Authorities (MPA) Act, 2021 has been enacted by Central Government which replaces the earlier act Major Port Trusts (MPT) Act 1963. The act seeks to provide for regulation, operation and planning of major ports in India and provide greater autonomy to these ports. Under the new act, the tariff setting functions, which was earlier bestowed on TAMP, is withdrawn. Major Ports and the PPP concessionaire have been given the powers to fix port tariff based on market conditions and on such other conditions as may be notified. Factor such as cost of operations, capital cost, the traffic, the competition level, etc., are taken into account during tariff fixation at a particular port. As these factors will vary from port to port and operator to operator, it may be difficult to have a standardized tariff as such.

At the same time, efforts may be done to have the standardization in the conditionalities and unit of levy of the tariff across all the ports. This will facilitate ease of business and bring in transparency.

Unit of levy of scale of rates of Major Ports (Vessel Related Charges and Cargo Related Charges) are uniform across all the Major Ports and PPP Concessionaires operating in Major Ports.

Table 49 Unit of levy for scale of rates

Scale of Rates	**Unit**
Vessel related charges	
Port Dues	INR per GRT (1 slab)
Berth Hire	INR per GRT-hour (1 slab)
Pilotage fee	INR per GRT (3 slabs)
Cargo related charges (Wharfage, handling and storage)	INR per tonne
Container related charges	INR per TEU

CURRENT LANDSCAPE OF TARIFF STRUCTURE – NON-MAJOR PORTS

The non-major ports are under the jurisdiction of respective State Maritime Boards/ State Government. Amongst the State Maritime Board, it is seen that State Government of Gujarat notifies in the State Gazette the schedule of port charges along with conditionalities and fees leviable by Gujarat Maritime Board (GMB) for the groups of ten ports listed in the schedule. Tamil Nadu Maritime Board and Andhra Pradesh Maritime Board have hosted the tariff on their respective website. The web site of Maharashtra State Maritime Board does not exhibit the tariff for port services.

Thus, as far as non-Major Ports are concerned, at present there does not appear to be any uniform Tariff Policy applicable across all the State Maritime Boards

KEY INITIATIVES

POLICY AND REGULATORY INITIATIVES

Following are the initiatives towards making conditionalities and unit of levy of the tariff uniform across all the ports:

- State Maritime Board may adopt uniform unit of levy for VRC and CRC for non-major ports
- All State controlled ports must host the tariff on their website. Presently the GMB, TMB & APMB have hosted the tariff on their website, other maritime boards also need to follow the same

- State Maritime Board may adopt uniform conditionalities for non-major ports in line with Major ports. Additionally, following items are recommended for standardization in the conditionalities and structure of tariff for major and non-major ports.

Table 50 Areas for standardization in the conditionalities

Area	Current Scenario	Action
Wharfage charge for cargo	Wharfage charge for cargo is specified for each good	Wharfage charge for cargo could be simplified into broad categories like dry bulk, break bulk, Machinery, chemicals, POL, crude oil, etc
Container handling charges	Charges for few ports are composite while in others they are unbundled	Either of the following structure can be followed across all the ports to ease the trade • Levying a composite container handling charge which will contain cost associated with different activities • Levying charges separately for different activities
Currency	Specified in USD for foreign vessels and INR for domestic vessels	This may be standardized either in US$ or in rupees terms
Port convenience	Definition of port convenience specified in individual SOR	Uniformity and standardization in the definition of the term 'Port convenience' across all ports
Anchorage charges	Anchorage charges are not prescribed in the SOR of all Major Ports	Anchorage charges could be prescribed in the SOR across all ports
Premium for over dimensional containers	At some Major Ports, it is based on the actual number of ground slots the respective container occupies	Premium up-to the extent of 50% on storage charge for over dimensional containers to be prescribed
Free Dwell Time	No uniformity in the definition of 'Free Dwell Time'	• For import cargo/ container, free dwell-time (storage) period should commence from the time after the day of landing of the container • For export cargo / containers, the free period should commence from the time the cargo/ container enters the terminal
Demurrage slabs	No uniformity in the definition of 'Demurrage slabs'	The definition of 'Demurrage slabs' can be simplified and made uniform across all ports

POLICY ON PREDATORY PRICING FOR SUSTAINABLE AND STRUCTURED GROWTH OF INDIAN MARITIME SECTOR

CURRENT LANDSCAPE

The dominant players in the Indian Maritime sector either independently or through cartel may misuse their dominance and indulge in predatory pricing to nullify or reduce competition within India.

Predatory price, as defined under the Competition Act, 2002, means the sale of goods or provision of services, at a price which is below the cost, as may be determined by regulations, of production of the goods or provision of services, with a view to reduce competition or eliminate the competitors.

The Competition Act, 2002 defines "dominant position" as a position of strength, enjoyed by an enterprise, in the relevant market, in India, which enables it to operate independently of competitive forces prevailing in the relevant market and affect its competitors or consumers or the relevant market in its favour.

Factors to be considered by the Competition Commission of India to determine whether the enterprise is in a dominant position is stipulated in Sections 19(4) and 19 (5) of the CCI Act, 2002 respectively. Thus, the Competition Commission is already empowered to look into the matter relating to predatory pricing and cartelization amongst other functions.

NO TRANSPARENCY IN TARIFF/ PRICING LEVIED BY NON-MAJOR PORTS

Whilst there is transparency in the tariff/ pricing of the Major Ports and the PPP concessionaire operating in Major Ports as tariff is hosted on the web site of respective ports at present, there is no such transparency as regards tariff/ pricing levied by non-major ports and the PPP concessionaire under the non-major ports. This create difficulty in identifying whether predatory pricing is being followed by a particular enterprise operating in a port.

PPP CONCESSIONAIRES IN NON-MAJOR PORTS ARE NOT UNDER ANY TARIFF REGIME.

As per the MPA 2021, the tariff regulation by TAMP for major ports is removed. Major ports shall have flexibility to frame their own Scale of Rates (SOR) following the Tariff Guidelines to be issued by the Government. Further, PPP projects after commencement of the MPA Act, 2021 will have complete freedom to fix their own tariff based on market conditions and such other conditions as may be notified. However, PPP Concessionaires in Non-major ports are not under any Tariff regime. They have flexibility to charge much lower rate to attract cargo of other competition ports mostly from major ports.

Big and dominant players in the port sector can reduce their tariff which may not be possible for the Major Ports or other private ports as they may not be able to even meet their operating cost. Major ports can charge lower rates, but at the same time, they have huge operating cost. Hence, they may not be in a position to charge lower than the approved tariff beyond a particular level to match the tariff levied by non-major port or PPP Concessionaire operating in non-major ports. Likewise, PPP Concessionaires in major ports can charge lower rates. However, they have to pay revenue share to the major ports on the approved tariff. Hence PPP Concessionaires in major ports may also not be in a position to charge lower tariff to match tariff levied by the non-major port/ PPP Concessionaire in non-major ports.

KEY INITIATIVES

POLICY AND REGULATORY INITIATIVES

With a view to explore possibility to minimize predatory pricing in maritime sector, the following points are suggested/ recommended:

MANDATORY LISTING OF TARIFF LEVIED BY ENTERPRISE IN A PORT ON PUBLIC DOMAIN

Presently, the tariff/ pricing of the Major Ports and the PPP concessionaire is hosted on the web site of respective ports. However, there is no such transparency as regards tariff / pricing levied by non-major ports and the PPP concessionaire operating under the non-major ports under the State Maritime Board/ State Government. There can be a directive that all the non-major ports including the PPP Concessionaire in non-major ports to host the updated tariff on their website to have transparency and ease of trade.

SETTING LOWER THRESHOLD FOR SCALE OF RATES

A directive may be given that pricing/ tariff should not be less than the operating cost per tonne/ TEU in respect of a port/ PPP concessionaire who is in the operation for more than 7 to 10 years or is a dominant player in the port sector. Further, there could be cap on number of years (say one to three years) for the new entrant in a

particular port to have reduced pricing to attract trade subject to compliance of the provisions of Competition Commission Act and specific provisions of the Concession Agreement in this regard.

RESTRICT MERGER/ ACQUISITION WHICH ARE LEADING TO 50% OR ABOVE MARKET SHARE IN THE SECTOR BY A PARTICULAR GROUP OF COMPANY OR ENTERPRISE

It is suggested to explore the possibility to stipulate a condition to restrict Merger/ acquisition which leads to beyond 50% of the market share in the port sector by a particular group of company or enterprise. Provided it is not violative of applicable laws in the Country.

TARIFF FIXATION BY PPP CONCESSIONAIRE IN MAJOR PORTS SHOULD BE CONSISTENT WITH THE COMPETITION ACT, 2002

The Major Port Authorities Act, 2021 notified by the Government gives flexibility to Major Port Authorities to frame their own SOR following the Guidelines (to be) issued by the Government. The Act mandates the Major Port Authorities to ensure that SOR is consistent with the Competition Commission Act, 2002.

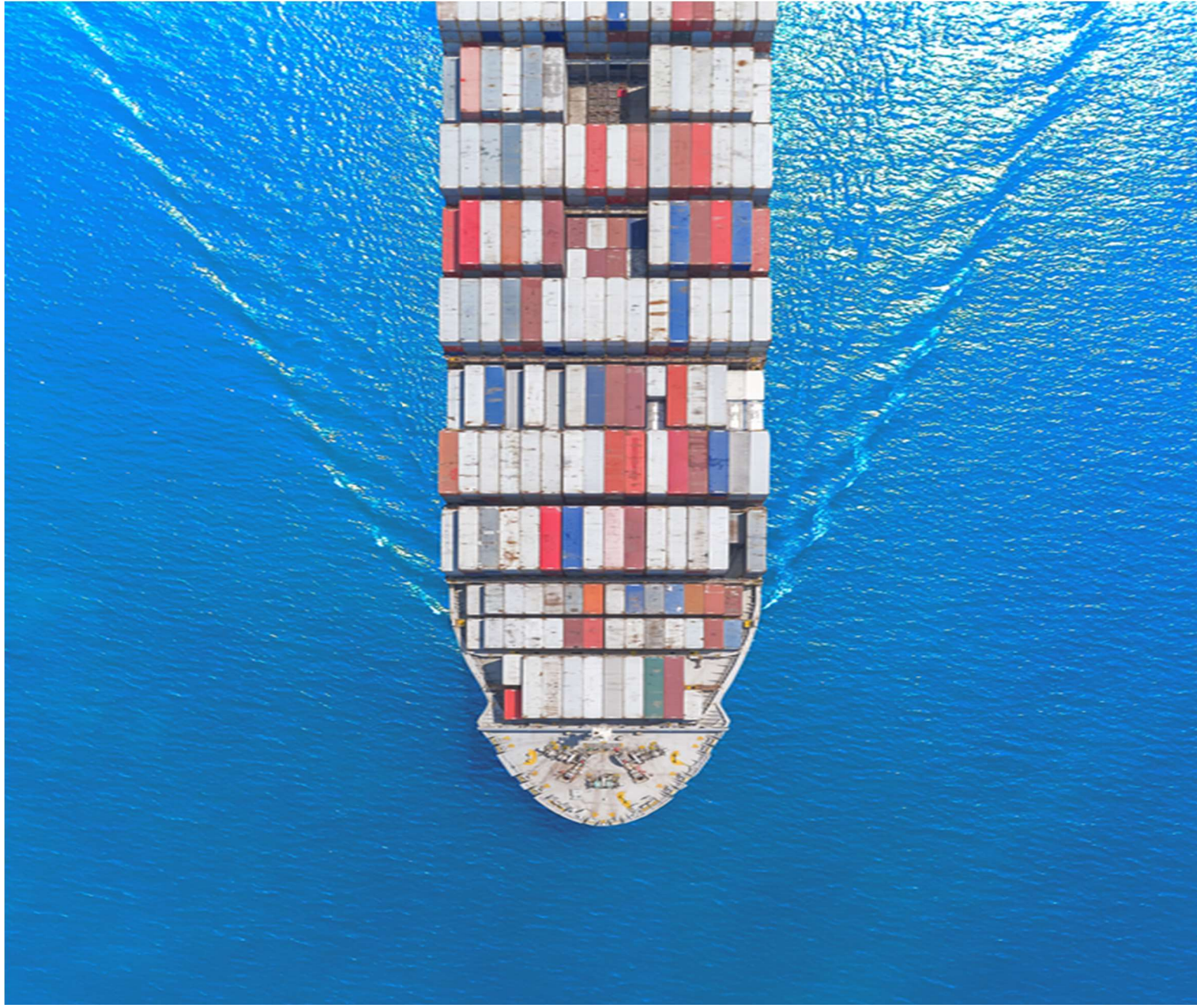
As per the MPA, 2021, the PPP projects in Major Ports after commencement of MPA Act, 2021 will have complete freedom to fix their own tariff based on market conditions and such other conditions as may be notified by the Government. One of the conditions to be notified by the Govt. for PPP Concessionaires can be that the pricing should be consistent with the Competition Act, 2002.

KEY PERFORMANCE INDICATORS

As part of Action plan, globally benchmarked targets have been defined as mentioned below to help India develop Best-in-class port infrastructure, attract private investment and ease of doing business.

Key Performance Indicators	Current Status	Target (2030)	Target (2047)
Best-in-class port Infrastructure			
Increasing overall Port handling capacity MTPA	2,563	3,000+	10,000+
Increasing traffic volume handled at the ports MTPA	1,320	4,000+	7,000+
Port clusters with capacity in the range of > 300 MTPA	1	7	12
No. of new major ports	-	2	2
Ports with 18-23 m draft	5	10	13
No. of ports in top-3 busiest transshipment hubs in the world	-	-	1
% of Indian cargo transshipment handled by Indian ports	32%	75%	95%
% of global transshipment volume handled by Indian ports	0.8%**	5%	10%
Median turnaround time for vessels at Indian ports	2.9 days	< 2 days	< 1 day
Investment attractiveness			
Percentage of cargo handled at Major Ports by PPP/ other operators of total throughput	51%	>85%	100%
% of berths under PPP in major ports	~30%	75%	95%
Ease of doing business			
Standardization in the conditionalities and unit of levy of the tariff across all the ports (in line with major ports)	12 major ports	All non-major ports	-

Theme 10
Enhance Efficiency through technology & innovation

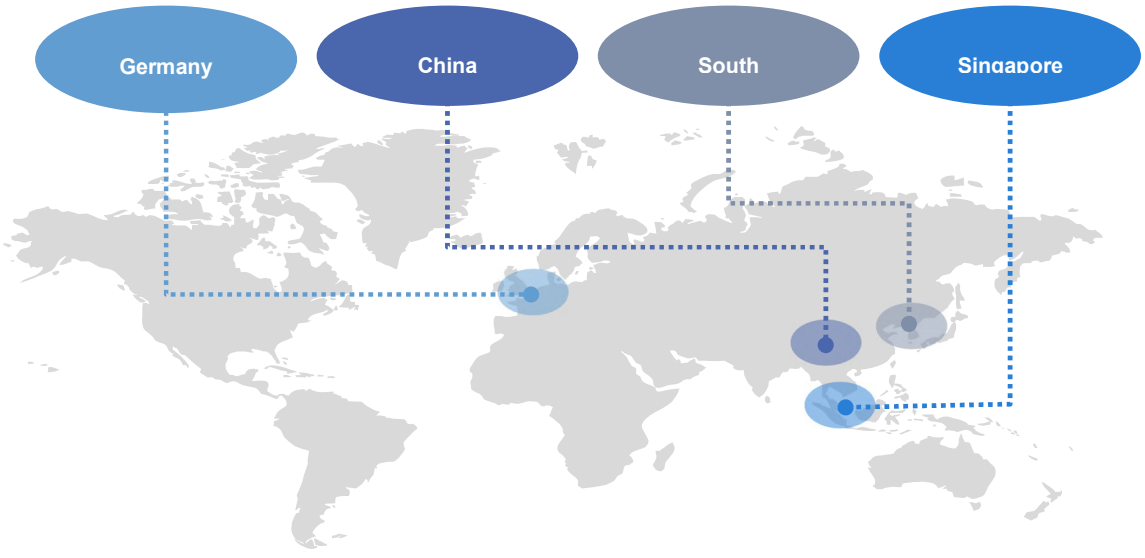


ENHANCE EFFICIENCY THROUGH TECHNOLOGY & INNOVATION

Maritime sector which carries ~90% of international cargo volume has seen technology advancement, innovation and transformation with the aim to bring in efficiency in operation, cost optimisation and ease of doing business. Like any other sectors, use of technology and its innovation in maritime sector has been consistency increasing over the years. The digital revolution in the last 10-15 years has emerged as one of the main drivers of change in the port and maritime sector. Data driven decision making and investment strategies would require the ports to enable digitalisation and integration of end-to-end process and stakeholders in the entire supply logistics value chain of maritime sector.

The digital transformation in this sector has brought in immense benefits by way of integration between stakeholders and activities through systems and devices. Covid-19 crisis has further underlined the critical role of digitalisation in functioning and operation of maritime supply chains across the world.

Figure 223 Globally maritime nations are moving towards digital transformation



Germany's Hamburg Port Authority has started smartPORT project comprising of smartPORT logistics and	SmartPORT logistics focusses on traffic flow, infrastructure, & flow of goods. SmartPORT energy focusses on renewable energy, energy efficiency & mobility
China is promoting construction of smart port pilot projects at 11 ports at government level	4 levers including intelligent port operation, safety management improvement, logistics integration, and business model innovation
Government of Korea planning to create a foundation for smart maritime logistics to boost the related industries and create a new growth model	Through R&D and pilot projects to enable establishment of smart ports based on the 4IR technologies
Singapore's TUAS port is a smart mega-port project, scheduled to be completed by 2040	Achieving fully automation through drones, ship tracking and on-time entry technology as well as robotic technology for terminal logistics systems

It is therefore critical and essential that maritime sectors in India also improve their position in respect of technological innovation, advancement and integration, not only to ensure and improve their competitiveness, but also to bring down the cost of international trade so that there are benefits to all stakeholders.

Technology in maritime sector has evolving and will continue to evolve with new technologies being invented even at faster pace. Technology adoption has resulted in several benefits and some of them are:

- Seamless transactions
- Efficiency enhancement
- Cost optimisation
- Ease of doing business
- Data Analytics
- Machine Learning/ Artificial Intelligence

Figure 224 India targets, international trade, 2030

CURRENT LANDSCAPE

In order to assess the level of technology adoption and advancement in maritime sector in India, following framework has been adopted. As depicted above, technology assessment has been carried out under three major hubs such as Ports, DG Shipping and IWAI and the same has been covered in the sub-sections below.

Figure 225 Hubs of Maritime Sector in India

PORTS

India has 12 major ports, and each port has adopted technologies based on their requirements. However, the current IT Systems in the major ports are as presented below:

Table 51 Current IT Systems in major ports, India

Port Operations Management System	Port Community System PCS 1x	Standard ERP System	Auxiliary IT system
This system is currently operational in all Major Ports as standalone or integrated system and includes majorly the following: • Commonly used modules- Vessel, cargo, railway, revenue, etc. • Main users of this module are Marine, Traffic and Accounts	This system is also operational in all Major Ports & 5 Non-Major Ports and largely includes the following: • Platform for exchange of messages among various stakeholders like Ports, Terminal Operators, Shipping Lines, Shipping Agents, Customs, CHA, PHO, Immigration, etc • Linked to Custom's ICEGATE, Port's POS / POMS, Terminals Operator's TOS.	This is also operational in almost all major ports in India and largely includes the following: • Port's internal digitisation / automation system	All major ports have auxiliary IT system to handle some independent functions as mentioned below. • E-office including Document Management System • Hospital Management System • GIS based Estate Management • RFID based Entry / Exit • Yard Management System

SHIPPING

DG Shipping (DGS) is an important stakeholder in Indian Maritime Sector. It deals with implementation of shipping policy and legislation so as to ensure the safety of life and ships at sea, prevention of marine pollution, promotion of maritime education and training in co-ordination with the International Maritime Organization, regulation of employment and welfare of seamen, development of coastal shipping, augmentation of shipping tonnage, examination and certification of Merchant Navy Officers, Supervision and Control of the allied offices under its administrative jurisdiction.

The DGS is dealing with matters regarding Ship registration and certification and Maritime Training. Considering that the above activities are based on the international norms such as:

- Survey and Certification requirements of IMO for ships operating in foreign waters and
- Training and certification for crew employed on ships as per STCW Convention

In terms of technology interventions in DGS, an e-Governance project was conceived in the year 2004 with an objective to migrate the functions of DGS on an e-platform. The DGS had embarked on an ambitious e-Governance project-titled "e-Samudra" in the year 2004.

The task of implementation the project was assigned to National Ship Design and Research Centre (NSDRC)/IMU Visakhapatnam. The modules developed by the e-Governance team till date are as follows:

- INDoS
- Examination
- MTO
- Crew
- Ship Registration
- CDC
- Cookery certificate
- Licensing & Chartering

- Training
- RPSL
- Sailing Vessel Identity Card
- Medical Fitness (Doctors)
- Liferaft Service Station
- ePass – Seafarer & non seafarer
- Stranded Seafarer
- Crew Manifest
- MTI digital eCert Module
- Finance
- Hindi
- CoC / CoC Revalidation
- CoP (Basic Wk, DC, Able Seafarer, IGF)
- Advanced DC & GMDSS
- Grievance Redressal
- Sign On vaccination module
- Ship Survey & Certifications

DGS has also employed the following technologies:

- E-Office
- Portal for EXIT Exam
- Shipbuilding Financial Assistance Portal

In addition to above, DGS has also undertaken the measures to reduce the compliance burden for the stakeholders and the same are given below.

- The numbers of steps (number of issuance procedure) for obtaining such certificates were identified for reduction in regulatory compliance burden. Further, certain registers and filings were also identified for making them online.
- A total of 201 items were identified under various heads for reducing the compliance burden.
- Phase-I: 96 compliances were reduced on 31st March 2021 and the status updated under the DIPP portal and completed.
- Phase-II: Remaining 105 compliance reductions are underway.

WATERWAYS

India has about 14,500 km of navigable waterways which comprise of rivers, canals, backwaters, creeks, etc. About 70 million tonnes of cargo is being moved annually by Inland Water Transport (IWT), a fuel - efficient and environment -friendly mode. The Inland Waterways Authority of India (IWAI) came into existence on 27th October 1986 for development and regulation of inland waterways for shipping and navigation. The Authority primarily undertakes projects for development and maintenance of IWT infrastructure on national waterways. Key technology interventions in IWT sector includes:

River Information Services (RIS)

IWAI established River Information System as per its mandate of disseminating navigational meteorological information about National waterways. RIS is akin to ATC in aviation, and it is necessary for safe navigation along the Waterways. Tracking and tracing of inland navigation vessels is an important part of the “River Information Services” (RIS) for the improvement of safety and efficiency.

RIS facilitates – (i) Enhancement of inland navigation safety in ports and rivers (ii) Better use of the inland waterways and (iii) Environmental protection. In addition, RIS enables safe and efficient inland water transport by minimizing the following risks – (i) Ship- to - Ship collisions (ii) Ship - Bridge collisions (iii) Groundings.

It also supports onboard navigation, shore-based traffic monitoring and other tasks such as calamity abatement. RIS supports users in enhancing their efficiency at work. It works on the basis of different information levels. RIS was inaugurated on 6th January 2016.

Portal for Assets and Navigational Information (PANI)

PANI is a digital service by IWAI that provides key systematic and aggregated River and Navigation information related to National Waterways (NW) in India for facilitating transportation of cargo and other vessels through National Waterways. This will help in better understanding of the key features of the NW that are essential for decision making on use of waterways mode for transportation. PANI has three major features:

Table 52 Key features of Portal for Assets and Navigational Information (PANI)

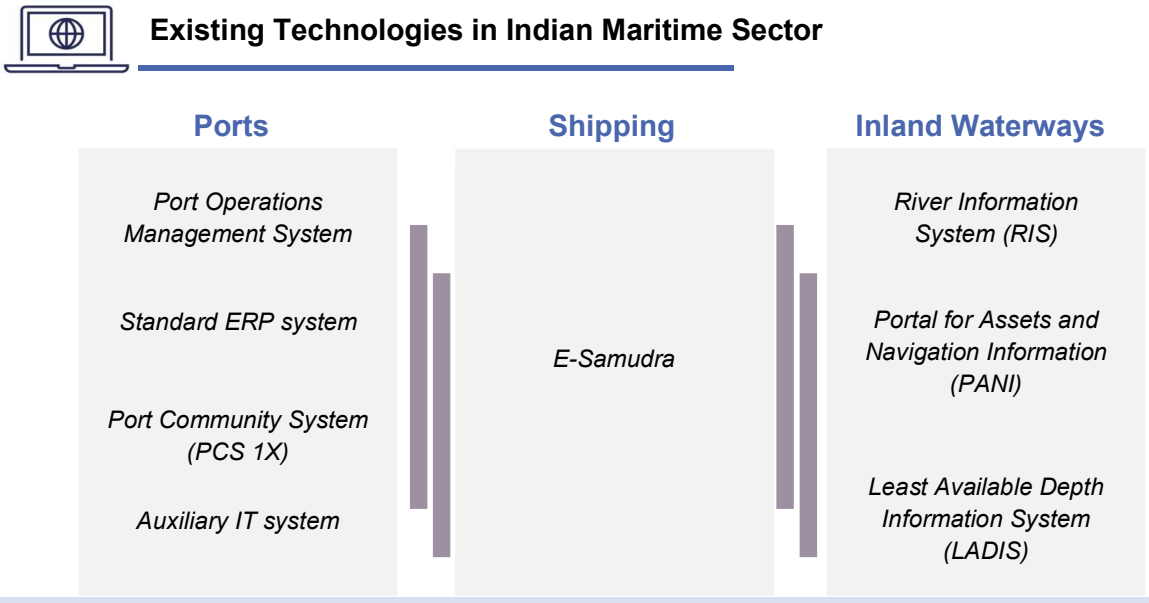
Features	Particulars
Easily Accessible Information	PANI provides detailed information on various waterways in India such as fairway (LAD, etc.), infrastructure facility (jetties, pontoons, cargo handling equipment, storage facilities), cross river structures (bridge locations locks, barrages), connectivity at jetties, emergency services for facilitating transportation of cargo and other vessels through inland waterways.
GIS Map Based Visualization	The portal uses BHARAT maps for easy accessibility and navigation. The Least Available Depth (LAD) across different segments, for various time periods can be seen. The location of Infrastructure facilities, Cross waterway structures, navigation aids can also be seen on a map.
Voyage Planning	The user can enter an expected date of journey, the required draught, vertical and horizontal clearing and the system will use historical data to predict the feasibility.

Least Available Depth Information System (LADIS)

IWAI launched a new portal LADIS – Least Available Depth Information System on 15th February 2019. LADIS ensures that real-time data on least available depths is disseminated for ship/barge and cargo owners so that they can undertake transportation on NWs in a more planned way.

The portal being hosted on IWAI's website has been developed in-house. IWAI has designed LADIS to facilitate the day-to-day operations of inland vessels plying on National Waterways and to avoid any hindrance in service and operation. It will enhance credibility and efficiency of information sharing to achieve seamless operations on National Waterways, besides pre-empting problems that may occur during movement of vessels. Vessel operators/ cargo owners will prepare their sailing plans strictly as per applicable waterways related information (Hydrographic survey reports, River Notices etc.) available on IWAI's website. If real time information is made available regarding LADs in stretches of various NWs, it will help transporters by guiding them on the suitability of time of movement.

Figure 226 Existing technologies in Indian maritime sector



CHALLENGES

Although all 12 major ports have implemented largely four types of IT Systems such as (i) Port Operations Management System (ii) PCS 1x (iii) Standard ERP System (iv) Auxiliary IT System, there are still issues and challenges in currently employed IT systems in the major ports, Directorate General of Shipping & Inland Water ways Authority of India. Some of the key challenges in the major ports include delay in message exchange from the customs department which cause disruption in efficient port function and hesitancy amongst the PPP operators in accepting PCS 1x which is defeating the benefit of integrated system. IT system currently deployed in DGS is old and requires upgradation to meet the emerging needs of the sector. There are issues in respect of seafarer profile, examination, certification, ship registration etc. largely regarding the duplication of data entry, non-standardisation of formats, payment & refund and central data base etc. Similarly, IT systems in IWAI have several challenges and some of them include inefficient communication exchange due to unreliable network, difficulty in terminal operation integration and also the difficulty in monitoring the dredging volume by each dredger.

While India has taken several initiatives to in maritime sector in last 5-10 years, there are challenges still faced in reaching desired goals of efficiency. These challenges include,

- High degree of manual intervention
- Higher paperwork and duplication
- Limited integration with international stakeholders
- Lack of SOPs & timeframes
- Lack of Intermittent tracking and traceability of cargo
- Inadequate data exchange across authorities to provide a holistic view
- EXIM processes are not digitized
- Lack of advanced technology interventions

INITIATIVES UNDERTAKEN

- PCS 1x and integration with other APIs
- E-marketplace transport solution
- Integration of IGM, Out of Charge & SMTP EDI Msg. with TOS
- RFID/ OCR based Gate Automation
- Container tracking by LBD portal
- Mobile X-ray container scanners

IMPACT

Gate processing time reduction for each TT from 5 -10 mins to 1 - 2 mins

Container dwell time reduced from 9.13 to 3.68 hours

Avg. import dwell time	**60%** ↓
Avg. export dwell time	**7%** ↓
Gross berth productivity	**11%** ↑
Gross crane productivity	**18%** ↑

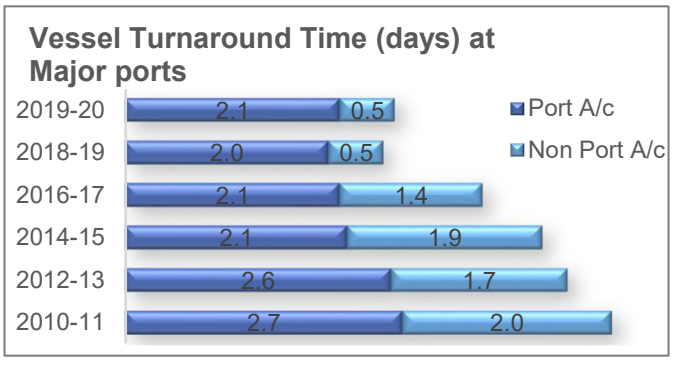
INITIATIVES UNDERTAKEN

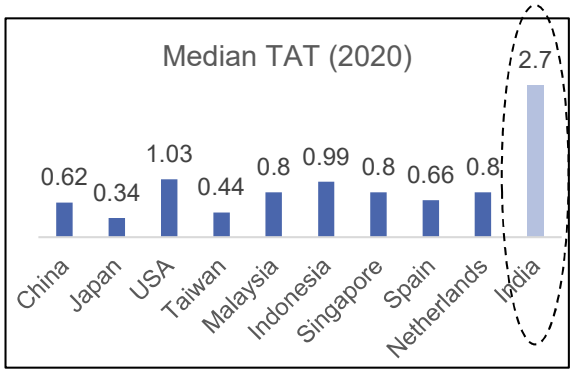
- Online approval of Vessels registration
- Mooring dolphins at liquid berths

IMPACT

Vessel turnaround time (TAT) reduced from 4.7

Processing time for approvals for berth allotment reduced from 6-7 hours (on port A/c) to a min 30





- Non-Port A/c showed considerable decline, while Port A/c indicates a further scope for reduction

PORTS

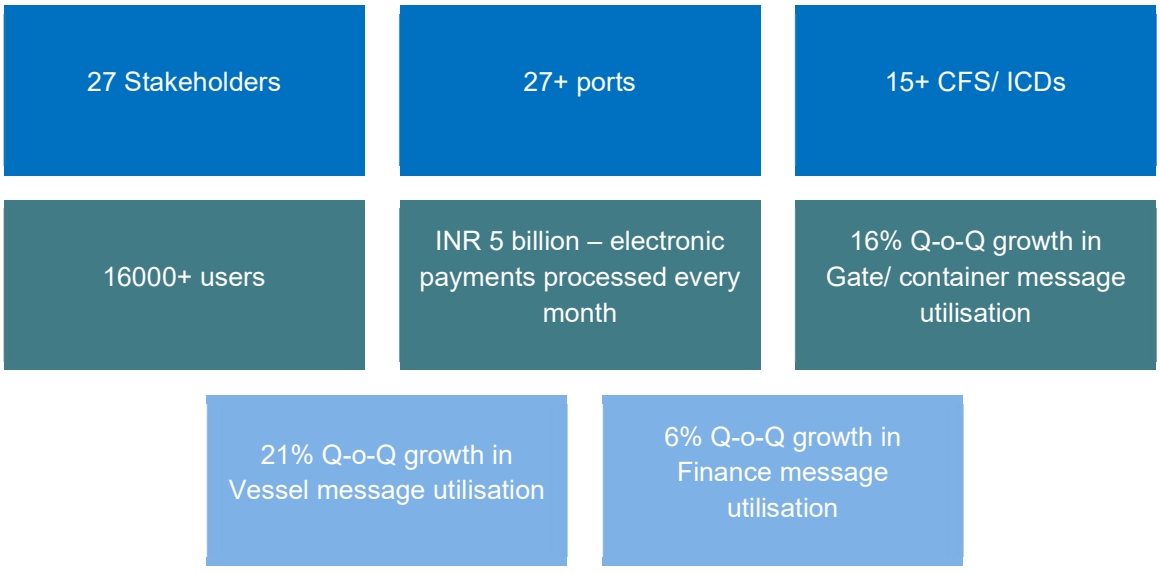
The Port Community System in India came into existence in 2008 as a local server-based system with a handful of stakeholders. In 2018, the PCS 1x was envisaged to upgrade the existing PCS with the following scope:

- Move to a cloud-based solution

- Intuitive UI / UX
- Dashboards and Reports
- Notifications and alerts
- Open Architecture
- Payment Gateway

The stakeholders onboarded on PCS 1x include Carriers, Custodians such as (Ports, CFS, ICDs, Empty Depots), Road and Rail Transport Operators, Govt agencies such as Customs, Navy, Port Health Dept, Mercantile Marine Dept, etc. As a part of PCS 1x implementation, level of achievement has been the following:

Figure 227 PCS 1x, levels of achievements



The status of various stakeholders onboarding in PCS 1x is mentioned in table below.

Table 53 Status: stakeholders onboarding in PCS 1x

Sr. No	Stakeholder	Count (Stakeholders groups)	No. of Users
1	Port Authority	20	162
2	Shipping Lines/ Shipping Agent	NA	3675
3	Customs	1	2
4	Container Freight Station	157	163
5	Custom Broker	NA	5050
6	Importer / Exporter	NA	6178
7	Bank	13	8
8	Container Agent	NA	568

9	Terminal Operator	NA	53
10	Stevedore	NA	257
11	Rail Transport Operator	NA	63
12	Mercantile Marine Department (MMD)	13	14
13	Navy/Coast Guard	2	19
14	Ships Chandler	NA	103
15	Port Health Organisation (PHO)	NA	11
16	Transporter	NA	20
17	Immigration	NA	0
18	Surveyor	NA	13
19	Tank Farm Operator	NA	13
20	Inland Waterways	NA	6
21	Coastal Shipping Operator	NA	18
22	Empty Yard	NA	221
23	Freight Forwarder	NA	36
24	Barge Owner / Operator	NA	13
25	NVOCC	NA	192
26	DGLL	1	1
27	Inland Container Depot	92	122
TOTAL		**300**	**16981**

As mentioned above, around 17000 users are currently using PCS 1x across 27 different stakeholders' groups in the maritime sector in India. There has been good progress with respect to the integration of various activities which are stated below.

A. Completed Integrations:

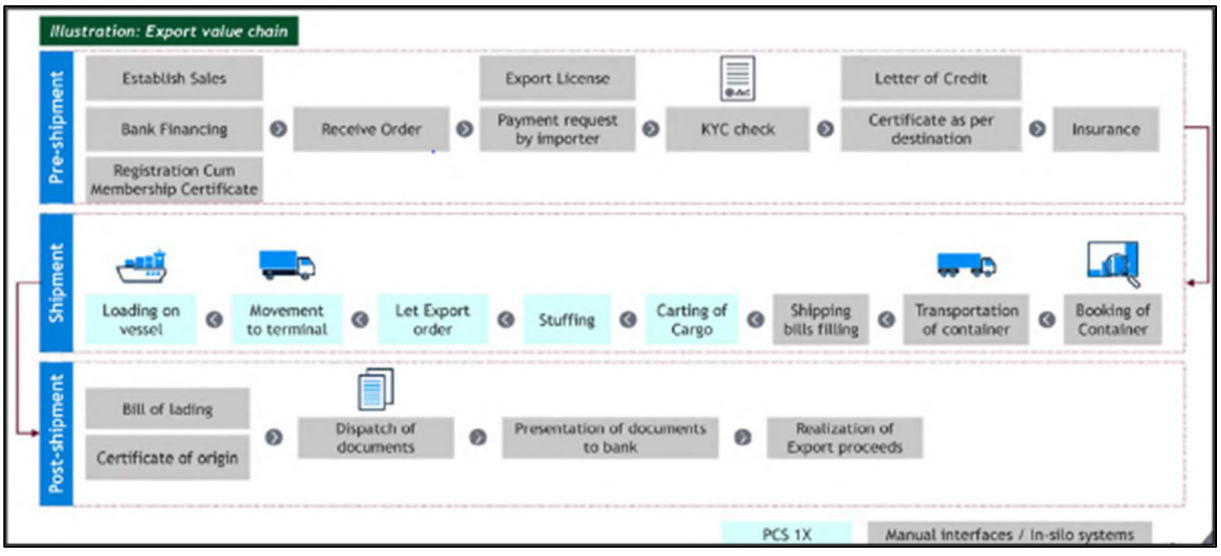
- 4 Ports integrated via API
- 1 Shipping line integrated via API for 14 Ports
- 4 Shipping Lines integrated via API through LSP
- 25 CFSs and 3 ICDs integrated via API
- 10 latch-ons live on API for B2B services (eVGM, eDO, Trucking Solution, eBL)

B. Ongoing integrations:

- ULIP (Unified Logistics Interface Platform)
- DGFT (Directorate General of Foreign Trade)
- CONCOR (Container Corporation of India)
- SLDE (Secure Logistics Document Exchange)
- Customs API

Despite above initiatives to plug the technology gaps, improve efficiency and thereby optimise the overall logistics cost, there are still high degree of manual interfaces in current export and import value chain. The figure below presents the export value chain and the manual interfaces.

Figure 228 Export value chain illustration



It can be seen above that major part of value chain are still performed through manual intervention and that cause delay and additional costs apart from hardship to the associated stakeholders.

Another issue is non usage of messages in PCS 1x and according to the data, only 47 messages (43%) are being either used by all or some ports while 63 messages (57%) are not being used by any major ports in India. Table below provides the summary of message usage in PCS 1x.

Table 54 Summary of message usage in PCS 1x

Message Categories	No of messages used by all ports	No of messages used by some ports	No of messages used by none of the Ports	Percentages of messages not used by any port
Vessel	6	12	10	36%
Containerized Cargo	0	11	7	39%
Non-Containerized Cargo	0	2	2	50%
MMD & PHO	0	0	7	100%
Transport	0	1	5	83%
Finance	0	4	2	33%
eDO & Gate	0	1	5	83%
Customs	8	2	25	71%
Total	**14**	**33**	**63**	**57%**

Some of other key issues are as follows:

- Upgradation of technology in Customs has caused changes in message format resulting in delay and disruption in data exchanges at major ports.
- BOT / PPP Operators are not willing to use PCS 1x system in view of data leakage fear and in some cases, they do not employ adequate IT systems.
- Several EXIM processes are not digitised, impacting logistics efficiency
- Higher paper rework and duplication as compared to best-in-class benchmarks
- Inadequate data exchange across authorities
- Lack of standardised operating procedures and standardised formats
- No single online Platform – duplication of work
- Limited technology and non-standardised ERP processes across the ports
- Lack of real-time information with intermittent tracking of cargo
- Lack of cross-border integrations

SHIPPING

As mentioned before, DGS had implemented the technology called e-Samudra in 2004 and that has become very old and as a result, there are several issues and challenges in operating the current system. These issues are mentioned below.

Table 55 Challenges faced in existing systems in Shipping sector

Key Area/ Module	Issues and Challenges
Individual (seafarer) profile	➢ Seafarer profiles are not linked to the 'Master Checker' (Maker checker) ➢ For verification purpose, respective authorities request supporting document in hard copy
CDC	➢ CDC data is partially integrated in the system ➢ Although the process is entirely online, SMO still uses a manual note sheet alongside duplicating each step that is done online anyway making the process cumbersome with large turnaround times. ➢ CDC Number format is not uniform throughout the country. For e.g. CDC's issues in Chennai have the prefix CH while Mumbai has MUM and Kolkata has KOL. ➢ It is very difficult to track the application online and check its progress against expected turnaround time. ➢ The CDC data is not integrated with SPFO and SWFS requiring them to verify the CDC details separately.
Examination	➢ In case of uploading any documents online, there is no standard format of that document (like pdf), nor is there any standard size of uploading photos and signature in case of online applications which often leads to error in processing. ➢ Due to error in uploading signature and photo on system, it is not being reflected on certificates or online properly ➢ In case of Online processes, online Note sheet have limitation of points and characters, so it become difficult for users to input additional points or long sentences leading them to maintain manual note sheets ➢ Submission of online form is error-prone due to lack of check and allowance of input of incorrect data in the system

Key Area/ Module	Issues and Challenges
Certifications	➢ In case of uploading any documents online there is no standard format of that document (like pdf), photos and signature, which leads to error in processing ➢ When new COC book is issued, the old COC booklet is not cancelled. Neither is it cancelled online, nor it is stated on COC booklet. It is only recorded on the register maintained either at MMD or at DGS ➢ In case of Online processes, note sheet have limitation of points and characters, so it become difficult for users to input additional points or long sentences ➢ Submission of online form is error-prone due to lack of check and allowance of input of incorrect data in the system ➢ Even in case of online process there is no option for raising query on the system, DGS staff has to raise the query separately by email or by phone call or by physical letter.
RPS (new module)	➢ All the processes related to RPS's are manual and hence, cumbersome with large turnaround times
Ship registration	➢ Documents asked keeps varying among MMDs- list is not standardised ➢ Current list of required documents is not updated online ➢ Documents already with DGS are being asked for again in some processes, as documents are not linked with central database ➢ Non compatibility of computer systems of MMDs and external stakeholders. MMDs use Windows Vista/XP while most shipping companies use newer versions of Windows OS ➢ SOPs on DGS' website are not exhaustive and are only available under 'helpdesk' tab. Stakeholders unclear about SOPs and respective processes ➢ Classification of checklists, SOPs, circulars done as per internal branch. Not readily available topic-wise to the stakeholder ➢ Mortgage discharge is not reflected in online records ➢ Issues with payment and refunds
MTO	➢ System issues were noted where a query is raised on an application only when the application is still at the DA level. Post the DA level, the application gets locked and the MTO team has to coordinate with the e-governance team to unlock the application

WATERWAYS

IWAI has implemented several IT systems as mentioned before. However, due to the nature of this sector which is continuously evolving, there are certain issues and challenges in efficient provision of services to different stakeholders associated with this sector. Key issues and challenges with respect to IT system currently have been described below.

Hydraulic Survey data is uploaded to the portal which can be accessed on real time basis through RIS. For the purpose of RIS, IWAI is relying on BSNL leased line for the communication system and due to its inadequate performance, IWAI is not able to achieve the objective of RIS. Technological challenge is to find a good cost-effective solution for the transmission of data. Finding, incorporating and integrating a viable effective and reliable communication system along the entire length of national waterways is the biggest technological challenges.

In River Water, there is a system called Automated Identification System (AIS), it gives the details of vessel its registration and other bare minimum information. It is a small hardware device which is installed in all the vessel, but IWAI has not been able to effectively enforce this because the cost of this equipment is around Rs.35,000 to Rs.40,000 which is considered to be quite high by the private vessels' owner. Higher cost of this device has resulted in lack of adoption of this technology.

Currently there is no system whereby a vessel can transmit the information related to water waves on a particular water way to another vessel so enable safe and efficient voyage.

India is currently at very nascent as far as operationalising the river ports are concerned. There is a challenge to adopt a good terminal management software which can be seamlessly integrated with RIS so that entire logistic chain under inland waterways can be integrated to bring in efficiency to all the stakeholders.

One of the important activities in inland waterway project implementation is the dredging. However, the current technology does not help in monitoring the quantity dredged by each dredger and as a result it is difficult to estimate the efficiency of entire dredging process. IWAI needs sensor based and IT driven solutions to identify the actual quantity of dredging undertaken by the dredgers.

KEY INITIATIVES

In order to address the issues and challenges identified before and to drive the digitisation vision, several initiatives have already been taken and some are proposed to be undertaken.

OPERATIONAL EFFICIENCY IMPROVEMENT

The advancement of technology has introduced new and better methods of controlling ports and terminals. The gradual shift towards implementing automation in all the process flows and operations conducted on ports has led to significant changes in the way maritime trade takes place.

Port automation can be defined as the use of integrated technology to develop intelligent solutions for efficient control of traffic and trade flows on the port thereby increasing port capacity and port efficiency.

Smart ports (or automated ports) generally deploy cloud-based software to assist in creating the operational flows that help the port function smoothly. Currently, most of the ports across the world have technology integrated to some extent, if not for complete management. However, there has been a gradual increase in the number of smart ports, thanks to global government initiatives and the exponential growth of maritime trade.

The port of Hamburg, Germany is one such smart port that uses cloud-based solutions for managing energy resources, traffic control, infrastructure facilities, and port property for efficient port operation.

Besides the following illustration shows how port-based automation has been adopted across regions.

Automated mooring system at Port of Helsinki

Smart Quay Walls at Port of Rotterdam

The automation of Indian ports is envisaged across the following areas:

E-gate 2.0 at all ports based on computer vision & OCR technologies

Fully automated terminal operations and services with holistic integrated systems to allow terminal operators to boost their productivity gains to handle more cargo with less man in the loop, e-gate 2.0 at all ports based on computer Vision

Drone based inventory management

Completely automated solution for inventory management using unmanned drones across ports. The new solution will allow companies to perform automatic warehouse inventories without disrupting normal operations, without needing human input or interaction.

Online facilitation for business transactions

In line with the MIV 2030, the ministry intends to transform all the ports in India to smart ports which will use emerging smart technologies to improve the performance and economic competitiveness of the ports apart from other benefits associated with technology adoption. It is envisaged that technology will integrate all stakeholders as presented below to perform seamless interaction and transactions amongst them.

NLP Marine will provide API integration facility with various Port Operating Systems, Terminal Operating Systems, and other stakeholder(s) systems. This entire ecosystem will be built on open standards with plug-and-play capabilities to allow changes at sub-system levels without affecting other parts and enable a heterogeneous multi- stakeholder environment to collaborate seamlessly. NLP will also have capabilities to connect with international stakeholders for seamless exchange of data and documents.

Just-in-time systems

The implementation of Just in Time Arrivals will not only save fuel spent at anchorage but also will be a means to reduce voyage speed and save fuel for voyage and supply of shore power will save fuel at port. This will not only have an impact on pollution, but the extra cost paid due to MBMs and **it is recommended that these must be explored for implementation at Indian ports.**

Automation of MHCs, pilotage, mooring & anchorage

Besides Mobile Harbour Cranes (MHCs), and mandatory pilotage for unloading, Automated mooring would expand the product transfer operational window throughout a greater range of berthing and environmental conditions, improving safety, lowering resource and space requirements, demanding less time to moor vessels and therefore minimizing infrastructure investment to increase berthing capacity.

Unmanned automated terminal operations

Through unmanned terminal operations container tracking would be improved with reduced losses through miscommunication and human errors during container handling.

Figure 229 Global Integrated digital solutions

Port of Rotterdam, Netherland

Multiple industry collaboration providing an integrated solution across stakeholders

Portchange — Used by Shipping lines & other ports

portbase — Used by terminal operators & logistics providers

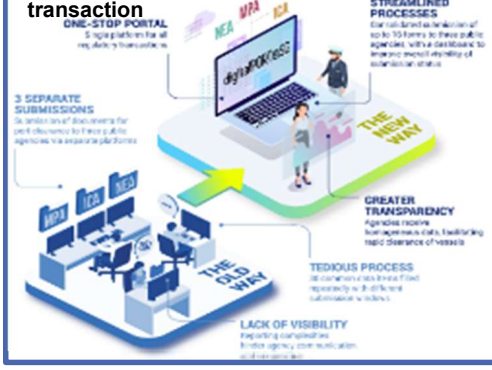
Navigate Find. Compare. Connect. — Used by shippers and forwarders

Ontrack — Used by Railways

BOXINSIDER — Used by Truckers

Maritime and Port Authority of Singapore

One-stop port clearance portal for streamlining transaction



The Port Process Integration would thus involve the following technologies in implementation:

UPGRADATION OF TERMINAL OPERATING SYSTEM (TOS)

- Upgrade terminal operating system from an operational tool to planning and forecasting system that help ports optimize their resource
- Advanced crane scheduling, dynamic workload distribution and deployment of cranes on berths to reduce operational costs at ports

PORT PROCESS IMPROVEMENT TOOLKIT IMPLEMENTATION

- 6-step process to enable port stakeholders to map processes and identify areas of improvement
- To monitor implementation of PCS/ NLP/ ULIP, process redundancy, physical touchpoints, hard copy submissions etc.
- Exercise To be repeated at regular intervals (6-12 months) to assess the impact

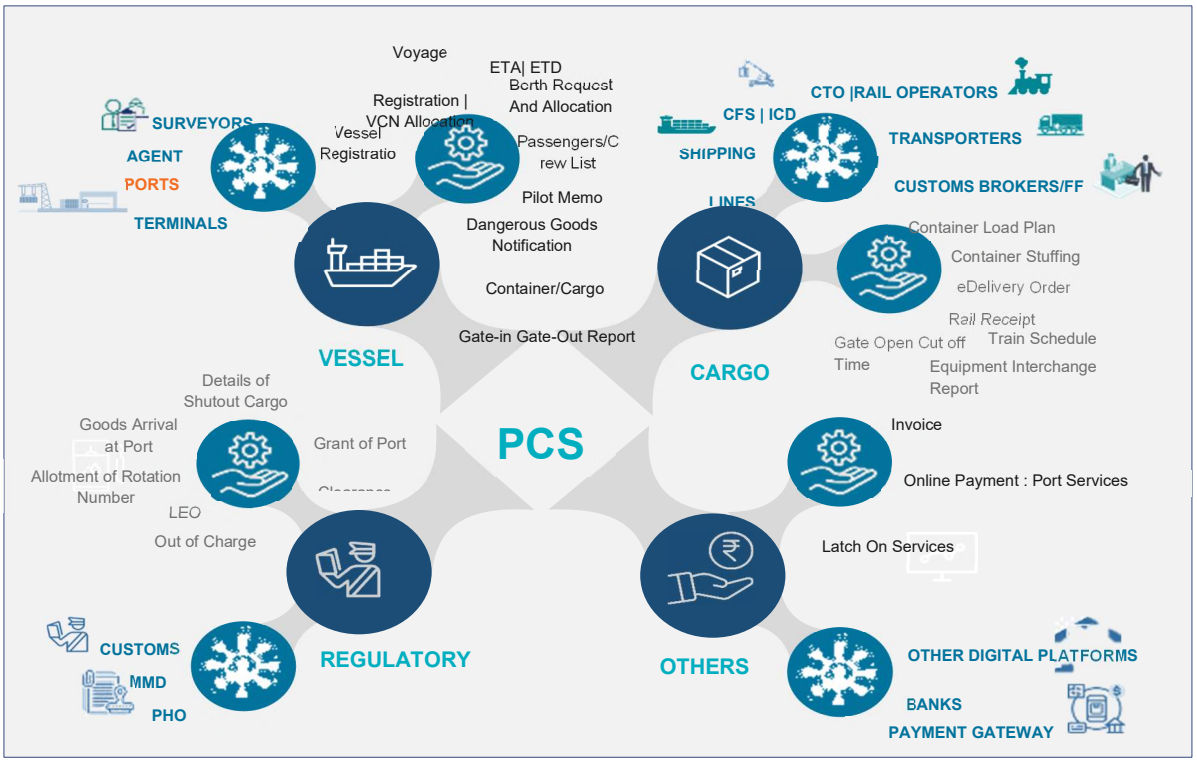
Figure 230 "6-step" Port process toolkit for areas of improvement

Data collection	Process mapping & validation	Identify areas of improvement	Root cause mapping	Development of action plan	Findings dissemination workshop with stakeholders	*The exercise would be repeated at regular intervals (6-12 months) or after every significant intervention to assess the impact*
Through stakeholder surveys capture Transactions across processes Documentation involved Digitalization	Detailed mapping of processes Capturing process variations Validation of process maps	Map continuous improvement matrix with details of key issues of various process groups Identify key issues prevalent in port	Map the key issues identified in the continuous improvement matrix Identify and map the root causes for the issues	Identify improvement areas based on root cause mapping Prepare detailed action plan and roadmap for the issues	Presenting roadmap and action plan to stakeholders Deliberating interventions and action plan to address findings	

INTEGRATING EXISTING SYSTEMS (PCS/ NLP/ TOS) WITH ULIP

- Neutral centralized platform to streamline and simplify operations for EXIM & Domestic trade
- Single stop access to all compliance requirements, document filing, certifications & approvals
- Gateway for data exchange between both government and private entities to cross-leverage each other's information

The following are the modules to enable a real time exchange of information across port stakeholders and enhance port ecosystem's efficiency,



Further, ULIP is designed for enhancing efficiency and reducing the cost of logistics in India by creating a transparent, single window platform to provide real-time information to all stakeholder

Unified Logistics Interface Platform (ULIP)

Ministry of Ports, Shipping & Waterways

- **Port Community System** — All trade related information
- **Terminal Operations System** — Operation system of individual Ports
- **National Logistics Portal (NLP)** — Integrate Marine, land & Air Logistics Porta
- **Inland Waterways Authority of India** — All IWT trade related information

Ministry of Civil Aviation

- **Air Cargo message exchange system (ACMES)**
- **Air Cargo Community System (ACCS)**
- **AAI Cargo Logistics and Allied Services (AAICLAS)**

Ministry of Road transport & Highways

- **Vahan** — Computerised database of vehicle information
- **Sarathi** — Computerised databased of driver license
- **FASTag** — Toll plaza transaction information system

Ministry of Finance

- **Indian Customs Electronic Gateway (ICEGATE)**
- **E-way bill**

Ministry of Commerce & Industry

- **DGFT** — Imported & Exported Database

Ministry of Railways

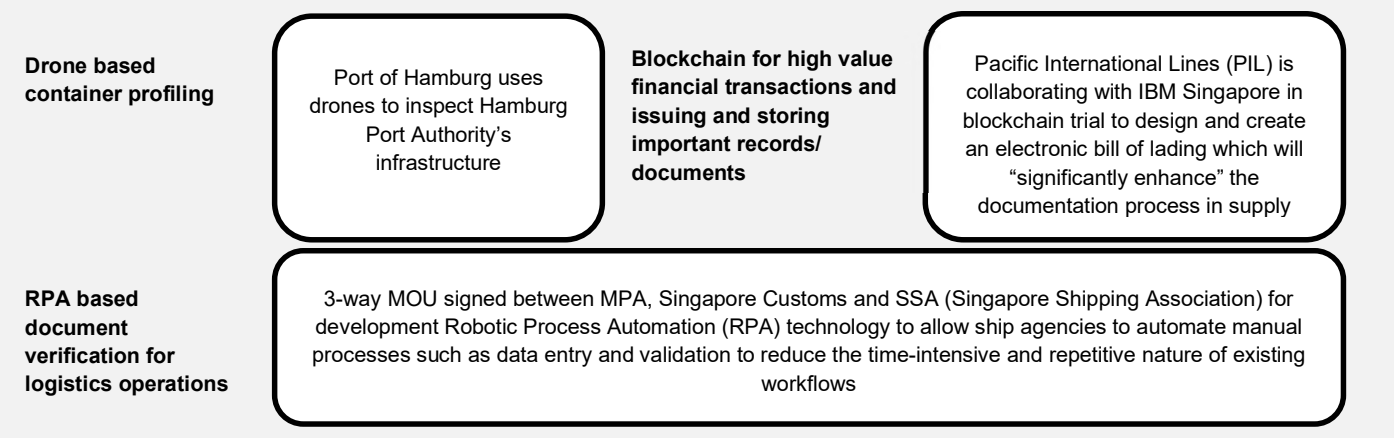
- **Freight Operations Information System (FOIS)**

Others

- **NICDC Logistics Data Services (NLDS) - LDB**

IMPLEMENTING SMART DOCUMENT MANAGEMENT SYSTEMS

- Robotic Process Automation (RPA) based document verification for logistics operations
- Blockchain for high value financial transactions and issuing and storing important records/ documents



PORT PLANNING & OPTIMIZATION

For the "Ability of each Major Port to successfully meet digital challenges would improve substantially with the institution of a **Centre of Excellence (CoE) for Maritime Efficiency** for proper e-governance." The CoEME will improve cross-port collaboration and drive ability to scale benefits for prioritized technology initiatives. It will be mandated to guide Major Ports in expediting their digital maturity on key components like ERP, digital applications and network/ technology infrastructure.

The Centre of Excellence for Maritime efficiency (CoEME) will be responsible for identification of technologies prevalent in ports around the world for developing autonomous ports. The CoE will get in touch with the ports for technology transfer and assess the feasibility of the relevant technologies at Indian Major Ports.

Further, the CoE will also promote the R&D programme and will constitute of the required subject matter experts and research infrastructure. The R&D programme will focus on developing requisite technologies indigenously for supporting autonomous ports. A network approach will be undertaken involving the academia-industry-government to ensure seamless transfer and commercialisation of the new technology at the ports.

Under the same, design, development and implementation of tools, technologies, solution, etc. have been proposed as follows:

DIGITAL TWIN FOR PORT AND SYSTEMS

Virtual replication of physical entire supply chain network to enable port authorities to simulate construction and operation process

7D BIM IMPLEMENTATION

Use of 7D (3D + time schedule + cost intelligence + sustainability) building information modeling in the maintenance and operation of a project throughout its entire life cycle

ADVANCED ANALYTICS-BASED YARD MANAGEMENT

Big data implementation for optimum utilization of yard & warehouses

AUTOMATED ALLOTMENT OF BERTHS USING AI/ ML

System integrated with marine traffic to extract vessel ETA in real-time & automatically allot berth (e.g., BERMAN/ VESRO)

AUTOMATED SPACE ALLOTMENT

GIS based Land Management System & Portal. Land allotment for storing cargo inside/ outside Custom Bonded Area using METAVERSE.

OPTIMIZING MARINE OPERATIONS

SMART COMMUNICATION SYSTEMS

In order to deal with current problem of communication system provided by BSNL, there is a need to have alternate system. There could be possible two options – (i) To have dedicated optical fibre communication (ii) Microwave and Very-small-aperture terminal (VSAT) terminal. IWAI will evaluate possible technologies/ system in this regard to identify and implement the best system.

Figure 231 Communication technology, VSAT in Pacific International Lines (PIL)

As on October 2021, Pacific International Lines (PIL) is installing satellite communication, or VSAT, on its entire fleet of around 100 vessels & over 4000 seafarers.

This is done through transmission of data from ship to shore for real-time data analysis to monitor machinery performance, predict failures and recommend maintenance windows. In addition, with the welfare of seafarers by having robust internet connection onboard the vessels allowing our crew members to stay connected with their family members while they are at sea.

If a vessel owner is live on the water waves, so whatever is observed by means of the senser and through visual observation, that should be shared with other vessel operator as well to enable the real time information about the voyage. IWAI will evaluate and identify suitable communication technology to address this need.

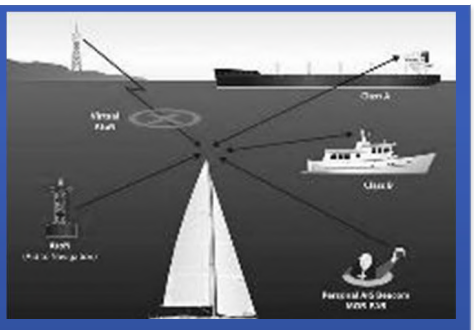
VSAT technology is an instant boon for maritime industry. With the VSAT implemented on a ship, the crew and the passengers are now connected to high-speed Internet services, telephone, monitoring weather patterns, filing regulatory documents and ordering supplies from sea to save time at port thereby increasing productive time and grow business intelligence. VSAT also enables voyage optimisation applications, using weather information to plan optimised routes. Applications also facilitate fuel reduction during voyages. Maritime operators around the world have started realising the value of VSAT and how they can increase the profitability and gain market. VSAT data rates are increasing with passing years allowing to stream videos and bandwidth-intensive business applications.

AUTOMATED IDENTIFICATION SYSTEM (AIS)

AIS is an important hardware device to improve the efficiency in inland waterways. In this regard, IWAI will evaluate and identify most suitable device, which is an omnibus, homogeneous, universal, economical and provide good technological solution.

Figure 232 Automated Identification System for Inland waterways

Technical capabilities of AIS deployed systems allow the transfer of differential corrections to ships. This approach will make it easy to carry out large-scale use of corrective information on board ships to improve positioning accuracy. Creation and implementation of automatic identification stations on ships (AIS) made it possible to multiply the volume of information transmitted between ships, vessels and dispatch centers. Currently in the world AIS along with traditional tasks (exchange of dynamic, static and voyage data about ships) is used for:



- sending meteorological information from ships to meteorological centers to increase the accuracy of weather forecasts
- forecasting and obtaining the vessel trajectories
- efficiency evaluation and analysis of the ships' operation
- various marine research
- risk assessment on sea waterways
- research of the ships' behavior in conditions of narrow sections' passing
- assessments of wind and wave impacts in ports and waterways
- improving positioning accuracy, etc.

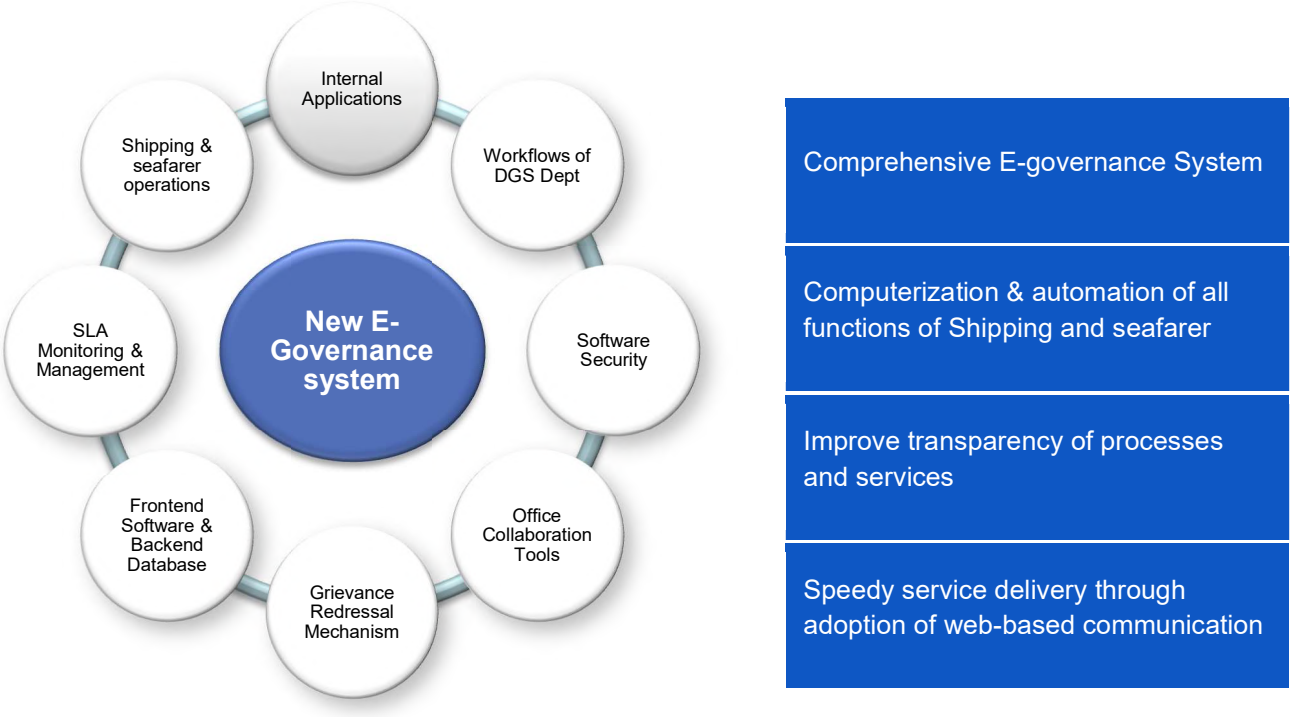
E-GOVERNANCE SOLUTION PROJECT

Optimizing marine operations require to develop a new/updated e-governance system to bring all its functions/processes, across its entire organizational fold, on an integrated holistic e-mode, leading to a footfall-free & completely automated service delivery. The government is pursuing a comprehensive process transformation to improve its operational efficiency and effectiveness leading to a customer centric service delivery with focus on ease of doing business, and an improved stakeholder's satisfaction. Existing e-Governance system to be replaced by a completely new, updated, state-of-the-art e-Governance.

The key objectives of e-Governance Solution are as below:

- To move towards a paperless regime
- Improve transparency and provide speedy service delivery through adoption of web-based communication, and latest technology advances
- Computerize and automate all its functions related to Shipping and seafarer operations and maintenance, and internal administration.
- Sustainable IT environment with major IT transformation for DGS that integrates technology into the framework of the DGS Business, Services and an emphasis on complete automation and governance and footfall free office

Figure 233 Improvised e-Governance System



SENSOR BASED MARINE DEVICES IMPLEMENTATION

In order to monitor the efficiency of dredgers and other vital equipment, IWAI will study and identify the suitable devices/ system, which is efficient, universal, cost effective and help achieve overall objective in this regard.

Nearly all the major ports and waterways in the world have at some time required new dredging works (capital dredging), as technological developments and the requirement to improve cost effectiveness have led to larger, more efficient ships, and expanding coastal infrastructure which more recently includes provisions for renewable energy developments. New port developments, and expansion of current facilities (including larger and deeper access channels, turning basins and appropriate water depths) are required along waterside facilities to accommodate these vessels. Recent and current examples include the London Gateway Port Development Project, the New Port Project in Doha, the expansion of Southampton docks in the UK and development of the Port of Hastings in Victoria, Western Australia.

Capital dredging projects can be both extensive and expensive. Accurate data ensures that dredging operations remain in compliance with set regulations. For accurate data, all sensors should be fully calibrated before the project begins. It would also allow for more informed, critical decisions about water allocation, flood mitigation and environmental flow requirements, which have implications for water security, industry and the economy. Innovative statistical methods and models are then applied to the data generated by these sensors. This helps convert the data into information which can be used for real-world river management.

Figure 234 Case study: Efficient & safe water systems through sensors, POLA

PORT NOLA
THE PORT OF NEW ORLEANS

Through a state program, the Port of New Orleans (Port NOLA) will deploy sensors on commercial ships, such as tugboats and barges, working in the region so that it can use the collected data to make navigating the Mississippi River more efficient and safer. The information provided by the new sensors on sedimentation and draft levels in the Mississippi is to help the port better assess where and when it needs to position dredgers.

MASS VESSEL DESIGNS – REMOTE & AUTONOMOUS WAY POINT NAVIGATION

Technological advancements and changing business models, the evolving maritime workforce, as well as other factors of enhanced safety and reliability contribute towards the development of smarter ships. As smarter ships become more prevalent, it is imperative for ports to similarly prepare for the future of autonomous shipping. This is also being explored by major maritime clusters such as Norway, Finland, the UK, China and Singapore. The strategic areas to be implemented may include

Making Indian Ports ready for **Maritime Autonomous Surface Ships (MASS) operations** including capabilities like remote and autonomous waypoint navigation through collision avoidance and detection algorithms, situational awareness with sensor fusion and intelligent route planning. Moving ahead, India may also play a key role in MASS vessel designs in partnership with prime shipyards and technology solution providers.

MARITIME SAFETY & SECURITY

Almost all the global ports are pursuing the highest standards of safety in ports waters and India is also working towards ensuring safe practices and culture, emergency preparedness exercises and efforts to promote navigational safety. The strategic areas to be implemented may include

- **Port security** including drone based aerial surveillance, container scanning across ports; GIS/ GPS based tracking of assets/ vehicles, next generation patrol vessels etc.
- **Cyber security** including development of digital technologies to reduce cyber threat, early detection and swift response towards cyber-attacks etc.
- **Navigational and operational safety** including advanced navigation research simulators; smart buoys to augment search and rescue efforts; and automated alerts and analysis for predictive incident management
- **Marine systems and equipment** including underwater hull inspection and cleaning; and autonomous inspection of structures to eliminate the risk of working at heights

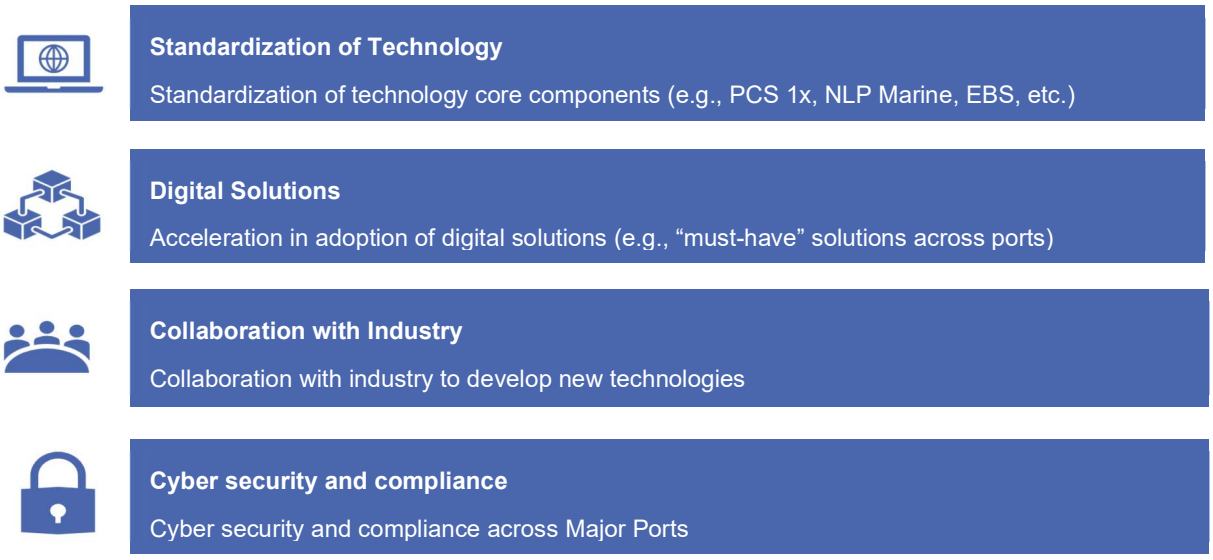
INSTITUTIONAL SUPPORT FOR IMPLEMENTATION

DIGITAL CENTRE OF EXCELLENCE FOR MARITIME EFFICIENCY (COEME)

The Digital Centre of Excellence is proposed to improve cross-port collaboration and drive ability to scale benefits for prioritized technology initiatives. It will be mandated to guide Major Ports in expediting their digital maturity on key components like ERP, digital applications and network/ technology infrastructure.

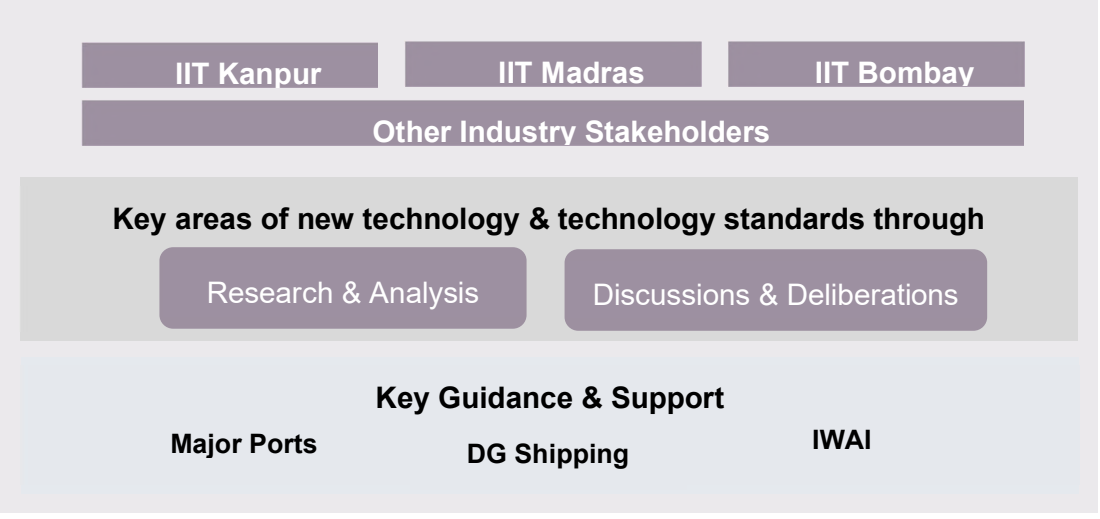
In this regard, IPA has been mandated to establish CoEME under its ambit and IPA will act as central institutional mechanism to drive digital transformation of Major Ports. CoEME will be a multi-functional and multi-locational coordinated centre which will primarily focus on following goals:

Figure 235 Key components of Centre of Excellence for Maritime Efficiency



IPA has made some progress on this front and identified Indian Institutes of Technology (IIT) like Bombay, Chennai and Kanpur which have expertise/researchers in digital technologies in maritime sectors. IPA has also signed the MoUs with these identified IITs.

Figure 236 Research & domain experts for CoEME



IIT Kanpur is proposed to be entrusted with the following broad responsibilities:

- Cyber Security Audit (i.e., System & Application Audit, Infrastructure & Architecture Audit, Data Audit, IT Compliance Audit)
- Consultancy Services for Cyber Security and related domains (i.e., Study/Assessment, Recommendation/ Advice, RFP Preparation, Support to Port on negotiations, etc)
- Design, Development and Implementation of Tools, Technologies, Solution, etc. in cyber security of physical systems, etc.

- Use of New Technologies including AI, ML, IoT, Data Analytics, Block chain, etc for improving port performance.
- Conduct of training session for Port Officials.
- Policy formulates and Project Implementation support in the above areas.

IIT Madras is proposed to be entrusted with the following broad responsibilities:

- Consultancy services (i.e., Study/Assessment, Recommendation/Advice, RFP preparation, Support to Port on negotiation, etc.)
- Design, Development and Implementation of Tools, Technologies, Solution etc. (Port Operation, Gate Operation, Facial recognition system for attendance, Centralized data centre for ports, Integrated command and control centre. etc.).

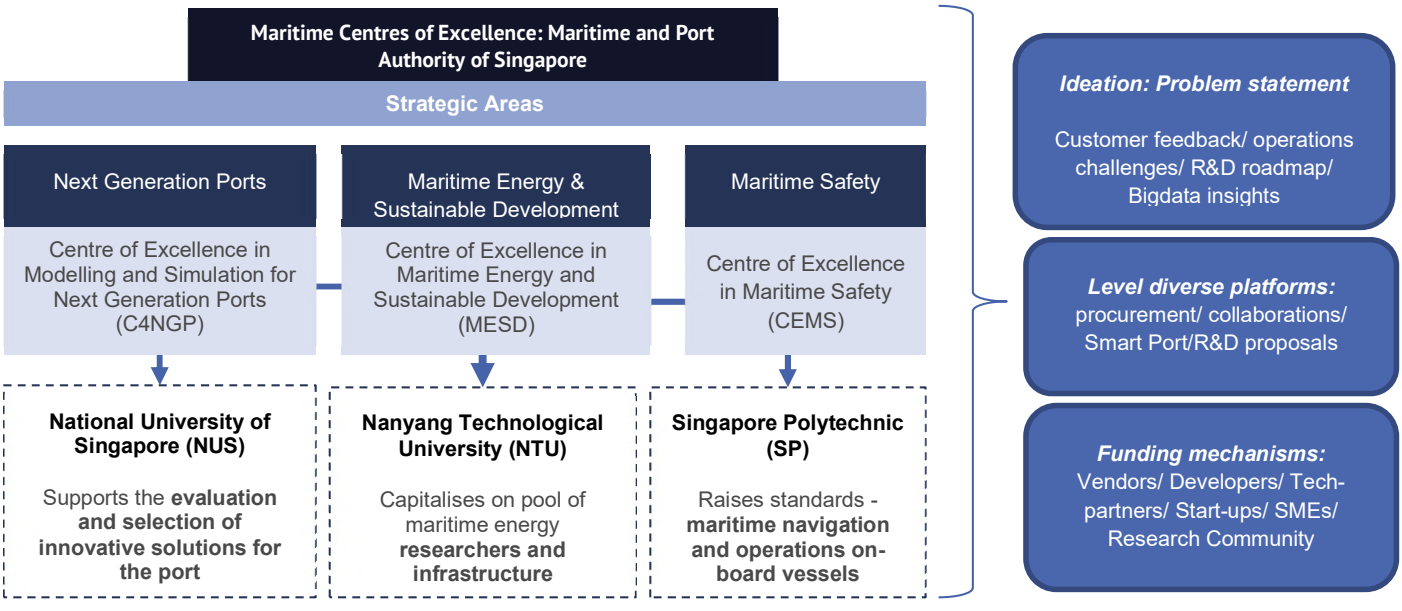
IIT Bombay is proposed to be entrusted with the following broad responsibilities:

- Consultancy Services (i.e., Study/Assessment, Recommendation/Advice, RFP preparation, Support to Port on negotiation, etc)
- Design, Development and Implementation of Tools, Technologies, Solution, etc (Gate operation, Digital Twin, IoT based Asset Monitoring, Drone surveillance, 7D BIM, GPS/GIS based tracking vehicles & monitor zoning, etc)

Operational Framework of CoEME

In order to effectively operationalise CoEME, it is envisaged that CoEME will get access to the resources of identified IITs and other premier academic institutions to achieve its objectives and goals. As stated before, each institution would be expected to provide the intelligence in their assigned subjects of maritime sector which would be analysed, researched, discussed and deliberated thoroughly to provide the suitable solutions with respect to standardisation, adoption and advancement in technology in the maritime sector.

Figure 237 Case study: Centre of Excellence at SMI~MPA Singapore for R&D capabilities in strategic areas



IN-HOUSE DIGITAL TEAM STRENGTHENING

For smooth in-house digital operations & nodal point for collaboration with Digital Centre of Excellence, a dedicated digital wing at individual Port is proposed to perform the following functions

- Maintenance of port applications
- Troubleshooting
- Suggestions to CoEME for new solutions

COMMAND & CONTROL CENTRE

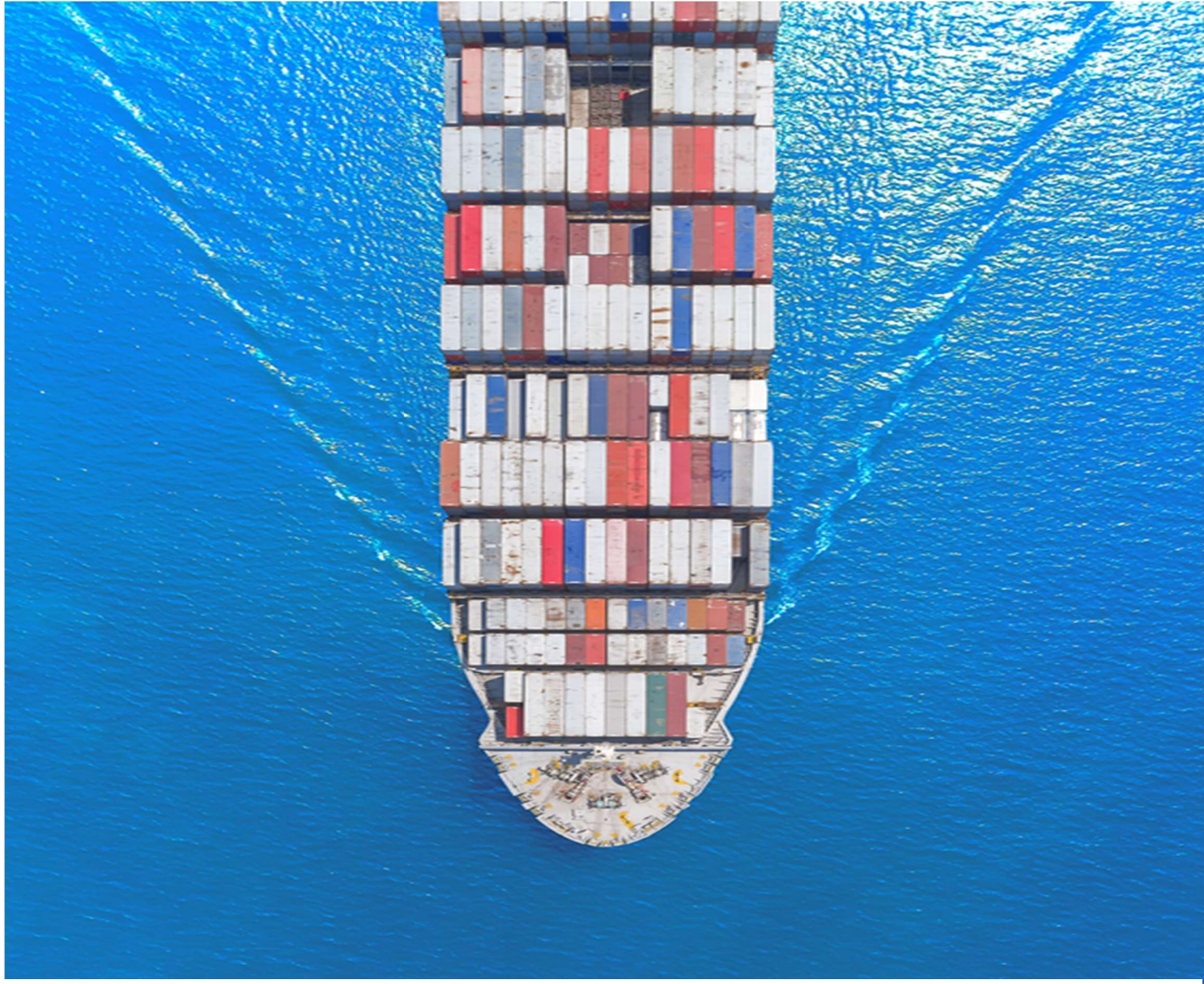
A single window for all Port related queries is proposed for Implementation at all Ports with key features as follows:

- Chatbot for immediate responses
- Grievance Redressal for all stakeholders
- Standard timelines for resolution of tickets

KEY PERFORMANCE INDICATORS

Key Performance Indicators	Current status	Target (2030)	Target (2047)
Indian cities' ranking in Maritime Technology amongst leading Maritime Capitals of World	-	Top 15	Top 5
Port process improvement and standardization	1800+ processes	<200 processes	-
Process Integration across all operations	PCS 1X	NLP+ULIP at all major Ports	NLP+ULIP at all minor/ Private/ IWT ports
Smart Ports	-	2 Ports	5 Ports

Theme 11
Improving India's Tonnage



ENHANCE INDIA'S TONNAGE

CURRENT LANDSCAPE

The growth of Indian-flag shipping tonnage has not kept pace with the growth of Indian trade needs. This has led to more than 93 per cent of Indian origin or destination international cargoes, and about 39 per cent of total Indian cargoes (including coasting and offshore fields), being carried on foreign-flagged ships, with an annual freight outgo of about USD 75bn. Participation of Indian tonnage in global cross trades is negligible, with hardly any freight and other receivables.

India should have a healthy Indian merchant marine fleet and policies that will promote growth of Indian tonnage by adding more ships to the Indian flag fleet which would further the economic and environment interests of India. This will also have positive outcome of helping the government of India achieve its binding green commitments as agreed at the COP. There is a need for a focused and dedicated shipping policy that would work towards making Indian shipping competitive vis-à-vis a foreign shipping company operating on the Indian coast and provide them with a level playing field vis-à-vis other foreign shipping companies on international trades.

The number of ships under Indian flag has grown over the years. However, the share of Indian fleet as a global percentage remains close to only 1% compared to China (5.0%) and Singapore (6.5) as on January 1, 2021, according to ISL Shipping Statistics & Market Review 2021.

As of 01 Aug 2021, India was positioned 22nd globally with 1,802 vessel contributing to a capacity of 10.4 m. GT[68]. It can be observed that the average age of Indian vessels is quite high at 19.3 years. The number of vessels flagged in India has increased in the last four years from 1,741 to 1,802 vessels. However, the tonnage carrying capacity has been declining from 11.2 m.GT to 10.4 m.GT. As shown in the table below, the top-10 flag states (7 of these have open registries) have about 40% of the fleet by numbers but 75% of the world's tonnage capacity.

Table 56: Flag state rankings with vessel no and GT

			No. of vessels			Million GT			01-Aug-21	
Rank	Flag States	Age	2018	2019	2020	2018	2019	2020	No.	Mn GT
1	Panama	18.7	7,822	7,887	7,996	219.2	218.5	227.3	8,071	230.9
2	Liberia	11.6	3,486	3,720	3,945	153.7	171.7	185.3	4,122	197.6
3	Marshall Is.	9.6	3,542	3,685	3,820	153.1	161	168.1	3,929	172.8
4	Hang Kong	11.6	2,707	2,700	2,718	125.1	127.4	129.8	2,705	131.8
5	Singapore	10.9	3,375	3,386	3,312	86.8	93	91.1	3,272	90.3
6	Malta	12.4	2,171	2,199	2,128	75	80.5	81.9	2,077	82.5
7	China P.R.	14.6	6,342	6,512	6,716	64.8	67.1	70.3	6,908	72.6
8	Bahamas	15.5	1,399	1,371	1,326	62.1	63.3	61.4	1,313	61.1
9	Greece	25.9	1,301	1,302	1,256	39.8	40	37.5	1,235	36.4
10	Japan	21	5,264	5,342	5,369	27.9	29.4	28.7	5,386	29.3
22	India	19.3	1,748	1,779	1,803	10.7	10.6	10.5	1,802	10.4

However, the tonnage has shrunk substantially to 14mn DWT and 392 ships if only ocean-going vessels **above the size of 10,000 DWT** are considered[69] (see below table). Out of this, about 5.3mn DWT and 133 vessels

[68] Clarksons' Research, August 2021
[69] Clarksons' Research

belong to SCI, which is undergoing divestment. Many vessels of the fleet are flagged outside India or controlled overseas. Apart from this, sizeable Indian-controlled tonnage is either flagged out or POEM of vessels is outside India.

Table 57: India-controlled tonnage in international trade, average-size >10,000 dwt

Rank	Owner Group	Total Ships	Total DWT	Avg Size DWT	Age
1	Shipping corporation of India	133	53,58,159	40,592	18.34
2	Great Eastern Shipping	65	37,39,285	57,527	12.28
3	Seven Island Shipping	20	11,55,250	57,762	18.17
4	Adani Group	60	9,92,235	20,671	10.95
5	Tolani Group	14	7,99,001	57,071	15.81
6	Apeejay Shipping	9	5,94,569	66,063	16.77
7	Sanmar Group	9	5,56,489	61,832	20.27
8	Pallonji & Co.	22	5,39,404	24,518	11.64
9	Reliance Industries	32	3,65,593	11,793	19.31
10	Essar	28	2,34,214	8,364	22.61

A significant part of India-controlled tonnage is Indian flagged, due to the combined effect of 'right of first refusal (ROFR)' and cabotage available to PSUs and also because dividend from overseas subsidiary is taxed in India. In spite of introduction of 100% FDI in shipping, tonnage tax regime and various incentives like ROFR for Indian cargoes and coastal cargo reservations, there is no appreciable increase in Indian-flagged tonnage.

Current incentives provisions for Indian-Flagged vessels

1- ROFR for Indian flag vessels for bulk import cargoes and associated freight subsidy (DGS Circular No.2 of 2021)

In the DG Shipping circular - 'Shipping development Circular 02 of 2002', the ROFR was extended to all import/export cargo though INSA. INSA was granted two working days to match the lowest bid submitted by a foreign flag vessel[70]

Under the provisions of Circular No. 2 of 2021, the terms for granting license were limited to import tenders only and chartering of vessels for export of cargo from India was exempted from licensing. Therefore, an Indian-flagged vessel has ROFR within a price band of 20 percent, to match the L1 bidder in an international import tender by any importer in India. There are provisions for Indian-owned Indian-flagged vessel and for Indian-built vessels for priority[71]

Further, there is an incentive for Indian-flag vessels bidding for PSU cargoes in the form of subsidy ranging from 5 to 15 per cent depending on the age of the vessel and the difference between the quotes by L1 and eligible Indian ships during the bid process. The total subsidy over five years is estimated to be INR 1,624 crore.

2- Reservation of Coastal Cargo for India-flagged tonnage and Cabotage

[70] https://www.dgshipping.gov.in/Content/viewNotice.aspx?noticeid=99

[71] https://www.dgshipping.gov.in/writereaddata/ShippingNotices/20210211112229296212 2DGSCircular-2of2021-SD-.pdf

As per India's cabotage policy, only Indian-flagged vessels or vessels chartered by an Indian person (i.e. citizen/ company/ co-operative society) operating under a valid license, issued by DG Shipping under Section 406 or 407 of MSA can carry, *inter alia*, cargo or passengers from one Indian port to another.

Foreign-flagged vessels are permitted to carry cargo or passengers only if

(i) Indian-flagged vessels of similar specifications are not available, or
(ii) if such Indian-flagged vessels of similar specifications, though available, cannot match the price at which the foreign-flagged vessel is available. The license is generally granted for a period of 2-3 years and has to be renewed thereafter.

Before an application for Section 406/407 License is made by an Indian charterer of a foreign flagged vessel, it must be established that no Indian-flag vessel which can meet the specifications and freight of the foreign-flag vessel seeking the license, is available. If an Indian vessel of the same specifications and freight is available for chartering purposes, then the Indian charterer cannot charter a foreign-flag vessel. SDC Circular No. 2 of 2002 provides for ROFR for Indian-flag vessels for all coastal cargoes controlled by both PSUs and private sector companies.

In order to encourage flagging in India and promote the Make-in-India initiative, ROFR for chartering of vessels in open/global tenders, is exercised in the following order, in compliance with DG Shipping's guidelines:

1. Indian-built, Indian-flagged and Indian-owned
2. Foreign-built, Indian-flagged and Indian-owned
3. Indian-built, foreign-flagged and foreign-owned

Provided that all vessels flying the flag of India (i.e., registered in India) up to the date of issue of new circular by DG Shipping, shall be deemed to be Indian-built vessels and will fall in the first category above.

CHALLENGES

LIMITED SOURCES OF VESSEL FINANCING IN INDIA

- **Alternative Investment Fund (AIF)**

  An AIF is a privately pooled investment fund incorporated in the form of a trust or LLP or a company and registered as such with the SEBI. There are multiple categories of AIFs, a Category I or II AIF i.e., a sector which government consider as socially or economically desirable OR a private equity fund or a debt fund, respectively that invests primarily in unlisted investee companies according to fund's stated investment objective.

  Currently, the Foreign Portfolio Investors (FPIs) are **not permitted** to invest in Category I and II AIFs. The Regulation 20 of the SEBI (FPI) Regulations reads as follows:

  A foreign portfolio investor shall invest only in the following securities:

  - Shares, debentures and warrants issued by a body corporate; listed or to be listed on a recognized stock exchange in India;

- Units of schemes launched by mutual funds under Chapter V, VI-A and VI-B of the Securities and Exchange Board of India (Mutual Fund) Regulations, 1996;
- Units of schemes floated by a Collective Investment Scheme in accordance with the Securities and Exchange Board of India (Collective Investment Schemes) Regulations, 1999;
- Derivatives traded on a recognized stock exchange;
- Units of real estate investment trusts, infrastructure investment trusts and units of Category III Alternative Investment Funds registered with the Board;
- Indian Depository Receipts;
- Any debt securities or other instruments as permitted by the Reserve Bank of India for foreign portfolio investors to invest in from time to time; and
- Such other instruments as specified by the Board from time to time.

- **Permitting pension funds to invest in vessel financing**

  The National Pension System (NPS) is a national contributory pension fund system available for subscription to all Indian citizens (including non-resident Indians) which is regulated by the Pension Fund Regulatory and Development Authority (PFRDA) under the **PFRDA Act, 2013**.

  Pension funds are not permitted to invest funds of subscribers, outside India, either directly or indirectly. However, it is unclear whether this restriction would also apply to investment by pension funds into (a) leasing entities established in IFSC, or (b) domestic Category I or II AIFs which in turn provide finance to leasing entities established in IFSC.

  The Section 25 of the PFRDA Act states that *No pension fund shall, directly or indirectly invest outside India, the funds of subscribers*.

- **Removing restriction on ship leasing by insurance Companies**
  - Currently, the Insurers in India are permitted to invest only a certain portion of their assets or controlled funds, as described under the Insurance Act and the Insurance Regulations framed thereunder, in various categories of investment as prescribed by the IRDAI.
  - Under Section 27A (4) of the Insurance Act, insurance companies are not permitted to invest in private limited companies.

- **National Investment and Infrastructure Fund (NIIF)**

  NIIF is a sovereign wealth fund registered as an AIF for the purpose of providing long-term funding to infrastructure related projects. The NIIF is currently managing three funds, with an estimated corpus as follows:

  (i) Master Fund – INR 16,000 crore

  (ii) Funds of Fund – INR 5,000 crore; and

  (iii) Strategic Fund - within INR 10,000 crore and continuing to attract sizeable funds.

While the Master Fund and Funds of Fund are focussed on investing in airports, ports, roads, renewable energy and other such infrastructural sectors, the Strategic Fund is a private equity and sector agnostic fund.

However, NIIF and the funds it invests in **do not address** capital intensive industries such as **ship leasing**, aircraft leasing etc.

- **Giving infrastructure status to vessels**

  Vessels are not included as an infrastructure subsector listed as per the RBI Infrastructure Circular.

  The definition of infrastructure lending and the list of items included under the infrastructure has been notified vide RBI Circular DBOB.BP.BC.No. 58/08.12.014/2012-13 dated November 20, 2012, as amended from time to time (referred to as the "RBI Infrastructure Circular").

- **Restrictions on External Commercial Borrowings under RBI's Master Directions**

  ECB is a vital form of financing ship acquisitions and ship leasing, and its enablement would go a long way to developing India IFSC as a leasing financing hub.

  As per ECB Master Directions, the following are the restrictions:

  i. All-in-cost for ECBs are capped at LIBOR (or equivalent benchmark rate) plus 450 bps spread;

  ii. Minimum Average Maturity Period (Para 2.1(V) of Part I) is between 3-7 years depending on the purpose of the loan. Call and put options shall not be exercisable prior to completion of the minimum average maturity.

  iii. Further, foreign branches/ subsidiaries of Indian banks cannot advance ECBs for the purpose of refinancing domestic debt.

- **Investment limitation of Mutual Funds**

Mutual funds are not allowed to invest more than 10%-12% of its NAV in rated debt instruments, 10%-25% of their NAV in unrated debt instruments and 5%-10% of their NAV in unlisted equities. Schedule VII of SEBI (Mutual Funds) Regulations, 1996 prescribes restrictions on investments by mutual funds:

1. A mutual fund scheme shall not invest more than 10% of its NAV in debt instruments comprising money market instruments and non-money market instruments issued by a single issuer which are rated not below investment grade by a credit rating agency authorised to carry out such activity under the Act. Such investment limit may be extended to 12% of the NAV of the scheme with the prior approval of the Board of Trustees and Board of Directors of the asset management company.

2. A mutual fund scheme shall not invest more than 10% of its NAV in unrated debt instruments issued by a single issuer and the total investment in such instruments shall not exceed 25% of the NAV of the scheme. All such investments shall be made with the prior approval of the Board of Trustees and the Board of asset management company.

3. A mutual fund scheme shall not invest more than 5% of its NAV in the unlisted equity shares or equity related instruments in case of open-ended scheme and 10% of its NAV in case of close ended scheme

- **IFSC consideration**

  SEBI (IFSC) Guidelines do not clarify the categories of investors permitted to invest in Mutual Funds.

Clause 22(1) of the SEBI (IFSC) Guidelines prescribes that a mutual fund operating in an IFSC can accept investments from the following categories of investors:

- person resident outside India
- non-resident Indian
- institutional investor resident in India eligible under foreign exchange laws to invest funds offshore (to the extent permitted)
- person resident in India having a net worth of at least USD 1 million, to the extent allowed in the Liberalized Remittance Scheme i.e., maximum of USD 250,000.

- **Setting up of a branch office in IFSC**

  FEMA IFSC Regulations recognize 'non-banking financial companies' as a category of companies that may set up operations in IFSC as a financial institution. While presently NBFCs may set up operations in the IFSC as a Finance Company under the IFSC (Finance Company) Regulations, 2021, RBI does not permit opening of branch office overseas.

  Also, prior approval of RBI is needed while making overseas investments by NBFCs in form of subsidiary/ JV/ Representative office/ other investments.

- **Identify Ship leasing as a financial product**

  Presently, the term 'ship lease' has been defined by the IFSCA (Finance Company) Regulations, 2021 to mean financial leases, operating leases and any hybrids in respect thereof of ships or ocean vessels and engines of ships or ocean vessels or any other part thereof. However, ship lease is **not notified as a 'financial product'**.

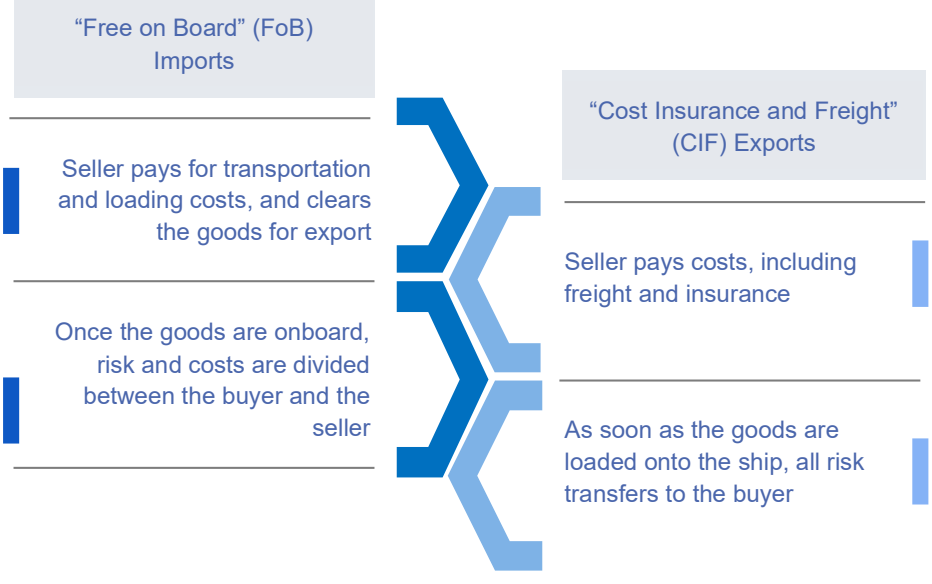
"FREE ON BOARD" (FOB) VS "COST INSURANCE AND FREIGHT" (CIF)

The Government of India's Cargo Transportation Policy of 1957 prescribing Imports on "Free on Board" basis (FoB policy) and exports on the basis of "Cost Insurance and Freight" is followed in default with a large number of imports being carried out on CIF basis.

The higher costs of operating an Indian shipping company do not arise from the 'operating' costs of the company, i.e., the components which go into operating a vessel. In fact, what spikes the cost of operating an Indian ship are the taxes and duties such as IGST, customs, income tax and financial costs (funding, employment and training obligations among others which are imposed only on Indian ships.

While foreign ships do not bear these costs or pay duties, nor provide employment to Indian seafarers or training to Indian

Figure 238: "Free on Board" (FoB) Vs "Cost Insurance and Freight" (CIF)



cadets, policies provide full and free access to coastal and EXIM cargo to them, even if they are not flagged in India. There is therefore no incentive for any foreign shipping company to flag in India.

This has led to almost 93.47% of India's EXIM cargo to be carried on foreign flag vessels as on FY20. It is estimated that an amount of USD 52 billion is remitted from India to foreign shipping companies towards freight for this. Diversion of this freight to Indian companies will lead to a massive plough back into the Indian economy.

Table 58: Table showing FoB and CIF parcels for cargo imported by the arms of the Indian Govt

Commodity	Year	FoB (%)	CIF (%)
Crude oil Source: Oil Cos	2018-19	16	84
Fertilizer Source: Trade	Past 7-8 years	25	75
Coal Source: Trade	Past 7-8 years	5	95

Malaysia, by law, does not permit exports on an FOB basis and thus reserves the cargo including LNG for Malaysian vessels

ISSUANCE OF GENERAL ORDERS 1, 2 & 3 IN 2018

In 2018, Orders Nos. 1 of 2018, 2 of 2018 and 3 of 2018 were issued permitting foreign flag vessels to transport EXIM laden containers, Agri products, horticulture, fisheries, animal husbandry commodities and fertilizers between two or more Indian ports without obtaining a license from the DGS. Orders were issued with the following objectives:

- Reduction of transshipment of India's EXIM cargo over Colombo,
- Reduction in freight for Indian Exporter and Importer.
- Increased movement of agriculture, horticulture, fisheries and animal husbandry commodities on coast; and
- Increased movement of Fertilizer on the coast

Table 59: Orders issued permitting foreign flag vessels to transport EXIM laden containers

Order	Substance of Order
General Order No.1 of 2018 dated 21st May 2018	Permission to foreign ships to carry EXIM and empty containers on the coast without a licence or ROFR to Indian container ships.
General Order No.2 of 2018 dated 22nd May 2018	For movement of agriculture, horticulture, fisheries and animal husbandry commodities on foreign ships without ROFR to Indian container ships
General Order No.3 of 2018 dated 22nd June 2018	For movement of fertilizers on foreign ships without ROFR to Indian container ships

However, the actual impact of this was as follows:

Table 60: Impact of Order-1,- 2,- 3, 2018

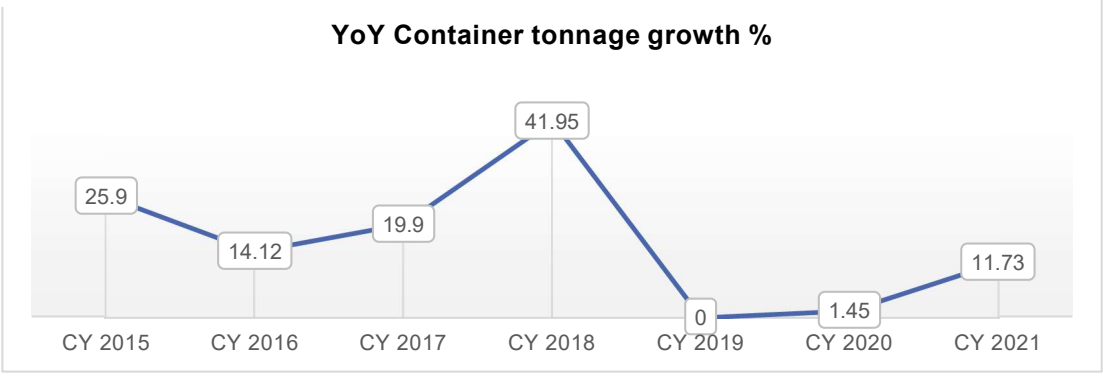
Objective	Substance of Order
Reduction of transhipment of India's EXIM cargo over Colombo	Containers from India transhipped over Colombo have INCREASED. Sri Lanka Port Authority has reported an actual increase in the volume of containers from India.

Reduction in freight for Indian Exporter and Importer	There has been no reduction in freight for the exporter or Importer. Foreign container lines imposed various surcharges on Indian export and import containers. Currently, Indian EXIM trade faces a scarcity of empty containers.
Increased movement of agriculture, horticulture, fisheries and animal husbandry commodities on coast	Zero movement of Agri products
Increased movement of Fertilizer on the coast	All Fertilizer in containers continues to move on Indian flag ships efficiently

Continuing detrimental impact on Indian shipping and India:

- Cargo being carried by Indian companies have been transferred to foreign ships.
- Given the uncertainty of continuity of business, Indian companies decided to charter vessels instead of buying ships (SCI – 2 vessels, Shreyas – 2 vessels)
- Loss of GST revenue to GoI since foreign flag vessels do not pay GST on carriage of containers between two Indian ports.
- The problem of scant return cargoes has been exacerbated by the Notification 1 of 2018 which has allowed foreign ships to carry coastal cargoes - empties/feeder that were hitherto carried by Indian ships.
- Increased profit for foreign ships with no benefit to Indian exporter.
- Increase in surcharges by foreign ships (no Indian option available)
- Loss of volumes at JNPT

Figure 239 De-growth of Indian shipping due to Order-1, -2 & -3 of 2018



OTHER CHALLENGES TOWARDS IMPROVING COMPETITIVE ABILITY OF INDIAN SHIPS

Table 61: Competitive advantage in operating parameters, Indian Vs Foreign flag ships

Operating parameters for a coastal voyage	Indian flag ship	Foreign flag ship	Competitive advantage rests with
Safe manning rules prescribe the number of seamen to be mandatorily employed on a vessel	Tankers - 19 Bulkers - 19 Containers - 19	Tankers -16 Bulkers - 14 Containers - 13	Foreign flag ship
OSVs & PSVs awaiting employment in EEZ pending clearance by Indian Navy	Indian ships with Indian crew need to take clearance of India Navy to operate vessels in India	Not applicable since only Indian flag OSVs operate in EEZ	N.A.
Seafarers' taxation	Indian seafarers working on Indian flag ships have to pay tax on wage, so costs on account of seafarers go up by ~30%	No tax on wages earned even for Indians working on foreign flag ships on the coast	Foreign flag ship
Direct tax	High rate of tax on income OR Tonnage tax + training obligation. Annual training cost of each cadet - Rs. 30 Lakh	Lower rate of tonnage tax and no training obligation	Foreign flag ship
IGST on import of ships	5% on value of ship	Does not apply	Foreign flag ship
Inability to offset input GST on procured goods	5% of the value of the goods (bunkers, stores, spares) gets blocked	Does not apply	Foreign flag ship
Uncertainty of operations due to varying Customs procedures	First Entry of Indian ships requires B/Entry to be filed. Entire process takes as many as 4-5 days while ships remain unemployed awaiting clearance from Customs. This is a huge cost on the shipowner.	Does not apply	Foreign flag ship
GST on MRO services procured abroad on a reverse charge basis	5% on cost of dry dock/ship repair	Foreign flag ship doing repairs in India doesn't pay. If they repair outside India no GST applies	Foreign flag ship

GR WAIVER FOR INDIAN FLAG TUGS AND OFFSHORE VESSELS

Unlike cargo carrying vessels which are freely allowed to be taken out of India for rendering services, non-cargo carrying Tugboats and offshore vessels are currently required to get a GR waiver for deploying the vessel abroad on contract. The Tugboats and offshore vessels go out of India to provide services to ports and/or to E&P Companies. The condition of obtaining GR waiver is needless and cumbersome awaiting waiver. Tugs and Offshore vessels by their very nature are meant to provide services internationally and hence it becomes unviable to keep applying for GR waivers and delaying Indian companies from being competitive and place their businesses worldwide.

33 DAYS DELAY IN NAVAL CLEARANCE OF INDIAN FLAG OFFSHORE SUPPLY VESSELS (OSVS)

Prior to a change that has come into effect from January 2021, it was normal to receive the clearance from the Indian Navy within about 3 -4 working days. However, the revised guidelines issued by the Directorate General

of Hydrocarbons (DGH) dated 15/01/2021 have revised the processing time for such a clearance to 30 working days for fresh cases and 10 working days for continued operation cases. Further the DGH has advised to add 3 working days for processing the application at the DGH.

Even if the clearance is given before 30 days, the same would have been effective only after the expiry of 30 days. Thus, vessels which are ready to operate cannot begin operations. This is a loss for Indian shipping companies which remain unproductive. Due to this, Indian ships remain needlessly unemployed for 30 days even though they are ready for all purposes and leads to loss of earnings and productivity.

CUSTOMS RELATED ISSUES FACED BY INDIAN SHIPPING COMPANIES

Table 62: Location-wise challenges faced in Customs processes by Indian shipping companies

Issue	Problem being faced
Difficulties faced in respect of conversion of vessels from Foreign going status to Coastal Status and reversion to Foreign going status *Sikka, Vadinar and Kandla/ Mundra are the ports where formalities are very smooth and trade friendly. Conversion and reversion process is much easier. There is no insistence on filing bill of entry each time a vessel comes in for conversion. Time taken to complete the procedure is short and duty payable is on provisional basis.*	**MUMBAI** The vessel is treated as a fresh import and is required to file manifest by declaring vessel as goods and subsequently filing of bill of entry for vessel in lieu of Custom Notification 16/2012-Cus dated 13.06.2012 and Public Notice 106/2017 dated 18.08.2017 issued by Principal Commissioner of Custom (G) Mumbai. For reversion of vessel, agents have to carry out Exportation formalities for passing Re-Export Shipping Bill as per Notification No.85/2017 –Customs dated 14.11.20 Condition 102. Vessel has to provide documents in respect of Importation carried out at “Port of Conversion”. Until then the vessel gets held up as Mumbai Customs ask for importation details and reasons for not importing the vessel. This creates a complex situation. **MANGALORE** At the time of conversion of vessel, customs insist that documentation is complete only after payment of customs duty, which has to be done in advance prior to vessel arrival at Mangalore Port. It takes about 2-3 working days for completion of all formalities and getting the permission for conversion, hence if vessel arrives during weekends, delays are anticipated. **PARADIP** Formalities are smooth at the time of conversion and vessels do not face any delays. However, Finalization of Bill of Entry for payment of Customs duty are delayed for long periods. **PIPAVAV** The permission for conversion/ reversion has to be obtained from HQ-Jamnagar, which takes about 3-4 days. The customs duty has to be paid in advance to obtain the permission. There is insistence for an undertaking for Duty on IFO for Indian Flag container vessels even though it is exempted.

Issue	Problem being faced
Difficulties faced in respect of First entry (Import) of vessels	Lack of standard processes at various Indian ports **MUMBAI** Mumbai customs insists on GTL before beginning formalities for importation and conversion to Coastal vessel. This is not asked by any other Custom house. Mumbai insists on obtaining valuation report from a CE. All ships have an invoice from the OEM and the Builder of the vessel. Mumbai insists on taking the insured value as the invoice value. The insured value is always higher due to the add ons to the insurance cost such as war risk costs, voyage perils cover, crew cover etc. Mumbai treats self-propelled as if they were brought in by another carrier or shipping line and Stamp duty is asked to be paid. Our vessels have their own power and come on their own power. **KOCHI** There is insistence on Animal Quarantine (AQ) clearance from Chennai while filing EDI Bill of entry at Kochi. The AQ officials insist on 100% certificates for meat, fish and dairy products, which becomes very difficult to obtain.
Differing practices in respect of import of Spares for ships	Spares for a coastal vessel are to be treated as per Notification No. 50/2017 and so are subject to NIL duty. However, officers of the Customs apply differing rates including IGST for spares imported by an Indian flag. INSA members reported cases where previously imported spares are also then impacted and the ship owner went through needless iterations/ visits with the Customs.
Requirement to file Shipping Bill in respect of already imported spares, stores and provisions on coastal vessels.	**MUMBAI** Shipping companies are asked to file Shipping bills for provision of spares and stores, and provisions in coastal vessels. These are meant for local consumption on coastal vessels and not for export. Due to this, already cleared imported goods/ spares are produced once again to Customs by generating a local GST invoice, packing list, AWB. For this, sundries need to be paid as per shipping bill and it takes a full day. Apart from this, the port also charges wharfage on the spares @ 0.44% of the value of the spares. Despite declaring that provisions are for crew consumption, Customs insists on filing the Import bill of entry. The EDI software by default directs the Bill of Entry to AQ department for seeking their approval. This has to be rectified in the software as an option for permanent import or for crew consumption use.
Treating an imported vessel as 'Out of charge' regardless of completion of formalities under the Merchant Shipping Act, 1958.	**COCHIN** Out of charge for an imported vessel is not given until the vessel registration is over. Registration under the Merchant Shipping Act has no connection with the factum of import.

Issue	Problem being faced
Dispensing with requirement of obtaining Port Clearance from the Customs in respect of Indian flag vessels.	Despite the DG Shipping order no. 08 of 2016 dated 30.11.2016 and copied to Member (Customs) and Special Secretary to the GoI, DoR and MoF dispensing with the requirement to produce statutory certificates and documents and replacing the same with a simple declaration-cum-undertaking format, Indian ships are still required to take a Port Clearance (PC) from Indian customs before sailing out of a port.
Baggage of Indian crew working on coastal vessels should not be made subject to examination of customs while on pure coastal voyages.	Presently, baggage of Indian crew is subject to examination by Customs even though the vessel is on a coastal voyage.

KEY INITIATIVES

ALLOWING OTHER SOURCES OF VESSEL FINANCING

- **Alternative Investment Fund (AIF)**

  There is need for creation of a separate category of AIFs that will allow for investments in ship leasing companies by amending the existing regulatory framework of Category- I or II AIFs. This will permit greater concentration of investments in entities engaged in ship financing/ leasing.

  AIF would fund the entity undertaking the ship leasing/ financing activity and would not undertake leasing activities itself. However, there can be two scenarios:

  - A Category I or II AIF located in the DTA (i.e., outside the IFSC) financing a leasing company located in the IFSC; and
  - A Category I or II AIF located in the IFSC financing a leasing company in IFSC.

- **Permitting pension funds to invest in vessel financing**

  - There is a need to amend investment guidelines to allow pension funds to invest in equity or debt instruments of companies.
  - The pension funds to be permitted to invest into domestic AIFs, even if they may use funds for investments into ship financing/ leasing entities located in IFSC, or that investment into IFSC entities would not be considered as overseas investment by pension funds.

- **Removing restriction on ship leasing by insurance Companies**

  - There is a need for exempting the insurance companies in IFSC from the investment restriction.

- The Central Government, in exercise of its power under Section 2CA, should relax the provision of Section 27A(4) with respect to investments by insurers in IFSC into ship leasing entities in GIFT City.

- **National Investment and Infrastructure Fund (NIIF)**

  NIIF needs to create a strategic fund for investing in transport infrastructure, so as to aid greenfield capital incentive industries such as **ship leasing** being develop in India-IFSC.

- **Giving infrastructure status to vessels**

  There is a need to include vessels under infrastructure category.

  RBI, in the exercise of its power under Section 35A of the Banking Regulation Act, 1949, to pass a notification including "vessel" in "infrastructure". The said inclusion of "vessel" should also be incorporated into the 'Harmonised Master List of Infrastructure Subsectors' bearing number F. No. 13/1/2017- INF dated April 26, 2021. This definition of vessel should be aligned with the proposed definition under Section 3(d)(vi) of the IFSCA Act, 2019.

  If vessels owned and financed by or operated by IFSC shipping entities are granted 'infrastructure status' as per RBI Infrastructure Circular, the benefits would be as follows:

  i. It will allow access to long-term funding at competitive rates, since asset life of a vessel is 15-25 years.

  ii. Banks will have provisioning benefits since DCCO extension and refinancing will not be treated as restructuring

  iii. Banks can also fund equity in certain circumstances (Para 2.3.7.4(i) of the Master Circular on Loans and Advances).

  iv. Infrastructure status also allows funding from the proposed DFI for Infrastructure financing.

- **Restrictions on External Commercial Borrowings under RBI's Master Directions**

  The 'all in cost ceiling' caps the returns for the lender on ECB financing. However, for a cyclical and capital-intensive industry such as shipping, further flexibility on pricing is required, given the market volatility, vessel age, new technology risk, bespoke structures (leasing- finance and operating, non-recourse) so as to accommodate and provide required flexibility for long economic life assets**.**

  RBI, in its capacity of foreign exchange regulator, can issue specific directions under Section 11 of Foreign Exchange Management Act, 1999 (FEMA Act) to provide specific exception/ relaxation for entities engaged in ship financing from the restrictions in so far as all in cost and minimum average maturity are concerned. Further, offshore branches of Indian banks may be permitted to refinance domestic debt through ECBs.

- **Investment limitation of Mutual Funds**

  There is a need to introduce amendments to the existing framework for mutual funds, permitting greater exposure to target companies that are ship leasing companies (for instance, special or separate schemes).

- **IFSC consideration**

There is a need to clarify the categories of investors that would be permitted to invest in mutual funds. Given the limitation on domestic investors investing into a mutual funds based out of IFSC, further liberalize the options for Indian HNIs to invest in mutual funds targeting ship leasing in IFSC.

- **Setting up of a branch office in IFSC**

  Setting up of a branch office in IFSC by an NBFC in India should be permitted and the ODI investment by NBFC should be under automatic route.

- **Identify Ship leasing as a financial product**

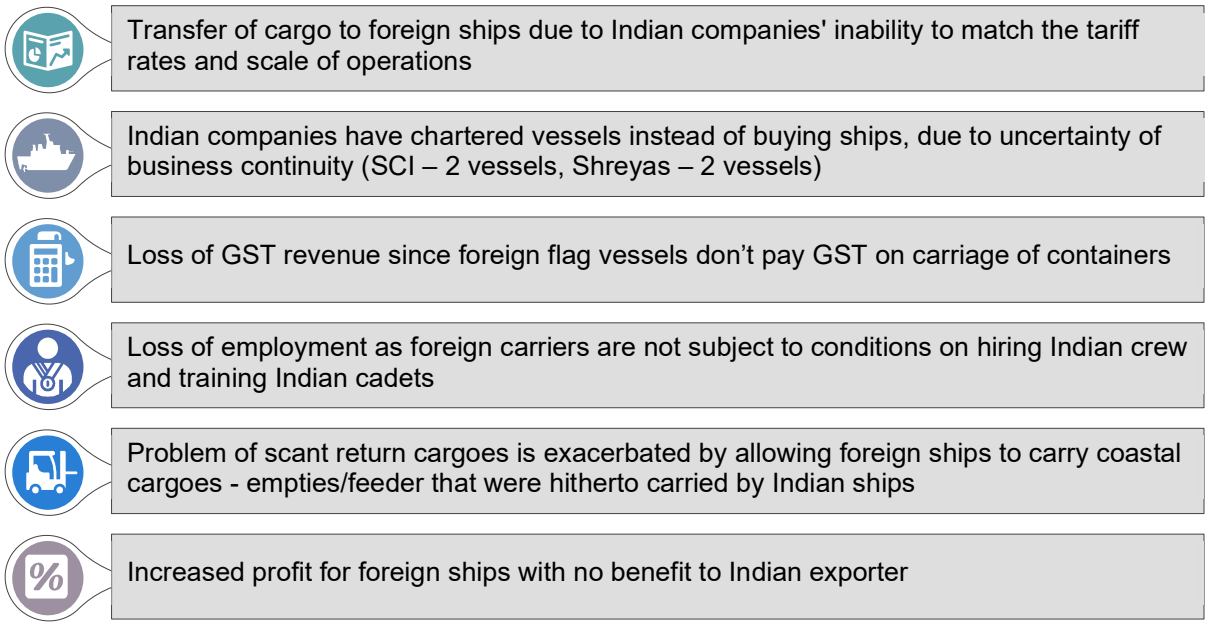
  Vessel leasing (including chartering) needs to be notified as a 'financial product' by notification of the Central Government under Section 3(d)(vi) of the IFSCA Act. Financial entities located in IFSC can undertake such activities if their home country regulator does not expressly bar it.

STRICT ADHERENCE TO IMPORTS ON "FREE ON BOARD" BASIS (FOB) AND EXPORTS ON "COST INSURANCE AND FREIGHT" (CIF) BASIS

There is a need to ensure that the Policy of FOB Imports and CIF Exports must be followed strictly. For cases requiring exceptions to the above rule, a proper SOP must be formulated, which must in line with the suggestion provided by INSA. The application of the CPSE to enter CIF contracts should contain the following information or following processes:

Figure 240 Key points for measures to improve India's ranking in world tonnage

To implement above, a detailed stakeholder consultation may be conducted to take their consensus.



REVERSAL OF THE GENERAL ORDERS NOS. 1, 2 AND 3 OF 2018

Reversal of the Orders Nos. 1 of 2018, 2 of 2018 and 3 of 2018 which permit foreign flag vessels to transport EXIM laden containers, Agri products, horticulture, fisheries, animal husbandry commodities and fertilizers between two or more Indian ports without obtaining a license from the Director General of Shipping, is now a requisite to increase India's ranking in world tonnage due to the effects mentioned earlier.

To implement above, a detailed stakeholder consultation may be conducted to take their consensus.

Table 63: Operating parameters and solutions to improve competitiveness of Indian ships

Operating parameters for a coastal voyage	Indian flag ship
Safe manning rules prescribe the number of seamen to be mandatorily employed on a vessel	Safe manning for Indian ships should be on par with Safe manning rule for Whitelist MOU flag vessels
OSVs & PSVs awaiting employment in EEZ pending clearance by Indian Navy	Do away with the requirement for Indian flag vessels registered with DG Shipping and manned with Indian citizen to obtain clearance from the Indian navy in order to operate in the EEZ of India and ask the Indian Navy to take steps to kindly revert to status ante quo so that one will continue to get clearances within 3 - 4 working days.
Seafarers' taxation	Suitable provision to specifically exempt the wages paid to Indian seafarers by Indian companies from applicability of the provisions of TDS
Direct tax (High rate of tax on income OR Tonnage tax + training obligation)	Equality in training obligation to stimulate growth of Indian Shipping Industry. Any foreign flag ship employed by an Indian charterer for more than 6 months to flag in India. Foreign flag ships employed for more than six months to comply with training obligations
IGST on import of ships	5% IGST on Indian ships should be withdrawn.
Inability to offset input GST on procured goods	Rate schedule for Voyage charters as well as for Time charters has a condition that no input tax credits can be availed on inputs - Notification 11/2017 Central Tax (Rate) & Notification 1/2018-Central Tax rate. This restriction in the Rate Schedule needs to be removed In addition, as per Section 10(1)(a) of the IGST Act, the place of supply for goods is 'location of the goods at the time at which movement of goods terminates for delivery to the recipient'. The following clause needs to be inserted to sub-section (1) to Section 10 of the IGST Act as follows: (f) Notwithstanding anything contained in clauses (a) to (e), where the goods are supplied to a shipping company, the place of supply shall be that location of the principal place of business of the shipping company"
Uncertainty of operations due to varying Customs procedures	Indian Customs should undertake time bound conversion of Indian flag vessels as well as time bound completion of 'first entry of vessels. The entire process should be run parallel with cargo operations and should not exceed more than 24 hours.
GST on MRO services procured abroad on a reverse charge basis	Indian ships should not be required to pay GST on reverse charge for MRO services consumed outside India.

To implement above, a detailed stakeholder consultation may be conducted to take their consensus.

GR WAIVER FOR INDIAN FLAG TUGS AND OFFSHORE VESSELS

It is proposed to insert “Tug and Tugboats including vessels used for providing offshore support services registered under the Merchant Shipping Act, 1952” under Regulation 4 of FEMA 23(R) issued under the Foreign Exchange Management (Export of Goods and Services) Regulations, 2015.

NAVAL CLEARANCE OF INDIAN FLAG OFFSHORE SUPPLY VESSELS (OSVS)

It is proposed to:-

- do away with the requirement for Indian flag vessels to obtain clearance from the Indian navy in order to operate in the EEZ of India, and
- ask the Indian Navy to take steps to kindly revert to status ante quo so that we will continue to get our clearances within 3 - 4 working days.

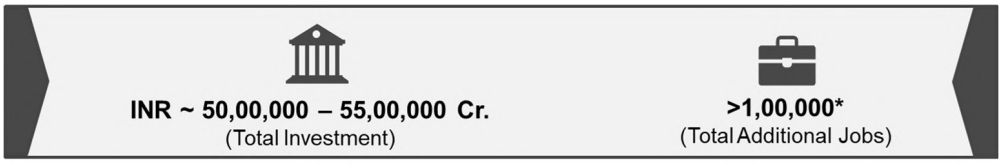
SOLUTIONS TO CUSTOMS RELATED ISSUES

Table 64: Suggested solutions for Customs related concerns in Indian Shipping

Issue	Suggested solution	Justification
Difficulties faced in respect of conversion of vessels from Foreign going status to Coastal Status and reversion to Foreign going status	Circular No. 58/97 dated 06.11.1997 is the standard guideline for filing of Bill of Entry and payment of duty on bunkers/stores in the case of conversion of the vessel. Since there is no requirement of payment of duty on the vessel in terms of the said circular, IGM and Bill of Entry for vessel should not be filed for so called import of the vessel. It is proposed that the procedures followed at Sikka, Vadinar and Kandla are followed at all ports, which would ease ship owners’ problems, saving time and also costs.	The formalities and procedures for conversion and reversion should be trade friendly, easy, smooth, process driven and not subject to arbitrariness. The formalities and procedures should be the same across all Indian ports.
Difficulties faced in respect of First entry (Import) of vessels	A standard process may be prescribed. It may be clarified that importation may be concluded without waiting for registration under the Merchant Shipping Act and without the need of a GTL by the shipowner. The ship owner should not be required to obtain a separate valuation from a CE. The insured value of the vessel cannot be the value of the vessel since in addition to the value of the Hull and Machinery, there are always additional covers which the shipowner will take from the Insurer. The Hull and Machinery policy value may be taken for the purposes of guidance. Otherwise for all practical purposes the invoice issued by the seller or the builder of the vessel should be sufficient to indicate the value of the vessel. Custom authorities in Mumbai should not ask for payment of Stamp Duty on the duty paid.	
Differing practices in respect of import of Spares for ships	Import of Ship Spares may be processed by default in the RMS (Risk Management System), which would help to reduce delay and subjectivity in assessment and examination and save time and money. Since the spares do not attract any duty, ship owner can pay 5% IGST and can be cleared same day on its arrival.	

Requirement to file Shipping Bill in respect of already imported spares, stores and provisions on coastal vessels.	It may be clarified that spares and stores and provisions meant for Coastal vessels need not file Shipping Bills.	
Treating an imported vessel as 'Out of charge' regardless of completion of formalities under the Merchant Shipping Act, 1958.	It may be clarified that an imported vessel may be made 'out of charge' regardless of completion of formalities under the Merchant Shipping Act, 1958.	
Dispensing with requirement of obtaining Port Clearance from the Customs in respect of Indian flag vessels.	All field formations may be informed of the DG Shipping order no. 08 of 2016 dated 30.11.2016 and copied to Member (Customs) and Special Secretary to the GoI, DoR, MoF to stop asking Indian flag vessels to take a Port Clearance from local Customs before sailing out of port.	This will considerably ease the conduct of coastal shipping, reduce paperwork and also speed up the sailing out process of Indian ships in India.
Baggage of Indian crew working on coastal vessels should not be made subject to examination of customs while on pure coastal voyages.	It may be clarified that the baggage of Indian crew signing on or signing off on Indian flag coastal vessels is not subject to Customs examination and is permitted to pass in a sealed condition.	

Total investment required and potential job opportunities



Note: *Current number of seafarers on Indian flag vessels is about 65,000[1], with an increase in Indian tonnage to ~20% share this number can **increase to ~1,75,000**

KEY PERFORMANCE INDICATORS:

Key Performance Indicators	Status (as of 2021)	Target (2030)	Target (2047)
World ranking for tonnage under Indian flag vessels	**22**	**Top 10**	**Top 5**

Detailed Amrit Kaal Vision 2047 Action Plan on Logistics, Infrastructure and Shipping (Including Transshipment)

Implementation Plan for Implementing **Infrastructure, Institutional, Capacity Building and Technology Initiatives**

Green Port

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation[72]	Implementing Agency
1	Non-availability of sufficient infrastructure and incentives support for faster adoption of LNG/CNG	Increase usage of clean fuel/ reduce air emission - Use of alternate fuels (LNG/ CNG)*[73] as a fuel source for the vehicles Explore PPP model for conversion of trucks and for development and O&M of LNG fuel station at ports. Pilot adoption of PPP model to be explored at JNPT, Chennai and Paradip port and further, the model to be extended it to other ports Projects already identified under the initiative: - (Source: **MIV 2030**) 1.Drive adoption of multi-clean fuels (Electric, CNG, LNG) for vehicles in port ecosystem	Technology and Infrastructure	Following structure is proposed for faster adoption of LNG based trucks Private player will provide services to install LNG engines on diesel trucks and set-up LNG station in port premises and sell LNG to truck operators Petroleum companies will supply LNG to LNG stations Port authority will provide land for setting up LNG facility. Converting diesel trucks to LNG based trucks will come at a cost, therefore, port authority will provide conversion cost subsidy. In return, port authority will receive a revenue share from private player on per btu of LNG sold. Further, in order to make faster and smooth adoption of LNG trucks, port authority will provide a fixed time period (2-3 years) beyond which it will not provide entry to diesel-based trucks	Port authorities to conduct a study to estimate number of diesel-based trucks carrying goods from/ to ports and operating inside port premises in a year and also estimate the future increase in average number of trucks based on traffic growth. This study will help in estimating the market size of trucks for conversion and annual LNG fuel requirement.	Q2 FY2024	Major Port Authority
					Port authority to also conduct a techno-commercial study to estimate the payback period on incremental capex required for conversion and work on subsidies and infrastructure to be provided to fleet owners for faster adoption of LNG fuels	Q3 FY2024	Major Port Authority
					Port authority to get approval for estimated budget for providing subsidies and infrastructure	Q3 FY2024	
					Prepare tender document containing scope of work, technical specifications, evaluation criteria for the bidders and other necessary information as deemed fit	Q4 FY2024 – Q4 FY2025 (by all major ports)	Major Port Authority
					Conduct tender process and select the concessionaire for the development required LNG infrastructure	Q1 FY2025 – Q1 2026 (by all major ports)	Major Port Authority
					Development of required LNG infrastructure at ports	Q2 FY2031	Major Port Authority
2	Usage of battery-operated equipment/ vehicles in ports are low Existing solutions are limited by long-battery charge time and distance coverage	Increase usage of clean fuel/ reduce air emission Use of battery-operated equipment Projects already identified under the initiative: - (Source: **MIV 2030**)	Technology and Infrastructure	Electrification of equipment moving cargo at port area e.g., RTGCs, reach stackers, straddle carriers, forklifts, etc. Ports shall mandate purchase of electrical equipment as a replacement for all further purchase to achieve >90% electrification	Ports to conduct a study to identify requirement of port-owned equipment to be replaced and added and find measures to incentivize private players to use battery operated equipment	Q3 FY2024 – Q2 FY 2025 (by all major ports)	Major Port Authority
					Prepare tender document containing scope of work, technical specifications, evaluation criteria for the bidders and other necessary information as deemed fit for	Q1 FY2025 – Q4 FY2026 (by all major ports)	Major Port Authority

[72] The timelines mentioned for key initiatives are as per the Indian financial year format

[73] Any other alternate fuels such as blended biofuels

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation[72]	Implementing Agency
		1. Electrification program for material handling equipment across all ports			procurement of battery operated RTGC, reach stackers, straddle carriers, forklifts		
					Select the bidder and award tender	Q3 2025 – Q2 2027 (by all major ports)	Major Port Authority
3	Cost, performance, and durability are still key challenges in the fuel cell industry	Increase usage of clean fuel/ reduce air emission - Hydrogen, Methanol, Ammonia based fuel cells	Technology and Infrastructure	A fuel cell uses the chemical energy of hydrogen or other fuels to cleanly and efficiently produce electricity. Fuel cells have lower or zero emissions compared to combustion engines. Fuel cells work like batteries, but they do not run down or need recharging. They produce electricity and heat as long as fuel is supplied. If hydrogen is the fuel, the only products are electricity, water, and heat	MoPSW to conduct meeting with MNRE, national laboratories, universities and industries who are working on fuel cell technology to discuss feasibility of using Hydrogen, Methanol, Ammonia based fuel cells in vehicles and understand the support required from the Government	Q2 FY2031	MoPSW
					MoPSW to identify national laboratories, universities, and industry partners who are in advance stages to overcome critical technical barriers to fuel cell development	Q3 FY2031	MoPSW
					Continue supporting identified organization in bringing fuel-based technologies into operation	Q4 FY2031 till 2047[74]	MoPSW
					MoPSW in conjunction with MNRE to work on subsidy schemes to promote shift from diesel-based engines to fuel cell-based engine in future	Depends on the time when fuel cell technology develops	MoPSW
4	In port, ships use their diesel auxiliary engines to produce electricity for hoteling, unloading and loading activities which generates various air pollutants	Increase usage of clean fuel/ reduce air emission - Shore to ship power supply Prioritize port-based vessels in 1st phase to provide shore to ship electricity followed by Indian coastal/ EXIM vessels Currently, first phase of providing shore to ship electricity to port-based vessels (tugs, port crafts) is already being implemented in some of the ports. For instance, Vishakhapatnam port is giving shore to ship power for tugs. Kamarajar port also has shore power supply for tugs and pilot boats. Chennai port gives shore power to vessels including	Technology and Infrastructure	One measure to reduce air emissions from ships while at berth, is to provide electricity to the ships from the national grid instead of producing electricity by the ships own auxiliary diesel generators. To provide ships with electricity, a shore-side electricity supply (Onshore Power Supply) arrangement is required. Onshore Power Supply (OPS) arrangement consist of two main components – Port Onshore Power Supply and Ship Onshore Power Supply Port onshore power supply consists of main substation building with frequency convertor, cable arrangement, shore side transformer station, shore side connection arrangement Ship onshore power supply consists of cable reel system, and a transformer to transform high voltage electricity.	MoPSW to conduct discussion with all Ports on following aspects: Required infrastructure and equipment to establish shore to ship power supply Commercial models for providing shore to ship electricity to vessels at port List of clearances, approvals and licenses required to distribute electricity to vessels at ports on commercial basis	Q3 FY2024	MoPSW
					Ports to obtain license for commercial power transmission, distribution, and trading from power commission under State Government	Q4 FY2024- Q4 FY2025	Major Port Authority
					Ports to hire technical consultant and prepare detailed project report for setting up shore to ship power supply facility in port premises.	Q2 FY2025 – Q2 FY2026	Major Port Authority
					Prepare tender document containing technical specifications, evaluation	Q3 FY2025 – Q3 FY2026	Major Port Authority

[74] The timeline may extend depending on the time when fuel cell technology develops

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation[72]	Implementing Agency
		coast guard vessel. Cochin port has infrastructure for shore power at 11 berths. Mormugao port Authority supplies shore power to cruise, tugs, and Indian coast guard vessel. Shore power supply operations for coast guard and port vessels has stated at Mumbai port Authority. JNPT is currently supplying shore power to tugs. Other ports should also follow suit and expedite the phase-1 implementation of shore to ship electricity. Once the phase 1 is fully implemented, ports can start phase 2 implementation process wherein they can provide necessary infrastructure to Indian coastal and EXIM vessels for receiving shore to ship electricity Following are the aspects to be considered while implementing shore-to-ship power supply facility at the ports. *Development model* - Ports shall look to assign a revenue sharing contract to an external entity which will invest in the Ship-to-Shore facility and operate the same *Distribution license* - As per Electricity Act 2003, commercial power transmission, distribution and trading is not permitted by any entity other than DISCOMs. MoPSW to align with Ministry of Power so as to allow ports for commercial power distribution *Technical specifications* - Technical standardization across ports to be aligned. Power demand varies depending on what type of vessel. The port must be			criteria for the bidders and other necessary information as deemed fit for procurement of required infrastructure and equipment for shore to ship supply facility		
					Select the bidder and award tender for setting up the shore to ship power supply facility	Q1 FY2026 – Q1 FY2027	Major Port Authority
					With the available facility, conduct phase -1 operation of providing ship to shore power for port-based vessels	Q2 FY2026 - Q2 FY2027	Major Port Authority
					Reassess the available Infrastructure and equipment for compatibility/ suitability with bigger vessels (Indian coastal and EXIM vessels)	Q4 FY2026 – Q4 FY2027	Major Port Authority
					Procure additional equipment for compatibility/ suitability with bigger vessels (Indian coastal and EXIM vessels) through tender process	Q2 FY2027 -Q2 FY2028	Major Port Authority
					Conduct phase -2 operation to supply ship to shore power to Indian coastal and EXIM vessels	Q4 FY2027 – Q4 FY2028	Major Port Authority

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation[72]	Implementing Agency
		aware of the vessels power demand, system voltage and system frequency when designing the shore-side power supply facility Projects already identified under the initiative: - (Source: **MIV 2030**) 1. Provide shore to ship electricity to vessels (tugboats, coastal vessels and EXIM trade vessels) in a 3-phase targeted manner					
5.	Limited demand and limited infrastructure for LNG bunkering	Increase usage of clean fuel/ reduce air emission - LNG bunkering Indian ports to increase adoption of LNG by promoting awareness of LNG based vessels & establishing LNG bunkering stations in following manner. Phase 1 - Truck to Ship bunkering – In the first phase, ports should start providing bunkering services through truck to ship bunkering method due to following reasons: LNG demand is limited and therefore, limited capacity trucks would be suitable option Relatively low investment cost than other methods Trucks can also be used for LNG distribution for other purposes Phase 2 - LNG bunkering (Ship to Ship Bunkering or Shore to Ship Bunkering) – As the demand picks up and become stable, large capacity would be required. In this case, either of the following two methods can be used:	Technology and Infrastructure	LNG bunkering can be performed by following three methods: Truck to Ship - Among the various methods for in-port bunkering of LNG-fueled ships, Truck-to-Ship (TTS) transfer is currently most frequently used. With TTS, the LNG truck is connected to the ship on the quayside, generally using a flexible hose. This is today the most widely used bunkering method, because of the still limited demand in combination with the lack of infrastructure and the relatively low investment costs. For these reasons, truck-to-ship bunkering is a good provisional solution for LNG bunkering. For capacity reasons, truck-to-ship bunkering is most suitable for smaller LNG-fueled vessels with limited bunker volumes, like tugboats, inland vessels, coastguard vessels and smaller passenger vessels. Ship to Ship - Ship-to-ship bunkering can take place at different locations: along the quayside, at anchor or at sea. The high investment cost for bunker vessels is considered the main barrier. The industry is hesitant to invest in such vessels, in part because they have only limited alternative operations when LNG bunker demand is limited. Given the high flexibility of bunkering vessels, ship-to-ship bunkering is suitable for large vessels such as RoPax/RoRo vessels, bulk carriers, and container vessels. Shore to Ship - Another bunkering method is shore-ship, whereby LNG is either bunkered directly from an (intermediary) tank or small station, or from an import or export terminal. Pipelines from the terminal to the quay are needed if the LNG terminal is not directly situated at the berth. Shore-ship bunkering is especially suitable	For phase -1, MoPSW to conduct meeting with Ministry of Petroleum and Natural Gas (MoPNG) to discuss feasibility of establishing LNG storage station and providing truck to ship bunkering services in ports	Q3 FY2024	MoPSW
					Ports to prepare feasibility report for truck to ship bunkering services covering following aspects: Capacity of LNG storage station required Number of trucks required LNG bunkering charges to be levied	Q1 FY2025 – Q1 FY2026	Major Port Authority
					Invite proposals from companies for establishing LNG storage station	Q2 FY2025 – Q2 FY2026	Major Port Authority
					Ports to invite quotations from companies such as Petronet LNG, IOCL, BPCL for supply of LNG	Q3 FY2025 – Q3 FY2026	Major Port Authority
					Award contract and establish LNG storage station and LNG supply	Q3 FY2026 – Q3 FY2027	Major Port Authority
					Ports to conduct traffic assessment of LNG fueled vessels coming to their ports and expected increase in their numbers in future (This will help the ports to gauge if high demand of LNG is expected in the future)	Q1 FY2027 - Q1 FY2028	Major Port Authority
					Ports with high demand of LNG would undergo phase-2 of LNG bunkering operation. Port to conduct feasibility study of both methods (Shore to Ship and Ship to Ship bunkering) covering following aspects:	Q2 FY2027 – Q2 FY 2028	Major Port Authority

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation[72]	Implementing Agency
		Shore to ship bunkering - In this method, LNG is either bunkered directly from an (intermediary) tank or small station, or from an import or export terminal. In this case, ports would need to be equipped with LNG terminal. However, other type of facilities such as FSRU, fixed storage terminal can also be explored for providing bunkering services. Ship to Ship bunkering – This method is suitable for all type of vessels due to high flexibility of bunkering vessels. Ports would need to invite private participation for building and operation of LNG bunkering barge to serve ocean carriers. The commercial model in this method would be such that Government will get revenue share for every unit of LNG sold by private player Projects already identified under the initiative: - (Source: **MIV 2030**) 1. Establishing LNG bunkering stations at select ports in line with fuel adoption trends by shipping liners		shipping services with a high frequency, limited demand, less strict timetables, and limited vessel draft. Examples include bunkering vessels, tugs, inland shipping vessels, utility vessels and fishing boats	Capacity of LNG storage station required Infrastructure requirement (pipeline, storage tanks) LNG barge technical specification LNG bunkering charges to be levied Ports with LNG terminal may already have infrastructure required for LNG bunkering		
					For, additional capacity of storage tanks, and supply of LNG, ports would need to collaborate with their existing service provider or invite fresh tender	Q4 FY2027 – Q4 FY2028	Major Port Authority
					Ports, where ship to ship bunkering facility is feasible, should perform following actions: Prepare tender document containing scope of work, technical specifications of barge vessel, evaluation criteria for the bidders and other necessary information as deemed fit for procurement of barge vessel Select the bidder and award tender	Q2 FY2028 – Q2 FY2029	Major Port Authority
					Development of required infrastructure for phase 2 of LNG bunkering operation.	Q2 FY2030 – Q2 FY 2031	Major Port Authority
6.	*Land availability*- Solar power projects are highly land intensive *Storing electricity*- Storage is a significant issue as batteries tend to become bulky with increasing storage capacity and therefore, cumbersome to handle, require considerable maintenance, and need frequent replacement	Accelerate adoption of Renewable Energy Solar PVs - Accelerate adoption of renewable source of energy through usage of Solar PVs which can be extended to other ports for rooftop installation and for mooring and dolphin operation Facility of remote water jet and robotic cleaning may be provided in order to counter the challenges of maintenance Projects already identified under the initiative: - (Source: **MIV 2030**)	Infrastructure	Solar energy is the major contributor to the renewable energy mix. Further, Solar power generation cost is lower than coal power generation cost. Adoption of Solar PV needs to be encouraged across all ports.	Port authority to conduct meeting to set targets for power generation through solar energy	Q3 FY2024	Major Port Authority
					Ports to identify spaces for installation of solar panels	Q4 FY2025 -Q4 FY2026	Major Port Authority
					Decide on the budget for installation of solar panels	Q4 FY2025 -Q4 FY2026	Major Port Authority
					Get approval for budget from competent authority	Q4 FY2025 -Q4 FY2026	Major Port Authority
					Prepare tender document containing specific technical specification of panels	Q2 FY2026 -Q3 FY2027	Major Port Authority
					Conduct tender process and select the supplier	Q3 FY2026 - Q3 FY2027	Major Port Authority
					Installation of solar panels	Q3 FY2027 - Q3 FY2028	Major Port Authority

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation[72]	Implementing Agency
		1 Increase usage of renewable energy to >60% of total energy by 2030 across Indian ports with primary focus on solar and wind 2 Evaluate and pilot advanced energy solutions (e.g., wave, tidal) at select Indian Ports by conducting a detailed feasibility study (e.g. tidal at Deendayal port, wave energy at Cochin port)					
7.	*Land acquisition-* Wind power projects are highly land intensive *Spatial Crowding-* Onshore wind energy farms also face several issues such as spatial-crowding caused by the erection of urban structures in the vicinity, which affect the speed and pattern of the wind, and lower the efficiency of the farms High capital investment needed	Accelerate adoption of Renewable Energy- Wind Energy	Infrastructure	Conventional Wind Turbines can be installed onshore in available land at port or offshore in shallow water areas within the port operational area	Port authority to conduct meeting to assess potential of wind energy at respective locations	Q3 FY2024	Major Port Authority
					Port authority to set targets for wind energy production	Q3 FY2024	Major Port Authority
					Conduct feasibility study and identify feasible areas for onshore wind farms across port land, shallow waters, and breakwaters	Q1 FY2025 – Q3 FY2025	Major Port Authority
					Decide on the budget for installation of wind farms	Q3 FY2025 -Q4 FY2025	Major Port Authority
					Get approval for budget from competent authority	Q4 FY2025 -Q4 FY2026	Major Port Authority
					Prepare tender document containing specific technical specification	Q2 FY2026 -Q3 FY2027	Major Port Authority
					Conduct tender process and select the supplier for installation of wind farms	Q3 FY2026 -Q3 FY2027	Major Port Authority
					Installation of wind farms	Q1 FY2027 - Q1 FY2028	Major Port Authority
8	In India, while DG-Coast Guard oversees any Oil Spill disaster as per National Contingency Plan, National Disaster Response Force (NDRF) is the agency to tackle any disaster like situations. There exists a need to setup a unified authority in maritime sector to streamline safety training & incidence response.	Adopting the Maritime Rescue Sub Centers (MRSCs) to aid Port Emergencies	Institutional	Recommendation to adopt the Maritime Rescue Sub Centers (MRSCs) to aid Port Emergencies and Disasters The infrastructure, staffing, communication aids and equipment available with the MRCSs are comprehensive to cater to coastal emergencies including shore-based/Port and maritime related events. The MRCSs should be strengthened to cater to Port based emergencies in the following respects: 1. A liaison cum control center (with necessary staff, on deputation/float basis) should be established in each Major, private and or State operated Port, to have real-time communication with the nearest MRSC in the event of an emergency 2. Port and marine assets will coordinate with the liaison cum control center for marine incidences (in accordance with National Law (Merchant Shipping Act) and IMO Casualty Investigation Code) in their	MoPSW to conduct meeting with Indian coast guard to discuss catering of port-based emergencies	Q2 FY2024	MoPSW
					Decide on the infrastructural requirements for setting up control centre at ports	Q3 FY2024	MoPSW & Indian coast guard
					Sign an agreement between respective port and Indian coast guard	Q4 FY2024 – Q2 FY2025	Major Port Authority
					Setup control centres at ports	Q4 FY2025 – Q2 FY2026	Major Port Authority

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation[72]	Implementing Agency
				catchment/Port limit/vicinity 3. Along-with the nearest MRCS and Port authorities, coordinate with the Distt. Collector/Administration and functionaries to handle and coordinate natural disasters 4. Mock drills in the Ports and maritime assets will have the MRSC representative as a. Independent evaluator b. Consultant to fill-up gaps by means of training c. Recommend on capacity building (infrastructure and human resource) d. Lend advisory support in management of Emergency Aid and Rescue system of the Port 5. Coordinate with following agencies on behalf of the Port in the case of emergencies: (a) Indian Navy. (b) Indian Air Force. (c) Directorate General Shipping. (d) Chief Hydrographer of India. (e) Airports Authority of India. (f) Department of Telecommunication and Local Authorities. (g) Department of Space and Local Authorities. (h) Customs Authorities. (j) Fishing Authorities. (k) Port Control Authorities. (l) Ministry of Shipping and Local Authorities. (m) State Government / Local Administration authorities. (n) Police Authorities. (p) Oil and Natural Gas Commission and Local Authorities. (q) Transport Corporation of India (r) Dredging Corporation of India (s) Indian Army (t) Pawan Hans Helicopters Limited			

Implementation Plan for **Tax, Regulatory and Policy Initiatives**

Green Ports

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1.	**Bilge and ballast water from the vessels -** India is not yet a signatory of The International Convention for the	DG Shipping has issued guidelines in relation to bilge and ballast water management to	Guidelines/ Regulation	All ports must establish guidelines for bilge and ballast water management which Indian ships and calling	MoPSW to conduct meeting with all ports and DG shipping to discuss guideline on bilge ballast	Q2 2024	MoPSW

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	Control and Management of Ships' Ballast Water and Sediments, 2004 (BMW convention)	Indian vessels making calls to Ports where the convention is in force		vessels from non-signatory countries must follow in order to berth at Indian ports	water management covering following aspects: • Technical specification of ballast system Ballast Water Sampling Points for compliance monitoring		
					DG shipping to publish guideline for bilge and ballast water management for Indian ships and calling vessel especially from countries which are not a part of Ballast Water and Sediments, 2004 convention through notification	Q4 2024	DG shipping
2.	Indian ports except ports with vast land area are facing challenge to meet the recommended greening area due to inadequate land	MoEF&CC mandates greenbelt development in ports through guidance manual for Environment Management Plan (EMP) to control air and noise pollution As per the mandate, ports are allowed to have 33% area under green belt Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Develop green belt (including mangrove, mudflats) cover at ports with participation of corporates under CSR program 2 Employ water conservation techniques at select Ports by deploying atomizers and mist canons on pilot basis and expand to other ports post incorporation of learnings from pilot	Regulation	**Green belt** Ports shall enter into discussion with MoEF&CC to allow mangrove plantation in alternative land and develop mangrove under 33% greenbelt cover	MoPSW to conduct meeting with MoEF&CC to discuss mangrove plantation under greenbelt cover	Q1 2024	MoPSW
					MoEF&CC to allow mangrove plantation in alternative land under 33% greenbelt cover	Q3 2024	MoEF&CC
3.	Currently, port operators have no incentive/ mandate to adopt green initiatives	Currently, there is no policy as such to promote faster adoption of green initiatives in port operations	Policy	Develop implementation framework to promote faster adoption of green initiatives • New terminals – Introduce green KPIs basis base line study on select operational terminals and include the KPIs in the concession agreements for concessionaire to achieve; Bidders would include the cost incurred in adopting green initiatives in the quotation • Existing terminals - Introduce green KPIs basis base line study the existing terminal, concessionaire need to prepare impact assessment report including cost estimates of the proposed green initiatives; Government may cover 50% of the cost of the initiatives to attain cost neutrality in the form	• New terminal - Initially, project authorities would need to conduct baseline study on select operational terminals across parameters such as usage of clean fuel in various port operations, area under green belt, share of renewable energy, vessel turnaround time on the basis of last 3-year performance of the terminals • Existing terminal - Project Authorities would need to conduct baseline study basis last 3-year performance of the terminal and minimum standards in concession agreement across the key	Q3 2024	Major Port Authority

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				discount on revenue share while remaining amount would be borne by concessionaire	parameters. If Base lining study is prepared by PPP project operator, then it shall be vetted and approved by an independent third party		
					Existing and New Terminal - Post base line study, project authorities would need to define/ revise target KPIs (existing/ new) and introduce green KPIs across all the parameters	Q1 2024	Major Port Authority
					Existing terminal - PPP Port Operators/ Project Authority would need to submit an action plan proposing multiple green projects/intervention to the MoPSW/ State Maritime Boards for approval	Q4 2024	PPP port operators/ Port Authorities
					Existing terminal - PPP Port operators/ Project Authorities would need to prepare an impact assessment report, estimating upfront capital cost, technical changes, improvement in efficiency, increase in operating cost for terminal, impact on environment and efficiency in port operations	Q2 2025	PPP port operators/ Port Authorities
					Existing terminal - MOPSW/ State Maritime Boards may employ independent agencies to vet and approve the funding requirement, targeted outcomes of the proposed projects/interventions	Q3 2025	MoPSW/ State Maritime Boards
					Finally, the identified KPIs and green KPIs would need to be accordingly included in concession agreement	Q4 2025	Major Port Authority
4.	Ship liners do not have any incentive/ mandate from Indian port authorities to increase usage of green fuel in the vessels which are conducting operations at Indian ports	Currently, there is no mechanism in place to promote usage of green fuel in vessels	Regulatory	Indian port authority to recognize any of the 4-5 key rating/ certification programs (e.g., RightShip GHG Emissions Rating, Environment Shipping Index, Green Award, Clean Shipping Index, Green Marine, Energy Efficiency Design Index) to offer discounts on port dues or any other form of incentives to promote operations of clean fueled vessels at port	Formulate a working group to review the existing rating/ certification programs	Q4 2023	MoPSW
					Submit a report on the existing rating/ certification programs covering following aspects: • Parameters covered by various rating/ certification programs • India's strategy on sustainable vessel operations • How different programs are aligned with India's strategy on sustainable vessel operations	Q1 2024	Working group

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					• Shortlisted programs for adoption by port authorities		
					MoPSW to seek stakeholders' feedback on the proposal	Q2 2024	MoPSW
					Submit the final proposal-based on stakeholders' feedback	Q3 2024	Working group
					MoPSW to issue guidelines to port authorities to recognize the shortlisted ratings/ certificate programs for offering discounts to ship liners which are complied with the shortlisted programs	Q4 2024	Major Port Authority
5.	Ports and related infrastructure are vulnerable to various kinds of natural and manmade disasters such as flood, cyclone, tsunami, earthquake, major fire, explosion, nuclear attacks, etc.	Existing DMPs of ports are not standardized Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Strengthen safety at ports to ensure 'Zero accidents' at Indian Ports 2 Strengthen training program for port workers through a 2-pronged approach to reach 100% staff trained on areas specific to their job 3 Conduct process reengineering by redesigning material handling operation at Indian Ports to reduce physical hazards at Indian Ports 4 Implement special medical or occupational health services dedicated for port workers aimed at providing swift essential aid for safety to reach 'days lost due to health/safety' to zero 5 Implement a medical monitoring program for port workers by driving active prescreening and regular documentation on monitoring of worker health throughout the work tenure	Regulatory	Aspects of DMPs towards extreme coastal extreme coastal climatic events and general areas of strengthening are discussed below: • Standard Operating Procedure- Fill gap(s) in the DMPs by cross port audits and adopting best practices of other ports. Further, ports can standardize their DMP format for better implementation and quick familiarization. • Early warning systems - Establish early warning system for Tsunami preparedness. Additionally, put in place hotline between ports to India Meteorological Department (IMD) and District DM for pre-event and post event coordination. Further, usage of harmonized system codes should be encouraged for emergency communication and coordination through walkie talkies. • Post event immediate relief- Recovery activities to be conducted within a week post disaster like debris removal, corpse management, medical facilities, medical relief, food (community kitchens), supply of clean water, etc. should be included in DMP. Delegation of Authority should be put in place for spending of CSR funds for post event relief activities. • Mock Drills- Disaster specific mock drill should be conducted to check the effectiveness and to identify gaps in existing DMP • Climate change response and adaptation- Ingrain resilience to extreme climatic events in port operations and maintenance activity. Rebuilding of damaged infrastructure should be taken up on the basis of "Build Back Better" principle which aims at reducing the risk to the people of nations and communities in the wake of future disasters and shocks	Establish working group to review existing DMPs of all ports	Q2 2024	MoPSW
					Prepare a template considering best-in class practices and National Disaster Management Plan	Q3 2024	Working Group
					Seek stakeholders' feedback and submit the final template for approval to MoPSW and National Disaster Management Authority	Q4 2024	Working group
					Port authority to align their respective DMPs as per the approved template	Q1 2025	Major Port Authority
					Periodically update the template based on learnings from various events	Continuous process	Major Port Authority

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		6 Enhance infrastructure capabilities of existing hospitals, bed and staff via viable model of PPP 7 Build a real time monitoring program to track key HSE KPIs across ports, shipyards, and ship recycling areas 8 Drive adherence to National Action Plan for green shipping for safety and quality of vessels; ensure uniform HSSE regulations and policies across all ports					
6.	Port operators have no mechanism in place to monitor activities related to sustainability of ports	Currently, there is no framework to monitor sustainability of ports at regular intervals Projects already identified under the initiative: - (Source: **MIV 2030**) Ensure adequate provisions in the Land Use Policy to support various collaboration models (central/state govt. , industrial bodies, etc.)	Guidelines	A Sustainability tool kit to be developed to monitor performance of ports across these 13 areas - Land use planning, Air Quality, Soil & ground water quality, Modalities & connectivity, Dredging impacts, Sound impacts, Climate adaptation, Habitat & species health, Surface water & sediment quality, Ship related waste management, Sustainable resource management, Landscape management & quality of life, Energy & climate change mitigation The exercise would be repeated at regular intervals (6-12 months) or after every significant intervention to assess the impact	Conduct discussion with port authorities and other stakeholders on following aspects across 13 identified areas for sustainability of ports: 1. Key parameters to be assessed under each area 2. Existing and proposed mechanisms to capture the parameters 3. Composition of PMU team for monitoring	Q1 2024	MoPSW
					Prepare tender document containing scope of work, evaluation criteria for the bidders and other necessary information as deemed fit	Q2 2024	MoPSW
					Conduct tender process and select the consultant for preparation of monitoring tool kit covering key monitoring parameters under each area, mechanism to capture data, responsibility matrix and monitoring frequency	Q3 2024	MoPSW
					MoPSW to conduct meeting with port authorities and other concerned entities to set up the monitoring mechanism of each parameter	Q4 2024	MoPSW
					Port authorities and concerned entities to operationalize the monitoring mechanism as per the guidelines	Q3 2025	Major Port Authority

Green Shipping

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Lack of a dedicated cell for decarbonization roadmap development	Decarbonisation Cell formation	Institution	To work on Building strategic regulatory frameworks/ propose policies Pilot vessel development and other green initiatives Collaborative research & partnerships with leading nations Green technology enablement	Select areas for Decarbonization cell across IMO GHG strategy & 2050 targets	Q4, 2023	MoPSW/ DGS/ CSL
					Nominate atleast two official each from CSL, Major ports, IMU and IRS who will form the core team of cell (at Director level) with clearly defined areas of work such as policy making, alignment with IMO green objectives, design & technology, decarbonization regulations, monitoring & tracking of decarbonization initiatives)	Q4, 2023	MoPSW/ DGS/ CSL
					Recruitment/ onboarding of dedicated workforce	Q4, 2023	MoPSW/ DGS/ CSL
					Conduct MoUs with MNRE, MoEFCC, MoC and other agencies with clearly defined scope of work and areas of cooperation	Q4, 2023	MoPSW/ DGS/ CSL
					Develop India's decarbonization roadmap outlining the need for specific policies; initiatives being/ to be taken by major ports and shipping industry; technology & R&D initiatives.	Q2, 2024	Decarbonisation cell
					Define plan of action for next 1-2 years for areas of work which decarbonisation cell will work on	Q4, 2024	Decarbonisation cell
2	Need funding to support decarbonization implementation initiatives	Set up initial corpus based Green Shipping fund	Institution		Preliminary study to calculate the fund corpus	Q4, 2023	DGS/ CSL
					Proposal to MoPSW to provide required corpus highlighting needs and benefits of such fund	Q4, 2023	MoPSW
3	Lack of technology to develop Green fuel vessels	Develop cutting edge technology vessel development with pilot runs	Technology	To develop Green fuel enabled vessels	1 Hydrogen fuel ferry in Varanasi (100 pax ferry with 2x25 kWh H2 fuel & 6 KWh solar plant (research committee of MoPSW has granted in-principle approval for funding 75% of project cost)	Q4, 2023	Decarb cell/ CSL
					Electric Catamaran ferry - water taxies with 40 pax & 120 kWh battery	Q4, 2024	Decarb cell/ CSL/ IWAI
					Hybrid electric Ro-Ro ferry with 50 pax capacity, 12 cars & 3 trucks with 240~300 kW installed power & ~10kW solar PV & 100 kWh battery	Q4, 2024	Decarb cell/ CSL/ IWAI
					Hybrid LNG electric cargo carriers with 2 LNG powered generators of about 1.5 MW	Q4, 2026	Decarb cell/ CSL/ IWAI
					Hybrid tug with 2 Diesel generator of approx. 2.8 MW & battery storage of 600 kWh	Q4, 2026	Decarb cell/ CSL/ JNPT

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Conversion of existing Container Ro-Ro ferry operating in Kochi to duel fuel – LNG & Diesel	Q2, 2027	Decarb cell/ CSL/ IWAI
					Green Hydrogen/ Ammonia propelled Coastal cargo bulk carrier (min. 8000 T capacity)	Q4, 2028	Decarb cell/ CSL/ Port
					Green Hydrogen/ Ammonia propelled offshore vessel	Q4, 2029	Decarb cell/ CSL/ Port
					Green Hydrogen/ Ammonia tugs each at select 4 major ports	Q4, 2031	Decarb cell/ CSL/ Port
4	Capital cost of Green vessels are ~30% higher than that of traditional fuel vessels	Extension of Ship building financial assistance policy for Green vessels for another 10 years with ~30-40% assistance (including retrofitting	Policy	To support private players to shift towards green fueled vessels	Prepare a proposal with rationale behind the suggested action and send it to the MoPSW for approval	Q1, 2024	CSL/ INSA
					MoPSW to extend the proposal to Ministry of Finance (MoF) with budget corpus requirement	Q2, 2024	MoPSW
					Approval from MoF and issue a circular with full disclosure of terms and conditions	Q3-Q4, 2024	MoF
5	Capital cost of Green vessels are 20-30% higher than that of traditional fuel vessels	Green incentive program with rebate in tonnage tax and vessel registration fees for vessels demonstrating better EEDI	Policy	To support private players to shift towards green fueled vessels	Detailed study on suitable operational incentives to shipping lines demonstrating EEDI more than what is required	Q4, 2023	DGS
					Approval from competent authority (MoPSW, Income tax department, major ports etc.) based on type of incentives	Q4, 2023	MoPSW
					Issue of incentive scheme	Q4, 2023	MoPSW
6	Need to align with IMO Green strategy	Ratification of green conventions	Policy	Ballast Water Management Convention 2004 International Convention relating to Intervention on the High Seas in cases of Oil Pollution Casualties 1969 (Intervention 1969) Protocol relating to Intervention on High Seas in cases of pollution by substances other than oil 1973 London convention & London Protocol	Preparation of SOP by IMO cell for ratification of conventions	Q4, 2023	IMO cell/ DGS
					Ratification of conventions already shortlisted	Q4, 2024	IMO cell/ DGS
					Preparation of SOP by IMO cell to develop rules for new conventions/ update rules for existing conventions	Q4, 2023	IMO cell/ DGS
					Preparation of rules for new Conventions to be ratified in Q4, 2023	Q4, 2025	IMO cell/ DGS
7	Need to align with IMO Green strategy	Extension of PLI scheme for Marine (Hydrogen) fuel cells and Ammonia marine engines	Policy	To support manufacturers to invest in Green fuel	Preparation of proposal for inclusion of Marine hydrogen fuel cells and Ammonia marine engines in PLI scheme with funding corpus	Q4, 2023	MoSPW
					Approval & implementation of scheme	Q1, 2024	MoPSW/ Ministry of Electronics & Information technology
8	Need to align with IMO Green strategy	Inclusion of environmental requisites (energy efficient designs) in public procurement processes for	Policy	To mandate players to follow green shipping obligations	Study to identify environment requisites to be included	Q4, 2023	MoSPW through in-house study/ consultancy
					Preparation of Draft RFP conditions	Q2, 2024	MoSPW through in-house study/ consultancy

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		domestic/ short sea shipping ferries, OSVs, PSVs, Port vessels, cruise and cargo vessels			Development of Revised public procurement guidelines	Q3, 2024	MoSPW through in-house study/ consultancy

THEME 2: PROMOTE OCEAN, COASTAL AND RIVER CRUISE SECTOR - IMPLEMENTATION PLAN

Implementation Plan for Infrastructure, Institutional, Capacity Building and Technology Initiatives

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Lack of a dedicated team to monitor the sector growth and take necessary act	Dedicated cruise action team Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Establish a dedicated cruise action team Indian Maritime Centre to establish strong governance and overview mechanism for promotion and development of the sector	Institution	Establish a dedicated Cruise action team, governed by Executive committee of "Indian Maritime Centre" or the "Tourism Ministry of India" has been proposed to manage the sector growth. This action team will act as a single point of contact for all public and private stakeholders for cruise industry in India.	Prepare roles and responsibilities for Cruise Action team	Q1, 2024	MoPSW
					Select representatives from concerned ministries. Proposed from • Ministry of Ports, Shipping & Waterways • Ministry of Tourism State tourism departments	Q1, 2024	MoPSW
					Hire dedicated workforce	Q2, 2024	MoPSW
2	Cruise tourism in India has remained limited to four major ports - Mumbai, Mormugao (Goa), New Mangalore & Cochin. Vizag and Chennai do have port infrastructure but have not been explored by cruise liners.	Improvement of infrastructure of the current and potential new ports Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Infrastructure development and enhancement at select 12 ports for domestic and international cruise terminal development	Infrastructure	Develop 10 new cruise ports and upgrade 6 existing ports.	Conduct a study to • Identify additional locations viable for cruise tourism as well as assessment of infrastructure improvement at existing locations • Capital expenditure requirement • Business modality assessment	Q1, 2024	SDCL/ Cruise Action team
					Floating of RFP for construction	Q2, 2024	SDCL/ Cruise Action team
					Upgradation of exiting ports Completion of new infrastructure development	Q4, 2025 Q4, 2030	SDCL/ Cruise Action team/ MoPSW
3	Lack of dedicated promotional and marketing campaigns makes it hard to attract international cruise liners	Dedicated promotional and marketing campaigns Projects already identified under the	Marketing and promotion	The global cruise industry is likely to spread out from the current cruising sectors of Caribbean, Mediterranean, China, etc., and find new destinations. India can be a promising alternative, given a long coastline and multiple tourist attractions encompassing Wellness, Culture, Ayurvedic, Beaches and Pilgrimage. Therefore, it is important that India builds its brand as a viable cruising destination and a unique cruise opportunity	Preparation of a marketing roadmap for next 2-3 years	Q4, 2023	Cruise Action team
					Implementation of the roadmap	Q4, 2023 onwards	Cruise Action team

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		initiative: - (Source: **MIV 2030**) 1 Dedicated promotional and marketing campaigns to activate and attract global cruise lines and passengers 2 Drive five demand enablers identified to generate awareness for cruise sector					
4	Despite the presence of Maritime Training Institutes (MTIs) and hospitality institutes, the training required for the scale of operations on cruise ships, merits the establishment of a world-class training facility in India	Establish 3 dedicated cruise training academies in partnership with Global Cruise lines to enhance availability of competent talent for cruise ships Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Establish dedicated cruise training academies in partnership with Global cruise lines to enhance availability of competent talent for cruise ships	Capacity Building	For further growth and efficient operation of the cruise industry, it is proposed to establish three dedicated cruise training academies in partnership with Global Cruise lines to enhance availability of competent talent for cruise ships.	Establish partnership with one or multiple International institutions for setting up the training center	Q1, 2024	Cruise Action team/ MoPSW
					Finalize the training curriculum accreditation for the training centre	Q2, 2024	Cruise Action team
					Develop training centres at Goa, Kerala and West Bengal (Potential locations)	Q2, 2025	MoPSW
5	Despite having 14,500 Km of inland waterways, river cruising is not fully explored in India	Development of River & Inland cruises Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Terminal infrastructure and ecosystem development at 4 theme based coastal destination circuits to activate cruise demand 2 Holistic development for island infrastructure and ecosystem across Andaman and Lakshadweep to make them an	Infrastructure	Potential on NW 97, NW 8, NW 73 and NW 100 for cruising subject to demand/ proposals received from State Government/ Tourism Department.	Conduct discussions with State Govts for identify potential areas for cruising/ ferry	Q4, 2023	IWAI
					Provide Infrastructure support	Q1, 2024	IWAI

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		attractive cruise destination 3 Development of terminal infrastructure and creation of concrete and floating pontoon jetties across the identified circuits for cruise operations					
6	With modern navigational and digital instruments, ships arriving at Indian ports are no longer guided by the Light Houses and are unnecessarily charged for the same	Transform lighthouses as tourist areas for recreational facilities Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Development of 13 lighthouses as day excursion destinations for attracting coastal and ocean cruise passengers	Infrastructure	All the light houses be transformed to tourist areas where recreational facilities are created for the benefit of visiting tourists.	Conduct a study to develop light houses in phased manner (68 light houses)	Q4, 2023	Cruise action team/ Ministry of Tourism
					Development of light houses	Q2, 2024	Ministry of Tourism
7	Despite having good water connectivity, currently, there is no ferry service operational between India and its neighboring countries	Introduction of ferry service between Karaikal and Jaffna (Sri Lanka) Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Development of domestic and international ferry circuits (Sri Lanka) to promote movement of passengers and cruise	Institution	The ferry service will connect India and Sri Lanka via coastal route with 2-3 hours journey and low-cost trips than airways	Prepare a proposal for the Ministry of External Affairs with all requisite information and disclosures for discussion with government of Sri Lanka for operationalization of Karaikal – Jaffna ferry service	Q4, 2023	MoPSW
					Hold up talks and agree for operationalization of the proposed route	Q4, 2023	MEA/ Both Govts
					Prepare and sign MoU/ Agreement with Sri Lanka on clearly defined scope of work, roles, responsibilities, and areas of funding & cooperation	Q4, 2023	MEA/ Both Govts
					Finalize a mutually accepted governance structure with Sri Lanka having • Council of Ministers (Minister of Shipping) • Director General of Shipping • Joint Shipping Committee • Promotion Centre	Q1, 2024	MEA/ Both Govts
					Appoint members in Joint Shipping Committee & Promotion Centre	Q1, 2024	Both Govts
					Prepare SOPs for operations	Q1, 2024	Joint Governance Committee
8	No infrastructural/ terminal capabilities are present in the shortlisted O-D pair	Setting up of Infrastructure capabilities for ferry service between Karaikal and Jaffna (Sri Lanka) Projects already identified under the	Infrastructure	Lack of infrastructure facilities is hindering the growth potential of Indian waters. Construction/ reconstruction of jetties/terminals will help unlock the true potential of International and domestic ferry service and prove to be a major catalyst for the Indian economy	Conduct infrastructure vetting and a detailed study on the infrastructure availability and requirement	Q1, 2024	SDCL/ Joint Governance Committee
					Construction and setting up of port, terminal infrastructure and ancillary infrastructure at both Karaikal and Jaffna	Q2, 2025	SDCL/ Joint Governance Committee

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		initiative: - (Source: **MIV 2030**) 1 Development of terminal infrastructure and creation of concrete and floating pontoon jetties across the identified circuits for cruise operations					
9	Despite having good water connectivity, currently, there is no ferry service operational between India and its neighboring countries	Introduction of ferry service between Kolkata and Chattogram (Bangladesh) Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Develop additional cruise, ferry and cargo connectivity routes to neighboring countries to establish maritime leadership position	Institution	The ferry service will connect India and Bangladesh via coastal route with 2-3 hours journey and low-cost trips than airways	Hold talks and agree for operationalization of the proposed route	Q4, 2023	MEA/ Both Govts
					Amend Coastal Shipping Agreement (CSA) with inclusion of ferry services and clearly defined scope of work, roles, responsibilities, and areas of funding & cooperation	Q1, 2024	MEA/ Both Govts
					Prepare SOPs for operations	Q4, 2023	Joint Governance Committee under CSA
10	No infrastructural/ terminal capabilities are present in the shortlisted O-D pair	Setting up of Infrastructure capabilities for ferry service between Kolkata and Chattogram (Bangladesh)	Infrastructure	Lack of infrastructure facilities is hindering the growth potential of Indian waters. Construction/ reconstruction of jetties/terminals will help unlock the true potential of International and domestic ferry service and prove to be a major catalyst for the Indian economy	Conduct infrastructure vetting and a detailed study on the infrastructure availability and requirement	Q4, 2023	SDCL/ Joint Governance Committee under CSA
					Construction and setting up of port, terminal infrastructure and ancillary infrastructure at both Karaikal and Jaffna	Q1, 2025	SDCL/ Joint Governance Committee under CSA
11	Indian ferry service is untapped and has the potential to transform the maritime economy subject to a suitable business modality	Operationalize Indian domestic ferry service across select O-D pairs	Operations	A standardized business model needs to be established for proper functioning of the current and future projects	Route identification – 30 O-D pairs identified based on initial interest from parties, but a detailed assessment is required to ascertain project viability, traffic visibility and business modality	Q4, 2023	SDCL/ MoPSW
					Conduct infrastructure vetting and a detailed study on the infrastructure available on shortlisted routes and requirement	Q4, 2023	SDCL/ MoPSW
					Develop infrastructure by Govt.	Q4, 2025	SDCL/ MoPSW
12	Indian ferry service is untapped and has the potential to transform the maritime economy subject to a suitable business modality	Enablement of Operational subsidy	Operations	To tap private players, suitable operational subsidies to be provided for an initial period, till market establishes	Send representation to Income Tax department on reducing taxes on fuel by 50% for 10 years and approval	Q4, 2023	SDCL/ MoPSW
					Send representation to state Govts for providing power and water at concessional rates and approval	Q4, 2023	SDCL/ MoPSW
					Approval on exemption on Port dues and terminal handling charges for 10 years from MoPSW	Q1, 2024	SDCL/ MoPSW
					Prepare and issue RFP for operationalization of service for which infrastructure shall be established	Q2, 2024	SDCL/ MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Start of operations	Q2, 2026	SDCL/ MoPSW
13	Indian ferry service is untapped and has the potential to transform the maritime economy subject to a suitable business modality	Standard designs for jetty development based on zonal categorization	Infrastructure	Major parameters that govern type of infrastructure depends are various factors. If there is a standardization of the infrastructure at berths available, then it is much easier to fix up the vessel, its modifications and operationalization	Approval of low-cost standard designs	Q4, 2023	IIT Madras & IRS
					Development of standard design guidelines for development of berths based on zonal categorization and type of movement (only passenger/ Ro-Ro/ Ro-pax)	Q1, 2024	MoPSW

Implementation Plan for Tax, Regulatory and Policy Initiatives

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Domestic passengers sailing on domestic sector are not entitled to buy duty free products on the cruise ships and in case where passengers make any on-board transaction, they will have to pay customs duty when they disembark at the next port. This is making cruises unattractive for domestic passengers	CBIC notification dated 4th October 2018	Tax and duties	Zero taxation for on-board transactions for a period of 10 years	Prepare a proposal with detailed rationale and send to CBIC, MoF for approval	Q4, 2023	MoPSW
					CBIC, MoF to review the proposal and approve	Q1, 2024	CBIC, MOF
					Issue of notification	Q1, 2024	CBIC, MOF
2	Cruise ships have legal obligation to pay customs duty on consumption of products including alcohol. Further, computation of custom duties presently levied for consumption within 12 nautical miles from Indian shores involves cumbersome paperwork and manpower	CBIC notification dated 4th October 2018 Projects already identified under the initiative: - (Source: **MIV 2030**) Custom charges optimization and standardization to ease passenger movement	Tax and duties	Customs duty payment for consumables may be exempted for a period of 10 years. If exemption is not possible, a flat rate per passenger should be charged with no paperwork. In case, flat rate is also not acceptable, then a simple declaration of consumption from the Master of the ship should be referred for custom duties	Prepare a proposal with detailed rationale and send to CBIC, MoF for approval	Q4, 2023	MoPSW
					CBIC, MoF to review the proposal and approve	Q1, 2024	CBIC, MOF
					Issue of notification	Q1, 2024	CBIC, MOF
3	India imposes 18% GST on cruise passengers' tickets compared to airlines where only 5% GST is imposed for Economy class and 12% for Business class	CBIC rate notification IGST - 14.06.2021, row 8 item (vii) (code 9964) Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Streamline GST related issues for cruise terminal/line operators	Tax and duties	18% GST from passenger tickets to be reduced to a lower rate in the range of 5-12% as in case of airlines	Conduct feasibility study to assess the impact of revision in tax and send representation to GST council	Q4, 2023	MoPSW
					GST council to conduct meeting and approve the revised rates	Q1, 2024	GST Council
4	India imposes GST of 18% on commission of General Sales Agent / Preferred Sales which is not the case with other countries	CBIC rate notification IGST - 14.06.2021, row 5 (code 9961)	Tax and duties	Reduce GST to 5% on agent commission from current 18% GST	Conduct feasibility study to assess the impact of revision in tax and send representation to GST council	Q4, 2023	MoPSW
					GST council to conduct meeting and approve the revised rates	Q1, 2024	GST Council
5	Charge of INR 8/Ton on Net weight on international cruises or Indian cruises entering Indian waters from another region. At present, all vessels are equipped with GPS and don't	Section 13 of the Light House Act, 1927	Tax and duties	Cease charging lighthouse dues to cruise vessels	Conduct feasibility study to assess the impact of revision and send representation to Directorate General of Lighthouses and Lightships	Q4, 2023	MoPSW
					Directorate General of Lighthouses and Lightships to conduct meeting and approve	Q1, 2024	GST Council

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	require the services of lighthouses	Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Implement specific changes in key legislation to address issues in the sector -Light House and Light ships Act					
6	Cabotage law was seen to be protectionist and aimed at shielding Indian shipping from foreign competition. This proved to be counterproductive for India	India's cabotage policy, part of the Merchant Shipping Act, 1958	Policy & Regulatory	Cabotage relaxation, which is valid till Feb 2025, needs to be extended until at least Feb 2030 or cabotage law should be permanently abolished to enable foreign flag vessels to carry passengers to call on Indian ports without obtaining a license from the Director General of Shipping	Conduct a study for the relaxation of India's cabotage policy	Q1, 2024	DG Shipping
					Approval from MoPSW & Issue of circular	Q2, 2024	DG Shipping/ MoPSW
7	E-visa facility is limited to only five seaports	-	Policy & Regulatory	To be extended to other Indian ports such as Andaman & Nicobar Islands, Lakshadweep, Porbandar, Dui and Kolkata	MoPSW to send representation to MHA/ MEA	Q4, 2023	MoPSW
					MHA/ MEA to review the representation and approve	Q1, 2024	MHA/ MEA
					Issue of circular	Q1, 2024	MHA/ MEA
8	Standardized Operating Procedures (SOPs) for cruise vessels have been revised and operationalized w.e.f. November 2017 at all major ports, but same needs to be updated in line with international standards and strictly adhered	- Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Development of new Standard Operating Procedures (SOPs) and training manuals for immigration center, ports, PHO, CISF etc. 2 Development of a comprehensive River cruise policy with standardized SOPs	Regulatory	SOPs across the value chain (arrival process, terminal facility operations, and departure process) are necessary to ensure uniform and coordinated implementation across all cruise terminals.	Create a committee for SOP updation and implementation	Q4, 2023	MoPSW
					Scrutinize and update the SOP in line with international standards	Q1, 2024	SOP Committee
					Monitor implementation of SOP in all ports by all agencies uniformly	Q2, 2024 onwards	SOP Committee
9	Indian cruise tourism is at nascent stage and need support from govt for overall development	- Projects already identified under the initiative: - (Source: **MIV 2030**) Finalize Public Private Partnerships model for cruise terminal operations and management under O&M model with trunk infrastructure created by Centre/State	Tax	Tax holiday may be provided for cruise tourism industry for a period of 5 years	MoPSW to send representation to Income tax department	Q4, 2023	MoPSW
					Income tax department to review the representation and approve	Q1, 2024	Income Tax department
10	Different acts have different rules for ferry licensing which creates confusion	-	Policy	A single website (portal) for all vessels where activities can be carried out centrally and the monies can be transferred to the respective bodies	On board a system integrator for development of website	Q4, 2023	IPA, IWAI
					Collate information of the current licensing authorities - their jurisdictions, limits of IV vessels etc.. and populating the portal with database	Q1, 2024	IPA, IWAI
					Pooling personnel of state governments, who by deputation can render services centrally	Q2, 2024	IPA, IWAI

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
11	Different acts have different rules for ferry licensing which creates confusion	-	Policy	A single set of rules that explicitly defines a vessel type to avoid complicating definitions and interpretation across various rules/ acts	Development of new policy to have standard set of rules and definitions	Q1, 2024	IPA, IWAI
					Scrapping of existing acts that are obsolete and several Government orders that are issued in the domain.	Q2, 2025	IPA, IWAI
12	No single point information portal for ferry information	-	Policy	Bhuvan portal to include information on inland and coastal navigation zones, jurisdiction, ferry licensing, permits and registrations	Development of portal and populate readily available date with NRSC ISRO for facilitating navigation, identifying jurisdiction of respective authorities, their contact websites, addresses and other useful data by coordinates	Q1, 2024	IPA, IWAI

THEME 3: ENHANCE TRANSPORTATION THROUGH COASTAL AND INLAND WATERWAY - IMPLEMENTATION PLAN

Implementation Plan for Infrastructure, Institutional, Capacity Building and Technology Initiatives

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Smaller parcel size of individual players and lack of agglomeration	Port based Agglomeration centres Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Steel: Develop coastal circuits for steel and agglomeration centers to drive growth of steel coastal cargo	Infrastructure	To reduce overall cost and for quick turnaround	Discussion with Anchor steel players (e.g. SAIL) on their interest for development of Infra (individual/ jointly)	Q4, 2023	SDCL
					Frame Agreement	Q4, 2023	SDCL
					Development of Agglomeration centres	Q4, 2024	SDCL
					Conduct studies to see viability on other locations	Q1, 2024	SDCL
2	Inadequate handling and storage infrastructure at ports	Port based warehouses/ silos Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Cement: Build silo infrastructure to improve coastal vessel turnaround time at targeted ports and drive additional cement coastal demand 2 Food grain: Establish food grain depots near 6 ports (Chennai, NMPT, Cochin, Tuticorin, Karaikal, Mormugao) in coordination with FCI 3 POL: Ensure infrastructure readiness to	Infrastructure	To reduce overall cost &for quick turnaround	Detailed study to identify the potential locations (over 20)	Q2, 2024	SDCL
					Discussion with FCI & cement players on infrastructure development modalities	Q2, 2024	SDCL
					Frame Agreement	Q2, 2024	SDCL
					Development of Silos/ Warehouses	Q2, 2025	SDCL
					Policy to allow movement to multiple coastal districts from a port-based warehouse	Q1, 2025	SDCL
					Devise mechanism for FCI to share cost saving from port-based warehouse with the state	Q1, 2025	SDCL

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		support POL coastal cargo increase projected by 2030 4 Drive coastal cargo adoption of other commodities (e.g., container cargo) across major and minor ports 5 Deploy commodity-specific ancillary services & facilities (such as faster food testing by FSSAI) at ports					
3	High first and last mile cost	Coastal berths Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Promoting captive jetties 2 Formulate incentives for promoting coastal shipping in India	Infrastructure	To reduce overall cost &for quick turnaround	Detailed study to identify the potential locations (over 20)	Q1, 2024	SDCL
					Access the viability to develop coastal berths with financial assistance from “Coastal Berth Scheme” launched by MoPSW	Q1, 2024	SDCL
					Development of coastal berths	Q4, 2026	SDCL
4	Inadequate connectivity of ports/ berths with origin/destination centers, restricting coastal movement of cargo	Last mile connectivity projects Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Push for implementation of port connectivity projects (e.g., mine to port via rail) and drive coastal coal adoption at western ports 2 Develop 10 Ro-Ro terminals in partnership with State government 3 Develop Ferry terminals across 60+ locations in partnership with State government on Arth Ganga model	Infrastructure	To reduce overall cost &for quick turnaround	Detailed study to identify the potential locations (~6 ports)	Q1, 2024	SDCL
					Agreement with with Ministry of Road Transport and Highways (MoRTH) & Ministry of Railway (MoR) for last mile connectivity development	Q2, 2024	SDCL
					Development of last mile connectivity infrastructure	Q4, 2026	SDCL
5	Concept to be explored	Tidal mini ports	Infrastructure	To reduce overall cost &for quick turnaround	Detailed study to analyse viability of Tidal mini ports development along with potential locations (Gujarat has potential for such development)	Q4, 2023	SDCL
					Development of mini ports in association with State Govt.	Q4, 2025	SDCL
6	Despite being operation, very limited cargo movement as fully potential not being realized	Development on NW-1	Infrastructure	To enable modal shift to waterways	Development of navigation lock at Farakka along NW 1	Q4, 2023	IWAI
					Construction & operationalization of Haldia multi-modal terminal	Q4, 2023	IWAI

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Operationalize 23 waterways by 2030 through infrastructure enhancement (10 out of 16 functional and 7 new waterways), fairway development, navigational aids and RIS provisioning (Kindly refer to annexure 2.1 for details on projects)			Navigational Aids deployment & RIS stations (O&M and CMC operationalization)	Q2, 2025	IWAI
					O&M of Gaighat Terminal	Q3, 2025	IWAI
					Finalization of Concession Agreement of Sahibganj MMT	Q4, 2023	IWAI
					Operationalizing intermodal cargo terminals at Kalughat, Ghazipur	Q2, 2025	IWAI
					Completion of Assured depth contract: Sultanganj – Mahendrapur stretch	Q3, 2025	IWAI
					Completion of Assured depth contract: Mahendrapur – Barh stretch	Q3, 2025	IWAI
					Completion of Assured Depth contract (Farakka – Kahalgaon)	Q1, 2025	IWAI
					Implementation of Arth Ganga Program	Q4, 2025	IWAI
7	Despite being operation, very limited cargo movement as fully potential not being realized	Development of multi-modal hubs near waterways for cargo aggregation and transshipment	Infrastructure	To reduce first & last mile cost	Land acquisition for ICLP Sahibganj	Q4, 2023	IWAI
					Land acquisition of Freight Village at Varanasi	Q4, 2024	IWAI
					Finalizing Concession Agreement for operationalisation of ICLP at Sahibganj	Q4, 2025	IWAI
					Finalizing Concession Agreement for operationalisation of Freight Village at Varanasi	Q4, 2026	IWAI
8	Despite being operation, very limited cargo movement as fully potential not being realized	NW2 & NW16 (North east waterways Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Operationalize 23 waterways by 2030 through infrastructure enhancement (10 out of 16 functional and 7 new waterways), fairway development, navigational aids and RIS provisioning	Infrastructure	To enable modal shift to waterways	Award of work for construction of Jogighopha terminal	Q4, 2023	IWAI
					Development of Boundary wall at IWAI parcels at Pandu, Neamati & Dibrugarh	Q4, 2023	IWAI
					Signing of Concessionaire agreement of Pandu & Dhubri Terminal	Q2, 2024	IWAI
					Upgradation of Badarpur & Karimganj	Q1, 2024	IWAI
					Award of work for Pandu ship repair facility	Q4, 2023	IWAI
					Award of Karimganj & Badarpur terminals on PPP basis	Q4, 2023	IWAI
					Updation of DPR for NW2	Q4, 2024	IWAI
					Construction & Operationalization of Pandu Ship repair facility	Q4, 2025	IWAI
					Completion of work for construction of Jogighopha terminal	Q1, 2026	IWAI
					Connectivity & widening of road from Pandu to NH & land acquisition	Q2, 2026	IWAI
					Award for improvement of existing approach road for Dhubri Terminal	Q1, 2026	IWAI
					Completion of improvement of existing approach road for Dhubri Terminal	Q2, 2027	IWAI
9		Other 13 National Waterways (NW9, NW86,	Infrastructure	To enable modal shift to waterways	SFC approval for undertaking development of proposed waterways	Q2, 2024	IWAI

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	Despite being operation, very limited cargo movement as fully potential not being realized	NW8, NW-27, NW68, NW111, NW3, NW97, NW10, NW44, NW4, NW57 & NW52 Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Operationalize 23 waterways by 2030 through infrastructure enhancement (10 out of 16 functional and 7 new waterways), fairway development, navigational aids and RIS provisioning 2 Enhance integration of inland waterway movement with coastal traffic through modification in vessel policy regulations			Facilitation of navigational aids in NW-4 (Phase-I: 80 Kms)	Q2, 2024	IWAI
					Providing Floating pontoons in Goa Waterways and additional navigational aids if required (NW-27,68 & 111)	Q2, 2024	IWAI
					Establishment of River Information System on Goa Waterways (NW-27,68 & 111)	Q2, 2024	IWAI
					Providing floating pontoons on NW-97 along with additional navigation aids and River information system	Q2, 2025	IWAI
					Providing floating pontoons on NW-10, 86, 57 & 52 (one pontoon on each waterway)	Q2, 2025	IWAI
					Providing navigational aids and River Information System on NW-8 & 9	Q4, 2025	IWAI
					Establishing river information system on NW-3	Q4, 2024	IWAI
					Development of 03 number of RO-RO terminals on NW-4 along with River information system (need basis)	Q2, 2026	IWAI
10	Lack of private participation in IWT sector	Dedicated PPP cell Projects already identified under the initiative: - (Source: **MIV 2030**) Leverage private participation for terminal development and operations-Ro-Ro (OMT model); Ferry (DBFOT model) and Inter-modal/Multi-modal terminals (EOT/OMD models)	Institution		Establish dedicated PPP cell	Q2, 2024	IWAI
					Award PPP concession for upcoming cargo terminals across 15 waterways basis detailed assessment	Q2, 2027	IWAI
					Leverage private participation for developing ferry terminals on DBFOT model	Ongoing	IWAI
					Leverage private participation for developing Ro-Ro terminals on OMT model	Ongoing	IWAI
11	First & last mile cost makes IWT overall costly compared to other modes	DIPP policy to include provision for preference towards setting up new industrial centres / logistics hubs in proximity to NWs. Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Reduction in GST rate on input services availed by IWT operators to enable lower mismatch in GST input credit and reduce overall cost of operations	Policy	To reduce first and last mile cost	Preliminary study and draft proposal to DIPP to include provision for preference towards setting up new industrial centres / logistics hubs in proximity to NWs in their policy to promote cargo movement through national waterways which is an efficient and eco-friendly mode of transportation	Q4, 2023	IWAI
					Communication to various hinterland states benefitting from key national waterways to include such provisioning and emphasis in the respective state industrial policies	Q1, 2024	IWAI
					Development of a Joint Coordination Committee with representation from members of DIPP, relevant state industrial agencies, Indian Railways and IWAI to discuss and strategize efforts of Centre and States towards creation of future industrial and logistics land banks along national waterways	Q1, 2024	IWAI
					Preparation of SOP and detailed guidelines to include benefits and incentives	Q4, 2024	IWAI
12	Lack of dedicated cell for promotion and marketing	Coastal and Inland Cargo Facilitation Centre (CICFC)	Institution	To facilitate cargo movement	Set up a CICFC promotion cell in MoPSW headed by JS/ Director MoPSW & 2-3 internal members of MoPSW	Q4, 2023	MoPSW
					Set detailed scope of works and terms & conditions of the proposed centre	Q4, 2023	MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Establish a Coastal and Inland Cargo Facilitation Center (CCFC) under MoPSW to drive demand for coast cargo through outreach and collaborative planning with select PSUs, trade associations, private players and Rail/ road ministries 2 Enhance cargo movement across NWs through demand promotion and activation			Request nomination from other bodies including Logistics Division,State Maritime Boards, Indian Railways, NHAI, IWAI	Q4, 2023	MoPSW
					Hire dedicated workforce	Q1, 2024	MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
13	Inland waterways: Lack of sufficient LAD for commercial movement of cargo Navigation infrastructure has improved but is still inadequate for an 'all-weather' round-the-year movement. Major routes suffer from siltation, shifting of channels, challenging night navigation	Undertake dredging activities to improve India-Bangladesh IWT connectivity – Following projects are proposed along the key routes: • Dredging and navigation aids - Capacity augmentation (dredging & nav aids) of NW2 & NW16 • Dredging and navigation aids - Capacity augmentation (dredging & nav aids) of Kolkata – Mongla – Dhaka stretch • Dredging and navigation aids - Capacity augmentation (dredging & nav aids) of Dhulian to Aricha (route 5 & 6)	Infrastructure	Dredging along the key routes will allow commercial movement of large vessels which will in turn reduce transportation cost for end-users on account of economy of scale	Conduct detailed study on the identified projects which should cover following key areas • Budget requirement • Business model for dredging	Q4, 2023	IWAI
					Conduct discussion with Ministry of Ports, Shipping and Waterways (MoPSW) and Ministry of Finance (MoF) regarding the investment required to implement the identified projects and the proposed business model for dredging	Q4, 2023	IWAI
					MoPSW/ MoF to review the proposals concerning budget requirement and business model for dredging and provide approvals	Q4, 2023	MoPSW/ MoF
					Post receiving approvals, conduct a roadshow to gauge the interest of players in dredging activity under proposed business model	Q2, 2024	IWAI
					Conduct tender process and select the eligible bidder for implementation of the identified projects	Q4, 2025	IWAI
14	Inland waterways: Unavailability of vessel fleet - Vessel availability remains a significant challenge on Indian waterway routes and acts as an impediment to sector growth.	Increase vessel fleet in the sector with suitable PPP models	Infrastructure / Equipment augmentation	Different type of business models is proposed for procurement,	Review all the three proposed models along with budget requirement to execute model 1 and 2	Q4, 2023	SDCL/ IWAI

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				operation, and maintenance of vessels Model 1: Capital investment by government, Operations to private with no demand risk Model 2: Procurement & maintenance and operations by private players, lease revenue protection by government; Operating cost recovery through end user fee Model 3: Full demand risk transferred to private sector once baseline of strong performance on waterways established on key routes	Conduct discussion with Ministry of Ports, Shipping and Waterways (MoPSW) and Ministry of Finance (MoF) regarding the budget requirement and the proposed business models for procurement, operation, and maintenance of vessels	Q4, 2023	SDCL/ IWAI
					MoPSW/ MoF to review the proposals concerning budget requirement and business model for procurement, operation, and maintenance of vessels	Q4, 2023	MoPSW/ MoF
					Post receiving approvals, conduct a roadshow to gauge the interest of private players in operations of vessels under model 1	Q1 2024	SDCL/ IWAI
					Identify number of vessels to be procured under model 1 including finalizing the technical specifications	Q2 2024	SDCL/ IWAI
					Form SPV between SDCL and Cochin Shipyard Limited	Q3 2024	SDCL/ IWAI
					Prepare procurement documents and invite quotation from Indian shipyard/ foreign shipyards for procurement of vessels	Q4 2024	SPV (SDCL & CSL)
					Finalize the quotation and procure the vessels from Indian shipyards/ foreign shipyards	Q1 2025	SPV (SDCL & CSL)
					Conduct tender process and select the eligible bidder under model 1	Q2 2025	SPV (SDCL & CSL)
					Once, cargo visibility is established in the inland waterways sector, conduct a roadshow to gauge the interest of private players in model 2	Q1 2030	SDCL/ IWAI
					Identify number of vessels to be procured under model 2 including finalizing the technical specifications and prepare tender documents	Q2 2030	SDCL/ IWAI
					Conduct tender process and select the eligible bidder under model 2	Q3 2030	SDCL/ IWAI
					Once the sector is fully established, conduct a roadshow to gauge the interest of private players in model 3	Q1 2035	SDCL/ IWAI
					Identify number of vessels to be procured under model 3 including finalizing the technical specifications and prepare tender documents	Q2 2035	SDCL/ IWAI
					Conduct tender process and select the eligible bidder under model 3	Q3 2035	SDCL/ IWAI
15	Inland waterways: Lack of sufficient LAD for commercial movement of cargo Navigation infrastructure has improved but is still inadequate for an 'all-weather' round-the-year movement. Major routes suffer from siltation, shifting of channels, challenging night navigation	Introduction of low draft designed vessels (tug-barge combination)	Infrastructure development/ Equipment upgradation	Tug-barge combination has following key features as compared to conventional vessels 1. More volumes in less draft 2. Reduction in transport cost	Design low draft tug barge flotilla as per IBP and NW river characteristics	Q4 2023	SDCL/ IWAI
					Conduct discussion with MoPSW and MoF regarding the applicability of low draft tug barge flotilla	Q4 2023	SDCL/ IWAI
					MoPSW/ MoF to review the proposal and provide approval	Q4 2023	SDCL/ IWAI

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				Standard low draft tug barge flotilla may be designed as per IBP river characteristics Typical arrangement plans of a tugboat in river Danube (EU) - Karadjordje L = 40.45 m B = 13.0 m H = 2.8 m Power = 3 x 1294 kW V = 14Km/h Load capacity = 12 barges of 1700 DWT each	Procure, operate and maintain the vessels as per the proposed models indicated above	Q4 2025	SDCL/ IWAI
16	Limited capacity at terminals and poor last mile connectivity	Upgradation of ports and improving last mile connectivity	Infrastructure development	Following key projects are proposed • Mechanization/ upgradation of Indian & Bangladeshi Ports - Uttarpara (near Dankuni /Tribeni) in India; regions near Chandpur, Khulna/ Narayanganj in Bangladesh • Upgradation of Ashuganj Port as a MMLP with RoRo facilities • Development of MMLPs Bogibeel & Silchar • New terminal development at Kolaghat • Improved last mile connectivity infrastructure	• Conduct feasibility study of Indian ports - Uttarpara (near Dankuni /Tribeni) and their last mile connectivity • Conduct tender process and select eligible bidders for the development of the project	Q4 2026	IWAI
					• Conduct feasibility study of Bangladesh ports – regions near Chandpur, Khulna/ Narayanganj and their last mile connectivity • Conduct tender process and select eligible bidders for the development of the project	Q4 2026	BIWTA
					• Conduct feasibility study of the project titled – “Upgrade Ashuganj Port as a multi-modal logistics hub with RO-RO facilities” and their last mile connectivity” • Conduct tender process and select eligible bidders for the development of the project	Q4 2026	BIWTA
					• Conduct feasibility study of the project titled “Development of MMLPs Bogibeel & Silchar” and their last mile connectivity” • Conduct tender process and select eligible bidders for the development of the project	Q4 2026	IWAI
					• Conduct feasibility study of the project titled “New terminal development at Kolaghat” • Conduct tender process and select eligible bidders for the development of the project	Q4 2026	IWAI
17	Limited capacity at terminals and poor last mile connectivity	Custom bonded terminal development/ upgradation at Maia – Godagari, with fairway development	Infrastructure development	Custom bonded terminal to have following key features: • Ro-Ro terminal at Maia & Godagari (with capacity of ~15 trucks of 20T) • Dredging works to increase the permissible draft for Ro-Ro vessels	• Conduct feasibility study of the project • Conduct tender process and select eligible bidders for the development of the project	Q1 2026	IWAI/ BIWTA

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				• 24X7 Customs and immigration services • Statutory clearances for proposed Ro-Ro Jetty as “Customs area” and necessary security clearances from central and state security agencies			
18	Limited capacity at terminals and poor last mile connectivity	Custom bonded terminals development/ upgradation at River Ichamati, with fairway development	Infrastructure development	Custom bonded terminal to have following key features: • Ro-Ro terminal at suitable location on River Ichamati (with capacity of ~12 trucks of 20T) • Dredging works to increase the permissible draft for Ro-Ro vessels • 24X7 Customs and immigration services • Statutory clearances for proposed Ro-Ro Jetty as “Customs area” and necessary security clearances from central and state security agencies	• Conduct feasibility study of the project • Conduct tender process and select eligible bidders for the development of the project	Q1 2026	IWAI/ BIWTA
19	Limited capacity at terminals and poor last mile connectivity	Custom bonded terminals development/ upgradation at Sonamura – Daudkhandi with fairway development	Infrastructure development	Custom bonded terminal to have following key features: • Terminal development/ upgradation at Sonamura*/ Srimantpur and Daudkhandi • Dredging works to increase the permissible draft • 24X7 Customs and immigration services • Statutory clearances for proposed Jetty as “Customs area” and necessary security clearances from central and state security agencies	• Conduct feasibility study of the project • Conduct tender process and select eligible bidders for the development of the project	Q1 2026	IWAI/ BIWTA
20	Limited capacity at terminals and poor last mile connectivity	Custom bonded terminals development/ upgradation at Dhubri – Chilmari with fairway development	Infrastructure development	Custom bonded terminal to have following key features: • Improved customs facility at Dhubri and Chilmari. (Customs officials have to travel 50 km to Chilmari to clear a consignment plus no modern-day technology is available at both the custom ports) • 18Dredging works to increase the permissible draft	• Conduct feasibility study of the project • Conduct tender process and select eligible bidders for the development of the project	Q1 2026	IWAI/ BIWTA
21	Limited capacity at terminals and poor last mile connectivity	Establish Storm shelters (3-4 nos)	Infrastructure development	Make provisions for the safety of vessels & establish storm shelters in the region	• Conduct feasibility study of the project • Conduct tender process and select eligible bidders for the development of the project	Q1 2026	Ministry of Shipping of respective countries

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				Shatnol, Chandpur, Mehendiganj, Char Bhairabi, Sandwip (Sarikait), Nolchira, NW 1, NW 2			
22	Inland waterways: Lack of communication infrastructure - IWAI's digital interventions not integrated with Bangladesh and other countries.	Communication infrastructure - Integration of existing digital initiatives - RIS, voyage planning, cargo booking Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Promote digitization of IWAI operations to increase efficiency	Infrastructure development	Digitalisation can help enhance efficiencies of all stakeholders in the waterways value chain including shippers and vessel operators, port operators, port authorities, government officials and end consumers through provision of better and reliable quality of service, accurate and up-to-date information as well as relevant data. Establishment of an integrated regional digital platform to provide a comprehensive solution that brings together all stakeholders. The platform may comprise of three main elements: (i) RIS; (ii) a data platform for barge operators, allowing them to control data on their vessels, voyages, cargo and crew; and (iii) integrating the data platform with booking and transport management platforms of shippers and logistics service providers.	Review the applicability of integrated digital platform along with stakeholders' feedback and assess the budget requirement and design specifications of the platform	Q1 2026	IWAI, BIWTA, Ministry of Shipping in respective countries/ Regional organization
					Conduct meeting with respective governments/ regional organization regarding the budget requirement for integrated digital platform	Q2 2026	
					Finalize design specifications of integrated digital platform and prepare tender documents	Q3 2026	
					Conduct tender process and select eligible bidder to implement the initiative	Q1 2027	

23	No commonly accepted model for integrated water management nor for navigation management	Strengthen the existing institutional structure between India & Bangladesh	Institutional	Three principal bilateral agreements on waterway trade exist between India and Bangladesh - PIWTT: Protocol on Inland Water Transit and Trade, CVA: Coastal Vessel Agreement and ACMP: Agreement on use of Chattogram and Mongla Ports administered by separate institutional structure
				
				It is suggested to strengthen the existing institutional structure between India & Bangladesh by
					• Government of India and Bangladesh to conduct joint discussion to receive approval on following aspects:
					
					  • Increasing the meeting frequencies of Shipping Secretary level talk from annual to half yearly
					  • Increasing the meeting frequencies of Standing Committees from annual to quarterly
					  • Enhancing role of Joint monitoring Committees to cover - infrastructure development, digital integration, policy implementation, trade facilitation, resolution of operational issues
						Q4 2023	Ministry of Shipping in India and Bangladesh

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				• Increasing the meeting frequencies of Shipping Secretary level talk from annual to half yearly and of Standing Committees from annual to quarterly • Enhancing role of Joint monitoring Committees to cover - infrastructure development, digital integration, policy implementation, trade facilitation, resolution of operational issues	Post receiving approval from respective government on above aspects, issue the guidelines/ mandate for the institutions to comply with	Q1 2024	
24	No commonly accepted model for integrated water management nor for navigation management	Establish regional governance structure to include countries like Nepal, Bhutan & Myanmar Set up a new institution for joint governance of eastern waterway grid with inclusion of countries – Nepal, Bhutan and Myanmar Functional scope to include regulatory, observatory, advisory services with representative from each member states	Institutional	Regional governance structure may form a four-tier structure • Principal Advisory Board (PAB) (to be led by Council of Ministers (Shipping) of respective countries) - Main decision-making body to amend/ adopt laws and coordinate policies. Promote Vision & Strategies. Discuss potential synergies. Select initiatives that the country will pursue and lead • Regional Group (RG) (To be led by Secretary (Shipping) of respective countries) - Seek consensus on specific initiatives— approach, boundaries, elements, and broad interventions • Agree on a mechanism for moving forward on specific initiatives • Working Group with Lead specialists (LS) (to be led by sector experts selected by Regional Group on mutual consensus (LS can be national of any of member countries) - Formulation of action plan in respective areas • Task Force/ Implementation team (External pool of experts) -	• Conduct joint discussion with all the concerned countries in the region –India, Nepal, Bhutan, Myanmar, Bangladesh regarding formation of regional governance structure and seek feedback • Seek approval from all the countries regarding formation of regional governance structure	Q4 2026	MoPSW
					Seek nominations from member countries to represent various bodies such as Principal Advisory Board, Regional Group, Task Force/ Implementation Team	Q4 2029	MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				For detailing, implementation and monitoring. Responsible for implementation of policies, ease of operations, project implementation etc.	Enter into an agreement with all the concerned countries government. The agreement should clearly delineate roles and responsibility of each body and decision-making process for effective function of the regional institution	Q4 2031	
25		Increase investment in strategic ports to deepen economic and security cooperation with its maritime neighbours • Duqm port, Oman • Sittwe, Kyaukpyu and Dawei ports, Myanmar • Trincomalee, Sri Lanka, • Payra port Bangladesh	Strategic investment		Conduct meetings with respective Government to understand their future plan of actions on selected terminals	Q1 2047	MEA
					Identify areas where India can support respective Government in meeting their future plan of action		
					Prepare proposals and seek comments/ feedback from respective Governments		
					Formulate and sign agreements with the governments		

Implementation Plan for Tax, Regulatory and Policy Initiatives

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	No input tax credit is available on goods purchased in various states in coastal shipping due to place of supply For shipping companies, the "place of supply" to be the respective State / Ports from where the goods such as furnace oil, lubes, spares, ship stores, etc. purchased by shipping companies However, consumption is taking place in place from where the shipping companies are providing transportation service which could be different State / Ports Similarly, ships move to other states for dry docking, spares etc. and "place of	As per Section 10(1)(a) of the IGST Act, the place of supply for goods is 'location of the goods at the time at which movement of goods terminates for delivery to the recipient'. Based on the above, for goods such as furnace oil, lubes, spares, ship stores, etc purchased by shipping companies at various ports/States, the place of supply shall be the respective State / port where goods are delivered	Tax	Following interventions are required: Changing the definition of place of supply for shipping companies from "location of the goods at the time at which movement of goods terminates for delivery to the recipient" to "location of the principal place of business of the shipping company". Rate Schedule to be amended since it speaks of conditional rate with no credit for input goods other than Capital goods	MoPSW to send representation to Income tax department	Q4 2023	MoPSW
					Income tax department to review the representation and approve the required amendment in Income Tax Act	Q4 2023	Income Tax Department, GoI

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	supply" in this case basis current regulations would be the respective state Thus, shipping companies cannot avail Input Tax Credit Impacting the price competitiveness of Indian Flag Vessels						
2	Wage Cost contributes ~30-33% of the vessel operating cost. Salaries of Indian Seafarers on Indian Flagged vessel operating within coastal waters are subject to TDS before payment as compared to wages of Indian Seafarers on Foreign Flagged vessels where these are not subjected to TDS	TDS is applicable on wages of seafarers on Indian Flagged Vessels	Tax	Level playing field to be introduced on the deduction of TDS on wages of seafarers for both Indian and Foreign Flagged Vessels by either removing TDS on Indian Seafarers on Indian Flagged vessels operating in coastal waters or including the wages of Indian Seafarers on Foreign Flagged vessels operating in coastal waters.	MoPSW to send representation to Income tax department	Q4 2023	MoPSW
					Income tax department to review the representation and approve the required amendment in Income Tax Act	Q4 2023	Income Tax Department, GoI
3	Difference in Higher GST on multimodal transportation & port handling charges and Lower or Nil GST at end product adds another layer of cost over and above the logistics cost for transportation of cargo through coastal shipping / inland waterways.	GST on Single Mode of Transport i.e. road or rail is 5% GST on multimodal transportation is 12%	Tax	Reduction in GST on multimodal transportation from 12% to 5%	Conduct feasibility study to assess the impact of revision in tax and send representation to GST council	Q4 2023	MoPSW
					GST council to conduct meeting and approve the revised rates	Q4 2023	GST council
4	Higher rate of GST of 18% on handling charges at ports. This rate is charged even in case such as service is availed for commodities like Agri Products on which GST is exempted. This increases the unutilized credit with multi modal companies	GST on handling charges at ports is 18% Agricultural Commodities such as rye, barley, oats etc. are exempted from GST Commodities, which are predominantly have multimodal transportation, such as fertilizers (which include organic fertilizer, manure, urea etc.) and food grains (which include wheat, millet etc.) have 5% GST Fertilisers attracting 5% GST have a provision of Input Tax Credit	Tax	Reduction in port handling charges to 5% for handling commodities such as Fertiliser and Food Grains which are taxed lower. GST to be exempted for handling agricultural commodities on ports	Same as above	Same as above	Same as above

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
5	Varied custom rules Complex custom procedure - Cargo consignment leaving Kolkata Port have to undergo multiple customs check before reaching destination port in Bangladesh	Varied custom rules - All bilateral treaties have different customs rules. For Indian cargo transiting through Bangladesh, the rules include the issuance of customs bonds. For both Bhutan and Nepal cargo, risk of diversions is guaranteed by the customs authorities in each respective country (in respect to transit through Bangladesh) or in the form of insurance policies or bank guarantees (for transit	Policy and Regulatory	Simplification of customs procedures through a single-window clearance system – It is recommended that countries in the region work towards developing an integrated network in the form of a single-window clearance system for the entire region to simplify the process of obtaining clearances and permissions.	Countries to conduct a joint study to assess the applicability of single-window clearance system by taking following aspects into consideration: • Existence IT tools available across	Q2 2024	Ministry of Shipping in respective countries

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	Overlaps in jurisdiction between land and sea customs – For example, Loading at Haldia Port is conducted under seaport rules and unloading in other inland port is conducted as per land customs rules Additional Fees/ charges	through India), the quantum of which is dependent on the mode of transport chosen. Complex custom procedure - Multiple customs check points and long waits at check posts lead to longer overall transit time, especially when using IWT between India and Bangladesh Overlaps in jurisdiction between land and sea customs (river ports are under land customs, seaports under sea customs) results in duplication of processes and delays and, hence, increase in cost of trade Additional Fees/ charges - While customs duties are reduced/ eliminated under regional agreements (for non-sensitive listed goods), additional customs charges, such as supplementary or regulatory duties and other levies, including social development levies, have been added by each state			countries, functions, stakeholders (including shippers and vessel operators, port operators, port authorities, government officials) • Total investment requirement for implementing Single Window System and contribution from respective Governments • Design specifications of the system		
					Seek approval from countries and stakeholders for creating single window system	Q1 2025	
					Prepare tender documents and conduct tender process to select eligible bidder to implement single window system	Q4 2025	
6				Transparency in rules and regulations- Agreed rules and procedures must be published online on an integrated digital portal, ideally linked with the single-window system. Outreach efforts should be undertaken by the IWAI and BIWTA to inform shippers and CHAs of all relevant rules and procedures.	Consolidate list of existing rules and regulations across countries and governments	Q4 2025	Ministry of shipping in respective countries
					Publish the consolidated soft copy of rules and regulation online on an integrated digital portal, linked with the single-window system	Q4 2025	
7				Simplify customs arrangement and inspections - Regional agreements and protocols should importantly work to simplify customs arrangements and the need for inspection (as most of these often designate common routes and ports). Consideration should be given to simplifying the process for accreditation of ship- and cargo-owners or their agents, specifically those engaged in regular trade, subject always to using a 'trust but verify' approach to ensure such traders comply with legal, management, safety and cargo security provisions required by customs	Conduct stakeholder consultation regarding simplifying the customs arrangement and inspections	Q2 2024	Ministry of shipping in respective countries
					Make the required amendments in the regional agreements and protocols		

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
8				Progression to a 'one cargo- one seal' system where cargo is customs checked in the country of origin once and then again only in the country of destination would be desirable. To ensure smooth processing, countries can consider aligning their documentation procedures according to the guidelines set by World Customs Organization	Review guidelines of custom inspections of goods by World Customs Organization, take stakeholders feedback and align on the procedures for custom inspection Align documentation procedures as per the agreed procedures for custom inspection	Q3 2024	Ministry of shipping in respective countries
7.	Authorized Economic Operator (AEO) schemes and/ or other schemes are not reflected in many of the agreements. Moreover, the current eligibility criteria prevent most small and medium traders that use the waterways from benefiting from AEO or other schemes	Poor uptake of customs improvement initiatives such as the AEO scheme (for lack of provision in various agreements or due to reasons of ineligibility of small/medium traders)		Utilization of AEO and other programmes in India and Bangladesh - While both India and Bangladesh have the AEO programmes within the WCO's framework of Standards to Secure and Facilitate Global Trade, the procedure for accreditation needs to be simplified to expand these programmes, so that more entities can benefit from the faster clearances offered to AEOs	Review the current eligibility criteria for availing AEO and other schemes and seek stakeholder feedback Review current provisions of such schemes in various agreements and protocols Relax eligibility criteria based on stakeholders' feedback and include provisions of such schemes in various agreements	Q3 2024	Ministry of Shipping in India and Bangladesh
8.	Voyage permission restrictions	Voyage permission restrictions - An inland waterway vessel is usually prevented from sailing until all customs and other dues are settled	Policy and Regulatory	Rationalization of voyage permissions - Customs rules (and payments) for cargo to be separated from the operation of the ship. Also, vessels in the sub-region need to obtain advance voyage permissions for use of inland waterways. The SOPs should be suitably amended to align to the requirements of coastal shipping whereby term permissions for a calendar year are provided	Conduct stakeholder's consultation regarding voyage permission restrictions Based on the stakeholder's deliberations, amend the SOPs/ protocols/ agreements to align the following requirements • Customs rules to be made separated from the operation of ships • Mandate to obtain advance voyage permission	Q4 2024	Ministry of shipping in respective countries
9.	Mismatch in vessel specification Mismatch in rail and road design specifications	**Mismatch in vessel specification -** In Bangladesh, vessels specifications are set as per Inland Shipping Ordinance of	Policy and Regulatory	Harmonized standards for fleet, crew, navigation, road and rail design specifications etc. in the existing bilateral agreements	Review existing design specifications of vessels, road, rail etc. standards across countries	Q2 2024	Ministry of shipping in respective countries

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		Bangladesh whereas in India, it is done as per Inland Vessels Act **Mismatch in rail and road design specifications -** Gauge standards of railway lines are different for different countries.			Seek stakeholders' feedback and align on optimal design specifications for vessels, road, rail etc. for obtaining uniformity across countries		
					Amend the existing regulations with revised design specifications for vessel, road, rail etc.		
10.	Non-uniform testing and quality standards Lack of reciprocity regarding recognition of quality certification of one country by the other	**Testing & Certification -** Testing and quality standards are not harmonized between India and Bangladesh, restricting the export and import of food items between the two countries. Additionally, there is a limited reciprocity regarding recognition of quality certification of one country by the other. For example, the SPScertification provided by the Government of Bangladesh is often not recognized by GoI, and vice versa	Policy and Regulatory	**Harmonization of product-wise testing and quality standards between countries -** Countries need to work towards alignment of testing and quality standards, coupled with greater reciprocity regarding recognition of quality certification provided in one country by the other. Alignment of testing and quality standards will improve transparency, reduce duplication and constant manual interventions, which will be critical for enhancing the value proposition of integrated coastal shipping and inland waterway routes	Review existing testing and quality standards adopted by various countries and take stakeholders' feedback	Q4 2023	Ministry of shipping in respective countries
					Based on the feedback received, align testing and quality standards across countries	Q4 2023	
					Apprise and make concerned countries aware about the testing and quality standards adopted in various countries for wider acceptance of the standards	Q4 2023	
11.	Restrictions on ports regarding handling specific type of commodities	**Restrictions on ports -** Existence of port restrictions are a major regulatory challenge. For instance, only Benapole is allowed to import cotton yarn. Such a restriction hinders the shift from roadways to the waterways route in case of export of cotton yarn from India to Bangladesh.	Policy and Regulatory	Facilities used to offload and load cargo within a particular port of call should be the shippers' choice.	Review the existing regulations and assess such restrictions which allow ports/ facilities to handle only certain type of commodities	Q4 2023	Ministry of shipping in respective countries
					Amend the concerned regulations whereby facilities are allowed to handle any type of cargo and	Q4 2023	Ministry of shipping in respective countries
12.	Limited designated navigation routes under each bilateral agreement	**Limited designated navigation routes -** Often ship owners wish to be free to choose a routing plan to optimize time and fuel consumption and avoid areas of congestion, river blockages, adverse tidal or river currents and other navigational or commercial factors. However, there are	Policy and Regulatory	**Freedom of navigation -** Vessels engaged in inland trade should be at liberty to choose their routes when navigating between named ports of call, border crossing points or other approved landing places (subject to design limitations and impact on navigability and safety). In addition, vessels engaged in tramp services across	Review the existing agreements (PIWTT, Coastal shipping agreement and others) and identify the restrictions w.r.t number of designated routes	Q4 2024	Ministry of shipping in respective countries

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		limited designated routes listed in the various protocol agreements for navigation. PIWTT – 4 designated routes including return Coastal Shipping Agreement - 4 designated routes including return Agreement on the use of Chattogram and Mongla Ports - 4 designated routes including return		borders should also be free, within the limits of navigation, to call at any port or terminal in India or Bangladesh where there may be a cargo requiring carriage.	Make the required amendments in the agreement so as lift the identified restrictions		
13.				**Alignment of the transit rules between India and Bangladesh with the transit rules to Bhutan/ Nepal -** There is a need to create transit provisions which allow each country access to multimodal transport services in the other. In this context, transit rules made between India/ Bangladesh and Bhutan/Nepal provide landlocked countries rights of access to and from the sea and freedom of transit by all means of transport, based on the principal of international law, specifically the United Nations Convention on the Law of the Sea 1982. Similar rules should be formulated between India and Bangladesh.	Review the existing transit regulations which allows landlocked countries (Nepal and Bhutan) rights of access to and from the sea and freedom of transit by all means of transport, based on the principal of international law, specifically the United Nations Convention on the Law of the Sea 1982	Q4 2024	Ministry of Shipping in India and Bangladesh
					Conduct stakeholder discussion to make the similar provision between India and Bangladesh		
					Make the required amendment in the transit rules which allow India and Bangladesh access to multimodal transport services in the other		
14.	Non-competitive charges	**Non-competitive charges** - Port charges for waterways including berthing charges, berthing occupancy charges, terminal charges, cargo handling charges, truck entry charges, etc. make IWT non-competitive.	Policy and Regulatory	Rationalization of port charges - Uniform and rationalized port charges & other freight rates which is similar across all bilateral agreements	Review port charges and its contribution to overall cost of transportation and compare transportation cost of other mode of transportation	Q2 2026	Ministry of Shipping in India and Bangladesh
					Rationalize port charges on a commodity-by-commodity basis to make IWT competitive versus other modes to enable a modal shift and make the required amendment in regulations/ guidelines		
15.	Multiple bilateral agreements that are inconsistent	Multiple bilateral agreements between the countries currently govern regional trade and transit, including waterways. However, they include different rules to regulate the operation of ships and other means of transport, despite allowing, in most instances, use of the same waterway routes and ports.	Policy and Regulatory	It is recommended that countries should work towards combining various transit and trade rules currently in existence into one regional agreement Specify a uniform set of policies governing goods in transit and trade. Policies formulated under the agreement should ensure uniformity in rules irrespective of whether	Consolidate all rules and regulations, governing trade and transit of goods, across countries	Q1 2036	Ministry of Shipping in respective countries
					Conduct stakeholder consultation with objective of making		

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				transport is via inland waterway vessels, or coastal or foreign-going ships.	regulation uniform across countries		
					Formulate regional agreement consisting of uniform set of rules		
16.	Limited supportive financing and subsidy schemes in the inland waterways sector	**Lack of supportive financing -** Indian Private players either lack funds or confidence to invest in IWT vessels leading to limited vessel availability in India. An initial push from Govt is required to develop the supportive eco-system	Policy and Regulatory	Introduction of innovative vessel financing to aid integrated IWT and coastal shipping operations. Following are the financial incentives to promote inland waterways sector which can be explored • Innovative fiscal incentives such as discount on port dues for inland vessels having a Green Award Certificate (as done by Port of Rotterdam) • Financial support to local ship builders for bringing in green, cutting-edge technologies (as done in GRENDEL and Sustainable Shipbuilding subsidy in Europe) can be explored to promote construction and development of environment-friendly vessels. • Tax incentives for use of greener modes such as IWT • Excise duty exemptions on fuel used in IWT • Loan guarantee schemes	Conduct study to assess the impact of providing fiscal support (incentives/ subsidies) and send representation to Ministry of Finance/ MoPSW	Q4 2023	SDCL
					Ministry of Finance/ MoPSW to review the proposal and provide approvals for including such incentives/ subsidies in the national program	Q1 2024	MoF/ MoPSW
					Other countries to follow the above steps and include incentives/ subsidies in their respective national programs	Q1 2024	Respective authorities in the countries
					Countries can then coordinate to jointly introduce favorable policies to incentivize investment from private sector players in the region	Q1 2027	Respective Governments in the countries
17	Coastal Shipping hasn't reached its full potential and needs incentivization	Nil	Policy	Development of policy on coastal incentive scheme (3-year scheme) Preparation of Incentive scheme to include Provision of up to 50% reduction in port dues and terminal handling charges for ships demonstrating modal shift Provision of refund of GST up to 3% on goods transported for Company routing at least 50% of cargo through coastal shipping	Preliminary study to assess the impact of the reduction in port dues/ terminal charges and GST on goods	Q4, 2023	MoPSW through internal study/ consultancy
					Draft policy preparation aligned with the impact of the study	Q1, 2024	
					Send representation to GST council for their approval	Q2, 2024	MoPSW/ GST council
					Policy issuance	Q3, 2024	MoPSW

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
18	Coastal Shipping hasn't reached its full potential and needs incentivization	Nil	Policy	3-year Maritime Green fund corpus to compensate port authorities/ private ports against reduced port dues/ terminal charges	Calculate the fund corpus required for 3 years for Port / Terminal operators to claim the subsidies and pass on the benefit to Shipping Lines based on the study proposed in item 1	Q4, 2023	MoPSW through internal study/ consultancy
					Development of a Fund corpus under MoPSW	Q4, 2023	MoPSW
19	Coastal Shipping hasn't reached its full potential and needs support from Govt organizations (PSUs etc.)	Nil	Policy	Formation of policy mandating PSUs & cooperative companies dealing with transportation of food grains, coal (Power & Steel PSU's) and fertilizers to transport 10% of their monthly cargo via coastal shipping/ inland waterways by aligning their cargo routes and potential ports/ terminals for competitive movement via coastal shipping/ inland waterways	Preparation of concept note and proposal with clearly outlining the potential volume, potential savings (direct) and savings due to reduced emissions (indirect)	Q4, 2023	MoPSW through internal study/ consultancy
					Inter-ministerial/ stakeholder (MoRTH, MoR, SAIL, FCI etc..) consultations	Q1, 2024	MoPSW & other ministries
					Approval from the competent authority	Q3, 2024	MoSPW
					Policy implementation	Q4, 2024	MoSPW

THEME 4: PROMOTE MARITIME CLUSTERS - IMPLEMENTATION PLAN

Implementation Plan for implementing **infrastructure, institutional, capacity building and technology initiatives**

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Promoting Maritime Industrial Cluster							
1	The industrial development near the ports is heterogenous and does not have manufacturing units targeting a basket of commodities which can help port generate additional cargo	Develop industry-based clusters/ economic zones by identifying targeted industries relevant to port location Projects already identified under the initiative: - (Source: **MIV 2030**) Drive commodity-specific industrialization efforts by identifying targeted industries relevant to port location	Institutional	The maritime industrial clusters proposed in Kandla, VoCPT, Haldia and Andaman & Nicobar Islands can focus on the following commodities: • Bulk clusters for basic input industries such as power, refineries & petrochemicals and cement • Discrete manufacturing clusters, in the labour-intensive sectors of electronics, automotive, apparel, furniture and food-processing.	Major Port Authorities of DPT, SMPT, VoCPT and ALHW to evaluate and identify specific commodities/industries to target basis port's location, cargo profile and growth expectations of various industries	Q4, 2023	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
					Assess the land area requirement for each of the commodity specific industry	Q4, 2023	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
					Major Port Authorities of DPT, SMPT, VoCPT and ALHW to hold discussions with the industry associations of their respective identified commodity for the need of additional incentives and requirement of infrastructure including plug and play industrial infrastructure.	Q2, 2024	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
					Major Port Authorities of DPT, SMPT, VoCPT and ALHW to hold discussions with the SDCL for additional incentives that could be required for attracting the commodity specific industries to the industrial parks near ports	Q1, 2025	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
					SDCL to hold discussions with the respective Central Government Ministry and Departments such as Textiles Ministry, DPIIT etc. and also with respective State Government Departments on the need of additional incentives	Q2, 2025	SDCL
2	No definite structure/operating model for port industrial area development and management to undertake port led industrialization	Co-developmental models considering tie-ups with Central bodies or State Govt. or private players Projects already identified under the initiative: - (Source: **MIV 2030**) Ports to explore co-development models to drive port led industrialization through collaboration with various partners (e.g., partnership with state	Institutional	Three key models are suggested 1. Model 1 - Co-development (G-G model) - Port can form JV with state government/ central govt. authorities. Port can provide land whereas state govt./ central govt. authority provides land and development and marketing support 2. Model 2 - PPP (SPV- Equity participation) - Port and/ or State Govt. allot land rights against	SDCL to hold joint discussions with partners such as State Government (State Industrial Development Corporations and State Maritime Boards), central agencies (like NICDC), private developers and Major Ports for collaboration for developing port-based industrial parks	Q4, 2023	SDCL
					State Industrial Development Corporations along with State Maritime Boards and Major Ports to identify the location and quanta of the land parcels which are available near both Major and	Q4, 2023	SDCL

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Promoting Maritime Industrial Cluster							
		governments, central bodies – NICDC, etc.)		equity in the SPV. Private player offering the highest equity in the SPV to Port and/ or State Govt. will be the successful bidder 3. Model 3 - PPP (SPV - Revenue share) - Port and/ or State Govt. allot land rights on lease to the SPV. Private player offering the highest gross revenue share to Port and/ or State Govt. will be the successful bidder	Non-Major Ports for developing industrial infrastructure		
					Assessment of the cost involved for making the land available for development by the Private Developer or by State Government	Q1, 2024	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
					Major Port Authorities of DPT, SMPT, VoCPT and ALHW along with State Industrial Development Corporations and State Maritime Boards to assess the requirement of development of plug and play industrial infrastructure on PPP mode.	Q2, 2024	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
					Major Ports (where industrial infrastructure is to be developed adjacent to Major Ports) to appoint technical and financial Consultants. The Technical Consultants will prepare the Detailed Project Reports while the Financial Consultants will prepare the PPP structure and revenue model for the selection of Private Player to development and operate the industrial infrastructure.	Q1, 2025	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
					Major Ports (where industrial infrastructure is to be developed adjacent to Major Ports) to undertake the selection of the Private Player through their respective financial Consultants.	Q4, 2025	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
					Major Ports (where industrial infrastructure is to be developed adjacent to Major Ports) to sign Concession Agreements and / or shareholder agreements, depending upon the PPP structure for the development of the industrial infrastructure including plug and play industrial infrastructure.	Q2, 2026	Major Port Authorities of DPA, SMPA, VoCPA and ALHW
3.	Delay in governmental clearances leads to project delays, increase in cost, loss of potential investors and other issues for the tenants	Integrated single window system integrating approvals under the state single window with the approvals for units in the cluster	Institutional	Port Community Systems which have been implemented in the Major Ports can be integrated with the Central Government Single Window and State's single window approval process to allow for a faster approval process for the tenants 1. State's Single Window system: Clearances linked to State's single window for industries - Electricity,	Consultations to be conducted with coastal states by SDCL to assess the creation of single window clearance for port led industrial development in Maritime Industrial Clusters	Q1, 2024	SDCL
					SDCL to undertake the discussions with NIDC to be the liaison with Central Government Departments for the requisite approvals to the tenants of the Maritime Industrial Clusters	Q2, 2024	SDCL

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Promoting Maritime Industrial Cluster							
				land, forest, environment clearance, water, sewage, effluent treatment, fire safety etc. for the tenants 2. Port's single window clearance system: Port, State Government and Central Govt. will be party to the system. Port's Single Window System will assist all the unit holders in the industrial cluster to get the required approvals and clearances.	States to provide the list of the bodies such as Urban Local Bodies, State Industrial Development Corporations, State Maritime Board, Town Planning etc. which will be part of the Single Window Clearance Committee	Q4, 2024	Respective Coastal States
					SDCL along with Port Authorities, State Maritime Boards, SIDCs, NIDC to appoint representative which will drive the Single Window Clearance and also provide solutions to the grievances of the tenants	Q1, 2025	SDCL along with Port Authorities, State Maritime Boards, SIDCs, NIDC
					Major Port Authorities of DPT, SMPT and VoCPT to integrate the Port Community System with the State's single window clearance and the Centre's Single Window Clearance for the developing industrial infrastructure	Q2, 2025	Major Port Authorities of DPT, SMPT, VoCPT and SDCL
4	The processing facilities are located at a distance from the fishing harbours and landing sites. This leads to the loss of post-harvest loss as there are conventional methods used for storage of fish in transit.	Promoting development of fish processing plants within the maritime industrial clusters with a possibility of plug and play infrastructure. This will help in reduction in the time from landing to processing and then exporting. Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Develop plug and play infrastructure/value added services (using Maritime Development fund, cash reserves or with co-developer) and commercial flexible terms for attracting industries to port land	Infrastructure	The availability of fish processing plants in Maritime Industrial Cluster to help in reducing the loss of fish and increase the earnings of the fishing community	Major Port Authorities of DPT, SMPT, VoCPT and ALHW to provide specific zones for setting up of fish processing facility within the Maritime Industrial Cluster.	Q4, 2023	Major Port Authorities of DPT, SMPT, VoCPT and ALHW
					Major Port Authorities of DPT, SMPT, VoCPT and ALHW to also provide recommendations to the MoPSW for providing any additional incentives to the investors for setting up Fish Processing Units within the Maritime Industrial Cluster.	Q4, 2023	Major Port Authorities of DPT, SMPT, VoCPT and ALHW
5.	The available quality of fishing harbours and land sites result in congestion for unloading the fishes from the vessels which impact the overall catch.	Introduce private sector investments in the fishing industry through PPP investments with focus on developing or refurbishing the port harbour and landing sites. Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Establish centralized investor outreach and	Infrastructure	The development of fishing harbour on PPP basis can help in providing the required efficiencies in handling infrastructure, which would help further in reducing losses	The Department of Fisheries under Ministry of Fisheries, Animal Husbandry & Dairying to form working groups with state maritime department, state fisheries department and port Authorities to identify the locations for development or refurbishment fishing harbours, fishing jetties, cold chain etc.	Q4, 2023	Department of Fisheries under Ministry of Fisheries, Animal Husbandry & Dairying, state maritime department, state fisheries department and port Authorities
					The Working Groups based on the identification of the locations will undertake the feasibility	Q4, 2023	Working Group

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Promoting Maritime Industrial Cluster							
		marketing cell under IPA/MoPSW to attract investment in port land			studies and preparation of Detailed Project Reports.		
					Post completion of the preliminary studies, the Working Groups will finalize the PPP structure involving Viability Grant Funding, revenue sharing mechanism etc. for attracting private sector investment.	Q4, 2023	Working Group
					Based on the finalized models, the bids will be invited for development of the infrastructure	Q1, 2024	Working Group
6.	Fishing vessels that are currently being used consume significant amount of fuel and thus have a large proportion in the overall operating cost for catching fish	Use of modernized fishing vessels	Infrastructure	This can help in providing solutions to the challenges faced by the fishing industry. These can be undertaken through extending the use of technology to the fishing vessels	The Department of Fisheries under Ministry of Fisheries, Animal Husbandry & Dairying to develop incentive mechanism for encouraging the fisherman to acquire and operate modernize fishing vessels.	Q1, 2024	Department of Fisheries under Ministry of Fisheries, Animal Husbandry & Dairying
7.	There is limited availability of cold chains near the fishing harbours and landing sites and thus the conventional	Development of Cold Chain infrastructure near fishing harbours and land sites on PPP model	Infrastructure	The development of cold chain infrastructure provides quality storage facilities to the fishing community to help minimize the post-harvest losses.	The Department of Fisheries under Ministry of Fisheries, Animal Husbandry & Dairying along with state fisheries department to identify the locations for development cold storage facilities.	Q2, 2024	Department of Fisheries under Ministry of Fisheries, Animal Husbandry & Dairying and State Fisheries Department
					The central and state fisheries department to develop the PPP structure including any Viability Gap Funding (if required)	Q3, 2024	Department of Fisheries under Ministry of Fisheries, Animal Husbandry & Dairying
					Undertake feasibility study and prepare Detailed Project Report for development of cold chain facility on PPP basis	Q4, 2024	Department of Fisheries under Ministry of Fisheries, Animal Husbandry & Dairying
					State Fisheries department to invite tenders for Selection of the private player for development of cold chain	Q3, 2025	State Fisheries Department
8	The quality of road connecting the fishing harbours and landing sites with the processing plants and demand centers	Development of connectivity road infrastructure	Infrastructure	This will allow for an efficient evacuation of the harvest once it lands on the fishing harbour to minimize the losses	State Fisheries department along with respective state department to identify and develop quality connectivity infrastructure with the Fishing harbours and landing sites	Q1, 2024	State Fisheries Department
9	Dredging has significant impact on the marine environment and the dredged material may cause suspended solids during dredging as a result of substratum disturbance and	Employ sustainable dredging disposal mechanism and promote waste to wealth	Infrastructure Initiative	Sustainable dredging is a dredging approach that is not harmful to the ecosystem, preserves natural resources and supports long term ecological balance. Dredging vessels (simply Dredgers) play an important role in sustainable	DCI along with SDCL Conduct study for identifying innovative methods for recycling/reusage of the dredged material	Q2, 2024	DCI and SDCL
					SDCL collaborate with dredging partners to identify and build port wise strategy & roadmap for	Q2, 2025	SDCL

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Promoting Maritime Industrial Cluster							
	during transport to the surface, overflow from barges or leakage from pipelines during transport between dredged and disposal sites	Projects already identified under the initiative: - (Source: **MIV 2030**) Employ sustainable dredging disposal mechanism and promote waste to wealth		dredging. For example, the trailing suction hopper dredgers that suction out the deposits are considered to be a major cause for turbidness in the dredged water-part. Hence, modern dredgers should ensure that the process of dredging is carried out without any debilitating effects	recycling and reusage of dredged material		
					Land Reclamation and creation of bunds across ports to be evaluated by Major Ports and provide recommendations to SDCL	Q1, 2026	Major Ports and SDCL
					Implementation of identified methods for 1 port on pilot basis	Q1, 2027	SDCL
					SDCL to incorporate learnings and expand to other ports in phases - i) Phase 1: Extend implementation coverage to min. 4 ports ii) Phase 2: Extend implementation coverage to min. 8 ports iii) Phase 3: Extend implementation coverage to all ports	Q1, 2031	SDCL

Islands as Maritime Cities

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Creation of a nodal body for developing islands as maritime cities							
1	For developing islands as a maritime city, a nodal agency is required. In the present scenario there is no nodal agency which can help in holistic development of islands as maritime cities	It is proposed that Andaman Lakshadweep Harbor Works (ALHW) to be appointed as a nodal agency. It works towards having a holistic development of the islands as maritime cities	Institutional	The key responsibilities of the ALHW as a nodal agency would include: 1. Review and Implementing Policies: Work with Central Ministries such as Ministry of Tourism, MoPSW and other concerned ministries & departments to implement policies for promoting islands as maritime cities	Ministry of Ports, Shipping and Waterways to initiate discussion with AHLW for expanding its scope for undertaking the holistic development of the island	Q4, 2023	Ministry of Ports, Shipping and Waterways and AHLW
				2. Undertake studies and land identification: Studies for identification of specific land parcels within the islands for developing key themes such as Bunkering	ALHW to prepare the detailed responsibility areas required for developing islands as maritime cities across islands	Q4, 2023	ALHW
					ALHW to identify the activities that will be undertaken by the	Q4, 2023	ALHW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				Terminal, Sea Plan Building & Repair facilities etc.	body to facilitate private sector investments		
				3. Investment Facilitator: Act as the nodal point for the private sector for any clearances or handholding for setting up facilities on the island 4. Monitoring of projects: Monitor Island connectivity projects which have been proposed by MoPSW for timely completion and ensure maintenance of the connectivity infrastructure created	ALHW to finalize the detailed responsibilities with Ministry of Ports, Shipping and Waterways before initiating the development of islands as maritime cities.	Q1, 2024	ALHW
2	The current location providing bunkering services are not on the international trade routes. The ports such as Mundra, JNPT, Cochin, Chennai, Kakinada etc. which currently provide bunkering services and these are currently located away from the international trade routes.	It is proposed that the development of the bunkering terminal to be undertaken on Greater Nicobar island	Infrastructure	The port location near to the mainline routes is critical for the success of a bunkering terminal. The major bunkering hubs are located along the main trade routes which allow the vessels to undertake bunkering operations without deviating from their main routes. Therefore, it is proposed that Greater Nicobar Island can be considered for development of a bunkering hub due to the following reasons: • Greater Nicobar is in close proximity to Malacca Strait (the route for East West trade route) and also to Singapore (a major transshipment and bunkering hub) • Vessels voyaging in East West Trade can have bunkering services at Greater Nicobar due to proximity • Vessels in the coastal waters along East Coast, Bangladesh and Myanmar can also benefit from bunkering services at Greater Nicobar	ALHW to undertake discussions with Ministry of Petroleum and Natural Gas and MoPSW for setting up of bunkering terminal on the Greater Nicobar Island	Q3, 2024	ALHW and Ministry of Petroleum and Gas
					ALHW to hold discussion with the Administration of Union Territory of Andaman and Nicobar Island for identification of land on the island for developing the bunkering terminal on the Greater Nicobar Island	Q3, 2024	ALHW and Administration of Union Territory of Andaman and Nicobar Island
					ALHW to appoint consultant to undertake the techno-economic feasibility study for the development of bunkering terminal along with development of a project structure to attract private player for developing and undertaking O&M of the bunkering terminal at Greater Nicobar Island	Q1, 2025	ALHW
3	The presence of private players in the bunkering sector is low as compared to	The presence of private players needs to be	Institutional	It is proposed that multiple players to provide bunkering services to be adopted	ALHW based on the project structure created undertake the transaction process for the	Q1, 2025	ALHW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	state owned refineries and oil companies.	increased for providing the bunkering services		including development of storage infrastructure. This will allow for greater competition resulting in better services. This model is prevalent in major bunkering hubs globally	selection of the private players for developing and O&M of the bunkering terminal		
					ALHW to prepare a transaction structure involving different players providing supply of bunkering fuels to the vessels and run the transaction process for selection of the private players	Q2, 2025	ALHW
4	The bunker barges undertake limited operations during the night resulting, while the bunkering services is a round the clock operation. Therefore, there is a reduced attractiveness for the vessels due to increase waiting time.	Provision of night navigation which would help in providing bunkering services through day and night	Infrastructure	The availability of night navigation will allow for an efficient bunkering service to be provided to the vessels	ALHW to foresee the availability of sufficient night navigation services being provided at the proposed Transshipment Port at Greater Nicobar Island	Q3, 2025	ALHW
5	Most of the ports in India do not have separate barge loading jetties. Barges are loaded at same jetties where cargoes are handled and get loading permission from the ports only when jetties are free from cargo operations of the vessels. This results in increasing the time for providing bunkering services to the vessels	Development of separate bunker oil loading points to allow for unhindered bunkering services to the vessels	Infrastructure	The availability of dedicated loading berths helps in reducing the waiting time of the vessels availing the bunkering services and thus help in increasing the attractiveness	ALHW to discuss with MoPSW or provision of a dedicated berth at the proposed transshipment terminal on Greater Nicobar Island	Q4, 2025	ALHW
6	The bunker barges currently are not treated as floating storage and need to load every time there is an individual bunker nomination	Bunker barges should be treated as floating storage and should be allowed to keep always loaded instead of Customs permitting barge loading against individual bunker nominations	Institutional	It allows the barges to deliver bunkers to multiple vessels. Post the delivery the bunker supplier can submit copies of Bunker Delivery Notes to Customs and reloading of barge should again be allowed for next deliveries. This shall enable Bunker Supplier to deliver bunkers as and when demanded by ship-owners at short notice.	MoPSW to hold discussions with Ministry of Finance towards considering the bunker barges as floating storage	Q1, 2026	MoPSW and MoF
					Ministry of Finance to hold discussion with Central Board of Indirect Taxes and Customs to issue requisite guidelines for considering bunker barges as floating storages	Q2, 2026	MoF
7	Location for development of transshipment free trade zone	Greater Nicobar Island can be considered for the development of Transshipment Free Trade Zone	Infrastructure	Greater Nicobar Island can be considered for the development of Transshipment Free Trade Zone due to the following reasons: a. A transshipment port is proposed on the Greater Nicobar Island. The availability of transshipment port will allow for availability of cargo	MoPSW to program the development of transshipment free trade zone along with the proposed transshipment hub proposed at the Greater Nicobar Island and subsequently hold discussions with ALHW and Administration of Union Territory of Andaman & Nicobar Island	Q3, 2024	MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				b. Greater Nicobar is in close proximity to Malacca Strait (the route for East West trade route) and also to Singapore (a major transshipment hub). This would allow for the Transshipment Free Trade Zone to attract the cargo for South and South East Asia moving on the trade route.			
8	Based on the current guidelines, minimum 25 hectares (~61 acres) of land is required for developing a Free Trade Zone. The islands in the country, due to their existing ecology, the availability of the contiguous land as per area requirement of the guidelines would be difficult.	Relaxing the requirement of minimum land area for the development of transshipment free trade zone to 10 hectares	Institutional	The minimum area requirement is 25 ha of contiguous land for an FTZ (called as Special Economic Zones in India; SEZ includes Free Trade Warehousing Zone also in ordinary parlance). It could be difficult to have 25 ha (62.5 acres) in a contiguous fashion in any island territory. Hence, the possibility of establishing a FTZ can be in Greater Nicobar as a start would require lesser quantum of land and once the traffic is established, the facility can be expanded. Therefore, the minimum land requirement of 25 ha can be relaxed to 10 ha.	MoPSW to undertake discussions with Ministry of Commerce and Industry for issuing the guidelines for reducing the quantum of land for transshipment free trade zone to 10 hectares	Q3, 2024	MoPSW
9	No definite structure for developing and O&M of Transshipment Free Trade Zone with private sector involvement	Co-developmental models considering tie-ups with Central bodies or State Govt. or private players	Institutional	Three key models are suggested 1. Model 1 - Co-development (G-G model) – ALHW can form JV with Administration of Union Territory of Andaman & Nicobar Island. 2. Model 2 - PPP (SPV-Equity participation) – ALHW and/ or Administration of Union Territory of Andaman & Nicobar Island allot land rights against equity in the SPV. Private player offering the highest equity in the SPV will be the successful bidder 3. Model 3 - PPP (SPV - Revenue share) - Port and/ or Administration of Union Territory of Andaman & Nicobar Island allot land	ALHW to hold joint discussions with partners such as Administration of Union Territory of Andaman & Nicobar Island, private developers and Ministry of Ports, Shipping and Waterways for collaboration for developing the transshipment free trade zone on Greater Nicobar Island	Q4, 2024	ALHW
					ALHW and Administration of Union Territory of Andaman & Nicobar Island to identify the location and quanta of the land parcels for developing transshipment free trade zone	Q1, 2025	ALHW and Administration of Union Territory of Andaman & Nicobar Island
					Assessment of the cost involved for making the land available for development by the Private Developer or by ALHW	Q2, 2025	ALHW
					ALHW along with Administration of Union Territory of Andaman &	Q3, 2025	ALHW and Administration of Union Territory of Andaman & Nicobar Island

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				rights on lease to the SPV. Private player offering the highest gross revenue share to ALHW will be the successful bidder	Nicobar Island to appoint technical and financial Consultants. The Technical Consultants will prepare the Detailed Project Reports while the Financial Consultants will prepare the PPP structure and revenue model for the selection of Private Player to development and operate the transshipment free trade zone		
					ALHW along with Administration of Union Territory of Andaman & Nicobar Island to undertake the selection of the Private Player through their financial consultant.	Q2, 2026	ALHW and Administration of Union Territory of Andaman & Nicobar Island
					ALHW along with Administration of Union Territory of Andaman & Nicobar Island to sign Concession Agreements and / or shareholder agreements, depending upon the PPP structure for the development of the transshipment free trade zone	Q3, 2026	ALHW and Administration of Union Territory of Andaman & Nicobar Island
10	The custom procedures for clearing the imported spares are complex which increases the lead time for repairing the vessel as ~65% of the components of the vessels are imported.	Simplification of customs procedures for priority clearance of the imports comprising of spare parts of the vessels.	Institutional	The simplification of the process will allow for reduction in time required for repair of the vessels	Ministry of Ports, Shipping and Waterways to discuss with Ministry of Finance for simplification of the process for import of spares for the vessels	Q4, 2023	MoPSW
					Ministry of Finance to issue guidelines to Central Board of Indirect Taxes and Customs for simplification of process allowing for reduction in time for importing the vessel spares	Q4, 2025	MoF

Implementation Plan for **Tax, Regulatory and policy initiatives**

Promoting Maritime Industrial Clusters

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Promoting Maritime Industrial Cluster							
1.	Land acquisition issues Current land act is inflexible and not suitable for large scale land acquisitions Land near ports often require substantial development cost towards levelling, compaction, etc.	The RFCTLARR Act introduces a distinction between the treatments of land acquired for a set of specified public purposes for the government's own use, hold and control and that acquired for the same public purposes, but for private or Public-Private-Partnership (PPP) projects. Whereas, the Act permits acquisition without consent when land is for the government's use, hold and control, it requires the consent of 80% of the owners if the land is acquired for private projects and of 70% if acquired for PPP projects. The Act was perceived to solve the issues related to land acquisition for development of infrastructure for industries which will support and empower the economy and help in generating jobs for the people in the country. However, problems in land acquisition persist for several infrastructure projects when the projects are being developed by Private Player or on PPP basis. The issues in the act are mainly related to lack of clarity on benefits accrued to landowners and lack of implementation of Resettlement & Rehabilitation (R&R) of the affected parties as mandated by law.	Policy	The introduction of guidelines of Land Acquisition similar to NH Act 1956 will help in land acquisition in the following manner: 1. Central Government and its authorized project executing agencies are competent to acquire land for construction and development of National Highways under the NH Act, 1956; States do not have a case to insist that Statutes / Policies of the State Governments / UT Administrations have to be applied for the land acquisition. 2. Compensation under NH Act in conformity with the provisions of RFCTLARR Act, 2013 3. Towards minimizing litigation and ensuring faster availability of land for NH Projects, land can be procured directly from the landowners in accordance with Statutes / Policies of the State Governments / UT Administrations subject to the condition that the compensation payable is no more than that prescribed under NH Act, 1956. 4. Further, NHAI would also be agreeable to acquisition of land for projects in accordance with such consent mechanism of the State, subject to the condition that the concerned State Government / UT Administration bears the cost of any additional compensation over and above that prescribed under RFCTLARR Act, 2013.	Major Port Authorities to send a proposal to SDCL suggesting the need for introduction of guidelines or Act on similar lines to NH Act, 1956 for the acquisition of land for port led industrialization	Q4, 2023	Major Ports and SDCL
					SDCL to undertake a detailed study towards the impact of introduction of such Act for land acquisition required to increase port led industrialization	Q4, 2023	SDCL
					SDCL to undertake consultation with the State Government and State Industrial Bodies along the coastline for introduction of land acquisition on similar lines to NH Act, 1956 for land acquisition	Q1, 2024	SDCL
					SDCL post consultation send the recommendations to MoPSW for making provisions in the current land acquisition Act	Q2, 2024	SDCL
					MoPSW to prepare the proposal and send for Cabinet Approval	Q3, 2024	SDCL
2.	As compared to State Industrial Development Corporations, Major Ports do not have the leverage to provide land price incentives and thus would be difficult to attract the investors to set up manufacturing units.	The land prices at ports command a higher price due to availability of land with better quality connectivity and logistics infrastructure. The Land Policy Guidelines for Major Ports do not provide much flexibility in the land pricing. The following is the clause related to	Policy	The Clause in the determination of lease amount should allow flexibility to the Port Authority for providing discounts on the lease / land prices to the tenants.	Major Port Authorities of DPT, SMPT, VoCPT and ALHW, based on the needs of the identified commodity specific industry in their land parcels, assess the requirement of land and optimum value that can be derived from the land by handing it to the tenant for setting up industry	Q4, 2023	Major Port Authorities of DPT, SMPT, VoCPT

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		Fresh Leases in the policy Guidelines [Clause 11.2 (f)] for determination of lease amount: "*In respect of PPP projects, the annual lease rent based on latest SoR with the approved rate of annual escalation would be indicated to the bidders at the bidding stage itself. With respect to land allotted for captive facilities, the lease rentals for the land allotted shall be recovered from the user as per the annual lease rental based on latest SoR notified as per Para-13(c), with the approved rate of annual escalation. The lease rental, as well as the rate of annual escalation would be approved by the Port Trust Board*".			Major Port Authorities of DPT, SMPT and VoCPT to identify the maximum discounts that can be given to the tenants based on the assessment undertaken	Q4, 2023	Major Port Authorities of DPT, SMPT, VoCPT
					Major Ports to hold discussions with MoPSW for the revision in the Land Policy Guidelines to allow discounts to the tenants in the port led industrial infrastructure developed.	Q4, 2023	Major Ports and MoPSW
					MoPSW to issue clarification to the Guidelines for providing flexibility in the	Q1, 2024	MoPSW
3.	The land is provided through auction and there is a fixed reserve price. And since the land cost near ports is higher, therefore, the reserve price for such land parcels is also higher. This can have negative impact in attracting Private Player for developing maritime industrial clusters on PPP Model.	The following is the current provision in the Land Policy Guidelines of Major Ports under Clause 11.2 (Fresh Leases) sub-Clause (d) "*Land shall be leased through tender -cum -auction methodology through a competitive bidding process over the reserve price of such plots which shall be the updated SoR notified by TAMP. At the tender -cum -auction stage, depending upon its financial requirement, the Port may decide to invite bids either on- (i) Upfront basis, where the bidding parameter is the one-time upfront payment offered by the bidder for the lease period and a nominal lease rent of Rs. One per square metre to be collected every year for the currency of lease period, or (ii) Premium basis, quoted by the bidder over and above the Reserve Price in terms of the annual lease rent, calculated as per the provisions of para13(b). While leasing out land on upfront basis, the Board shall fix the Reserve Price which would be the NPV of the sum total of annual lease rentals calculated as per Para 13(b), escalated annually at the rate approved by the Board as*	Policy	Reserve pricing in land allotment for PPP development projects need to be reconsidered to support private participation for developing the maritime industrial clusters and development of Plug and Play Infrastructure on PPP model	Major Port Authorities need to hold discussions with SDCL and MoPSW for reviewing the guidelines for removal of allotment of land on reserve price basis and to be determined during the bid stage while selecting the Private Player.	Q2, 2024	Major Port Authorities and SDCL

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		indicated in para 13(c). The discount factor would be the longest-term G-sec rate as per the latest RBI Bulletin. In both cases, the Port shall keep equivalent of two years rentals as security deposit'					
4.	The current practice for allotment of land to tenants is through Tender-cum auction. This may create bottleneck to retain investors as they may lose out on price bid. In addition, the PPP investors may not be willing to partner through tender-cum auction route.	The following is the current provision for Fresh Allotment in the Land Policy Guidelines of Major Ports under Clause 11.2 (Fresh Leases) sub-Clause (d) "*Land shall be leased through tender -cum -auction methodology through a competitive bidding process over the reserve price of such plots which shall be the updated SoR notified by TAMP. At the tender -cum -auction stage, depending upon its financial requirement, the Port may decide to invite bids either on- (i) Upfront basis, where the bidding parameter is the one-time upfront payment offered by the bidder for the lease period and a nominal lease rent of Rs. One per square metre to be collected every year for the currency of lease period, or (ii) Premium basis, quoted by the bidder over and above the Reserve Price in terms of the annual lease rent, calculated as per the provisions of para13(b). While leasing out land on upfront basis, the Board shall fix the Reserve Price which would be the NPV of the sum total of annual lease rentals calculated as per Para 13(b), escalated annually at the rate approved by the Board as indicated in para 13(c). The discount factor would be the longest-term G-sec rate as per the latest RBI Bulletin. In both cases, the Port shall keep equivalent of two years rentals as security deposit*'	Policy	It is proposed that allotment of the land parcel to tenants may be undertaken on Application based allotment. The application-based allotment can also allow in accepting single bids in the absence of competitive bids. It is also recommended that dedicated land zoning may be made for PPP development to promote plug and play industrial infrastructure.	Major Port Authorities need to hold discussions with SDCL and MoPSW for reviewing the guidelines for removal of allotment of land on reserve price basis and to be determined during the bid stage while selecting the Private Player.	Q3, 2024	Major Port Authorities and SDCL
					Major Ports to develop the mechanism of providing land on application-based allotment to the Private Players	Q4, 2024	Major Port Authorities and SDCL
5.	The lease tenure offered by port authorities based on the policy guidelines is 30 years with a provision of extension irrespective of the quantum of investment being made and whether a developed land parcel is available or not. This is comparatively lesser than that offered by state industrial	The following is the current provision for Land Lease Tenure in the Land Policy Guidelines of Major Ports under Clause 11.2 (Fresh Leases) sub-Clause (b) "*Land can be leased up to a maximum cumulative period of 30 years by the Port with the approval of the Board. Renewal of leases*	Policy	Lease tenure of land parcels is another critical aspect impacting the attractiveness of a particular location in attracting tenants. Port authorities have increased the tenure from 30 years to 60 years. However, it is less as compared to State Industrial Development Corporations. Therefore, it is recommended the following:	Major Port Authorities need to hold discussions with SDCL and MoPSW for reviewing the guidelines for land lease tenure and provide more flexibility based on the quantum of investment and the availability of developed land parcels.	Q2, 2024	Major Port Authorities, SDCL and MoPSW

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	development authorities where lease upto 99 years is provided without any extension.	*beyond thirty years and for a maximum cumulative period of 99 years should be recommended by the Port Trust Board after satisfying itself that the same is required to be renewed and that the Port does not require the said land for its own use. Renewals will be granted through the Empowered Committee mechanism subject to the approval of the Government and renewals will be limited to a maximum cumulative period of 99 years*" Sub-Clause (c): "*In certain cases, the lessee may require land for capital intensive investment like tank-farms, refineries etc. The Port may at its option decide to fix the tenure of lease for a period which is more than 30 years. Such proposals are to be submitted with the recommendations of the Board to the Empowered Committee and Ministry for its approval. The Port in its land-use plan should identify land which can be allotted on long-term lease basis, i.e., for a tenure of 30 years and beyond".*		a. Ministry of Shipping through the Land Policy Guidelines may provide lease tenure that is competitive to that offered by competing SIDCs b. Flexible lease tenures may also be considered (and allotment may be done through annual or upfront or interval-based payments) to suit the need of investors			
6.	Ports are bound by land policy guidelines for pricing (offering limited flexibility) and the land cost is determined based on the prevalent land values, transactions registered, auctioned prices etc. This provides ports with limited flexibility to ports for providing land price incentives	The following is the current provision for determination of Lease Rentals in the Land Policy Guidelines of Major Ports under Clause 11.2 (Fresh Leases) sub-Clause (f): "*In respect of PPP projects, the annual lease rent based on latest SoR with the approved rate of annual escalation would be indicated to the bidders at the bidding stage itself. With respect to land allotted for captive facilities, the lease rentals for the land allotted shall be recovered from the user as per the annual lease rental based on latest SoR notified as per Para-13(c), with the approved rate of annual escalation. The lease rental, as well as the rate of annual escalation would be approved by the Port Trust Board*".	Policy	The cost of land near the ports is higher as compared to adjoining areas due to the availability of infrastructure. This impacts the lease rentals that can be charged by the Port-Led Industrial Park to the tenants and thus the competitiveness of the land provided by State Industrial Development Corporation increases. Therefore, the ports need to provide the competitive lease rentals in line with State Industrial Development Corporations	Major Port Authorities of DPT, SMPT and VoCPT to assess the impact of the discounts on the lease rentals that can be provided to the tenants.	Q4, 2023	Major Port Authorities of DPT, SMPT and VoCPT
					Based on the assessment, Major Port Authorities and State Maritime Board to assess the maximum discount that can be provided on the lease rentals	Q4, 2023	Major Port Authorities of DPT, SMPT and VoCPT
					Based on the assessment, Major Port Authorities of DPT, SMPT and VoCPT to give recommendations to the MoPSW to make suitable changes in the Land Policy Guidelines of Major Ports	Q1, 2024	Major Port Authorities of DPT, SMPT and VoCPT
7.	To attract manufacturing units for setting up units at the port-led industrial parks, suitable incentive	Currently there is no incentive mechanism available	Policy	To promote the port-led industrialization, the combination of following incentives can be	Major Port Authorities of DPT, SMPT and VoCPT to conduct assessment of the industries that can be attracted to the port-led	Q4, 2023	Major Port Authorities of DPT, SMPT and VoCPT

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	schemes need to be developed. The incentive schemes currently are not focused on incentivizing port led industrial development			considered for the tenants at the port-led industrial parks: • Direct and indirect tax incentives like those for SEZs • While the government is providing the incentives to 13 sectors under PLI scheme, it may be considered that a sector agnostic PLI scheme can be provided for the manufacturing units in Maritime Industrial Clusters • Incentives such as subsidized cargo handling charges, preference in berthing of dedicated vessels, right of way for pipelines and providing infrastructure for sourcing raw material to industrial area making it available on site etc. may incentivize developers and investors • Port authorities may also cross-subsidize investment occurred for development of such area through conforming minimum guaranteed cargo movement by the industrial units • Central and state government schemes such as bonded manufacturing facilities, tax incentives under warehousing, etc. may be used for offering incentives to investors	industrial parks or have established manufacturing units near ports. The assessment would provide the gap which these manufacturing units need to fill through the availability of incentives. In addition, the assessment would also provide insights on the EXIM and coastal shipping cargo generated through these manufacturing units established near ports. The Major Ports and State Maritime Boards to provide the assessment to Ministry of Ports, Shipping and Waterways.		
					Major Port Authorities of DPT, SMPT and VoCPT based on the incremental EXIM and coastal traffic generated from these manufacturing units, assess the discounts that can be provided these units in terms of port charges. Based on the assessment, Major Ports and State Maritime Board to provide recommendations to Ministry of Ports, Shipping and Waterways.	Q2, 2024	Major Port Authorities of DPT, SMPT and VoCPT
					Ministry of Ports, Shipping and Waterways based on the recommendations received from Major Ports and State Maritime Boards prepare the guidelines for providing discounts in port charges to manufacturing units providing EXIM and coastal cargo to ports.	Q4, 2024	MoPSW
					Based on the assessment shared by the Major Ports and State Maritime Boards for incentives, Ministry of Ports, Shipping and Waterways to prepare note on incentives related to direct and indirect taxes similar to those provided to SEZs and extension of PLI scheme beyond the 13 identified sectors.	Q2, 2025	MoPSW
					Ministry of Ports, Shipping and Waterways to discuss and finalise the incentive scheme with relevant ministries such as Ministry of Commerce and Industry. Post finalization of incentives, MoPSW to prepare incentive scheme for implementation	Q2, 2025	MoPSW

Islands as Maritime Cities

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Development of island city providing bunkering services							
1.	There are challenges related to taxes and duties on the bunker fuel reduce the cost competitiveness compared to other bunkering hubs	As per Central Board of Indirect Taxes and Customs, GST on bunker fuel is 5% for both coastal and foreign going vessels with no input tax credit	Tax	It is proposed to allow Input Tax Credit on the bunker fuel sale to the coastal vessels and 0% GST on the foreign going vessels (both Indian and Foreign flagged). This is required as with the availability of Input Tax Credit cost of operations for the coastal vessels will be reduced. The reduction of GST to 0% on bunker fuel supplied to the foreign going vessels (both Indian and foreign flagged) would help in the reduction of the fuel cost and make the terminal attractive for foreign vessels moving along the main trade routes.	MoPSW to hold discussion with Ministry of Petroleum and Gas to hold discussion with Ministry of Finance for allowing Input Tax Credit on the bunker fuel sold to coastal vessels and reduction in GST to 0% on the bunker fuel supplied to foreign going vessels	Q4, 2023	MoPSW
					Conduct feasibility study to assess the impact of revision in tax and send representation to GST council	Q4, 2023	MoPSW
					GST council to conduct meeting and approve the revised rates	Q1, 2024	MoPSW
2.	There is currently no major incentive available for setting up of the transshipment free trade zone as the fiscal incentives available under the SEZ policy have been withdrawn.	Currently there is no incentive mechanism available	Policy	Fiscal incentives provided to the SEZ which can be considered for tenants and developers of the Transshipment Free Trade Zone	Ministry of Ports, Shipping and Waterways to hold discussion with the Ministry of Commerce and industry for the possible fiscal incentives that can be provided to the developers and tenants of the transshipment free trade zone.	Q4, 2023	MoPSW
					Ministry of Ports, Shipping and Waterways based on the discussion to finalize the incentives that can be provided to the tenants and developers of transshipment free trade zone.	Q4, 2023	MoPSW
3.	There is a lack of availability of spares within the country as majority of the Original Equipment Manufacturers (OEMs) are present in international geographies	There is a policy by Ministry of Shipping for availability of ROFR for India owned and/or flagged vessels. This policy helps in making the shipping industry attractive and increasing the demand for vessels	Policy	It is proposed that a policy guideline may be issued for vessels availing cargo ROFR through Public Sector Undertakings (PSUs) and other Government Entities mandatorily be repaired in Indian shipyards only. This will help in increasing demand of repair by vessels in the Indian Shipyards and thereby increasing the demand for OEMs, which can be established in India	MoPSW to prepare and issue the policy guideline making it mandatory for the vessels availing benefits under ROFR policy should undertake the repair of the vessels in Indian Shipyards	Q4, 2023	MoPSW
4.	The availability of tax holiday under section 80IA of income Tax Act has been withdrawn	There are currently no deductions available in terms of tax holidays for the infrastructure developers and O&M Players	Tax	It is proposed that the tax holiday on the lines section 80IA of the Income Tax Act be reintroduced as it will help in attracting private sector players in developing the islands as Maritime Cities	Ministry of Ports, Shipping and Waterways to hold discussion with Ministry of Finance for issuance of guidelines for availability of tax holiday for private sector players on the lines of section 80IA of Income Tax Act	Q4, 2023	MoPSW
					Ministry of Finance to hold discussion with Central Board Direct Taxes for issue of guidelines for availability of tax holiday for private sector players on the lines of section 80IA of Income Tax Act	Q1, 2024	MoF

Action Plan for Implementing **Infrastructure, Policy, Institutional, Capacity Building and Technology Initiatives**

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	As per Arbitration Act 2015, all the arbitration disputes are to be settled within a period of 12-18 months, however there is lack of such fast-track dispute resolution mechanism for out of court settlement	Setting up a Conciliation & Settlement Committee (CSC)	Policy & regulatory	CSC committee shall ensure speedy & cost-effective disposal of pending or new cases of disputes thereby reducing unnecessary litigations	Formation of a committee to finalize and appoint the independent experts of CSC in the following categories: • **Vigilance expert** (Former Chief Vigilance Commissioner (CVC)/ ex- Secretary to the Government of India / ex-Chairman, Major Port Trust/ex-DG Shipping/ ex-Chairperson IWAI) • **Legal expert** (Retired Judge of a High Court / former Lokayukta) • **Public finance expert** (Retired Secretary to the Government of India) • **Maritime Industry Expert** (A renowned person having experience in the Maritime Sector) • **Accounting expert** (Formerly a Senior Partner with one of the reputed accounting firms)	Q2, 2024	Committee set up for IMAC establishment/ MoPSW/ through external consultancy/ NALSAR
					Appointment of independent experts in CSC	Q3, 2024	Committee set up for IMAC establishment/ MoPSW/ through external consultancy/ NALSAR
2	No process available for conducting maritime conciliation	Preparation of Standardised Operational Procedure (SOP) for Conciliation & settlement	Policy & regulatory	The SOP shall support Conciliation & Settlement Committee (CSC) in dispute resolution.	Detailing of SOP framework for referring the dispute matter to CSC for Conciliation. A broad SOP has been proposed in the report on lines of one adopted in road sector. The CSC would need to align a detailed SOP from maritime perspective.	Q4, 2024	MoPSW
					Publish draft for stakeholder consultations	Q4, 2024	Committee set up for IMAC establishment/ MoPSW
					Review and finalization of SOP	Q1, 2025	Committee set up for IMAC establishment/ MoPSW
3	Lack of clearly defined scope for conducting conciliations	Define Terms & conditions as well as scope of independent experts under CSC	Policy & regulatory	The terms will include membership fee, procedure for Committees day-to-day sittings, timelines for conciliation closure etc.	Detailing of terms and conditions of Conciliation & Settlement committee. Broad terms and conditions have been proposed in the report on lines of one adopted in road sector. CSC would need to review the terms and conditions from maritime perspective.	Q4, 2023	Committee set up for IMAC establishment/ MoPSW
					Publish draft for stakeholder consultations	Q4, 2023	Committee set up for IMAC establishment/ MoPSW/ IMAC administrative experts
					Review and finalization of Terms & Conditions	Q1, 2024	SDCL
4	Over 100 litigation cases pending before the Courts / Arbitration panel on contractual disputes of Major Ports alone	Resolution of existing litigations through Conciliation and Settlement Committee	Policy & regulatory	This will ensure reduction in existing litigations subject to interest of parties involved in such litigations to approach CSC	Preparation of SOP framework for referring the litigations matter to CCS	Q4, 2023	Committee set up for IMAC establishment
					Review and finalization of SOP	Q1, 2024	Committee set up for IMAC establishment
5	Lack of dedicated dispute resolution centre for maritime sector in India	Establishment of Independent Maritime	Institution	IMAC shall be an independent, industry governed, and merit-based	Set up a committee for establishment of IMAC	Q4, 2023	Committee set up for IMAC establishment

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		Arbitration Centre (IMAC) Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Develop international leadership by setting maritime Arbitration body for International maritime dispute resolution		institutional arbitration system that will cater to domestic or international disputes in maritime sector	**Option 1: GIMAC to be developed as IMAC** Proposal to Gujarat Maritime University & International Financial Services Centres Authority to take GIMAC under central purview with name change to reflect National centre (GIFT city, Gujarat)	Q4, 2023	Committee set up for IMAC establishment/ MoPSW
					Option 2: Development of an Independent body Location finalization for establishment of IMAC from the following: • National law University, Delhi • IMU, Mumbai • NALSAR, Hyderabad	Q4, 2023	NALSAR
					Issuance of circular to formalizing the center as nodal body to prevent mushrooming number of other regional maritime arbitration associations and/ or centres in India	Q4, 2023	NALSAR
6	Indian Arbitration rules are based on Arbitration and Conciliation Act, 1996 and are different from international guidelines which results in parties approaching international arbitration centres or dispute resolution	Formation of charter and guidelines for IMAC	Policy & Regulatory	The guidelines of proposed IMAC shall be based guidelines of international maritime arbitration bodies such as LMAA, SMAC & HKIAC etc.	Study and analysis of international rules such as LMAA, SMAC & HKIAC etc. for development of IMAC guidelines. For example, the 19 elements of LMAA guidelines can be considered while preparing guidelines for IMAC	Q2, 2024	Committee set up for IMAC establishment/ MoPSW/ through external consultancy/ NALSAR
					Development of Arbitration guidelines for IMAC	Q3, 2024	Committee set up for IMAC establishment/ MoPSW/ through external consultancy/ NALSAR
					Based on proposed Arbitration guidelines, decision on the following: • Development of new Maritime Arbitration Act, or • Amendment in existing Arbitration and Conciliation Act 1996	Q4, 2024	MoPSW
7	Lack of world class arbitrators in maritime sector in India	Finalise the composition and panel of IMAC	Institution	The IMAC shall have institutional structure in lines with international bodies such as LMAA, HKIAC etc.	Finalise the institutional structure of IMAC. Some of the positions at administrative level could be: • **President** (CVC officer/ chairman level) • **Secretary** (Secretary level) • **Board of Directors** (Comprising of a mix of experienced personalities from private, academic and public sector. Example: A senior retired Judge, two practicing law firm partners, two independent domestic & international *non-lawyer arbitrators/mediators, DG Shipping, Chairman of IPA, Chairman of Indian National Shipping Association)*	Q4, 2023	Committee set up for IMAC establishment/ MoPSW
					Onboarding of IMAC administrative panel	Q1, 2024	Committee set up for IMAC establishment/ MoPSW
					Finalise various committees to be working under IMAC. Some of the proposed committees are: • **Adjudication and Dispute resolution committee** • **Mediation Committee** • **Liaison committee** (International advisory panel - Supporting Members representing all sections of the shipping industry, both in India and overseas to provide feedback from the	Q2, 2024	Committee set up for IMAC establishment/ MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					perspective of other regions and views of the shipping industry at large on matters of interest)		
					Selection and onboarding of experts under each of these committees	Q2, 2024	Committee set up for IMAC establishment/ MoPSW/ IMAC administrative experts
8	Lack of a dedicated space for resolving maritime disputes	Infrastructure development for IMAC centre	Infrastructure	The infrastructure shall either be developed at Gift city, Gujarat (if option 1 is opted) or at the campuses of either of these institutes (if option 2 is opted): • National law University, Delhi • IMU, Mumbai • NALSAR, Hyderabad	Land allotment/lease of land from campus for	Q4, 2023	SDCL
					RFP for appointment of a contractor	Q1, 2024	Committee set up for IMAC establishment
					Selection of contract	Q1, 2024	Committee set up for IMAC establishment
					Infrastructure development & handover	Q2, 2025	Committee set up for IMAC establishment
9	Limited sectoral knowledge, lack of research & training activities	Collaboration of IMAC with NALSAR Projects already identified under the initiative: - (Source: **MIV 2030**) Extend partnerships with 9 leading maritime nations across 5 areas to develop domestic capabilities (e.g. maritime law, port logistics etc.)	Capacity building	Support in drafting of IMAC rules, research & training activities in maritime sector	Agreement with NALSAR & IMU with clearly defined role and responsibility including • Preparing, Reviewing, revising, amending and updating Maritime laws • Administering dispute resolution • Training & capacity building	Q2, 2024	Committee set up for IMAC establishment/ MoPSW
					Development of plan for research, training & internship opportunities	Q3, 2024	NALSAR
					Nominate at least 5-10 students every year to take internship in IMAC	Q2, 2024	NALSAR

Action Plan for Implementing **Infrastructure, Institutional, Capacity Building and Technology Initiatives**

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1		**Option 1** - Dedicated maritime vertical	Institutional		MoPSW to conduct discussion with Ministry of Finance (MoF) on the need for having a dedicated fund for maritime sector under the proposed DFI	Q4 2023	MoPSW/ MoF

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		under the newly proposed DFI by Government of India Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Increase India's insurance capacity for maritime sector to reduce dependence of foreign markets for direct and reinsurance		The fund will be housed under the newly proposed DFI The fund will contain team of sector experts for project appraisal and evaluation The fund will mainly focus on commercially viable projects and to perform the functions of NBFCs, Alternate Investment Fund and Asset Reconstruction Company	MoPSW to provide details of following key considerations for setting up the fund to Ministry of Finance • Ownership structure - The fund will be housed under the DFI which is proposed to be fully government owned • Regulatory Provision - Key amendments required in the existing regulation (NBFC-IFC, AIF, ARC) for efficient operation of MDF • Products to offer & corpus • Clarity on revenue potential for MDF - Ringfencing of maritime projects revenues to create long term sustainability of fund e.g., Port VRC charges • Well defined appraisal mechanism - Guidelines on what type of projects will be evaluated, its review mechanism, targets to be achieved for disbursement, timelines for disbursement • Institutional structure to ensure robust implementation - Mechanism for coordination amongst various nodal agencies	Q4 2023	MoPSW/ MoF
	Limited availability of low-cost, long-term capital Limited domain expertise in existing financing institutions Higher collateral requirement Stringent terms of domestic loans				Ministry of Finance to establish MDF under the proposed DFI with following key activities: • Location for setting up the office • Hire sector experts for project appraisal • Set-up required infrastructure – office, IT infrastructure, computing devices etc. • Appoint board members – chairman, independent directors, managing directors to manage the fund • Infuse initial corpus to the fund	Q4 2024	MoF
2		**Option 2 -** Creation of Maritime Development Fund for providing low-cost and long-term capital in the maritime sector Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Increase India's insurance capacity for maritime sector to reduce dependence of foreign markets for direct and reinsurance 2 Set-up Maritime Development Fund (MDF) for low-cost, long-term financing support to maritime sector stakeholders	Institutional	The MDF will be created with a corpus of INR 5,000 Cr. The 51% ownership of the fund to be with multilateral/bilateral agencies and the balance 49% to be with the Government of India. The fund will contain team of sector experts for project appraisal and evaluation The fund will mainly focus on commercially viable projects and to perform the functions of NBFCs, Alternate Investment Fund and Asset Reconstruction Company	MoPSW to conduct discussion with Ministry of Finance (MoF) on the need for having a standalone dedicated fund for maritime sector	Q4 2023	MoPSW
					MoPSW to provide details of following key considerations for setting up the fund to Ministry of Finance • Ownership structure - Multilateral/ Bilateral agencies are proposed to take majority of the ownership to pierce sovereign rating • Regulatory Provision - Key amendments required in the existing regulation (NBFC-IFC, AIF, ARC) for efficient operation of MDF • Products to offer & corpus • Partners - Interactions with multilateral/ bilateral institutions to define role and institutional structure • Clarity on revenue potential for MDF - Ringfencing of maritime projects revenues to create long term sustainability of fund e.g., Port VRC charges • Well defined appraisal mechanism - Guidelines on what type of projects will be evaluated, its review mechanism, targets to be achieved for disbursement, timelines for disbursement • Institutional structure to ensure robust implementation - Mechanism for coordination amongst various nodal agencies	Q4 2023	MoPSW
					Sagarmala Development Company Limited (SDCL) to conduct roadshow for creation of Maritime Development Fund with multilateral / bilateral agencies	Q1 2024	SDCL
					SDCL to sign Memorandum of Understanding with multilateral/bilateral agencies for creation of the fund	Q4 2024	SDCL

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Appointment of an Investment Banker, legal consultant, tax & accounting consultant, and regulatory consultant for preparation of Article of Association, company formation for the fund.	Q1 2025	SDCL
					The appointed consultant to help SDCL and the identified multilateral/bilateral agencies to seek approvals from SEBI, Ministry of Corporate Affairs, Ministry of Finance, Reserve Bank of India, and any other relevant Ministry / Department of Government of India for activities of MDF as AIF, NBFC and ARC	Q2 2025	SDCL
					PPP Wing of MoPSW to help provide SDCL sufficient funds to infusing its share of capital in the fund	Q3 2025	SDCL
3	Manual paperwork and documentation - High amount of paperwork and documentation in claim settlement process Hardcopy submission of documents	Explore ways to reduce paperwork through increased automation in claim settlement process for small and medium size claims (mainly of inland, fishing, and sundry vessels)	Process simplification	To simplify claim filing process, electronic mode of document submission is proposed. Automation of claims filing procedure with IT tools will help in faster settlement of claims.	MoPSW to have discussion with GI council for setting up committee towards simplification of paperwork and documentation process	Q2 2024	MoPSW
					Discussion may be held at GI council to explore ways to increase automation and reduce paperwork in the claim settlement process for small and medium size claims (mainly of inland, fishing, and sundry vessels) The committee may decide on following aspects to simplify process of document submission: • Facilitate online intimation through portals • Surveyor/investigators to be given logins for raising requirements and uploading documents • Identify double documentation in the process and reduce the number of hardcopy submission • Relaxation from scrutiny provisions for insurers and allow online approval of the claim based on scanned copies of the documents • SOP should be prepared mentioning the list of common agreed standard documents to be submitted for processing the claims	Q3 2024	GI Council and Respective insurance companies
4	Complex usage of policy wordings - Decoding insurance jargons can sometimes be confusing leading to multiple interpretations and delays Lack of standard proposal form in marine policies leading to issues of misrepresentation and non-disclosure at the time of claim Lack of standard Express Warranties and lack of knowledge of drafting Warranties lead to many claim disputes	Develop common understanding between insurers about the use of standard proposal forms for small and medium sized claims	Process simplification	Standard wordings and proposal forms in line with international standards should be used in the contract	MoPSW to have discussion with GI council for setting up committee towards standardizing marine policy documents	Q2 2024	General Insurance (GI) Council
			Process simplification		Discussion may be held at GI council to develop common understanding between insurers about use of standard proposal forms (marine policy document) for small and medium size claims Insurers may collate all contracts in vogue with a view of vetting and then standardize them to ensure uniformity and fairness in the wordings	Q4 2024	Insurance companies in coordination with Ministry of Finance
5	Claim process - Limited standardization of the practices followed by the	Develop common understanding between insurers about standard	Process simplification	Simplification of the claims procedure and paperwork, on account payment, better education of Insured and their claims and ship management teams	Letter to be sent to GI council for setting up committee to develop common understanding between insurers about standard practice to be followed at the time of claims such as issuance of bank guaranties, making direct payments to yards etc.	Q2 2024	General Insurance (GI) Council

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	insurers during claims (e.g., agreeing to a panel of surveyors in policies, providing bank guaranties in collision cases, making direct payments of repair cost to shipyards etc.)	practice to be followed at the time of claims such as issuance of bank guaranties, making direct payments to yards etc.		on risk management, and dos and don'ts after the loss will improve trust level between insured and insurers resulting in better compliance by insured and quicker settlement	Discussion may be held at GI council to discuss the following standard practices to be followed at the time of claims: • In long tail claims (involving extensive repair), making on-account payment wherever possible • Insured to be given ~5-10% of the claim amount upfront at the time claim is intimated • Insurers should encourage practice of direct settlement of repair costs with the yards instead of asking insured to pay first • In case of collision liability, the bank guarantee should be furnished by the insurer within a stipulated time • Explore inclusion of arbitration clause in marine policy document and setting-up arbitration committee	Q4 2024	GI Council and Respective insurance companies
6	Surveyors with no maritime background are being appointed to assess marine losses	Explore engaging seafarers for survey	Capacity Building	An IRDA "A" Category Surveyor is not necessarily an ex-seafarer or a person knowledgeable in Maritime Operations. A team of expert surveyors with seafaring background need to be developed.	Discussion may be held at GI council to explore engaging seafarers for survey	Q4 2023	GI Council and Respective insurance companies
7	Limited reinsurance market capacity in India for Ports Package and other liabilities risks	Creation of fund pool by Major Ports to help improve the capacity in the reinsurance sector	Institutional	Ports to create a pool on a contribution basis based on the following criteria as a short-term solution: • Type of cargo handled • Tonnage of cargo handled • Revenue earned • Geographical location • Risk survey and past loss experience Ports to retain certain part of the risk at the pool level which will entertain liability up to a certain amount	MoPSW to undertake discussion with GI council and Insurance companies to assess size of fund pool required	Q4 2023	MoPSW, GI Council and Insurance companies
					MoPSW to conduct joint discussion with insurance companies and major ports towards the requirements and key considerations for setting up pool fund such as • Structure of pool – Key management staff, contribution from different ports • Fund withdrawal mechanism for claim settlement • Standard operating procedure for seamless operation of the fund pool	Q1 2024	MoPSW, GI Council, Insurance companies and Major ports
					MoPSW to issue notification to the port for creation of fund pool	Q2 2024	MoPSW
					Major ports to contribute to the fund through their internal reserves	Q4 2024	Major ports
8	Little or no capability for P & I risks	Explore possibilities for foreign P&I Clubs setting up their offices in India	Institutional	Protection and Indemnity Insurance covers personal injury, Illness and death claims from the crew, passenger, cargo damage, vessel damage, liability due to collision of vessels, damage to fixed and floating objects (Jetty, Pier, marine animals, Rig, Fishery Facility, etc.)	Shipowner's association to conduct discussions with foreign clubs to explore options of setting offices of foreign P&I clubs in India	Q4 2024	Shipowner's association
9	Little or no capability for P & I risks	Setting up of an independent Indian club by shipping companies in collaboration with a foreign club and PSU company in GIFT city	Institutional		MoPSW to conduct joint discussion with shipowners, insurance companies, maritime lawyers for setting up Indian P&I club	Q4 2028	MoPSW
					MoPSW to invite deliberation from various shipowner associations on following aspects: • Structure of P&I club –Committee of directors, executives for managing the club, • Capacity of the P&I club • Surveyors for assessing claims • Location of the office • Infrastructure requirement for setting up office	Q2 2029	MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Shipowner's associations to create Indian P&I club	Q1 2033	Shipowner's association
10	Limited reinsurance market capacity in India	Creation of strategy and roadmap for augmenting India's reinsurance capacities	Strategy		MoPSW to conduct discussion with GI council to set up a committee to discuss following aspects • Strategy and road map for development of India's reinsurance capacity • Decide on timeline till which capacity to be developed with closure of fund pool	Q4 2024	MoPSW/ GI Council
					Appointed committee to prepare strategy and roadmap for augmenting India's reinsurance capacity The strategy document should cover the following • Objectives • Current challenges in reinsurance market in India • Interventions to address the identified challenges • Roadmap and implementation plan of identified interventions • Key performance indicators	Q4 2026	Committee
					Implementation of identified initiatives as per the implementation plan by concerned stakeholders to create reinsurance market capacity in India	2027	Concerned stakeholders

Action Plan for **Tax, Regulatory and Policy Initiatives**

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Shipping sector is not considered under 'Infrastructure sector'. Because of this, both banks and financial institutes do not address capital intensive industries such as ship financing and leasing	As per Ministry of Finance notification no. F. No. 13/1/2017-INF dated 14th November 2017 and subsequent amendments, shipping sector is not included in the Annexure -1 Harmonized Master List of Infrastructure Sub-sectors	Regulatory	Shipping sector to be included in Annexure -1 (Harmonized Master List of Infrastructure Sub-sectors) of the GoI notification no. F. No. 13/1/2017-INF	MoPSW to conduct discussion with Ministry of Finance on the need of including shipping sector in in Annexure -1 (Harmonized Master List of Infrastructure Sub-sectors) of the GoI notification no. F. No. 13/1/2017-INF	Q2 2024	MoPSW
					MoF to conduct meeting with concerned stakeholders and review MoPSW deliberation.	Q2 2024	MoF
					MoF to issue the updated Annexure -1 (Harmonized Master List of Infrastructure Sub-sectors) of the GoI notification no. F. No. 13/1/2017-INF	Q2 2024	MoF

Action Plan for Implementing **Infrastructure, Institutional, Capacity Building and Technology Initiatives**

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency	Budget/ Cost
1	Limited reinsurance market capacity in India for Ports Package and other liabilities risks	Creation of fund pool by Major Ports to help improve the capacity in the reinsurance sector	Institutional	Ports to create a pool on a contribution basis based on the following criteria as a short-term solution: • Type of cargo handled • Tonnage of cargo handled • Revenue earned • Geographical location • Risk survey and past loss experience Ports to retain certain part of the risk at the pool level which will entertain liability up to a certain amount	MoPSW to undertake discussion with GI council and Insurance companies to assess size of fund pool required	Q4 2023	MoPSW, GI Council and Insurance companies	US $ 500 million capacity required
					MoPSW to conduct joint discussion with insurance companies and major ports towards the requirements and key considerations for setting up pool fund such as • Structure of pool – Key management staff, contribution from different ports • Fund withdrawal mechanism for claim settlement • Standard operating procedure for seamless operation of the fund pool	Q4 2023	MoPSW, GI Council, Insurance companies and Major ports	
					MoPSW to issue notification to the port for creation of fund pool	Q2 2024	MoPSW	
					Major ports to contribute to the fund through their internal reserves	Q4 2024	Major ports	
2	Little or no capability for P & I risks	Explore possibilities for foreign P&I Clubs setting up their offices in India	Institutional	Protection and Indemnity Insurance covers personal injury, Illness and death claims from the crew, passenger, cargo damage, vessel damage, liability due to collision of vessels, damage to fixed and floating objects (Jetty, Pier, marine animals, Rig, Fishery Facility, etc.)	Shipowner's association to conduct discussions with foreign clubs to explore options of setting offices of foreign P&I clubs in India	Q4 2024	Shipowner's association	Capacity needed is $ 1 billion minimum for Ocean going vessels
3	Little or no capability for P & I risks	Setting up of an independent Indian club by shipping companies in collaboration with a foreign club and PSU company in GIFT city	Institutional		MoPSW to conduct joint discussion with shipowners, insurance companies, maritime lawyers for setting up Indian P&I club	Q4 2028	MoPSW	Capacity needed is $ 1 billion minimum for Ocean going vessels
					MoPSW to invite deliberation from various shipowner associations on following aspects: • Structure of P&I club –Committee of directors, executives for managing the club, • Capacity of the P&I club • Surveyors for assessing claims • Location of the office • Infrastructure requirement for setting up office	Q2 2029	MoPSW	
					Shipowner's associations to create Indian P&I club	Q1 2033	Shipowner's association	
4	Limited reinsurance market capacity in India	Creation of strategy and roadmap for augmenting India's reinsurance capacities	Strategy		MoPSW to conduct discussion with GI council to set up a committee to discuss following aspects • Strategy and road map for development of India's reinsurance capacity • Decide on timeline till which capacity to be developed with closure of fund pool	Q4 2024	MoPSW/ GI Council	-
					Appointed committee to prepare strategy and roadmap for augmenting India's reinsurance capacity	Q4 2026	Committee	-

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency	Budget/ Cost
					The strategy document should cover the following • Objectives • Current challenges in reinsurance market in India • Interventions to address the identified challenges • Roadmap and implementation plan of identified interventions • Key performance indicators			
					Implementation of identified initiatives as per the implementation plan by concerned stakeholders to create reinsurance market capacity in India	2027	Concerned stakeholders	

Action Plan for **Tax, Regulatory and Policy Initiatives**

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Shipping sector is not considered under 'Infrastructure sector'. Because of this, both banks and financial institutes do not address capital intensive industries such as ship financing and leasing	As per Ministry of Finance notification no. F. No. 13/1/2017-INF dated 14th November 2017 and subsequent amendments, shipping sector is not included in the Annexure -1 Harmonized Master List of Infrastructure Sub-sectors	Regulatory	Shipping sector to be included in Annexure -1 (Harmonized Master List of Infrastructure Sub-sectors) of the GoI notification no. F. No. 13/1/2017-INF	MoPSW to conduct discussion with Ministry of Finance on the need of including shipping sector in in Annexure -1 (Harmonized Master List of Infrastructure Sub-sectors) of the GoI notification no. F. No. 13/1/2017-INF	Q2 2024	MoPSW
					MoF to conduct meeting with concerned stakeholders and review MoPSW deliberation.	Q2 2024	MoF
					MoF to issue the updated Annexure -1 (Harmonized Master List of Infrastructure Sub-sectors) of the GoI notification no. F. No. 13/1/2017-INF	Q2 2024	MoF
2	Indian shipyards currently have limited capacity to manufacture merchant vessels more than 8,400 DWT Taxability of merchant vessels under Indian Flag disincentives the ship owners due to cost	5% IGST on import of merchant vessel under Indian Flag No IGST on import on merchant vessels under Foreign Flag	Tax	0% IGST only on import of merchant vessels more than 8,400 DWT	Conduct feasibility study to assess the impact of revision in tax and send representation to GST council	Q2 2024	MoPSW

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	disadvantage as companies which are engaged in international shipping are unable to offset the tax credit. Therefore, companies have to additional equity for payment of IGST as no loans are available				GST council to conduct meeting and approve the revised rates	Q2 2024	GST council
3	Inputs to vessels such as Furnace Oil, Spares, lubes etc. are charged at 5% with no provision of Input Tax Credit in both time and voyage charters	Rate schedule for Voyage charters as well as for Time charters has a condition that no input tax credits can be availed on inputs - Notification 11/2017 Central Tax (Rate) & Notification 1/2018- Central Tax rate. As the Rate schedule restricts the use of ITC on inputs for shipping sector Taxes paid on inputs become costs to the company and increases the cost of transportation. This problem is not faced by others in the transportation sector because their main fuel viz. Diesel and Air Turbine Fuel (ATF) are not under the GST regime whereas the main fuel for ships viz IFO is within the GST regime. However, the shipping industry can avail of ITC on fuel only if the restriction in the Rate Schedule is removed.	Tax	Removal of restriction in the rate schedule limiting Indian Shipping Companies to avail input tax credits	Conduct feasibility study to assess the impact of revision in tax and send representation to GST council	Q4 2023	MoPSW
					GST council to conduct meeting and approve the revised rates	Q4 2023	GST council
4	Foreign Trade Policy 2015-2020 has a scheme viz., Service Exports from India Scheme (SEIS) to benefit service exporters including major ports and the PPP Operators, Container Freight Stations and EXIM rail Operators and Indian shipping companies Scheme aims at making exports competitive in terms of price and promote export of services from India by providing duty scrip credit for eligible exports This Scheme has not been extended for the year 2019-20		Tax	The Scheme may be included in the new Foreign Trade Policy 2020-2025. These entities are highly capital intensive in nature and these benefits are utilized for upgradation/modernization of their infrastructure and Facilities to make them globally competitive.	MoPSW to send representation to Directorate General of Foreign Trade	Q4 2023	MoPSW
					Directorate General of Foreign Trade to review the representation and approve the inclusion of the scheme in the new Foreign Trade Policy 2020-25	Q4 2023	Directorate General of Foreign Trade

Action Plan for **Tax, Regulatory and Policy Initiatives**

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Indian shipyards outbid by foreign shipyards in Indian and Global markets [Cost disadvantage of 20%-35%* vis a vis foreign shipyard]. Further, the policy of Shipbuilding Financial Assistance couldn't achieve its targeted goal due the onset of pandemic	Ship Building Financial Assistance policy	Policy	Offset cost differential through financial assistance. Shipbuilding is Capital-intensive in nature with issues in availability of timely and adequate finance and hence to further promote growth of domestic shipbuilding, the policy should be extended for another 10 years	Prepare a proposal with the rationale behind the suggested action and send it to the MoPSW for approval	Q4, 2023	INSA
					MoPSW to extend the proposal to Ministry of Finance (MoF) with budget corpus requirement	Q4, 2023	MoPSW
					Approval from MoF and issue a circular with full disclosure of terms and conditions	Q1, 2024	MoF
2	Lower Customs Duty on import of used vessels such as port crafts, tugboats, offshore vessels etc. makes the vessel manufacturers in India uncompetitive as the vessel owners are getting incentivized to import vessels.	Imposition of custom duties on import of Port crafts and small dredgers Coastal and Offshore vessels Inland Vessels Based on the year of import and age of vessel. Duty will be reversed if similar vessel is made in India within the next 4 years of purchase	Policy/ Taxation/ Regulatory	Increasing the Custom Duty as below: For Port Crafts and Tugs it may be considered as 50% if the age of the vessel is less than 10 years; 100% if the age of the vessel is between 10 years – 25 years and import should not be allowed if the age of the vessel is more than 25 years For Small Dredgers with up to 5,000 GT, the custom duty on import may be considered as 50% if the age of the vessel is less than 10 years; 100% if the age of the vessel is between 10 years – 25 years and import should not be allowed if the age of the vessel is more than 25 years For Offshore Vessels, the Customs Duty may be considered as 50% if the age of the vessel is less than 10 years; 100% if the age of the vessel is between 10 years – 25 years and more than 25 years For Coastal Cargo vessels with GT upto 10,000, the custom duty may be considered as 25% if the age of the vessel is less than 10 years; 50% if the age of the vessel is between 10 years – 25 years and 100% if the age of the vessel is more than 25 years For Inland Cargo Vessels for GT upto 2,000, the import of such vessels should not be allowed.	Prepare a proposal with the rationale behind the suggested action and send it to the MoPSW for approval	Q4, 2023 onwards	INSA
					MoPSW to extend the proposal to the CBIC, Ministry of Finance for approval	Q4, 2023 onwards	MoPSW
					Approval from CBIC, MoF & issue of notification with full disclosure of terms and conditions	Q1, 2024 onwards	CBIC/ MoF
3	Lack of restriction on usage of foreign flag vessels for Govt/ PSU is restricting the growth of ship building in India	Restrict the movement of foreign flag vessels for services of Govt/ PSU duty Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Channelize domestic demand for Indian Shipbuilding by leveraging PPP (Aatmanirbhar Bharat)	Policy/ Taxation/ Regulatory	PPP (Atmanirbhar) scheme to include PSU hiring/ chartering service till 2023 Class 1: Indian Flag, Indian built vessel Class 2: Indian Flag, Foreign built Vessel Non-local: Foreign Flag Post 2023, only Indian flagged vessels to be allowed to serve PSU/ Govt. requirements. Post 2025, Foreign built port crafts with 30+ years of age, not allowed for PSU/ Govt duty No foreign flag vessels with 20+ years age to be allowed for Govt/ PSU/Private use	Conduct stakeholder consultations with PSUs and other relevant stakeholders	Q4, 2023	INSA
					Conduct a detailed study to evaluate the impact of the proposed action	Q4, 2023	INSA
					Preparation of detailed guidelines and issue draft guidelines to all relevant stakeholders to take their consensus	Q1, 2024	INSA/ DG Shipping
					Issue of guidelines post approval	Q2, 2024	DG Shipping

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
4	Limited number of Shipyards with limited capacity, most of which are currently engaged in building Indian Navy (IN)'s warships and Indian Coast Guard (ICG) vessels, besides a few commercial ships to meet the government's requirements.	-	Regulatory	Conduct grading of Shipyards based on technical capabilities and a policy may be evolved for selected shipyards for a combination of both defense and commercial projects to enhance capacity utilization and efficiency of yards.	Identify all shipyards and conduct grading of them based on technical capabilities	Q4, 2023	IRS
					Develop a policy for selected shipyards for a combination of both defense and commercial projects to enhance capacity utilization and efficiency of yards.	Q4, 2023	MoPSW & MoD
5	The conditions to set up a FTWZ are very cumbersome and so small-scale trades are not able to utilize this provision. The challenges include, Minimum area requirement for establishing FTD Minimum size and revenue requirement Minimum investment requirement condition Cumbersome process for return of unsold goods	SEZ Act, 2005	Regulatory	FTWZ conditions to be relaxed for setting up a Free Trade Depot. Key initiatives to include, Process of stablishing a FTD must be simple and effective The facility of FTD should be extended not only to the shipyards but also to manufacturers, ancillary parties, traders and entrepreneurs Policies need to be altered to permit establishment of FTD/FTWZ in Maritime Clusters Process for return of unsold goods must be simplified	Conduct a detailed study on covering the key areas including the conditions to be relaxed	Q4, 2023	CSL/ INSA
					Prepare a proposal with the rationale behind the suggested action and send it to the MoPSW for approval	Q4, 2023	CSL/ INSA
					MoPSW, to extend the proposal to the Ministry of Commerce and Industry for approval	Q1, 2024	MOPSW
					Pilot a free trade depot in one of the major yards and check for feasibility. Suggested destination is Cochin Shipyard Limited, which has land and expertise for the establishment of an FTD	Q2, 2024 (one year)	CSL
					Prepare a policy with the actions of permitting the establishment of FTD/FTWZ in Maritime Clusters and send it to Ministry of Ports, Shipping and Waterways for approval	Q4, 2025	CSL/ INSA
					Issuance of circular	Q1, 2026	MoPSW/ MoCI
6	India lags behind Bangladesh when it comes to ship recycling	Policy for providing subsidy on old ships & replace with new ones	Policy	Policy for providing subsidy on old ships & replace with new ones on international lines (50% subsidy on scrapping & remaining 50% subsidy on new development may be provided)	Detailed proposal on subsidy scheme with quantifiable benefits, area of subsidy, subsidy corpus calculation & eligibility criteria	Q4, 2023	MoPSW/ GMB/ CSL
					Approval from MoPSW	Q1, 2024	MoPSW
					Approval from other authorities (based on type of subsidy) e.g. Income tax department etc.	Q2, 2024	MoPSW
					Implementation of subsidy scheme	Q4, 2024	MoPSW
7	India lags behind Bangladesh when it comes to ship recycling	niL	Policy	Upto 70 new centres to come up in next 5 years. Policy may be prepared to incentivize these centres to develop their facility near coastal districts	Proposal to MoRTH for developing vehicle scrapping centres in coastal districts	Q4, 2023	MoPSW

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Devise suitable incentive scheme for coastal shipping arrangement	Q4, 2023	MoPSW
					Notification of circular	Q1, 2024	MoPSW
8	India is behind Bangladesh when it comes to ship recycling	BIS not recognizing recycled steel Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Modification of BIS regulations (IS 1786:2008) governing TMT bar production to allow usage of ship scrap basis material composition and strength/ quality in place of existing requirement of metallurgical history	Policy	Modification of BIS regulation (IS 1768:2008) governing TMT bar production to allow usage of ship crap basis material composition and strength/ quality in place of existing requirement of metallurgical history	Proposal to BIS based on detailed study	Q4, 2023	CSL/ GMB
					Approval from BIS	Q4, 2023	BIS
9	India lags behind Bangladesh when it comes to ship recycling	Import Duty 2.5% and GST 18%)	Policy	Reduction in tax rate in line with imported baled scrap	Detailed study to arrive at revised tax rates	Q4, 2023	CSL/ GMB
					MoPSW to send representation to Income tax department	Q4, 2023	MoPSW
					Approval from Income Tax department	Q1, 2024	Income Tax Department

Action Plan for **Infrastructure, Institutional, Capacity Building and Technology Initiatives**

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Currently, there is no unified platform for showcasing the products available for ship building	Develop common platform for ancillaries to showcase the product available for Indian Shipbuilding Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Develop common platform for ancillaries to showcase the	Institution	To be in line with International standards and the global market, a unified platform for showcasing the products available for ship building is required	Establish an independent association and identify & include all the parties that directly or indirectly are a part of the ship building process, as members	Q4, 2023	INSA/ SAI/ MoPSW
					Create an online and/or offline ancillary platform for showcasing the products available for ship building. The website should categorize the products offered for easy search and reach.	Q4, 2023	MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		products available for Indian shipbuilding					
2	Limited indigenous capability exists in basic design (around 30-40% indigenization only)	Create a common data base of standard-vessel basic design with pre-approval from Indian Register of shipping IRS to drive standardization, improve design process and leverage cost economies Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Create common database of standard-vessel basic designs with pre-approval from IRS available to all shipyards to drive standardization, improve design process and leverage cost economies 2 Develop strong marine design ecosystem by identifying design clusters and incentivizing for 'Design in India	Institution	Most of the basic and detailed engineering are prepared from the scratch for every vessel manufactured, which costs approximately 30-40 lakhs. This cost can be saved by using the basic design provided	Selection of vessel designs to be standardized and create design database	Q4, 2023	IRS
					Collaboration with foreign shipyards and design house t to develop basic and functional design for each vessel type	Q4, 2023	IRS
					Creation of digital models for design and databank for all pre-approved vessel designs	Q2, 2024	IRS
3	Lack of skill development and R&D capabilities	Ship building & repair Centre of Excellence Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Develop Centers of Excellence (CoE) for Ship repair in India	Institution	This would facilitate thought leadership and innovation in Ship building and repair particularly for large and upcoming vessel segments. The CoE would also help in training & development of workers & officers through creation of functional & vessel specific training programs and further support development of ancillary ecosystem to reduce import content and enable faster movement of material.	Conduct a detailed study outlining gaps in Indian shipbuilding & repair skills.	Q4, 2023	IRS/ CEMS
					Develop training program at CEMS based on gaps identified aligned with annual targets.	Q1, 2025	IRS/ CEMS
					Develop R&D centre at CEMS	Q1, 2025	IRS/ CEMS
4	Lack of ship repair facilities in the country which hampers growth of the industry	Develop ship repair clusters in select parts of India	Infrastructure	For the promotion of ship repair in India, a one stop solution for all repairs would be enabled through ship repair clusters and that will act	Finalize the destinations for ship repair clusters. Suggested destinations include Mumbai and Kochi.	Q4, 2023	CSL
					Conduct a detailed study across strategy, business modality, finance & taxation, commerce & industry, policy law, foreign trade etc. towards the Ship repair Cluster development	Q1, 2024	CSL

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Channelize domestic demand for Indian Ship repair by leveraging PPP (Aatmanirbhar Bharat) 2 Enhance ship repair capability in India- Develop two ship repair clusters (one each on the East & West coast)		as a catalyst for the growth of ship repair in India	Prepare a report with the rationale behind the suggested action, including tentative budget and send it to the Ministry of Ports, Shipping and Waterways (MoPSW) for approval	Q1, 2024	CSL
					Issue RFP for development of ship repair clusters with suitable business modality	Q1, 2024	CSL
					Development of ship repair clusters	Q4, 2027	CSL/ MOPSW
5	Ship repair Industry in India has not expanded over the years to its potential. India has a favorable location i.e. around 7-9 % of global trade passing within the 300 NM of coastline and hence huge potential lies in the country for becoming a major ship repair hub in the world. However, except for few main Shipyards in the country majority of the other yards lack the ship repair ecosystem and supporting infrastructure to capture the market potential	Develop specialized repair shops for vessels such as dredgers in India, South East Asian & Indian Ocean Rim	Infrastructure	To develop 2 major ship repair clusters which can leverage clustered availability of skilled manpower, infrastructure, ancillary support, technology support and training facilities. Basic framework needed to encompass a Ship repair Cluster which provides eco system for all types of repairs, conversions, upgradations in the Shipping. Infrastructure including docking facilities (dry dock /wet dock, floating docks, berths etc.), ancillary parks, OEM services centers, logistics including port connectivity, warehousing, facilities for workers etc. are the key requirement of the SR Clusters	Detailed location study to finalize the destinations for ship repair shops - Align with Ports and state bodies on land availability Conduct a detailed study across strategy, business modality, finance & taxation, commerce & industry, policy law, foreign trade etc. towards the specialized repair shops	Q1, 2024	CSL
					Prepare a proposal with the rationale behind the suggested action, including tentative budget and send it to the Ministry of Ports, Shipping and Waterways (MoPSW) for approval- Incentives schemes for players to be finalized	Q2, 2024	CSL
					Initiate development of trunk infrastructure	Q2, 2024	CSL
					Float EoI's for ship repair and allied facilities	Q2, 2026	CSL/ MOPSW
6	India lags in ship recycling behind Bangladesh	Enhance Ship recycling infrastructure through redevelopment of Alang Plots Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Enhance Ship recycling infrastructure through redevelopment of Alang plots and	Infrastructure	Enhancement of existing utilized capacity of 2 MMTPA (131 plots) to 5.24 MMTPA	• Relaxation in Annual fixed Charges • Amendment in Constitution changes of plot holder Transfer of Plots	Q4, 2023	GMB
					Adding 22 plots to enhance capacity to 0.88 MMTPA • Auction of 8 plots as directed by the Honorable SC • Amendments in Reservation Policy in a non-arbitrary manner, as directed by the Honorable SC Auction of 14 plots	Q3, 2025	GMB
					Adding 15 plots to enhance capacity to 1.20 MMTPA CRZ Clearance, Land Acquisition & Extension of road	Q3, 2025	GMB

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		establishment of additional recycling cluster on East Coast			Adding 30 plots to enhance capacity to 2.40 MMTPA CRZ Clearance, Land Acquisition & PMC finalization	Q3, 2027	GMB
7	India lags in ship recycling behind Bangladesh	Development of other ship recycling clusters	Infrastructure	Development of other ship recycling clusters at West Bengal & Vizag	Detailed location study to finalize the destinations Conduct a detailed study across strategy, business modality, finance & taxation, commerce & industry, policy law, foreign trade etc.	Q4, 2023	CSL/ MOPSW
					Prepare a proposal with the rationale behind the suggested action, including tentative budget and send it to the Ministry of Ports, Shipping and Waterways (MoPSW) for approval	Q4, 2023	CSL/ MOPSW
					Land acquisition & CRZ clearance	Q4, 2024	CSL/ MOPSW
					Issue RFP for development of ship recycling clusters with suitable business modality	Q1, 2025	CSL/ MOPSW
					Development of facility	Q4, 2026	CSL/ MOPSW
8	India lags in ship recycling behind Bangladesh	Collaboration with other countries in association with MEA Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Setup ship recycling facilitation centre to promote ship recycling activities and enhance marketability of ship by-products through trade fairs at ship breaking yards involving stakeholders across shipowners to downstream industries	Institution	Intervention of MEA, Govt. of India with European Union, OECD countries for sending their vessels directly to Alang without routing through Flag of Convenience (FOC) with subsidized selling price like Turkey MEA may also intervene with EU countries to send their vessels to Alang at subsidized rates considering HKC compliance status	Detailed study to arrive at subsized rated in line with international bodies	Q4, 2023	CSL/ GMB
					Proposal to MEA to collaborate with countries to send their vessels directly to Alang without routing through Flag of Convenience (FOC) with subsidized selling price	Q4, 2023	MoPSW
					Approval from MEA	Q2, 2024	MEA

Implementation Plan for Implementing **Infrastructure, Institutional, Capacity Building and Technology Initiatives**

Innovative Ecosystem

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Promoting Startups in the maritime sector-							
1	A nodal body is required for promoting startup policy in the maritime sector	Option 1 - Creation of an SPV between Major Ports and SDCL for operationalizing startup policy	Institutional	The following will be the functions of the SPV: 1. Operationalize the startup policy 2. Driving all necessary approvals, Committees, and funding for the policy 3. Mobilizing stakeholders (incubators, investors, mentors, State Govt bodies etc.) and resources (including funding) for shipping startups 4. Identification of bottlenecks in ecosystem and resolving these issues 5. Monitoring the progress of the innovation ecosystem in the maritime sector 6. Providing all the necessary funding and non-funding support to accelerators and incubators	MoPSW to align with Major Port Authorities and SDCL for forming an SPV for promotion of start-ups in the maritime sector and appoint nominees of the Working Group for tasks required for formation of the SPV.	Q2, 2024	SDCL and Major Port Authorities
					SDCL to undertake appointment of a regulatory consultant which will support the Working Group in taking the necessary approvals, creation of Memorandum of Association and Articles of Association for the SPV, support the Working Group in registering the SPV with the Ministry of Corporate Affairs, Government of India	Q2, 2024	SDCL and Major Port Authorities
					Working Group to send requests to Major Port Authorities and SDCL for appointing their officials to the key posts in the SPV	Q4, 2024	SDCL and Major Port Authorities
					Working Group to prepare the Standard Operating Procedure for the SPV providing the guidelines for screening of future incubators and accelerators including from Private Sector and Screening guidelines for Incubators and accelerators to select Startups or Incubation or acceleration based on the StartUp Policy	Q1, 2025	SDCL and Major Port Authorities
					SDCL and Major Port Authorities post assigning the officials for the SPV and provide the required paid up and subscribed equity capital for the SPV	Q1, 2025	SDCL and Major Port Authorities
					SPV to sign funding agreement with SDCL and Major Port Authorities for the funding which would be required to be paid to the Incubators and Accelerators	Q2, 2025	SDCL and Major Port Authorities
					Allocation of budget by SDCL and Major Port Authorities to the SPV through equity funding	Q3, 2025	SDCL and Major Port Authorities
2	For promoting startups in the maritime sector there are currently no incubators present in leading maritime institutes and Indian Maritime	Incubators will be set up across NTCPWC, CICMT, CEMS, NINI, Indian Maritime University and other maritime Universities (hereinafter referred to as "Institutes")	Institutional	As an incubator, these institutes will provide the following support: 1. Support in developing software, simulations, hardware resources for experimentation 2. Provide working space, mentorship, business plan assistance, support in finance/HR/legal etc. functions for startups 3. Provide support to Undergraduate and Postgraduate students with startup projects and necessary guidance 4. Help startups in developing the product upto proof of concept 5. Preparation of Feasibility report- Minor technical works like Technical or Business animations, modelling, and data analysis,	After setting up of SPV, MoPSW to send letters to the Institutes for setting up Incubation Centers	Q3, 2024	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
					Institutes to assess the requirements for setting up of incubator, specify buildings within their respective premises in which the incubators will be set up and prepare respective budgets.	Q3, 2024	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
					Institutes to appoint key officials for the incubator and have the prepare the Standard Operating Procedures for the working of the Incubator	Q4, 2024	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
					Institutes to tie up with international institutes, industry bodies and with incubators in other institutes such as IIMs and IITs	Q4, 2024	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				technical calculations can be done on own to prepare firsthand feasibility report.			
3	Currently there are accelerators in private sector foreign companies are solely focusing on their own benefits. Despite the presence of Incubators all over India especially IITs there are no visible growth of maritime startups. Some of the key challenges faced by Maritime sector include the hardware nature of maritime ideas, lack of shipping specific prospective investors, need for a common virtual platform to bring stakeholders together, financial support at nascent stages, procurement and regulatory support through policy, etc. Due to this, India couldn't leverage upon the benefits of Blue Economy all these years; rather, it resulted in the import of small to big marine products from foreign countries. India needs a common single accelerator to help startups grow.	Option 2 - National Marine Startup Acceleration Center (NMSAC) will be set up by IMU HO as a section 8 Not for profit company independently or by restructuring CEMS across NTCPWC, CICMT, CEMS, NINI, Indian Maritime University and other maritime Universities	Institutional	The National Marine Startup acceleratiomn Center will provide the following support to the startups: 1. Helping Startups 360 degree right from Ideation to Exit for Regulatory, Finance, Marketing 2. Work along with DG Shipping and other relevant Ministries / Departments of state & central government towards helping startups get requisite approvals 3. Help the startups to expand their markets through onboarding of shipping companies, port terminal operators etc. to run the pilot projects 4. Provide startups access to exhibitions and international events 5. Provide working space to startups if required 6. Tie ups with International Marine Accelerators, Technology centers, Companies and Venture funds for Scaling up Startups e.g. Port XL, Liquid Grid, Rainmaking, Maersk-Centre for Zero Carbon Shipping 7. Bulid Indian origin Shipping executives Angel Investor Pool by marketting with Shipping companies in Mumbai and Abroad 8. Forming joint Industry consortium projects by bringing national and international stakeholders together to successfully develope, regularise, commercialise and scale the startup ideas.	MoPSW to align with IMU to appoint nominees for initiating the works for setting up National Marine Startup Acceleration Center for promotion of startups in the maritime sector.	Q4, 2023	IMU and MoPSW
					IMU to undertake appointment of a regulatory consultant which will support the with both the University and MoPSW in taking the necessary approvals, creation of Memorandum of Association and Articles of Association for the SPV, support the IMU in registering the SPV with the Ministry of Corporate Affairs, Government of India as Section 8 company	Q1, 2024	IMU
					IMU to appoint officials to the key posts in the National Marine Startup Acceleration Center	Q3, 2024	IMU
					IMU to appoint the board for the NMSAC	Q4, 2024	IMU
					IMU to prepare the Standard Operating Procedure for the NMSAC providing the guidelines for screening of future incubators including from Private Sector and Screening guidelines for Incubators to select Startups or Incubation based on the StartUp Policy	Q1, 2025	IMU
					IMU to align with SDCL for getting the required funding through budget allocation for setting up and operations of NMSAC for 5 years	Q2, 2025	SDCL and IMU

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					NMSAC to develop Virtual Platform for acceleration centre - the portal or app as an market place/paltform for stakeholders to implement Startup policy	Q3 2025	Operational Committee of NMSAC
4.	There are hackathons that are organized in other sectors. However, currently there is no hackathon which is implemented in the sector	Organize Hackathons to allow startup ideas to be generated providing solutions to the challenges in the maritime sector	Institutional	Hackathons are events in which problem statement is provided and the start-ups provide the innovative solutions to the problem statements. These problem statements can capture the various issues that are faced by the maritime sector	MoPSW to appoint a Jury from NTCPWC, CICMT, CEMS, NINI, Indian Maritime University to judge the solutions submitted as part of Hackathon	Q4 2023	MoPSW (SM&PPP)
					MoPSW to formulate the problem statements for the Hackathon in consultation with Committee of National Marine Startup Acceleration center	Q4 2023	MoPSW (SM&PPP)
					NMSAC Acceleration center to organize the hackathon event and decide on the winner of the event based on the results provided by the Jury	Q2 2024	MoPSW (SM&PPP)
5	Faculty remuneration and empowerment - 1. Huge difference in pay between merchant navy and MTIs which Discourages maritime professionals to turn to teaching 2. Limited independence with faculty for research and industrial consulting assignments unlike IITs"	Maritime Institutes to allow flexibility to its faculty for working in the industry and allow faculty members to undertake independent research projects	Institution	For improving the remuneration and empowerment to the faculty in the maritime sector, following initiatives to be undertaken: 1. Faculty can be allowed to sail for 6 months after some years of teaching (e.g. 3-4 years) which will aid as financial incentive. 2. Empowering the faculty to conduct innovative teaching, research, and incentivize industrial collaboration. 3. Academic partnerships with global institutes can be leveraged for faculty exchange program	Maritime Institutes to make provisions to allow empowerment to faculty members to undertake independent research projects, have employment opportunities in the industry and have industrial collaborations	Q2, 2024	IMU
6	Long lead time to professorship - To become an Assistant Professor in maritime disciplines, one must have Certificate of Competency as Master (FG) or MEO Class I, which typically takes about 8 years after graduation [B.Sc (Nautical Science) or B.Tech (Marine Engineering)]. That means a mariner can become Assistant Professor only at the age of 30 years, whereas in non-marine disciplines, a 23-24 year old M.Tech graduate can become Assistant Professor	Maritime institutes to allow mariners as Associate Professors and Professors depending upon their qualification and competency certifications	Capacity Building	For reducing the lead time to professorship, it is proposed that 1. Mariners with Master (FG)/MEO (Class I) CoC with 2 years sailing experience at management level can be appointed by Associate Professors. After completion of Ph.D, they can be promoted as Professors. 2. Promoting Assistant Professor post completion of PhD."	Maritime Institutes to implement the policy for allowing seafarers as faculties in their respective institutes by assessing the vacancies, publishing advertisements and selecting the mariners	Q2, 2024	IMU
7	There is limited availability of faculty with domain expertise as Senior Maritime professionals unable to join as faculty owing to qualification criteria for Professors	Senior Maritime professionals can be appointed as permanent faculty or visiting faculty	Capacity Building	The introduction of seafarers as permanent faculty or visiting faculty to help in bringing in the required industry expertise in the maritime education.	Maritime Training Institutes to explore industry linkages to attract senior maritime professionals as visiting or permanent faculty	Q1 2024	IMU

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
8	There are limited faculty development initiatives available	Faculty development initiatives to be introduced by providing trainings, upskilling certifications etc. Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Strengthen faculty network across Maritime education and training institutes	Capacity Building	Faculty development initiatives can be undertaken through: **1.** Customize upfront training through partnerships **2.** Institutionalize short-term Professional Development / Certifications for upskilling faculty **3.** Cumulative Professional Development Assistance (CPDA) should be made available to Faculty in MTIs	Maritime Training Institutes and IMU to tie up with NITTTR Chennai and Teacher Training facility at IIT Chennai	Q2 2024	IMU
					Explore tie ups with international and other domestic institutions for short-term professional development courses	Q2 2024	IMU
9	The Maritime Institutes in the country such as IMU, NTCPWC, CEMS and CICMT have been working on engineering and technology aspects of the maritime sector. There is a need for the institutes to work on the emerging technologies	To enhance the research and innovation in the maritime sector innovation labs are proposed to be developed in the maritime sector. These innovation labs to be established across IMU, CICMT, NTCPWC and CEMS Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Drive research innovation and technology commercialization through establishing a living lab facility in partnership with NTCPWC & CICMT with a major port	Institutional	Following Centres / Labs are proposed to be developed at IMU campuses (i) Marine Fuel and Lubricant Research Laboratory (ii) Laboratory for Marine Geosciences (iii) Laboratory for Hydro-sciences (iv) Policy Study Center (v) Advanced Nautical Studies Center (vi) Maritime Environmental Labortory (vii) Ship Design and Research Center (viii) Advanced Maritime Training Center	(i) Marine Fuel and Lubricant Research Laboratory. Tie – up with private industry,for testing and design of marine fuel and lube, alternate fuel and engine design (ii) Laboratory for Marine Geosciences – Required for exploration and exploitation of Marine resources, characterization and mitigation of coastal hazards like erosion. Study the degradation caused by anthropogenic activities like coastal and offshore installations. Capacity building in marine geology, geophysics, geomorphology and geotechnical engineering (iii) Laboratory for Hydro-sciences – collaboration with leading universities (Delft, etc) along with stakeholders (IWAI, Ports) to develop a comprehensive simulation and experimental facility for sediment management, surveys, marine structures and autonomous vehicles (iv) Policy Study Center – to act as maritime repository and think tank to support the Government on maritime policy issues (IMO, Trade, commerce, maritime trade and logistics, ocean governance (v) Advanced Nautical Studies Center for new technologies in navigation (autonomous, underwater, Instrumentation) along with technology adaptation education and training (AR/VR) for seafarers, regulatory changes for new technologies (vi) Maritime Environmental Laboratory – port and coastal pollution – by air, water and underwater noise. Regulatory/ monitoring components. (vii) Ship Design and Research Center: studies in ship design/ breaking/ recycling - to host Software – as – service to Indian Marine Designers and consultancy services. (viii) Advanced Maritime Training Center to cater to maritime manpower development in special domains – simulators, software and physical model facilities for Pilot training, dredging, Inland water transport, hydrography, seabed engineering investigations, specialized ships	Q4 – 2023 Q4 – 2023 Q4 – 2024 Q4 – 2023 Q4 – 2023 Q4 – 2023 Q4 – 2023	IMU

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					(tankers, hazardous carriers, etc), offshore/underwater engineering,	Q4 – 2024	
				Labs are proposed to be developed at NTCPWC: 1. Smart Modelling & Simulation Lab 2. Marine Robotics Lab 3. Lab focusing on Climate Change 4.National Centre for Excellence Dredging Engineering & Management 5. Data Center for Ports 6. Marine Information and Communication Technology Lab	Assess the requirements in terms of manpower, budget, technology and equipment to set up the labs	Q4, 2023	NTCPWC
					Ink MOUs with identified international institutions for knowledge, technology and student exchange. The following provides the list of institutions for tie ups: (i) Smart Modelling & Simulation Lab: Tie ups to be with RWTH Aachen University, Aachen, Germany Swansea University, UK Port of Antwerp International, Belgium (ii) Marine Robotics Lab: Nanyang Technological University, Singapore. Norwegian University of Science and Technology, Port of Antwerp International, Belgium, PSA Singapore (iii) Advanced center for impact and adaptation of Climate Change and Sea Level Rise on Port infrastructure: Tyndall Centre for Climate Change Research, UK, Building Construction Authority, Singapore, DLR German Space Agency (iv) National Centre for Excellence Dredging Engineering & Management: Tudelft, the Netherlands, Port of Antwerp International, Belgium (v) Marine Information and Communication Technology Lab: Technical University of Munich, Germany and DLR German Space Agency.	Q4, 2023	
					Explore MoUs for Tie up with industry and startups it is incubating for using the technologies being developed in the Innovation Lab	Q1, 2024	
				Following labs are proposed for development at CICMT: 1. Shallow/Deep water Seakeeping & Maneuvering Basin 2. Combined wave and current flume laboratory 3. Laboratory for studying sloshing characteristics in LNG tanks	Assess the requirements in terms of manpower, budget, technology and equipment to set up the labs	Q4, 2023	CICMT
					Explore MOUs with identified international institutions for knowledge, technology and student exchange.	Q4, 2023	
					Explore MoUs for Tie up with industry and startups it is incubating for using the technologies being developed in the Innovation Lab	Q1, 2024	
				Following labs are proposed for development at CEMS:	Assess the requirements in terms of manpower, budget, technology and equipment to set up the labs	Q4, 2023	CEMS

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				1. Lab for Internet of Things in the Maritime Sector 2. Machine Control Lab 3. Lab on Augmented Realty	Explore MOUs with identified international institutions for knowledge, technology and student exchange.	Q4, 2023	
					Explore MoUs for Tie up with industry and startups it is incubating for using the technologies being developed in the Innovation Lab	Q1, 2024	
10	IMU currently lacks courses focusing on: 1. Upcoming areas of technology which are in demand viz IoT, sensors, autonomous systems etc. 2. Professional development for up-skilling for mid-senior executives 3. Different modules for open-education"	IMU to collaborate with institutes in the country, develop short-term courses and get registered distance learning platform for technical education currently present in the country	Institutional	The collaboration with institutes to help IMU acquire the required expertise to work on the new age technology. In addition, through development of short-term courses and registering on distance learning platform, IMU will expand its base"	IMU to collaborate with IITs to develop the courses related to emerging technologies	Q1, 2024	IMU
					IMU to develop short term courses for skill development of working professionals in maritime sector	Q2, 2024	IMU
					Creation of modular courses for distance learning and joining the NPTEL platform developed by IITs	Q3, 2024	IMU
11	1. IMU has Missing collaboration with leading domestic and foreign universities in maritime domain 2. IMU has Limited Industrial collaboration to carry out research activities"	IMU to start collaborating with national and international institute along with expanding its industry players Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Strengthen Maritime institutions to enhance India's capabilities at par with global standards	Capacity Building	This will help IMU to acquire industry expertise along with the international exposure which is required in the ever-changing environment of Maritime Sector	IMUs to ink MoUs with leading Maritime Institutes such as World Maritime University, Norway; Singapore Maritime institute etc.	Q4, 2024	IMU
					Appoint Maritime Chairs for acting as industry-institution interface	Q1, 2025	IMU
					Establish Industry Relations Cell within IMU and its centers across country to allow for developing relations with industry players	Q2, 2025	IMU
12	Government of India has prepared a National Master Plan depicting the economic zones and the infrastructure linkages required to support them with an objective to integrate all the multimodal connectivity projects and remove missing gaps for seamless movement of people, goods & services. This will lead to holistically integrate all the existing/planned initiatives of the various Ministries/Departments being undertaken for better synergy	Center of Excellence for multimodal logistics for undertaking Project Management of Multimodal Logistics Projects	Institutional	The Center of Excellence will be established in: **1.** Centre for Transportation and Logistics, Indian Institute of Management (IIM), Ahmedabad addresses critical passenger and freight transportation, and logistics challenges in India through an integrated, multidisciplinary program of research, post-graduate and executive education, technology transfer, and policy advice for enhancing the mobility of people and goods **2.** Centre for Trade Facilitation and Logistics (CTFL), Indian Institute of Foreign Trade (IIFT), Delhi aims at helping India's Trade and Logistics expertise by acting as a forum for collaborations on domestic and international fronts to gain competitiveness at a global level	Explore for tie ups with select institutes of excellence in Management and Commerce like IIMs, IIFTs, Maritime Universities	Q4 2023	MoPSW (SM&PPP)
					Develop the budget estimates which will be required for undertaking project monitoring of the Multimodal logistics projects, which will be implemented as part of the National Master Plan	Q4 2023	MoPSW (SM&PPP)

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
13	There is no chair available which will lead the Center of Excellence being established	Professional Techno Commercial leader will be appointed to drive the research program in both the Centers of Excellence	Capacity Building	Professional Techno Commercial leader with experience in Research, Consultancy and Project Management in the Infrastructure or Maritime sector who will be able to synergize the academic excellence available in the parent Institutes in delivering qualitative output to the Industry and Government and will be supported by grants from the Ministry of Ports Shipping and waterways.	MoPSW in consultation with Centre for Transportation and Logistics, Indian Institute of Management (IIM), Ahmedabad and Centre for Trade Facilitation and Logistics (CTFL), Indian Institute of Foreign Trade (IIFT), Delhi to appoint Professional Techno Commercial leader for the Center of Excellence	Q4 2023	MoPSW (SM&PPP)
14	Research activities in the maritime sector are in a nascent stage due to limited availability of institutes providing research opportunities	To promote research in the maritime sector, it is proposed that under a policy framework a Maritime Knowledge Cluster (MKC) will be established. Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Establish Maritime Knowledge Cluster to drive coordinated and collaborative research 2 Knowledge cluster to deliberate and publish on strategic goals set by IMO and create base documents for the 5 shadow and 7 base shadow committees in line with IMO committee structure	Institutional	The MKC will be established at IMU in research collaborations with maritime institutes such as NTCPWC, CICMT, CEMS, NINI and other maritime universities. (hereinafter referred to as ""Institutes"") The role of MKC will be to formulate research problems in the five key areas identified above based on the needs of industry and national importance. All the research problems (barring ones involving national security) will be communicated through a public portal and research proposals will be called from individuals, industry, consortium of academicians, industry and professionals. "	MoPSW to send letters to the Institutes for setting up Maritime Knowledge Cluster	Q3, 2024	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
					Institutes to assess the requirements for setting up of MKC	Q3, 2024	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
					Institutes to appoint key officials for the MKC and have the prepare the Standard Operating Procedures for the working of the MKC	Q1, 2025	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
					Institutes to identify research areas under each of the 6 research themes identified and collaborate with the affiliate institutes	Q2, 2025	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
					Institutes to tie up with international institutes for research and innovation support along with industry players by inking MoUs	Q3, 2025	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
					MKCs to appoint chair professors for guidance and set up Development Cells for collaborations	Q1, 2026	NTCPWC, CICMT, CEMS, NINI, Indian Maritime University
15	Key research areas need to be identified to undertake focus research and provide the required solutions for the maritime sector	MKCs will formulate research problems based on the needs of industry and national importance	Institutional	The research themes will be identified across the key areas of maritime sector which includes, port operations and management, navigation, vessel fleet, health, safety & environment, maritime law and maritime technology. The research in these areas will be taken up by lead institutes which have expertise in the area and will be supported by affiliate institutes	MKCs to formulate the problem statements across the key research areas which could include **1.** Advance knowledge of efficient usage and functioning of ports **2.** Channelize vessel traffic and promote safe travel of vessels **3.** Evaluate and promote best practices in shipbuilding **4.** Sustainable HSE activities in maritime sector **5.** Evaluate law, policy Formulation in maritime sector **6.** Identifying Engineering Solutions in the maritime sector	Q2 2026	MKC
					MKCs to provide the problem statements to each of the identified lead institute	Q3 2026	MKC
					Each of the Lead institute to tie up with an affiliate institute for promoting the research in their identified areas.	Q1 2027	MKC
16	Currently there is no research fund pool available to promote research in the maritime sector. The fund pool is essential for	It is proposed to create a maritime research fund pool under MKC to promote the research activities.	Institutional	The research fund pool which will be funded through the following three mechanisms:	MKCs in each of the Institutes to establish the budget requirement for funding the Research and Development Works to be undertaken under the 6 research Themes	Q4, 2024	MKC

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	incentivizing research in the sector			1. SDCL pooling funds for the projects requiring R&D in the short-term 2. Joint research and development projects in PPP mode with industry in the mid-term 3. Aligning research efforts in government announced dedicated missions such as Deep Ocean Mission and through National Research Foundation	MKCs to prepare and send the proposals to SDCL for the release of funds	Q1, 2025	MKC
					SDCL after assessing the requirement, release the requisite funds to MKCs	Q2, 2025	SDCL
17	There is a need for the researchers to take topic of research under MKC	A Blue Economy Research Fellowship can be developed	Institutional	IMU in collaboration with Ministry of Shipping, Ports and Waterways, Ministry of Earth Sciences and Ministry of Education will start a Blue Economy Research Fellowships for attracting talented students for PhDs on the lines of Prime Minister Research Fellowship. Industry sponsored (fully or partially) candidates with experience in the maritime sector will be allowed to pursue PhDs in IMUs.	IMU to develop the document for Blue Economy Research Fellowship providing the requisite incentives which can be given to attract talent	Q2 2024	IMU
18	The maritime universities and institutes have limited international collaborations which is critical for knowledge sharing and promoting research in the emerging areas	Joint PhDs/MS programs and joint research groups will be formed with leading maritime foreign universities and think tanks. Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Drive academic partnerships with 10+ leading foreign maritime universities prioritized to leverage student exchange, curriculum building, brand credibility as well as world class faculty 2 Establish & promote 3 new full-fledged domestic IMU campuses across Gujarat, Karnataka, Odisha, North-East and additional 5 satellite international campuses in partnership with BIMSTEC and IOR countries	Institutional	MKC will form collaborations with leading international maritime universities to promote research through Joint PhD/MS/MTech programs and Technology transfer. Joint research projects with leading maritime universities across the globe will also be carried out.	Each of the development cell in IMUs and the MKCs will identify leading foreign universities in the maritime sector to forge formal relationships in the area of academics and research and development.	Q2 2026	MKC
19	Limited Maritime Training Institutes in the country have government accreditation	The Maritime Training institutes to have NAAC Accreditation	Institutional	The availability of accreditation to the institutes helps in: a. Achieve a benchmarked status through an informed review process b. Increases potential employment opportunities c. Opens funding opportunities for the institute d. Standardize the maintenance of the institute	Maritime Training Institutes to apply to NAAC for accreditation and fulfill all the requirements for getting the accreditation	Q4, 2023	Maritime Training Institutes

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
20	Limited or no collaboration with international institutes	Maritime Training Institutes to be encouraged for have international collaboration	Capacity Building	The collaboration will help the maritime training institutes in: **1.** Exchange students to get trained in technologies available in other countries **2.** Exchange of expertise to allow Indian students in India gain from international experiences	Ink MoUs with leading Maritime Institutes to allow for exchange of student, knowledge, technology, and expertise.	Q4, 2023	Maritime Training Institutes
21	Currently there is no e-learning platform available with Maritime Training Institutes	Develop e-Learning platforms which would help in adoption of technology for providing the necessary trainings Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Digitize and upgrade CoC assessment mechanism of seafarers through end-end digitization of evaluation, assessment and certification process	Technology	The e-learning platforms provide the Maritime Training Institutes to provide trainings to a larger base of students.	Develop e-learning platforms for the identified courses which can be delivered through distance learning.	Q1, 2024	Maritime Training Institutes
22	There is lack of availability of latest technology	Enhancing the training equipment with latest technologies to help the students to upskill and stay relevant for the job, on board and ashore in the industry Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Modernize and digitize Recruitment and placement licensing system and implement stringent governance to regulate and improve functioning of RPSLs	Technology	The availability of equipment with latest technology helps the students in acquiring the skills which are required with the changes in the technological environment	Ink MoUs with technology providers and ports to acquire the technology (both hardware and softwares) required for enhancing training equipment	Q2, 2024	Maritime Training Institutes
23	The cruise industry is in a nascent stage in the country. To further promote cruises domestically, training of the cruise crew is a critical component	Develop training institutes at key cruise locations in India such as Mumbai, Goa, Kerala for sea cruise and Kolkata & Guwahati for reiver cruise	Institutional	The locations identified for setting up of the training institutes are the key river and sea cruise destinations in the country. These locations will provide the required on-ground training to the trainees at the institutes	IMU to start training courses in its Mumbai, Kochi and Kolkata campus for providing training related to river and sea cruise	Q4, 2023	IMU
					IMU to establish a campus in Guwahati for providing training for river cruise and in Goa for providing training courses related to sea cruise	Q4, 2024	IMU
24	Hospitality is a major component of cruise. Therefore, it is critical to have a holistic training of cruise crew by also considering hospitality management	IMU can collaborate with Hospitality Management Institutes and Cruise Service Providers to develop training programs	Institutional	The collaboration will provide the necessary skills required in the hospitality industry which is necessary for providing quality service at cruise	IMU for its campuses at Mumbai, Goa, Kochi, Kolkata and Guwahati to ink MOUs with Indian Institute of Hotel Management (IIHM) to provide hospitality related courses	Q4, 2023	IMU
25	Lack of training program available for the fishing community in the coastal areas	Develop training programs focusing mainly on the fishing community in the coastal areas	Capacity Building	The program will help in training the fisherman to efficiently undertake fishing activities in deep sea and be aware of the marine regulations & borders	IMU to develop courses for the fishing community with focus on emerging technology, shipping lanes, international boundaries and efficient fishing activities	Q4, 2023	IMU

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Develop a training scheme for fisherman in deep sea fishing vessels undertaken as a joint initiative of Ministry of Ports, Shipping and Waterways and department of fisheries 2 Develop a Scheme for Coastal Community Development through creation of training centers to promote the blue economy in India 3 Implement training schemes and programs for coastal communities to enhance skills, capabilities and safety					
26	Currently there is a lack of availability of training centers in the coastal areas to train the coastal community in various marine aspects	Establish training centers in the coastal areas with training programs of 1 to 2 months	Infrastructure	The development of training centers to impart 1-to-2-month training would help the coastal community to get trained in areas identified as fishing activities and coastal community development	Identify locations and establish training centers in the coastal areas	Q3, 2024	IMU
27	There is currently no minimum training time for the officers at major ports	A standard training man-days per year for all officers of Major Ports to be stipulated	Capacity Building	The fixing of minimum number of training time for the officers will help in attracting the officers of the major ports for training at the facility in JNPT	The training days to be fixed as per the Training Policy 2020 of the Ministry of Ports, Shipping and Waterways	Q1, 2024	JNPT
28	Officer training institute at JNPT currently has no collaboration with the international training institutes	Collaboration may be developed with other training institutes internationally	Capacity Building	JNPT in collaboration with Port of Antwerp International, Belgium has been imparting global technological practices through various training programmes.	Ink MoUs with other training institutes for trainee and knowledge exchange.	Q4, 2024	JNPT

Implementation Plan for **Tax, Regulatory and Policy Initiatives**

Innovative Ecosystem

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Promoting Start-ups in maritime sector							
1	Maritime sector being an important component of the logistics sector in the country and involving various components such as Port Terminals, vessels, ship building and repair etc. requires specific policy interventions for promoting start-ups	Currently there is no sector specific policy promoting startups in the maritime sector	Policy	Policy framework for promoting startups in the maritime sector to include 1. Forming of an SPV between Major Ports and SDCL for implementing the startup policy	MoPSW to draft the policy document required for promoting start-ups in the maritime sector	Q2, 2024	SDCL
					Freezing of the budget and policy document by MoPSW	Q3, 2024	SDCL
					MoPSW to publish the policy document for promoting start-ups	Q4, 2024	SDCL

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
				2. Screening of incubators and accelerators for promoting startups in the maritime sector 3. Provide funding support to startups through incubators and accelerators. The funding support to mainly include Seed Fund Grant, Tech Pilot Grant and Funding support to accelerators"			
2	There are three main challenges which make academic career at Maritime Training Institutes less attractive: 1. Time to become a professor in the marine sector is longer as compared to other sectors 2. Remuneration is less in academia as compared to industry in marine sector 3. Limited autonomy is available with the faculties in MTIs to promote independent research programs"	"The National Education Policy, 2020 provides emphasis on 'Motivated, Energized, and Capable Faculty' to develop higher education. The policy also provides for empowering the faculty to conduct innovative teaching, research, and service. Taking the idea of the National Education Policy, a policy framework is required to maritime academia attractive to seafarers and empower the current faculty members"	Policy	The Policy framework will provide solutions through: 1. Reducing the time for sea farers to become Professors from Assistant Professors 2. Emphasis to be provided to improve remuneration of faculties by providing other intermittent job opportunities. This will allow them to improve their remuneration and bring in the required industry expertise 3. Enhancing the faculty domain expertise by bringing in Senior Maritime Professionals 4. Introduction of faculty development initiatives with up-skilling programs relevant to the changing environment in the maritime sector"	MoPSW to send letter to IMU for drafting the policy for attracting seafarers to be attracted as faculties in maritime institutes and universities in the country	Q2, 2024	IMU
					IMU to draft the policy and freeze the provisions in consultation with MoPSW and industry experts	Q3, 2024	IMU
					MoPSW to publish the policy document for attracting seafarers as faculty in maritime institutes and universities	Q4, 2024	IMU
3.	Maritime sector advancement, today, is driven by advanced technologies across various dimensions – ports operation and management, navigation and traffic management, ship design technology, deep ocean maneuvers, maritime finance and governance. India has advanced capabilities in few of these areas while some early-stage work is ongoing in key areas. The infancy of research capabilities in the emerging areas may be attributed to administrative, financial, human resource, regulatory challenges that the current research ecosystem in the maritime sector faces	Currently there is no policy for promoting research in the maritime sector.	Policy	Policy framework has been proposed to promote research in the maritime sector. The policy with the following key focus areas intends to improve India's research capabilities and introduction of emerging technologies such as Artificial intelligence, Machine Learning, Big Data Analytics etc. in the maritime sector: 1. Establishing a Maritime Knowledge Cluster in Indian Maritime University in collaboration with industry and academia 2. Establishing a research fund pool for promoting research fund pool	MoPSW to send letter to IMU for drafting the policy setting up Maritime Knowledge Clusters and funding required for promoting research in the maritime sector	Q2, 2024	IMU
					IMU to draft the policy and freeze the provisions in consultation with MoPSW and industry experts	Q3, 2024	IMU
					MoPSW to publish the policy document for promoting research in the maritime sector	Q4, 2024	IMU

Academia led regional collaboration

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Extending Maritime Institute facilities							
1.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Identify existing facilities of the select institute	Capacity Building		Map the marketable courses among the courses conducted in Indian maritime institutes	Q4 2023	Indian Maritime University (IMU)
					Study & map the courses and their respective institutes that are going to be offered to foreign students. To include, -- Courses, faculty, labs, simulators, research activities, training related to maritime industries (18 fields)	Q4 2023	IMU in collaboration with all affiliated institutes
					Survey to find the reasons for preference to U.K and Singapore among the neighboring country students	Q4 2023	Maritime Association of Shipowners Ship managers and Agents (MASSA)
2.		Offer courses and obtain feedback	Capacity Building		Prepare concept paper	Q4 2024	A concept paper by HIMT (in collaboration with IMU and other affiliated institutes)
					Collect the feedback and analyze	Q4 2024	IMU
					Bilateral talks or multilateral talks with BIMSTEC and IORA nations as per feasibility to be carried out	Q2 2025	Ministry of External Affairs (MEA)
3.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	MoU & Offer admission	Capacity Building		Identify marketable courses and offer admission to students from neighboring countries	Q4 2025	IMU, HIMT
					Facilitate the signing of MoU (Bangladesh, Myanmar, Maldives, Sri Lanka, Thailand)	Q4 2025	MEA
4.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Streamlining admission	Capacity Building		Align Maritime institutes with Study in India partnership- single window for admission	Q4 2023	Individual institute
					Establish dedicated marketing team	Q4 2024	Representation from top MTI's
					Establish the equivalency - of marks, certificates of other nations to facilitate admission criteria, obtaining equivalency of degrees awarded, and establish mutual recognition of certificates	Q4 2025	Association of Universities

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
5.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Continuous evolution in teaching standard - New courses and flexibility in curriculum	Capacity Building		Develop courses by designated and relevant Institutes aligning with market demand.	Q4 2024	Respective MTI
					Flexibility in learning- accumulate credit system courses to seafarers along with online options to ensure education along job	Q4 2025	IMU/MTI's
6.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Continuous evolution in teaching standard - Standardization	Capacity Building		Standardization by getting accreditation from NAAC and/or any globally reputed organization	Q4 2024	Individual institute
					Accreditation from globally reputed institutions	Q4 2025	Individual institute
					Develop Joint E-Learning modules for students and faculty across BIMSTEC institutes	Q4 2026	Individual institute
7.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Continuous evolution in teaching standard - Partnerships	Capacity Building		Partnership with IITs offering course in fields of marine engineering, oceanography	Q4 2024	IMU/DGS
					Programmatic collaborations with World Maritime University and other global universities to offer maritime courses (Finance, Technology, Law etc)	Q4 2025	MoSPW/DGS
8.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Continuous evolution in teaching standard - IORA & BIMSTEC student & faculty collaboration	Capacity Building		Promote student and faculty exchange programs	Q4 2025	IMU, top institutes on back of MoU from MEA
					Develop Joint E-Learning modules for students and faculty across BIMSTEC institutes	Q4 2026	IMU, top institutes on back of MoU from MEA

Implementation Plan for Implementing **Infrastructure, Institutional, Capacity Building and Technology Initiatives**

Enhance India's presence at IMO

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing agency
Enhance India's presence at IMO							
1	Limited bandwidth by DG shipping (India's maritime administration) for new technical & R&D efforts in line with IMO objectives	Set up a dedicated IMO cell in India	Institution	The IMO cell shall be set up Directorate with branches at Indian Maritime University (IMU), Shipping Corporation of India (SCI) and Indian Register of Shipping (IRS). This cell will coordinate all the technical work done by various members of corresponding Indian committees and sub-committees and work in close cooperation with Indian representative at IMO	Selection of Committee by MoPSW & DG Shipping to nominate personnel in IMO cell (High level committee with personnel not below JS level & IMO core office with Director level officials)	Q4, 2023	MoPSW/ DGS
					Prepare ToR for IMO cell in lines with Blue economy initiatives & IMO objectives	Q4, 2023	MoPSW/ DGS
					Prepare job description for high level committee and IMO core office	Q4, 2023	MoPSW/ DGS
					Prepare Job descriptions for personnel in Committee and sub-committees for each of the areas including Legal, safety, facilitation, Environment & technical cooperation	Q4, 2023	MoPSW/ DGS
					Conduct MoUs with SCI, IMU, IRS & INSA with clearly defined scope of work and areas of cooperation	Q1, 2024	MoPSW/ DGS
					Recruitment/ onboarding of dedicated workforce at core office level	Q1, 2024	MoPSW/ DGS
					Recruitment/ onboarding of at least 2 personnel per committee/ sub-committee (i.e., 10 officials at committee level and 14 officials at sub-committee level)	Q1, 2024	MoPSW/ DGS
					Empanelment of private sector/ external organizations/ experts for each of the committee/ sub-committee areas	Q2, 2024	MoPSW/ DGS
2	India's permanent representative post at London has remained vacant for more than 25 years leading to less influence in decision making at IMO	Appointment of a permanent representative at IMO HQ, London Projects already identified under the initiative: - (Source: **MIV 2030**) Appoint permanent representative at IMO London to enhance India's representation at IMO	Capacity Building	A permanent representative having technical background at HCI, London from the Directorate to attend IMO meetings will be useful for effectively intervening and participating in the deliberations. Further, this will help in protecting India's interests by influencing decision at IMO.	IMO cell to nominate at least 2 qualified candidates per year for the Junior Professional Officer (JPO) Program at the IMO and other leadership programs at IMO	Q2, 2024 onwards	IMO Cell/ DGS

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing agency
3	India's presence at IMO main committees and sub-committees especially MEPC & MSC in last 10 years is negligible compared to other leading voices.	Develop Individuals to take up position of Chairman and Vice Chairman of various IMO Committees and Sub-Committees, working groups and correspondence group coordinators	Capacity Building	Since India's representation as Chairman and Vice Chairman of various IMO Committees and Sub-Committees is minimal; it is recommended that individuals be identified and developed to take up these positions.			
4	Most of solo submissions of India did not get accepted at IMO. There have been few/ no instances where India took lead role in co-sponsoring a paper	Cooperation with regional institutions for co-sponsored papers on topic of common interest	Institution	India needs to explore and build partnerships with regional forums for common areas of interest	IMO cell to identify areas where regional cooperation may be sought	Q3, 2024	IMO Cell/ DGS
					Preparation of concept note/ proposal to be sent to regional forums (applicable only if such area is identified)	Q3, 2024	IMO cell/ DGS
					Collaborate with regional institutions for finalize the proposal (applicable only if such area is identified)	Q4, 2024	IMO cell/ DGS
					Paper finalization for submission to IMO (applicable only if such area is identified)	Q1, 2025	IMO cell/ DGS/ MoPSW
5	Lack for process for decision making on selection and ratification of conventions	Development of SOP for ratification	Regulatory	-	Preparation of SOP by IMO cell for ratification of conventions	Q4, 2023	IMO cell/ DGS
6	India is yet to become signatory to over 15 conventions of IMO	Ratification of relevant conventions	Regulatory	Some of conventions that can be taken up immediately Ballast Water Convention 2004 • STCW-F 95 Convention • IMSO amendments 2006 & 2008 • London Convention72 • London Convention Protocol 96 • Cape Town Agreement 2012	Ratification of conventions already shortlisted	Q4, 2024	IMO cell/ DGS
					Selection of other Conventions (apart from 5 already mentioned above) by IMO cell to recommend ratification to which India is not a signatory	Q2, 2024	IMO cell/ DGS
					Review, decision, and ratification of conventions	continuous basis	IMO cell/ DGS
7	Lack for process for decision making on timely & effective implementation of identified conventions	Development of SOP to improve timely & effective implementation of identified conventions	Regulatory	-	Preparation of SOP by IMO cell to develop rules for new conventions/ update rules for existing conventions	Q4, 2023	IMO cell/ DGS
8	For some of conventions which India is part of, the rules for implementation have been framed years ago and need updation	Updation of rules framed under International Conventions	Regulatory	Merchant Shipping Cargo Ships Construction and Survey Rules 1991 • Merchant Shipping Carriage of Cargo Rules 1995 • Merchant Shipping Construction and Survey of Passenger Ship Rules 1981 • Merchant Shipping Life Saving Appliances Rules 1995 • Merchant Shipping Load Line Amendments Rules 2001 • Merchant Shipping Management of Safe Operation of Ships Rules 2014 • Merchant Shipping Prevention of Pollution by Sewage from Ships Rules 2010	Identify areas of ratified Conventions not covered by rules/ for which rules are outdated by IMO cell	Q4, 2023	IMO cell/ DGS
					Preparation/ amendment of rules for already ratified conventions	Q3, 2024	IMO cell/ DGS
					Preparation of rules for new Conventions to be ratified in Q4, 2023	Q4, 2025	IMO cell/ DGS

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing agency
9	Lack of digitization in remote surveys/ audits/ inspection	Implementation of remote surveys/ audits/ inspection after acceptance from IMO	Technology	The COVID-19 pandemic has forcefully shown the importance of digitalization and new technologies within the shipping industry, with the never before need for remote surveys and risk-based flag state inspection periodicity	Preparation of paper to be presented at IMO forum to permit Remote surveys, inspections and audits with proposed procedures	Q2, 2025	IMO cell/ DGS
					Implementation of remote surveys/ audits/ inspection after acceptance from IMO	Within 24 months from acceptance of paper	IMO cell/ DGS
10	Lack of digitization leading to delay in operational approvals	Digitization of certificates and process	Technology	• Dredge engineer/ master certification • ISM Certification • Bunker delivery receipt • Port reception facility receipts • Petroleum license • MARPOL Certificates • Preliminary Casualty report preparation and approval • SMC/ISPS/DOC Audit reporting • MLC Inspection reporting • Exemptions and dispensations • Ships statutory certificates • Safe manning document	Identification of certification/ processes requiring digitisation	Q2, 2024	IMO cell in consultation with shipping industries & IPA
					Implement digitisation	Q2, 2025	IMO cell/ DGS/ IPA
11	Vulnerability in Cyber security can affect the safety of crew, vessel, and cargo and even ports	Devise standard procedures for robust cyber and information security emergency response in the maritime sector and conduct of yearly drills	Technology	Standardize the processes in relation to cyber and information security management	Preparation of SOP by IMO cell	Q2, 2025	IMO cell/ DGS
					Implementation of yearly drills	Q4, 2025 onwards	IMO cell/ DGS
12	Lack of monitoring of conventions and rules	Develop & Monitor performance of Indian ships, shipping Companies and other entities through KPIs	Regulatory	• Number of Indian vessels involved in casualties. • Number of seafarer who died in accidents on ships. • Number of vessels detained under port state in foreign ports. • Number of seafarers abandoned. • Number of seafarers not paid regular salary. • Age profile of ships being registered to operate as coastal vessels: Since limits on quantity of pollutants emitted in ship exhaust is related to age of the vessel, because MARPOL Annex VI only progressively tightens this limit, this is an indicator of increase in pollution on Indian coast. • Number of Oil Pollution incidents. • Number of extensions/dispensations being given: This is an indicator poor SMS implementation by shipping companies. • Number of Indian ships involved in piracy incidents. • Average Survey days.	Preparation of KPIs by IMO cell	Q2, 2024	IMO cell/ DGS
13	Lack of monitoring of conventions and rules	Develop & Monitor effectiveness of port state inspections in India through KPIs	Regulatory	• Age profile of vessels coming to Indian Ports • Number of foreign ships involved in casualties on Indian Coast, which include groundings.	Preparation of KPIs by IMO cell	Q2, 2024	IMO cell/ DGS

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing agency
				• Number of seafarer abandoned in Indian ports. • Number of higher energy efficient ships coming to Indian ports. • Number of IOMOU high-risk ships coming to Indian ports. • Number of ships with Statutory Certificates issued by non-IACS RO coming to Indian ports. • Number of ships flagged in countries, which are black/grey listed in TOKYO/Paris PSC MOU or poor performers in USCG			
14	Lack of integrated digital system to capture & access KPI monitored results	Digital monitoring & analysis system based on results of KPI	Technology	An integrated database system through e-governance platform to capture data on KPIs contributing to Shipping Performance	Integration of KPIs on e-governance portal	Q3, 2024	DGS
				Create digitized mechanism for uploading of relevant information on IMO GISIS.	Integration of e-gov with IMO GISIS for direct dissemination of relevant information	Q1, 2025	DGS
				Electronic dashboarding that take inputs from monitored KPIs and display important statistics	Development of dashboarding feature on e-gov portal	Q4, 2024	DGS
				Develop operational feedback mechanism for rules/sop changes based on above data	Development of process	Q4, 2024	DGS
15	India needs to address UN SDG goals on Quality education	Training and capacity building for seafarers for their ease of living	Capacity building	Devise courses for seafarers, identify seafarer services which remain outstanding for digitization, review exiting services for ease of use and accessibility and create new services	Devise short-term courses (De-carbonization Strategies, Autonomous shipping, Data Collection, Analysis and Management etc.) Diploma/Certification/PG for existing seafarer with Industry participation enabling them to get benefit in shore job internationally	Q2, 2024	DGS/ IMU
					Completion of course syllabus and decision on start date of courses	Q3, 2024	DGS/ IMU
					Prepare Paper to IMO to permit digitized Certificate of Competence through amendment in IMO STCW convention.	Q2, 2024	IMO cell/ DGS
					Digitize all services to seafarer and provide pre-departure training to seafarers to use these digitized services	Q2, 2024	DGS/ IPA
					• Dual mode facilities that is e-mode and classroom made • Digitize all Competence Examination	Q2, 2024	DGS/ IMU/ IPA
16	India needs to address UN SDG goals on Gender equality, decent work and economic growth	Nomination of Indian personnel to IMO partnered institutes	Capacity Building	Ensure women empowerment and Indian capacity building in IMO related activities	Nominate and fund at-least one woman every year for MSC in WMU MALMO and one for LLM at WMU IMLI.	Q4, 2023 onwards	IMO cell/ DGS
					Nominate and get funding from IMO for IMO Sponsored courses	Q4, 2023 onwards	IMO Cell/ DGS

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing agency
					Women in Port Management Course at Galilee International Management Institute (GIMI), Nahalal, Israel. Courses on Women in Port Management, Institute Portaire d'Enseignement et de Recherche (IPER), Le Havre, France and A to N Managers Course, delivered in partnership with International Association of Marine Aids to Navigation and Lighthouse (IALA), IALA WWA, France Nominate at least one woman in Shadow IMO Committee/ Sub-Committee set up in India		
					Nominate Indian professionals for IMO Goodwill Maritime Ambassador Scheme, Internship and externship schemes	Q4, 2023 onwards	IMO Cell/ DGS
17	With the adoption of the UN's 2030 Agenda for sustainable development and the Paris Agreement at COP 21, climate change has been recognized as one of the greatest challenges of our time. Although shipping is one of the most energy-efficient modes of transportation, the shipping industry continues to pursue strategies to reduce emissions worldwide.	Methods to ensure effective waste management at Ports Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Strengthen solid waste & plastic waste management program in alignment with Swachh Bharat Mission & promote waste to wealth	Technology	Implementation of Swacch Sagar Portal by all IV and Non-Major Ports.	Circular by DG shipping to all maritime boards mandating Swacch Sagar Portal at all IV and non-major ports	Q4, 2023	Maritime Boards
18	Under IMO regulation, CII is an operational indicator and will be assessed annually from 2023 with yearly stricter emission	Support in CII rating scheme of Indian Ocean MoU	Regulations	• India may take a lead in CII R&D in regional forum for further promotion of regulations & periodicity in Port State Control inspections • India may suggest including CII rating in Indian Ocean MOU, IOMOU (Memorandum of Understanding on Port State Control for the Indian Ocean Region) risk calculation methodology in line with the new CO2 regulations, beginning 2023.	IMO cell to take proposal to regional forums	Q1, 2024	IMO cell/ DGS

Leadership position in regional forums

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Infrastructure augmentation – Road and Rail connectivity							

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Road & Rail - India-Bangladesh trade including transit cargo for India --> Road - Existing connectivity to North-east India from rest of India through road via Siliguri is congested; it takes 8-10 days for cargo to reach Guwahati from Kolkata through road Rail - Rail network of Bangladesh mainly consists of Meter Gauge which creates compatibility issues with the Broad-Gauge network of India Nepal and Bhutan trade with India --> Road (Nepal) - Design & strength of roads are not suitable for transportation of heavy cargo e.g., project equipment Road (Bhutan) - Road connectivity to India is through mountainous terrain which pose considerable challenge for cargo movement India-Myanmar trade including transit cargo for India --> Road - Connectivity is severely challenged due to uneven terrain with only one corridor from Digboi as the major road route Rail - No rail connectivity between India and Myanmar (All existing railheads in Myanmar are long distance from the borders with India)	Prioritisation and implementation of BIMSTEC master plan on transport connectivity *(e.g., Two-laning from the Assam / Meghalaya border, Dudhanai to Dalu, via Bagmara, NH 62)* Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Enhance investment in infrastructure development to improve regional connectivity to facilitate trade	Infrastructure development	BIMSTEC Masterplan has already been prepared and identified key projects to improve regional connectivity in BIMSTEC (e.g., Two-laning from the Assam / Meghalaya border, Dudhanai to Dalu, via Bagmara, NH 62) Member countries to implement the BIMSTEC Masterplan and accord projects that are economically beneficial for more than one country	Member countries to including BIMSTEC Masterplan projects in their respective National masterplans	Q2 2024	Respective Governments of Member countries

					• Conduct feasibility study of the projects and assess following key aspects
					  • Commercial viability projects
					  • Design specifications
					  • Business model (PPP, EPC, Item rate contracts etc.)
					  • Budget requirement
					  • List of approvals and clearances required
						Q1 2027	Respective Governments of Member countries

					• Obtain approvals from the respective government regarding the budget requirement to implement the projects • Obtain other approvals and clearances *(e.g., Environment Clearance, Forest Clearance etc.)*	Q4 2028	Respective Governments of Member countries
					• Finalize key technical requirements of the project and prepare tender documents	Q1 2029	Respective Governments of Member countries
					• Conduct tender process and select bidders for implementation of the projects	Q3 2029	Respective Governments of Member countries
Institutional reforms							

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
2	Limited regional coordination amongst BIMSTEC member countries contributing to project delays of ~ 10-12 years	Creating a robust BIMSTEC institutional structure in line with other advanced regional groupings (GMS, ASEAN) to ensure implementation of regional projects in a coordinated & timely manner Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Setting up of a regional BIMSTEC centre in India to cement place as an informal leader 2 Mutual Agreements to facilitate intra-BIMSTEC trade	Institutional	Below are the interventions required for creating a robust institutional structure which may result in timely execution of projects • Formulation of regional charter/ treaty clearly delineating roles and responsibilities of various bodies, decision making process • Availability of National inter-ministerial committee coordinating activities in each country • Sector-specific working groups consisting of line agency officials to conduct meeting at regular intervals • Conduct meeting at least twice per year at highest level (Head of Governments) for reviewing the overall progress of ongoing programs, approving other programs to be implemented in future and providing strategic directions • Institutional arrangement for the operational plan of transport projects would need to be strengthened • At National level, country-level implementing agencies to drive implementation which is monitored by National Coordinators/ Focal points • At Regional Level, sectoral implementing body to drive implementation and to provide semi-annual review to BIMSTEC Secretariat on each strategic area which in turn to provide overall semi-annual review to BIMSTEC ministerial meeting • Set up a BIMSTEC coordination desk to enhance cooperation in the areas on maritime activities & transport connectivity	BIMSTEC secretariat to conduct joint discussion with member countries to review the suggestions proposed to strengthen existing institutional structure and seek feedbacks	Q4 2023	BIMSTEC Secretariat
					Post receiving approval from respective government on above aspects, formulate regional charter/ treaty clearly delineating roles and responsibilities of various bodies, decision making process and the revised institutional structure	Q1 2024	BIMSTEC Secretariat
					Seek nominations from member countries to represent various bodies such as national inter-ministerial committee, country-level implementing agency, BIMSTEC coordination desk	Q2 2024	BIMSTEC Secretariat
Capacity building support – Extending Maritime Institute facilities							
3	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Identify existing facilities of the select institute Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Develop capabilities across BIMSTEC nations	Capacity Building		Map the marketable courses among the courses conducted in Indian maritime institutes	Q4 2023	Indian Maritime University (IMU)
					Study & map the courses and their respective institutes that are going to be offered to foreign students. To include, -- Courses, faculty, labs, simulators, research activities, training related to maritime industries (18 fields)	Q4 2023	IMU in collaboration with all affiliated institutes
					Survey to find the reasons for preference to U.K and Singapore among the neighboring country students	Q4 2023	Maritime Association of Shipowners Ship managers and Agents (MASSA)

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
4		Offer courses and obtain feedback	Capacity Building		Prepare concept paper	Q4 2024	A concept paper by HIMT (in collaboration with IMU and other affiliated institutes)
					Collect the feedback and analyze	Q4 2024	IMU
					Bilateral talks or multilateral talks with BIMSTEC and IORA nations as per feasibility to be carried out	Q2 2025	Ministry of External Affairs (MEA)
5	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	MoU & Offer admission	Capacity Building		Identify marketable courses and offer admission to students from neighboring countries	Q4 2025	IMU, HIMT
					Facilitate the signing of MoU (Bangladesh, Myanmar, Maldives, Sri Lanka, Thailand)	Q4 2025	MEA
6	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Streamlining admission	Capacity Building		Align Maritime institutes with Study in India partnership- single window for admission	Q4 2023	Individual institute
					Establish dedicated marketing team	Q4 2024	Representation from top MTI's
					Establish the equivalency - of marks, certificates of other nations to facilitate admission criteria, obtaining equivalency of degrees awarded, and establish mutual recognition of certificates	Q4 2025	Association of Universities
7	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Continuous evolution in teaching standard - New courses and flexibility in curriculum	Capacity Building		Develop courses by designated and relevant Institutes aligning with market demand.	Q4 2024	Respective MTI
					Flexibility in learning- accumulate credit system courses to seafarers along with online options to ensure education along job	Q4 2025	IMU/MTI's
8	BIMSTEC & IORA member nations) require collaboration in the field of Maritime	Continuous evolution in teaching standard - Standardization	Capacity Building		Standardization by getting accreditation from NAAC and/or any globally reputed organization	Q4 2024	Individual institute
					Accreditation from globally reputed institutions	Q4 2025	Individual institute

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator				Develop Joint E-Learning modules for students and faculty across BIMSTEC institutes	Q4 2026	Individual institute
9.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Continuous evolution in teaching standard - Partnerships	Capacity Building		Partnership with IITs offering course in fields of marine engineering, oceanography	Q4 2024	IMU/DGS
					Programmatic collaborations with World Maritime University and other global universities to offer maritime courses (Finance, Technology, Law etc)	Q4 2025	MoSPW/DGS
10.	BIMSTEC & IORA member nations) require collaboration in the field of Maritime Security, Disaster management, and Value-added courses. However, there appears no central body that can co-operate and interconnect with the aspiring nations and also act as a facilitator	Continuous evolution in teaching standard - IORA & BIMSTEC student & faculty collaboration	Capacity Building		Promote student and faculty exchange programs	Q4 2025	IMU, top institutes on back of MoU from MEA
					Develop Joint E-Learning modules for students and faculty across BIMSTEC institutes	Q4 2026	IMU, top institutes on back of MoU from MEA
Capacity building support – Extending LRIT services							
11.	Many IORA and BIMSTEC member countries do not have their own LRIT data centre	Extend LRIT services to countries on request Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Offer India's core expertise to developing countries for collaboration across three domains (Technology Assistance, Infrastructure Assistance, Capability development assistance)	Capacity Building	Need for robust strategic relationship Cultural roots of neighboring countries to be leveraged for convincing to LRIT services from India Common lingual connect and shared past may be a fulcrum to work upon towards positivity (e.g., Mauritius has a large population with inheritance from India and also 'Bhojpuri' language of India (mainly used in the Bihar and Uttar Pradesh) may be as an advantage with cultural catalysis for weaning the policymakers	Identify where to offer free of cost services especially to those that are critical to maritime security	Q1 2026	DGS
12.	Many IORA and BIMSTEC member countries do not have their own LRIT data centre	Expanding the trilateral mechanism to include more littoral countries in the region like Mauritius, Seychelles, Madagascar who have	Capacity Building		Conduct economic viability study for comparative data between service providers		
					Identify target nations based on the factors such as common lingual connect, political consonance, cultural similarity shared		

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		common security issues and interest in the broader sphere of Indian Ocean Region			past, common security issues, and interest in the broader sphere of Indian Ocean Region		
					Prepare detailed proposed for extending LRIT services and seek views and comments from the target nation		
					Post accepting the proposal by the target nation, offer LRIT services and the required support infrastructure		
13.		Operations framework for recognition of CoC foreign seafarers	Capacity Building	Exchange relevant information on the connected legislations - Interested country who desire's that their seafarer's CoC be recognized to forward all relevant connected legislation for review whether the provision in that country is equivalent to our country legislation as referred in M.S STCW Rules 2014 Infrastructure Verification - Infrastructure facilities can be visited by examiners/ officers from Indian Maritime Administrations for physical verification of maritime training examination & certification system Signing of MoU - Signing MOU while taking cognizance of a) Validity period b) Mutual commitment from that country for the guaranteed minimum trainee to be sent to India for maritime training c) Priority in providing their available infrastructures like drydock or any other facility as required to Indian vessels or seafarers Periodical evaluation to be carried out to ensure that provisions of STCW 1978 code, maritime training examination & certification system which are established are implemented continuously	Devise procedures for submitting request/ application along with preliminary analysis for recognition of foreign seafarer's CoC	Q4 2023	DGS/ IMU
					Decide priority criteria for carrying out assessments/ evaluations of the training and certification systems in the third countries for which the request was submitted	Q1 2024	DGS/ IMU
					Decide frequency of periodic evaluation (e.g., EU conduct evaluation once every 5 years)	Q2 2024	DGS/ IMU
					Decide timeframe to be given to third countries for taking corrective actions and legal changes in its system in order to comply with the requirements of the STCW	Q3 2024	DGS/ IMU
14.	Training of foreign candidates in Indian Maritime Training Institutes will increase the number of seafarers and affect the employability of Indian seafarers	Review study on employability of Indian seafarers after bilateral agreement being in operation for 3 years.	Capacity Building		Conduct impact study on employability of Indian seafarers after bilateral agreement being in operation for 3 years.	Q4 2028	DGS/ IMU
Strategic Investment							

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
15.	USA sanctions on Iran have a detrimental effect on the following areas for Chabahar port • Procurement of equipment for Chabahar port • Banking challenges and unavailability of credit facilities	**Capacity enhancement** - Procurement of Cargo Handling Equipment's required for Container Terminal Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Operationalize Chabahar port to drive geo-strategic advantages and establish International North-South Transport Corridor (INSTC) for cargo facilitation from CIS Countries	Infrastructure development/ Equipment upgradation	Number and design specifications of equipment would need to be decided MoPSW/ MoF support would be required to provide credit facility for the procurement of the equipment	Conduct a study to assess number of cargo handling equipment required for the terminal and their design specifications Seek approval from MoPSW/ MoF regarding the number of equipment required with their design specifications Prepare procurement documents and conduct tender process to invite quotation from various entities Select the bidder who will fulfil the required design specifications and provide the lowest quote	Q1 2024	IPGL

16.	High transport cost
	
	Banking and Insurance challenges
	
	P&I insurance and transit cargo cover
		Development of support Infrastructure: CFS, Warehousing, Container yard, Freight Forwarders to support trade	Infrastructure development/ Equipment upgradation		• Conduct feasibility study to identify following key aspects
					  • Investment required
					  • Location of the facility
					  • Business model – PPP, EPC etc.
					Obtain the necessary approvals and clearances for development of the support infrastructure
					Prepare tender documents and conduct tender process to invite proposals from interested parties
					Select the bidder for the development of the support infrastructure
						Q4 2027	IPGL

17.		Banking: Establish Bank Branch Insurance: Support from US in Extension waivers of Sections 212 and 213 of the Iran Threat Reduction and Syria Human Rights Act	Trade promotion	Establishment of Indian Bank Branches to support trade	Prepare a proposal clearly highlighting the need for establishment of Indian Bank Branch and the possible business opportunity for Indian Banks Seek approval from MoF regarding the proposal Conduct meeting with Indian Banks to gauge their interest in setting up branch in Iran Provide requisite support to interested Banks for setting up their branch in Iran	Q4 2026	MEA
18.	Challenges due to US Sanctions: Procurement of equipment due to US	Customs: Inclusion of Shahid Beheshti Terminal in Indian Customs ICE GATE portal	Trade promotion	Through ICE GATE facility Indian Customs offers a host of services, including electronic filing of the Bill of Entry (import goods declaration), Shipping Bills (export goods declaration), e-Payment of Customs Duty, a free of cost web-based Common Signer utility for signing all the Customs Documents, facility to file online supporting documents through e Sanchit, end to end electronic IGST Refund and etc.	Conduct discussion with CBIC regarding inclusion of Shahid Beheshti Terminal in Indian Customs ICE GATE portal	Q4 2023	Ministry of Finance- Dept of Revenue
19.	No rail connectivity to Chabahar Port	Rail Connectivity Establishment/ improvement of road /rail connectivity to	Trade promotion	Transport connectivity to Chabahar port will ease the evacuation of cargo	Conduct feasibility study to identify following key aspects • Investment required • Commercial viability	Q4 2030	MEA & Govt Of Iran

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		connect Chabahar to Zahedan in Iran		It will enable linkage with transport corridors	• Business model – PPP, EPC etc.		
					Obtain the necessary approvals and clearances for development of the transport infrastructure		
					Finalize key aspects/ clauses to be included in trilateral agreement amongst India, Iran, and the developer		
					Formulation of transit agreement and seek approval of concerned countries		
					Prepare tender documents and conduct tender process to invite proposals from interested parties		
					Select the bidder for the development of the support infrastructure		
					Signing of trilateral agreement and transit agreement		

20.	The long-term contract needs to be established	Activation of 10-year contract from current short lease agreement	Agreement and MoUs	Activating 10-year agreement would be a critical first step which would require multi facet approach
				• Clarity on timelines of disbursement of USD 150 Mn credit line, acquisition & deployment of rail mounted cranes to ensure phase 1 capacity is established
				• Negotiation and clarity on sanctions-waiver given by the US to the port project to ensure foreign banks open letter of credit (LC) that assures payment to the supplier
				• Positioning of dedicated manpower from India on terminal
				• Skilling and training of local staff to increase localization
				• Extension to 30-year agreement can be linked to allied commitments for India in
				  • Planning & Development of Indian Zone in Chabahar Free Zone
				  • Agreement on Chabahar – Zarang rail link
					Conduct meeting with Iranian Government regarding India's interest in long term commitment to support Chabahar port	Q4 2023	MEA, MoSPW & IPGL

					Signing of the agreement		

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
21.	Transporters and freight forwarders are all available in Bandar Abbas and not in Shahid Beheshti. Shahid Kalantari Port is a competitor	Inclusion in International North South Transport Corridor (INSTC)	Agreement and MoUs	The sustainability of the Chabahar Port hinges on the success of the INSTC corridor since another Iranian port (Bandar Abbas) has a competitive advantage compared to Shahid Beheshti Terminal. The Ministry of External Affairs (MEA) should activate the INSTC corridor at the earliest & have a mechanism to keep CIS countries engaged. Cargo interest requires that there is a regular ship calling at port especially for the container carriers, whereas the shipping lines require cargo volumes for ensuring the viability of the service	Ministry of External Affairs (MEA) should activate the INSTC corridor at the earliest & have a mechanism to keep CIS countries engaged Regional cooperation would be required to activate INSTC corridor	Q1 2025	MEA
22.	Absence of regular Weekly Vessel Call at Chabahar (Shahid Beheshti Terminal). No mainline vessels calling at Iranian ports. Bandar Abbas is closer to Dubai/Jebel Ali as almost all cargoes are offloaded there. The frequency and trade interests prefer Bandar Abbas due to geographic proximity	Trade of Non-Sanctioned Cargo	Trade promotion	Explore trade of medicines/ vaccines/ medical devices/ agricultural commodities which are exempt from sanctions	Conduct study to identify commodities which can be traded and are exempted from sanctions	Q1 2024	MoSPW & MoC
					Conduct trade promotion of identified non-sanctioned commodities through incentives and subsidies		
23.	Absence of regular Weekly Vessel Call at Chabahar (Shahid Beheshti Terminal). No mainline vessels calling at Iranian ports. Bandar Abbas is closer to Dubai/Jebel Ali as almost all cargoes are offloaded there. The frequency and trade interests prefer Bandar Abbas due to geographic proximity	Promoting liners call Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Reduce Vessel Related Charges (VRCs) in line with market trends and capital requirements	Trade promotion		Continue existing tariff discount on VRC and cargo handling for transit container to & from DPT and JNPT for near term (such as 80% discount on port dues for first 3 months)	-	MoSPW
24.	Absence of regular Weekly Vessel Call at	Trade promotion through Free Zone	Trade promotion	To attract EXIM trade by incentives of Free Trade Zone	Align incentives for export cargo from Iranian Government as well as for Free Trade Zone	Q4 2024	MEA

S No.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	Chabahar (Shahid Beheshti Terminal). No mainline vessels calling at Iranian ports. Bandar Abbas is closer to Dubai/Jebel Ali as almost all cargoes are offloaded there. The frequency and trade interests prefer Bandar Abbas due to geographic proximity				Marketing of port and proposed free zone through road shows in CIS countries	Q4 2024	IPGL/MOSPW
					Dedicated Indian Zone /Incentive schemes for Indian players to establish linkage	Q4 2024	IPGL/MOSPW
25.	There is less presence of India in developing port infrastructure in neighboring countries	Increase investment in strategic ports to deepen economic and security cooperation with its maritime neighbours • Duqm port, Oman • Sittwe, Kyaukpyu and Dawei ports, Myanmar • Trincomalee, Sri Lanka, • Payra port Bangladesh	Strategic investment		Conduct meetings with respective Government to understand their future plan of actions on selected terminals	Q1 2047	MEA
					Identify areas where India can support respective Government in meeting their future plan of action		
					Prepare proposals and seek comments/ feedback from respective Governments		
					Formulate and sign agreements with the governments		

Implementation Plan for Implementing **Infrastructure, Institutional, Capacity Building and Technology Initiatives**

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1.	Capacity expansion limitation at major ports due to geographical and regulatory constraints	Develop 4 port clusters with capacity >=300 MTPA and 2 port clusters with capacity >=500 MTPA Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Drive capacity expansion across major ports in phases basis traffic growth forecasts (Kindly refer to annexure 2.2 for details on projects)	Infrastructure	Develop 4 port clusters with >=300 mn ton capacity (CoPA – Vizhinjam port cluster, Galathea, South Bay port cluster, ChPA – KPL – Cuddalore Port Cluster and PPA – Other Non-Major Port Cluster) and 2 port clusters wit >=500 mn ton capacity (DPA – Tuna Tekra port cluster) and (JNPA – Vadhavan)	Conduct discussion with port authorities regarding demarcation of port cluster area	Q1 FY2024	MoPSW/ SDCL
					Appoint consultant for preparation of comprehensive master for each port cluster	Q4 FY2024	Major Port Authorities
					Prepare comprehensive master plan covering following aspects - demarcation of port cluster area, Land availability for capacity expansion, project identification (capacity augmentation, hinterland connectivity, dredging for deeper draft, berth mechanization) & prioritization in line with AMP & NMP, financing plan, and project monitoring framework.	Q4 FY2025	Major Port Authorities
					Prepare techno-economic feasibility reports of projects	Q4 FY2026 – Q4 FY2031	Major Port Authorities
					Obtain clearance and approvals (EC, CRZ, FC)	Q4 FY2028 – Q4 FY2036	Major Port Authorities
					Acquire any additional land required for the development of projects	Q4 FY2028 – Q4 FY 2036	Major Port Authorities
					Award of EPC and PPP bids	Q1 FY2029 – Q1 FY 2045	Major Port Authorities
					EPC work commissioning (Breakwater, Power, etc.)	Q2 FY2029 – Q2 FY2045	EPC contractor
					Commissioning of development of PPP projects	Q2 FY2029 – Q2 FY2045	PPP concessionaire
					Operationalisation of projects	Q4 FY2031 – Q2 FY2047	EPC contractor/ PPP concessionaire
2.	Inadequate hinterland connectivity infrastructure to the major ports	Prioritizing hinterland connectivity projects in line with PM GSMP and NLP Projects already identified under the initiative: - (Source: **MIV 2030** 1 Accelerate implementation of prioritized multi-modal connectivity projects (rail, road, coastal and inland waterways) to ports	Infrastructure	Develop an implementation plan for developing hinterland connectivity and multi-modal connectivity infrastructure to the major ports by prioritizing projects in the **PM GSMP** and **NLP**	State Governments to align with the Major Ports in their respective states to identify the hinterland connectivity infrastructure requirement	Q4 2023	State/ Central Government
					State Governments and major ports to prepare an implementation plan to improve hinterland connectivity infrastructure	Q4 2023	State/ Central Government
					State Governments to prioritize and align the projects as per the PM GSMP and NLP	Q4 2023	State/ Central Government
					Commissioning of development of projects	Q4 2023	State/ Central Government
					Operationalisation of projects	Q4 2030	State/ Central Government

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
3.	Capacity expansion limitation at major ports due to geographical and regulatory constraints	Develop 2 new major ports - Vadhavan and Galathea Bay Port	Infrastructure	2 new major ports – Vadhavan and Galathea Bay port are envisaged to be developed	Conduct discussion with port authorities regarding demarcation of port cluster area	Q1 FY2024	MoPSW/ SDCL
					Appoint consultant for preparation of comprehensive master for each port cluster	Q4 FY2024	Major Port Authorities
					Prepare comprehensive master plan covering following aspects - demarcation of port cluster area, Land availability for capacity expansion, project identification (capacity augmentation, hinterland connectivity, dredging for deeper draft, berth mechanization) & prioritization in line with AMP & NMP, financing plan, and project monitoring framework.	Q4 FY2025	Major Port Authorities
					Prepare techno-economic feasibility report	Q4 FY2026	Appointed Consultant
					Obtain clearance and approvals (EC, CRZ, FC)	Q4 FY2028	Major Port Authorities
					Acquire any additional land required for the development of projects	Q4 FY2028	Major Port Authorities
					Award of EPC and PPP bids	Q1 FY2029	Major Port Authorities
					EPC work commissioning (Breakwater, Power, etc.)	Q2 FY2029	EPC contractor
					Commissioning of development of PPP projects	Q2 FY2029	PPP concessionaire
					Operationalisation of projects	Q4 FY2031	EPC contractor/ PPP concessionaire
4.	Low draft at major ports as compared to global ports	Increase drafts of 8 ports to 18-23m for handling mainline and capsize vessels Projects already identified under the initiative: - (Source: **MIV 2030** Draft enhancement of major ports	Infrastructure	5 ports DPA, Vadhavan, VoCPA, Glathea Bay and PPA to have draft in the range of 18 meters to 23 meters by 2030. Further, 3 ports NMPA. CoPA and JNPA would have draft in the range of 20 meters to 23 meters by 2047	Conduct meeting with port authorities to establish dredging requirement and viability of 18-meters and above draft at ports	Q2 FY2024	MoPSW/ SDCL
					Port authorities to conduct survey to assess the amount of dredging required to reach at least 18-meters and above draft	Q4 FY2024 -Q4 FY2036	Major Port Authorities
					Prepare detailed project report for dredging works	Q4 FY2025 -Q4 FY2036	Major Port Authorities
					Finalize the implementation model (PPP/ EPC/ Item rate) for dredging work	Q1 FY2026 -Q1 FY2041	Major Port Authorities
					Conduct tender process and select the concessionaire/ EPC contractor	Q2 FY2026 – Q2 FY2041	Major Port Authorities
					Commissioning of dredging work	Q3 FY2026 – Q2 FY2041	Concessionaire/ EPC contractor
					Completion of dredging work	Q3 FY2027 – Q2 FY2041	Concessionaire/ EPC contractor

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Port Performance - Infrastructure planning to ensure zero waiting time for vessels on Ports							
5.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Marine Operations** - Marine department of the port / head of marine operations to use common Very High Frequency (VHF) channels for different activities such as marine navigation and traffic control, summoning rescue services and communicating with harbors, locks, bridges, and marinas	Technology	Use common VHF channel for faster communication to signal station Marine department of the port / head of marine operations to use common Very High Frequency (VHF) channels for different activities such as marine navigation and traffic control, summoning rescue services and communicating with harbors, locks, bridges, and marinas. The frequency range between 30 and 300 MHz, inclusive. The International Telecommunication Union (ITU) has allocated various bands of frequencies throughout the radio frequency spectrum to the maritime mobile service and the maritime mobile satellite service. As per ITU Radio Regulation 2016, Appendix 18, a total 68 VHF channels are available for port operations, ship movement and public correspondence	Conduct discussion with marine departments of ports regarding the existing international regulations for VHF communication and applicability of various frequency bands for different purposes in Indian ports such as: • Marine navigation and traffic control • Summoning rescue services • Communicating with harbors, locks, bridges, and marinas	Q2 2024	SDCL
					Conduct second round of discussion with marine departments of ports to understand following aspects and accordingly prepare representation/ proposal. • Marine VHF radio specifications • Budget requirement for the procurement of VHF radio in ports • Eligibility requirement for license to procure and use marine VHF radio	Q2 2024	SDCL
					MoPSW to review the proposal and approve it	Q3 2024	MoPSW
					Draft regulation regarding licensing requirement for using marine VHF radio	Q1 2025	MoPSW
					Prepare tender for procurement of VHF radio in ports and finalize bid evaluation criteria	Q2 2025	Major Port Authority
					Conduct tender process and select bidder based on evaluation criteria	Q4 2025	Major Port Authority

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
6.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Marine Operations** - Advance submission of berthing application through online mode	Technology	Submission of all documents in respect of vessels, requirement of berth in online mode by using PCS messages – (BERMAN/VESPRO) for saving time and manual involvement.	Conduct meeting with port authorities to discuss following key aspects: • Type of API to be built for PCS and port systems • Language (e.g., Java, Dot Net (ASP.net/ C#), PHP etc.) that support architectural standards of API • Web server to host API (*e.g., Dot Net - IIS and windows-based server, Java - Apache Tomcat, JBoss etc.)* • Authentication of web services (user ID, password) • Data format for sharing data	Q2 2024	SDCL/ MoPSW
					Individual ports to prepare proposal based on the discussion including budget requirement for setting up the technology	Q4 2024	Major Port Authority
					Prepare tender document containing specific technical requirement of each element (such as API, server) of the technology, evaluation criteria for the bidders and other necessary information as deemed fit	Q2 2025	Major Port Authority
					Conduct tender process and select the bidder	Q4 2025	Major Port Authority
7.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Marine Operations** – Maintain adequate number of pilots and pilot launches	Capacity augmentation	Pilots are professionally licensed mariners whose role is to board and assume the conduct of a vessel and guide it along the safest route to its port of call. Maintaining sufficient number of pilots at ports will increase availability of pilots at given point in time for pilotage and vessels may not have to wait for long at the anchorage station. This will help in reducing pre-berthing time of vessels. Port authorities need to recruit/ deploy pilots on contract basis to maintain sufficient strength for pilotage. Further, ports may also explore possibility of retrofitting the existing pilot launches with new engines or may resort to hiring of launches	Individual ports to conduct a survey to count daily vessel call at the port and assess the optimum number of pilots required for pilotage	Q2 2024	Major Port Authority
					Estimate the budget requirement of recruiting pilots	Q2 2024	Major Port Authority
					Seek approval from the authority regarding the budget and number of required pilots	Q3 2024	Major Port Authority
					Notify on public domain regarding pilot recruitment process	Q3 2024	Major Port Authority
					Conduct training and examination as per individual port regulation	Q1 2025	Major Port Authority
					Provide license to eligible candidates based on training and examination results	Q2 2025	Major Port Authority
8.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Marine Operations** - Maintain adequate number of Tugs	Capacity augmentation	Tugs help in mooring or berthing operation of a ship by either towing or pushing a vessel towards the port. If there are more tugs available at a given point in time, ports will be able to service more vessels subject to availability of berth. Ports should ensure sufficient tugs/ port crafts with minimum speed of 20 knots.	Individual ports to conduct a survey to count daily vessel call at the port and assess the optimum number of tugs required for towage.	Q2 2024	Major Port Authority
					Estimate the budget requirement of procurement tugs	Q2 2024	Major Port Authority

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Seek approval from the authority regarding the budget and number of required tugs	Q3 2024	Major Port Authority
					Prepare tender document containing specific technical specification of tugs, evaluation criteria for the bidders and other necessary information as deemed fit	Q1 2025	Major Port Authority
					Conduct tender process and select the supplier	Q2 2025	Major Port Authority
9.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Marine Operations** - Maintain Night Navigation facilities	Capacity augmentation	Ports should ensure adequate navigational buoys and other related facilities at berth for seamless movement of ships during night-time	Port authorities to assess topography of their navigation channel and estimate appropriate number of navigational buoys	Q2 2024	Major Port Authority
					Estimate the budget requirement of procurement of buoys	Q2 2024	Major Port Authority
					Seek approval from the authority regarding the budget and number of required buoys	Q3 2024	Major Port Authority
					Prepare tender document containing specific technical specification of buoys, evaluation criteria for the bidders and other necessary information as deemed fit	Q1 2025	Major Port Authority
					Conduct tender process and select the supplier	Q2 2025	Major Port Authority
10.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Marine Operations** – Maintain adequate skilled mooring gangs	Capacity augmentation	Ports should maintain adequate skilled mooring gangs round the clock for faster mooring operations. Further, mooring operation can be automated by utilising quick release mooring hooks (QRHs). It allows to quickly secure a vessel to a dock with minimum effort, and to release it quickly and easily, both in normal and in emergency operations	Individual ports to conduct a survey to count daily vessel call at the port and assess the optimum number of mooring gangs required for mooring operation	Q2 2024	Major Port Authority
					Estimate the budget requirement of recruiting mooring gangs	Q2 2024	Major Port Authority
					Seek approval from the authority regarding the budget and number of required mooring gangs	Q3 2024	Major Port Authority
					Notify on public domain regarding mooring gangs recruitment process and recruit skilled mooring gangs	Q4 2024	Major Port Authority
					Prepare tender document containing specific technical specification of QRHs, evaluation criteria for the bidders and other necessary information as deemed fit	Q1 2025	Major Port Authority
					Conduct tender process and select the supplier	Q2 2025	Major Port Authority
11.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-	**Optimize Marine Operations** -	Process simplification	Advance notice of 2.5 hrs to be given in order to give ample time to anchored vessels to remove anchoring and to reach pilot station	Estimate the total time taken for the vessel to reach pilot station from anchorage station	Q3 2024	Major Port Authority

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	in-class ports (e.g., Singapore, Rotterdam)	Advance notice for pilot booking			Issue the guidelines to marine department for implementing the modified process	Q4 2024	Major Port Authority
12.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Terminal Operations** - Adopt fixed berthing window schedule for container terminals	Process simplification	Vessels should report to pilot station ` two hours before its window schedule. This will reduce pre-berthing detention and vessels to run at economical speed thereby saving bunkering cost.	Estimate the total time taken for the vessel to reach pilot station from anchorage station	Q3 2024	Major Port Authority
					Issue the guidelines to marine department for implementing the modified process	Q4 2024	Major Port Authority
13.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Terminal Operations** - Simultaneous lashing/unlashing of container/cargo	Process simplification	Simultaneous lashing/unlashing of container/cargo while loading/unloading would help in reducing idle time	Conduct a pilot process of simultaneous lashing/unlashing of container/cargo while loading/unloading to understand the coordination required from the staff for implementing the process	Q3 2024	Major Port Authority
					Issue the guidelines for implementing the modified process	Q4 2024	Major Port Authority
14.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Terminal Operations** - Explore usage of Tandem Spreader and maximize twin lift operations (minimum capacity 60 tons)	Equipment upgradation/ productivity	Tandem Quattro offers a high capacity and flexibility, including the ability to handle four 20´ containers at a time – two 20´containers under each spreader, but at a low spreader weight	Assess the requirement of number of tandem spreaders in the terminal	Q3 2024	Major Port Authority
					Prepare tender document containing specific technical specification of twin-lift cranes, evaluation criteria for the bidders and other necessary information as deemed fit	Q1 2025	Major Port Authority
					Conduct tender process and select the supplier	Q3 2025	Major Port Authority
15.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimise Terminal Operations** - Simulator training for operators	Training and Skill Development	Investment in simulator training would assess and enhance the skills of crane operators	Identify globally/ domestically recognized training programs and their cost structure	Q3 2024	Major Port Authority
					Prepare a proposal containing merits/ benefits of training on crane operator productivity and budget requirement	Q4 2024	Major Port Authority
					Assign training schedule to crane operators in batches to avoid port operation disruption	Q2 2025	Major Port Authority
16.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Optimize Terminal Operations** - Installation of smart port technologies like smart quay, smart lane, etc.	Technology	Smart port operations automate the mechanism and improve operational efficiency of the process	• New terminal - Initially, project authorities would need to conduct baseline study on select operational terminals across parameters such as Gross Berth Output; Transit Storage Dwell Time; Turnaround Time for receipt/ delivery operation; Vessel turnaround Time on the basis of last 3-year performance of the terminals • Existing terminal - Project Authorities would need to conduct baseline study basis last 3-year performance of the terminal and minimum	Q3 2024	Major Port Authority

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					standards in concession agreement across the key parameters. If Base lining study is prepared by PPP project operator, then it shall be vetted and approved by an independent third party		
					Existing and New Terminal - Post base line study, project authorities would need to define/ revise target KPIs (existing/ new) and introduce smart KPIs across all the parameters	Q1 2024	Major Port Authority
					Existing terminal - PPP Port Operators/ Project Authority would need to submit an action plan proposing multiple smart projects/intervention to the MoPSW/ State Maritime Boards for approval	Q4 2024	PPP port operators/ Port Authorities
					Existing terminal - PPP Port operators/ Project Authorities would need to prepare an impact assessment report, estimating upfront capital cost, technical changes, improvement in efficiency, increase in operating cost for terminal, impact on ship and cargo turnaround time	Q2 2025	PPP port operators/ Port Authorities
					Existing terminal - MOPSW/ State Maritime Boards may employ independent agencies to vet and approve the funding requirement, targeted outcomes of the proposed projects/interventions	Q3 2025	MoPSW/ State Maritime Boards
					Finally, the identified KPIs and smart KPIs would need to be accordingly included in concession agreement	Q4 2025	Major Port Authority
17.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Customs/ PHO clearance** – Advance submission of documents and related approvals	Process simplification	Documents in respect of Port Health Organization (PHO), Customs and Immigration should be submitted in advance through email/ or any soft forms to the concerned Authority	Conduct stakeholders' meeting to discuss the feasibility of submitting soft copy of documents in respect of Port Health Organization (PHO), Customs and Immigration	Q2 2024	Major Port Authority
					Issue guidelines which shall include mode (email, web portal) of submitting documents and other necessary steps to be followed	Q3 2024	
18.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Customs/ PHO clearance** - Entry approval may be given in advance	Process simplification	Approval for inward entry, PHO, immigration may be given in advance i.e., before pilot boards the vessel for bringing the vessels to berth	Conduct stakeholders' meeting to discuss the impact of advance approval for inward entry	Q2 2024	Major Port Authority
					Issue guidelines which shall include steps to be followed for submitting the documents and the mode of submission (email, web portal)	Q3 2024	

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
19.	High waiting time leading to high vessel turnaround time at Indian ports compared to best-in-class ports (e.g., Singapore, Rotterdam)	**Streamlining Vessel Operations-** Feasibility of doing survey at anchorage prior to berthing of vessel to be explored Commodity-wise targets may be fixed for Pre-Survey and Surveyor remains standby prior to berthing of vessel Manifold may be fixed immediately after berthing of vessel	Process simplification	Vessel related documents, IGM(IAL), berthing & un-berthing application, vessel readiness and any other related documents should be submitted in advance to respective authorities	Conduct stakeholders' meeting to discuss the impact of submitting vessel related documents, IGM(IAL), berthing & un-berthing application, vessel readiness and any other related documents in advance	Q2 2024	Major Port Authority
					Issue guidelines which shall include steps to be followed for submitting the documents and the mode of submission (email, web portal)	Q3 2024	Major Port Authority
Best-in-class port infrastructure - Establish a transshipment hub in India							

20.	Insufficient draft
	
	Far distance to maritime routes
		Identify potential location/ region to develop transshipment hub based on following parameter:
		
		• Deep draft availability
		• Location near international trade routes
		• Good hinterland connectivity
			Infrastructure	Vizhinjam and Galathea Bay are identified as potential contenders for establishing a transshipment hub because of following favorable factors:
				
				• All the three regions have deep draft potential of ~20 meter
				• Proximity to international maritime route
				  • Galathea Bay - ~0.2-0.3 hours voyage time
				  • Vizhinjam - ~0.5-1 hours voyage time
				• Hinterland connectivity – Vizhinjam and Galathea Bay do not have last mile road & rail connectivity
					Seek stakeholders' feedback on setting-up transshipment hub in any of the proposed locations and suggestion on development model (PPP/ EPC/ Item rate contract)	Q2 2024	SDCL

					Based on stakeholders' feedback, finalize the region/ location for the development of transshipment hub	Q2 2024	SDCL
					Seek approval from the authority regarding the proposed region/ location for the development of transshipment hub	Q2 2024	SDCL
					Conduct tender process for selection of technical consultant for preparation of DPR	Q3 2024	SDCL
					Review the existing detailed project report (DPR)/ prepare DPR covering following key aspects: • Location map with topographical details • Block cost estimates and cost structure of ancillary services • Hinterland connectivity • Project economics (Cost competitiveness Project IRR, Equity IRR, NPV) • Estimated traffic • Clearances and approval required • Sensitivity analysis	Q2 2025	SDCL
					Prepare tender document containing scope of work, technical specifications, evaluation criteria for the bidders and other necessary information as deemed fit	Q4 2025	SDCL
					Conduct tender process and select the concessionaire/ EPC contractor	Q1 2026	SDCL

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Obtain requisite approval and clearances for the development of hub	Q1 2028	Concessionaire
					Signing of the concession document and commencement of construction phase	Q2 2028	SDCL and Concessionaire
					Commencement of the operation phase of the port	Q2 2031	Concessionaire
Investment attractiveness - Role of PPP in maritime sector							
21.	Private participation in terminal development, operation and maintenance can be increased	Implementation of PPP projects mentioned under PM Gati Shakti – National Master Plan (NMP) and Asset Monetization Plan (AMP)	Infrastructure	As per National Master Plan (NMP), 101 port projects are identified for implementation by 2024 with 43 projects are already under implementation whereas remaining 58 projects are yet to be developed. Out of 58 projects to be developed, 29 projects worth ~INR 15,431 Cr. are planned to be implemented under PPP mode. Please refer to annexure for detail list of projects under NMP which are planned to be implemented through PPP. The Government of India has recently announced an asset monetization plan wherein existing public assets would be monetized by leasing them out to private operators for fixed terms. The lease proceeds are expected to be used for new infrastructure investment. As per Asset Monetization Plan (AMP), 31 port projects worth INR 14,465 Cr are to be developed under PPP by FY 2025. Please refer to annexure for detail list of projects under AMP which are planned to be implemented through PPP.	Conduct tender process for selection of technical consultant for preparation of DPR	Q4 2023	Major Port Authority
					Review the existing detailed project report (DPR)/ prepare DPR covering following key aspects: • Location map with topographical details • Block cost estimates • Hinterland connectivity • Project economics (Cost competitiveness Project IRR, Equity IRR, NPV) • Estimated traffic • Clearances and approval required • Sensitivity analysis	Q3 2024	Major Port Authority
					Prepare tender document containing scope of work, technical specifications, evaluation criteria for the bidders and other necessary information as deemed fit	Q4 2024	Major Port Authority
					Conduct tender process and select the concessionaire	Q1 2026	Major Port Authority
					Obtain requisite approval and clearances for the development of the project	Q1 2029	Major Port Authority
					Signing of the concession document and commencement of construction phase	Q1 2029	Major Port Authority
					Commencement of the operation phase of the port	Q1 2032	Major Port Authority
22.	Apart from terminal operations, private participation through PPP mode is almost negligible in other services offered and assets operated by the ports.	Allow private towage companies to offer services to shipowners and charge them directly	Infrastructure	Major ports are facing multiple challenges related to captive tugs such as high maintenance costs, low availability of owned tugs, frequent breakdowns due to lack of proper up-keep and maintenance, unionized manpower. To overcome above challenges, major ports are gradually shifting from maintaining captive tugs to outsourcing the tugs to private players. Ports sign license contracts with towage service operators and operators directly charge vessel owners for the service.	Conduct meeting with port authority to establish requirement of tugs	Q4 2023	Major Port Authority
					Assess the budget requirement in hiring of captive tugs	Q4 2023	
					Seek approval from the authority regarding the budget	Q1 2024	

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Prepare tender document containing specific technical specification	Q3 2024	
					Conduct tender process and select the towage service operator	Q4 2024 – Q4-2041 (Depending on the life of existing tugs owned by ports)	
23.	Apart from terminal operations, private participation through PPP mode is almost negligible in other services offered and assets operated by the ports.	**Indian ports could follow PPP model for dredging**	Infrastructure	Dredging is another area where PPP can be evaluated to drive efficiencies. Historically, significant expenditure has been incurred by Port Authorities on capital and maintenance dredging activities across Indian ports. Explore PPP in dredging models so that the operator can recover costs linked to traffic in channel. Globally contract bundling and traffic-linked model leveraged to drive greater private participation. Ports combine capital & maintenance dredging in multi-year contracts. Indian Major ports need to explore PPP in dredging models so that the operator can recover costs linked to traffic in channel as well bundling of dredging contracts across Major Ports to ensure a larger contract value and attract international players.	Conduct meeting with port authority to establish dredging requirement	Q4 2023	Major Port Authority
					Assess the budget requirement for dredging	Q4 2023	
					Seek approval from the authority regarding the budget	Q1 2024	
					Prepare tender document containing specific technical specification	Q4 2024	
					Conduct tender process and select the dredging organisation	Q3 2025	
Investment attractiveness - Investor Facilitation Centre (IFC)							
24.	Existing web portals contain generic information about the sector and do not cater to investor specific queries/ information • Investment based portals - Existing web portals pertaining to investments in India are generic in nature covering multiple sectors • Port specific portals - No web-based interface, w.r.t ports, that exclusively targets investors. *e.g., web pages of individual ports, DGS, IPA* • Other sector portals - There is no web-based interface, w.r.t ports, that exclusively targets investors	Set up an Investor Facilitation Centre (IFC) which will perform following key functions: • Provide real time information • Act as a single window of interaction for the sector • Advocacy and streamlining within government for removal of obstacles • engagement with investors and investees on real time basis for fast closure of investment decisions	Institutional Infrastructure	The Proposed IFC would be based on the three-tiered structure with a nodal investment agency at the top and individual ports at the bottom of the structure to relay upward and downward information dissemination • Tier 1 - An integrated MOPSW unit, within Invest India, dedicated to investment in the maritime sector will allow the stakeholders to capitalize on the brand and credibility of Invest India. This essentially would open the door to an actual single-point-of-contact with minimal bottlenecks for potential investors. This unit would be optimally placed to promote maritime activities as a highly lucrative venue for deployment of funds and also increase the visibility of projects in this segment. • Tier 2 - Indian Port Association- a separate unit is proposed which is dedicated to business development, business process improvements and standardization of processes and centralized strategy and research vertical, data and knowledge repository and Centre of Excellence for ports and maritime sector in India • Tier 3 – Individual ports- The foundation of the IFC would be based in the individual ports and other organizations functioning under the ambit of MOPSW. This would allow for quick transmission of information including requirements and utilization of individual projects and proposals underway. • System integrated with marine traffic would extract vessel ETA in real-time and inform Ocean Carrier on berth	Conduct stakeholders' meeting comprises of representatives from Invest India, MoPSW, IPA and individual ports to discuss following key aspects of proposed IFC: • Organization structure • Roles and responsibilities of each body • Infrastructure and real estate requirement • Number of staff and their job description • IT infrastructure requirement • Budget for setting-up the above-mentioned requirements	Q2 2024	SDCL
					Based on stakeholders' feedback and discussion, prepare a proposal	Q3 2024	SDCL
					Seek approval from the authority on the above-mentioned aspects of proposed IFC including budget	Q4 2024	SDCL
					Issue memorandum/ government order describing roles and	Q1 2025	MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		• Advanced berth planning system		availability. This would help vessel operator to reduce vessel speed to save fuel cost and minimize vessel anchoring time.	responsibilities of all stakeholders for setting-up of proposed IFC		
					• Prepare multiple tender documents pertaining to specific infrastructure and real estate component (e.g., table, chairs, IT infrastructure, office set-up) • Tender document should contain technical specification requirements, evaluation criteria for the bidders and other necessary information as deemed fit	Q4 2025	SDCL
					Conduct tender process and select the supplier	Q4 2025	SDCL
					Hire personnel for following units • Individual port management team – 3 officers (one each in traffic, finance, and administration) • IPA Business Development Unit – One Executive Director and 2 officers • MOPSW integrated unit under Invest India	Q2 2026	MoPSW, IPA and individual ports
Investment attractiveness - Setting up 'Maritime Trade Facilitation Center [MTFC]'							
25.	Maritime decision inputs are provided in a fragmented manner by institutes and professional bodies such as Indian Ports Association (IPA), Indian Maritime University (IMU), and the Indian Institute of Foreign Trade (IIFT)s	A central body – Maritime Trade Facilitation Center that can act as a 'Think Tank' to the port planners Key functions include the following: • Analyze current challenges and future needs of India's maritime domain through data analytics, compiling views of stakeholders Evaluating GoI & Other Schemes Collating news and events from national and international sources • Provide port-specific inputs	Institutional	• MTFC will be set up as an independent body under an institute (e.g., IIFT Kolkata). • MTFC will draw mandate from the Governing Body. • Members in the Governing body would include representatives from MoPSW, GoI; NITI Aayog and Ports	Conduct stakeholders' meeting comprising representatives from MoPSW, GoI, NITI Aayog and ports to discuss following key aspects: • Organization structure • Institute under which MTFC will be set-up • Roles and responsibilities of each body • Infrastructure and real estate requirement • Number of staff and their job description • IT infrastructure requirement • Budget for setting-up the above-mentioned requirements	Q2 2024	SDCL
					Based on stakeholders' feedback and discussion, prepare a proposal	Q3 2024	SDCL
					Seek approval from the authority on the above-mentioned aspects of proposed MTFC including budget	Q4 2024	SDCL
					Issue memorandum/ government order describing roles and responsibilities of all stakeholders for setting-up of proposed MTFC	Q1 2025	MoPSW

S no.	Issues/ challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		including project consulting			• Prepare multiple tender documents pertaining to specific infrastructure and real estate component (e.g., table, chairs, IT infrastructure, office set-up) • Tender document should contain technical specification requirements, evaluation criteria for the bidders and other necessary information as deemed fit	Q4 2025	SDCL
					Conduct tender process and select the supplier	Q4 2025	SDCL
					Establish appropriate number and screening criteria to hire human resources including researchers, experts from maritime domain, data science professionals, academicians, support staff	Q2 2026	MoPSW, NITI Aayog
					Conduct recruitment drive	Q3 2026	MoPSW
					Sign MoUs with leading institutes to get data and information	Q1 2027	Select institute
					Subscribe to global knowledge databases such as Bloomberg, Reuter, Drewary, CMIE databases etc.	Q4 2026	Select institute

Implementation Plan for **Tax, Regulatory and Policy Initiatives**

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
Best-in-class port infrastructure - Establish a transshipment hub in India							
1	Cost competitiveness- high transshipment charges at Indian ports compared to global ports such as Colombo	As per the scale of rates published by ports, vessel related charges (VRC) of Indian ports are comparatively higher than Global transshipment ports *(e.g., VRC of JNPT – 28.7 USD/ TEU whereas VRC of Colombo – 5.9 USD/ TEU)*	Regulation	Remove the concept of full cost recovery from direct users/ beneficiaries and establish a cost sharing mechanism wherein cost of certain activities such as dredging to be partially/ fully borne by Government	Establish a working group comprising of representatives from major ports, IPA, SDCL	Q2 2024	MoPSW
					Conduct feasibility study to assess the impact of establishing a cost sharing mechanism between Government and port authority/ concessionaire and send representation to MoPSW	Q3 2024	Working Group
					Conduct meeting and approve cost sharing mechanism	Q4 2024	MoPSW

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
2	Cost competitiveness- high transshipment charges at Indian ports compared to global ports such as Colombo No specific guidelines for distribution of ARR recovery among vessel related charges (VRC) and cargo related charges (CRC).	As per the scale of rates published by ports, vessel related charges (VRC) of Indian ports are comparatively higher than Global transshipment ports *(e.g., VRC of JNPT – 28.7 USD/ TEU whereas VRC of Colombo – 5.9 USD/ TEU)*	Regulation	Ports may look to rationalize the distribution between VRCs, and CRCs based on the costs associated with different activities and benchmarking with the competition within India as well as internationally in case of transshipment traffic	Establish a working group comprising of representatives from major ports, IPA, SDCL	Q2 2024	MoPSW
					Conduct feasibility study to assess the impact of rationalizing the distribution of Annual Revenue Requirement (ARR) and send representation to MoPSW	Q3 2024	Working Group
					Conduct meeting and approve the revised mechanism	Q4 2024	MoPSW
3	Cost competitiveness- high transshipment charges at Indian ports compared to global ports such as Colombo	As per the scale of rates published by ports, vessel related charges (VRC) of Indian ports are comparatively higher than Global transshipment ports *(e.g., VRC of JNPT – 28.7 USD/ TEU whereas VRC of Colombo – 5.9 USD/ TEU)*	Regulation	Ports may consider outsourcing of services such as pilotage and towage to third party service providers. Major ports being a government body have to operate under certain restrictions which may limit the operational performance and efficiency. Outsourcing may lead to better operational efficiencies thus reducing the cost of providing the services	Establish a working group comprising of representatives from major ports, IPA, SDCL	Q2 2024	MoPSW
					Conduct feasibility study to assess the impact of outsourcing certain services to third party and send representation to MoPSW	Q3 2024	Working Group
					Conduct meeting and provide approval	Q4 2024	MoPSW
					Prepare tender document containing scope of work, evaluation criteria for the bidders and other necessary information as deemed fit	Q2 2025	Individual ports
					Conduct tender process and select the bidder	Q4 2025	Individual ports
4	Cost competitiveness- Light house dues in Indian ports are 3-4 times higher than Colombo port		Regulation	Lighthouse Dues in India to be brought down, at par with or lower than that of Colombo for ensuring competitiveness	Establish a working group comprising of representatives from major ports, IPA, SDCL	Q2 2024	MoPSW
					Conduct feasibility study to assess the impact of revising light house dues and send representation to MoPSW	Q3 2024	Working Group
					Conduct meeting and provide approval	Q4 2024	MoPSW
5	Customs clearance process in Indian ports is perceived to be more complex and time-consuming than global ports which leads to a high turnaround time and cargo lead times		Regulation	Simplification and digitization of customs processes for Gateway Cargo, and no customs involvement in transshipment	Establish a working group comprising of representatives from major ports, IPA, SDCL and CBIC	Q2 2024	MoPSW
					Conduct a study to identify areas/ ways to simplify and digitize custom processes and send representation to CBIC	Q3 2024	Working Group
					Conduct meeting and provide approval	Q4 2024	CBIC
6	Support services also play a crucial role in attracting and retaining mainliner ships	Inputs to vessels such as Furnace Oil, Spares, lubes etc. are charged at 5%	Regulation	Promote ancillary services such as • Availability of bunkering at competitive cost • Crew change services, • Ship chandelling and anchorage	Establish a working group comprising of representatives from major ports, IPA, SDCL and GST council	Q2 2024	MoPSW

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		This problem is not faced by others in the transportation sector because their main fuel viz. Diesel and Air Turbine Fuel (ATF) are not under the GST regime whereas the main fuel for ships viz IFO is within the GST regime		• Off-port and in port bunkering services • Ship repair and building	Conduct feasibility study to assess the impact of removing GST on fuels used in ships and send representation to GST council	Q3 2024	Working group
					Conduct feasibility study for other ancillary services and assess the impact on transshipment volumes	Q4 2024	Working group
					Conduct meeting and provide approval for removing GST on fuels used in ships	Q1 2025	GST council
Ease of Doing Business - Standardization of port tariff							
7	In non-major ports, there are no standardization with respect unit of levy. However, all major ports follow uniform unit of levy VRC and container/ cargo handling charges	As per the scale of rates published by respective major ports, unit of levy of Vessel Related Charges and Cargo Related Charges are uniform across all the Major Ports and PPP Concessionaires operating in Major Ports • Port Dues - INR per GRT (1 slab) • Berth Hire - INR per GRT-hour (1 slab) • Pilotage fee - INR per GRT (3 slabs) • Cargo related charges (Wharfage, handling, and storage) – INR per tonne • Container related charges – INR per TEU As far as non-major ports are concerned, at present there does not appear to be any uniform Tariff Policy applicable across all the State Maritime Boards	Regulation	State Maritime Board may adopt uniform unit of levy for VRC and CRC for non-major ports	Conduct meeting with all state maritime boards to decide on viability of uniform unit of levy for various charges	Q2 2024	SDCL
					Respective State Maritime Boards (SMBs) to notify all non-major ports and PPP concessionaires to charge tariff as per uniform unit of levy	Q3 2024	SMBs
8	Presently, there is no transparency in levy of tariff and conditionalities governing the tariff in non-major ports and PPP Concessionaires under the non-major ports	State Government of Gujarat notifies in the State Gazette the schedule of port charges along with conditionalities fees leviable by Gujarat Maritime Board (GMB) for the groups of ten ports listed in the schedule. Tamil Nadu Maritime Board and Andhra Pradesh Maritime Board	Regulation	All State controlled ports must host the tariff on their website, presently the GMB, TMB & APMB have hosted; others need to follow the same	Conduct meeting with all state maritime boards to align on publishing tariff on their official websites	Q2 2024	SDCL

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		have hosted the tariff on their respective website. The web site of Maharashtra State Maritime Board does not exhibit the tariff for port services.			Post discussion, respective State Maritime Boards (SMBs) to publish tariff on their websites and update periodically as and when required	Q3 2024	SMBs
9	There is uniformity in terms and condition on certain areas across major port which are as follows: • System of classification of vessel for levy of Vessel Related Charges and Criteria for levy of Vessel Related Charges (VRC) and cargo related charges at Concessional Coastal rate. • Regular review of exchange rate for conversion of dollar denominated tariff into rupee terms. • Penal Interest on delayed payments by users and/ refunds by Major Ports/ PPP Concessionaires. • Users are not required to pay charges for delays beyond a reasonable level attributable to the port. • Berths hire to stop 4 hours after the time of the vessel signaling its readiness to sail. • Penal berths hire equal to one day's berth hire charge is payable for a false signal. • Storage charges on abandoned FCL Containers/ Shipper owned containers shall be leviable up to the date of receipt of intimation of abandonment in However, uniformity on terms and conditions on the above areas/ items are not observed in non-major ports Additionally, there are certain areas/ items where both major and non-major ports have to bring uniformity and standardization	Following are the areas/ items where nonuniformity have been observed across major and non-major ports • Wharfage charge for cargo is specified for each good • Container handling charges are composite while for others they are unbundled • Currency is specified in USD for foreign vessels and INR for domestic vessels • Definition of port convenience specified in individual SOR • Anchorage charges are not prescribed in the SOR of all Major Ports • At some Major Ports, premium for over dimensional containers is based on the actual number of ground slots the respective container occupies • No uniform definition for 'Free Dwell Time' • No uniform definition for 'Demurrage slabs'	Regulation	State Maritime Board may adopt uniform conditionalities for non-major ports in line with Major ports. Additionally, following items are recommended for standardization in the conditionalities and structure of tariff for major and non-major ports **Wharfage charge for cargo -** It could be simplified into broad categories like dry bulk, break bulk, Machinery, chemicals, POL, crude oil, etc. **Container handling charges –** Either **of the f**ollowing structure can be followed across all the ports to ease the trade • Levying a composite charge which will contain cost associated with different activities • Levying charges separately for different activities **Currency -** This may be standardized either in US$ or in rupees terms **Port convenience -** Uniformity and standardization in the definition of the term 'Port convenience' across all ports **Anchorage charges -** Anchorage charges could be prescribed across ports **Premium for over dimensional containers -** Premium up-to the extent of 50% on storage charge for over dimensional containers to be prescribed **Free Dwell Time -** For import cargo/ container, free dwell-time (storage) period should commence from the time after the day of landing of the container. Further, for export cargo / containers the free period should commence from the time the cargo/ container enters the terminal **Demurrage slabs –** The definition of 'Demurrage slabs' can be simplified and made uniform across all ports	Conduct meeting with all state maritime boards and major port authorities to align on bringing uniformity and standardization in certain areas such as	Q2 2024	SDCL
					Post discussion, respective State Maritime Boards (SMBs) and major port authorities to issue notification highlighting the suggested uniformity/ standardization in the terms and conditions on certain areas/ items.	Q3 2024	SMBs and Major port authorities
Ease of doing business - Policy on predatory pricing for sustainable and structured growth of Indian Maritime Sector							
10	PPP Concessionaires in non-major ports are not under any tariff regime. They have flexibility to charge much lower rate	Major ports have flexibility to frame their own Scale of Rates (SOR) following the Tariff Guidelines to	Regulation	Setting lower threshold for scale of rates - A directive may be given that pricing/ tariff should not be less than the operating cost per tonne/ TEU in respect of a port/	Conduct meeting of all SMBs to assess feasibility of putting a lower threshold for scale of rates	Q3 2024	SDCL

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
	to attract cargo of other competition ports mostly from major ports. Thus, creating a risk of predatory pricing.	be issued by the Government. Further, PPP projects after commencement of the MPA Act, 2021 have complete freedom to fix their own tariff based on market conditions and such other conditions as may be notified. PPP Concessionaires in non-major ports are not under any tariff regime		PPP concessionaire who is in the operation for more than 7 to 10 years or is a dominant player in the port sector. Further, there could be cap on number of years (say one to three years) for the new entrant in a particular port to have reduced pricing to attract trade subject to compliance of the provisions of Competition Commission Act and specific provisions of the Concession Agreement in this regard	Post discussion, SMBs to issue directive to all non-major ports covering following aspects: • Pricing/ tariff should not be less than the operating cost per tonne/ TEU in respect of a port/ PPP concessionaire who is in the operation for more than 7 to 10 years or is a dominant player in the port sector. • Cap on number of years (say one to three years) for the new entrant in a particular port to have reduced pricing to attract trade subject to compliance of the provisions of Competition Commission Act and specific provisions of the Concession Agreement in this regard	Q1 2025	SMBs
11	PPP Concessionaires in non-major ports are not under any tariff regime. They have flexibility to charge much lower rate to attract cargo of other competition ports mostly from major ports. Thus, creating a risk of predatory pricing	Major ports have flexibility to frame their own Scale of Rates (SOR) following the Tariff Guidelines to be issued by the Government. Further, PPP projects after commencement of the MPA Act, 2021 have complete freedom to fix their own tariff based on market conditions and such other conditions as may be notified. PPP Concessionaires in non-major ports are not under any tariff regime	Regulation	Restrict Merger/ acquisition which are leading to 50% or above market share in the sector by a particular group of company or enterprise	Conduct meeting of all SMBs to discuss the aspects of merger/acquisition leading to 50% or above market share	Q4 2024	SDCL
					SMBs to issue guidelines/ directive restricting merger/acquisition leading to a dominant position in maritime sector	Q2 2025	SMBs
					CCI to oversee any merger/acquisition which could breach anti competition laws	Q4 2025	CCI
Ease of doing business - Role of PPP in maritime sector							
12	Inequitable risk allocation - Allocating risks in PPPs is inherently challenging. Risk transfer to the private sector comes at a price and transferring risks that the public agency is better able to manage is likely to erode Value for Money.		Policy and Regulatory	Statutory clearances like environment and forest clearance could be obtained by project implementation authorities before the award of projects	Prepare Environment Impact assessment (EIA) report	Q3 2024	Major Port Authority
					Get NOC from State Pollution control Board	Q4 2024	Major Port Authority
					Get approval from Environment Appraisal Committee	Q1 2025	Major Port Authority
					Get clearances from Ministry of Environment, Forest & Climate Change	Q2 2025	Major Port Authority
13	Limited fiscal benefits to private parties		Policy and Regulatory	Restore the full exemption from Import duties, including IGST, for service providers like Ports and Terminals	Conduct feasibility study to assess the impact of revision in import duties/ IGST and send representation to CBIC/GST council respectively	Q3 2024	MoPSW
					CBIC/ GST council to conduct meeting and approve the revised rates	Q4 2024	CBIC/GST council

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
14	Limited fiscal benefits to private parties		Policy and Regulatory	Customs cost recovery charges should be abolished by CBIC	Conduct feasibility study to assess the impact of revision in customs cost recovery and send representation to Central Board of Indirect Taxes and Customs	Q3 2024	MoPSW
					Central Board of Indirect Taxes and Customs to conduct meeting and approve abolition of customs cost recovery charges	Q4 2024	CBIC
15	Limited fiscal benefits to private parties		Policy and Regulatory	Waiver of GST during the project construction stage	Conduct feasibility study to assess the impact of revision in tax and send representation to GST council	Q3 2024	MoPSW
					GST council to conduct meeting and approve the revised rates	Q4 2024	GST Council
16	Limited fiscal benefits to private parties		Policy and Regulatory	Allow input tax credit on exempted services	Conduct feasibility study to assess the impact of revision in tax and send representation to GST council	Q3 2024	MoPSW
					GST council to conduct meeting and approve the revised rates	Q4 2024	GST Council
17	Limited fiscal benefits to private parties		Policy and Regulatory	Tax holiday of 10 years to enterprises engaged in developing, operating, and maintaining any infrastructure facility	MoPSW to send representation to Income tax department	Q3 2024	MoPSW
					Income tax department to review the representation and approve the required amendment in Income Tax Act	Q4 2024	Income tax department
18		Modal Concession Agreement for cruise terminal is not present	Policy and Regulatory	Develop Model Concession Agreements (MCAs) for cruise terminal	Following key provisions should be included in the MCAs for cruise terminals: • Flexibility to address changing market dynamics • Concessioning Authority's KPIs reflecting authority's responsibility • Concession duration should be reflective of capex lifecycle, adequacy of returns for concessionaire and strategic objectives of the authority - Provisions like RoFR can be included giving flexibility to authority and comfort to concessionaire. • Risk balancing while ensuring optimisation of cashflows • Tariff setting freedom & minimum guaranteed cargo (MGC)	Q3 2026	MoPSW

S no.	Issues/ Challenges	Initiative	Category	Description/ proposal	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	High degree of manual intervention that cause delay and additional costs apart from hardship to the associated stakeholders, leading to low operational efficiency	Operational Efficiency improvement Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Improve terminal performance for all container terminals with low QC productivity (less than 30 moves/hour) 2 Improve berth productivity for dry bulk terminals 3 National Logistics Portal (NLP) Marine to enable single integrated platform for EXIM activities across stakeholders 4 Develop digital registration and certification portal for Indian flagged ships and drive acceptance of e-documents across ports	Technology	Automation of operations at all Ports	• New terminal - Initially, project authorities would need to conduct baseline study on select operational terminals across parameters such as Gross Berth Output; Transit Storage Dwell Time; Turnaround Time for receipt/ delivery operation; Vessel turnaround Time based on last 3-year performance of the terminals • Existing terminal - Project Authorities would need to conduct baseline study basis last 3-year performance of the terminal and minimum standards in concession agreement across the key parameters. If Base lining study is prepared by PPP project operator, then it shall be vetted and approved by an independent third party	Q4 2023	Major Port Trust
					Existing and New Terminal - Post base line study, project authorities would need to define/ revise target KPIs (existing/ new) and introduce smart KPIs across all the parameters	Q1 2024	Major Port Trust
					Existing terminal - PPP Port Operators/ Project Authority would need to submit an action plan proposing multiple smart projects/intervention to the MoPSW/ State Maritime Boards for approval	Q4 2024	PPP port operators/ Port Authorities
					Existing terminal - PPP Port operators/ Project Authorities would need to prepare an impact assessment report, estimating upfront capital cost, technical changes, improvement in efficiency, increase in operating cost for terminal, impact on ship and cargo turnaround time	Q2 2025	PPP port operators/ Port Authorities
					Existing terminal - MOPSW/ State Maritime Boards may employ independent agencies to vet and approve the funding requirement, targeted outcomes of the proposed projects/interventions	Q3 2025	MoPSW/ State Maritime Boards
					Finally, the identified KPIs and smart KPIs would need to be accordingly included in concession agreement	Q4 2025	Major Port Trust
					Port automation implementation across various areas	2026-2031	PPP port operators/ Port Authorities
2			Technology	Upgradation of Terminal Operating System (TOS)	Appointment of service provider	Q4 2023	Port authorities, CoEME
					Submission and Acceptance of Business Requirement Specifications, Solution Architecture and Design	Q4 2023	
					Complete & integrate all iterations	Q4 2023	
3			Technology	Development of National Logistic Platform (NLP)	Appointment of service provider	Completed	Port authorities, CoEME
					Submission and Acceptance of Business Requirement Specifications, Solution Architecture and Design	Completed	
					Complete & integrate all iterations with microservices enabled platform	Q4 2023	
					Stabilization & fine tuning	Q4 2023	
4			Technology	ULIP Integration	Appointment of service provider	Q1 2024	Port authorities, CoEME, Cross sectoral bodies
					Integrate the information available with various government systems across the supply chain	Q3 2024	
					Development of Unified system for documentation and compliances	Q2 2025	

					Development of Gateway for data exchange between both government and private entities	Q2 2026	
					Complete & integrate all iterations based on requirements	2026 onwards	
5			Technology	Smart document management systems	Study of the technology architecture and infrastructure	Q4 2023	CoEME
					Basis detailed technical study, map out digital infrastructure requirements for a pilot port	Q4 2023	
					On-board a Multi-System Integrator (service provider) for pilot	Q1 2024	
					Roll-out solutions across major ports to enable digital transformation of ports	Q1 2025 onwards	
6			Technology	Implementation of Port process tool kit	Data collection at Ports including transactions across processes, documentation involved and level of digitization	Q4, 2023	Major Ports
					Detailed mapping of processes and validation	Q4, 2023	
					Map continuous improvement matrix with details of key issues of various process groups. Identify key issues prevalent in port	Q4, 2023	
					Map the key issues identified in the continuous improvement matrix with root causes	Q4, 2023	
					Identify improvement areas based on root cause mapping	Q4, 2023	
					Presenting roadmap and action plan to stakeholders.	Q4, 2023	
7	Limited capabilities to plan and optimize current and future terminal layouts in consideration of productivity, cost, traffic volumes and lifecycle factors	Port planning & optimization	Technology	Digital twin for port and systems Automated allotment of berths using AI/ ML Implementing 7D BIM at all ports Advanced Analytics based yard management	Study of the technology architecture and infrastructure by CoEME	Q4 2023	CoEME
					Basis detailed technical study, shortlist the solutions that can be taken up till 2030	Q2, 2024	
					Map out digital infrastructure requirements for pilot	Q2, 2024	
					On-board a Multi-System Integrator (service provider) for shortlisted technology solutions pilot	Q4, 2024	
					Roll-out technology solutions across major ports to enable digital transformation of ports	2025 onwards	
8				GIS based Land Management System & Portal	Collaboration with M/s Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG) to gather port land data for GIS mapping and management	Q4, 2023	CoEME
					Data mapping	Q1 2024	
					Development of Portal	Q3 2024	
					Integrating the same with the individual port's ERP systems.	Q4 2024	
9				Centralised Project Management System to monitor all Capex projects	Selection of Service provider	Q4 2023	CoEME
					Development of portal and uploading ongoing and pipeline project information	Q4 2023	
10	Faced with technological challenge which is also cost-effective solution for the transmission of data across maritime. Need for finding, incorporating and integrating viable effective and reliable		Technology	Implementation of Smart Communication Systems	Study of the major technologies available for the module (optical fibre communication, VSAT etc.)	Q4, 2023	CoEME
					Basic detailed technical study and map out digital infrastructure requirements	Q4, 2023	
					On-boarding of a Service Provider	Q1, 2024	
					Implementation of Communication system throughout the length of a pilot waterway/ coastal zone	Q4, 2024	
					Replication the communication system of other operational waterways/ coasts	Q4, 2026	

11	communication systems along the entire maritime ecosystem and channels	Optimizing marine operations		Use common VHF channel for faster communication to signal station	Conduct discussion with marine departments of ports regarding the existing international regulations for VHF communication and applicability of various frequency bands for different purposes in Indian ports such as: • Marine navigation and traffic control • Summoning rescue services • Communicating with harbors, locks, bridges and marinas	Q2 2024	CoEME
					Conduct second round of discussion with marine departments of ports to understand following aspects and accordingly prepare representation/ proposal. • Marine VHF radio specifications • Budget requirement for the procurement of VHF radio in ports • Eligibility requirement for license to procure and use marine VHF radio	Q2 2024	CoEME
					MoPSW to review the proposal and approve it	Q4 2023	MoPSW
					Draft regulation regarding licensing requirement for using marine VHF radio	Q1 2024	MoPSW
					Prepare tender for procurement of VHF radio in ports and finalize bid evaluation criteria	Q2 2024	Major Port Trust
					Conduct tender process and select bidder based on evaluation criteria	Q4 2024	Major Port Trust
12				Operationalise new e-Governance Solution Project	Selection of Service provider	Q4, 2023	D G Shipping
					Kick-off / Agreement	Q4, 2023	
					Submission of SRS	Q4, 2023	
					User Acceptance Test (UAT)	Q3, 2024	
					Go-Live	Q3, 2024	
					Stabilization	Q4, 2023	
					Operations and Maintenance	Up to 3 years from Go-live	
13				Sensor based devices	Study of the major technologies available for the module	Q1, 2025	CoEME
					Basic detailed technical study and map out digital infrastructure requirements	Q3, 2025	
					On-boarding of a Service Provider/ Procurement of such technology and developing India based IT solution	Q1, 2026	
					Implementation of proposed technology	Q1, 2027 onwards	
14		Maritime Safety & Security	Technology	Implementation of Maritime Safety & Security solutions	Study of the major technologies available for the module	Q4, 2023	CoEME
					Basic detailed technical study and map out digital infrastructure requirements	Q1, 2024	
					On-boarding of a Service Provider/ Procurement of such technology and developing India based IT solution	Q2, 2024	
					Implementation of proposed technology	Q2, 2025 onwards	

	India and global ports are facing concerns with safety in ports waters and need to take steps towards ensuring safe practices and culture, emergency preparedness exercises and efforts to promote navigational safety						
15	Inefficient communication exchange due to unreliable network, difficulty in terminal operation integration and concerns of monitoring across all operations of the maritime sector through a centralized institution	Institutional support for implementation Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Establish a Digital Center of Excellence (DCoE) under IPA to develop standardized architecture across ports and drive transition of Indian ports to "Smart ports" 2 Standardize internal processes and deploy Enterprise Business System (EBS) across 5 Major Ports	Institutional	Development of Centre of Excellence for Maritime Efficiency (CoEME)	Signing of MoU with identified three IITs with clearly defined scope	Completed	IPA
					Development of Institutional and Operational Framework of CoEME	Q4, 2023	
16				In-house Digital team strengthening	Development of ToR with required positions	Q4, 2023	Major Ports/ IWAI
					Selection of work force	Q1 2024 onwards	
17				Command & Control Centre	Selection of Service provider/ agency for C&C operations	Q4, 2024	CoEME
					SOP for operations	Q3, 2024	
					Technology solutions like chatbot implementation	Q4, 2026	

Action Plan for **Tax, Regulatory and Policy Initiatives**

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
1	Limited sources of vessel financing in India	**Restrictions on FPI investing in Category I and II AIFs:** Regulation 20 of the SEBI (FPI) Regulations, 2019 prescribes the types of securities that FPIs shall invest in. This regulation does not include Category I and II AIFs (investing in ship leasing and financing entities in the IFSC)	Regulatory	Amend AIF Regulations to create a separate category of AIFs for investments in ship leasing companies or amend the existing regulatory framework of Category- I or II AIFs to permit greater concentration of investments in entities engaged in ship financing/ leasing.	MoPSW to take up discussions with SEBI and Ministry of Finance to amend AIF Regulations to create a separate category of AIFs or amend the existing regulatory framework of Category- I or II AIFs for investments in ship leasing companies	Q1, 2024	MoPSW
				Regulation 20 of the SEBI (FPI) Regulations, 2019 may be relaxed to enable FPIs to invest in Category I and II AIFs (investing in ship leasing and financing entities in the IFSC), by virtue of the powers conferred upon SEBI under Regulation 20(h) of the said regulations.	SEBI to relax Regulation 20 of the SEBI (FPI) Regulations, 2019 to enable FPIs to invest in Category I and II AIFs (investing in ship leasing and financing entities)	Q2, 2024	
		Pension funds are not permitted to invest funds of subscribers, outside India, either directly or indirectly. It is unclear whether this restriction would also apply to investment by pension funds into **(a)** leasing entities established in IFSC, or **(b)** domestic Category I or II AIFs which in turn provide finance to leasing entities established in IFSC. Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Work with MoF for developing dedicated policy and capacity in select commercial banks like SBI and EXIM bank for lending in shipping sector 2 Work with Ministry of Finance to extend concessional income tax rates for promotion of ship leasing activities	Regulatory	PFRDA to clarify whether the restriction on pension funds to invest funds of policyholders outside India (either directly or indirectly) would apply to investments by pension funds money into entities established in IFSC or in domestic Category-I or II AIFs that are in turn investing in ship financing/ leasing entities located in IFSC. As regards the investments by pension funds in AIFs, the PFRDA may also issue a clarification that entities owning vessels or engaged in ship financing are 'infrastructure entities' as per para (ii) of Circular No. PFRDA/2017/18/ PF/ 2 dated May 04, 2017 PFRDA may permit pension funds to invest in equity or debt of companies set up in the IFSC.	MoPSW to hold discussion with PFRDA to get clarification on investments by pension funds in domestic AIF for investment in ship leasing and financing.	Q1, 2024	MoPSW
					For investments by pension funds in AIFs, PFRDA to issue a circular that clarifies that entities owning vessels or engaged in ship financing are 'infrastructure entities' as per para (ii) of Circular No. PFRDA/2017/18/PF/2 dated May 04, 2017	Q2, 2024	
		Under Section 27A (4) of the Insurance Act, **insurance companies are not permitted** to invest in private limited companies. This restriction is	Regulatory	The restriction under Section 27A (4) is a blanket restriction and neither the IRDAI nor the Central Government is empowered to relax this through regulatory or executive action. Therefore, a relaxation of this restriction would require a legislative amendment. However, under Section 2CA, the Central Government	MoPSW to hold discussion with Ministry of Finance to relax the provision of Section 27A (4) with respect to allowing investments to be made by insurance companies in ship financing/leasing companies registered in IFSC	Q3, 2024	MoPSW

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
		replicated under the Insurance Regulations.		has the power to relax the restriction for insurers in an SEZ. GIFT City IFSC is an SEZ. Central Government, in exercise of its powers under Section 2CA, should relax the provision of Section 27A (4) with respect to investments by insurers in IFSC into ship leasing entities in GIFT City.	Ministry of Finance, to issue notification under Section 2CA of the Insurance Act, 1938 to exempt insurance companies in IFSC from the investment restriction provisions under Section 27A (4) of the Insurance Act, 1938.	Q4, 2024	
		NIIF and the funds it invests in do not address capital intensive industries such as ship leasing	Regulatory	Create a strategic fund investing in transport infrastructure, so as to aid greenfield capital incentive industries such as ship leasing being developed in India-IFSC.	MOPSW to get in touch with NIIF and DoEA to discuss the strategic investment opportunities in ship leasing industry	Q3, 2024	
					NIIF to include ship leasing under the funds it invests in and start investing in the ship leasing industry	Q4, 2024	
		Currently, **vessels** are **not included as an infrastructure** subsector listed as per the RBI Infrastructure Circular Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Collaborate with Ministry of Finance to grant Infrastructure Status to Shipping Industry to enhance availability of low-cost long term funds availability	Regulatory	Vessels to be granted 'infrastructure status'. Hence, they will be able to avail long-term funding at competitive rates which is essential considering the fact that its asset life is 15 to 25 years. For this, RBI will issue a notification which clearly states the inclusion of 'vessels' in 'infrastructure' category The said inclusion of "vessel" should also be incorporated into the 'Harmonised Master List of Infrastructure Subsectors' bearing number F.No. 13/1/2017- INF dated April 26, 2021. This definition of vessel should be aligned with the proposed definition under Section 3(d)(vi) of the IFSCA Act, 2019.	MoPSW to hold discussions with MoF and RBI on inclusion of vessels as an infrastructure subsector.	Q1, 2025	
					RBI to make amendment to Infrastructure Circular and the 'Harmonised Master List of Infrastructure Sub-sectors; bearing number F. No. 13/1/2017- INF dated April 26, 2021 for vessels owned and financed by or operated by IFSC shipping entities to be granted 'infrastructure status'.	Q2, 2025	
		Restrictions on **External Commercial Borrowings (ECB)** under RBI's Master Directions – ECBs, Trade Credit, Borrowing and Lending in Foreign Currency by Authorised Dealers ("ECB Master Directions")	Regulatory	RBI, in its capacity of foreign exchange regulator, can issue specific directions under Section 11 of Foreign Exchange Management Act, 1999 (FEMA Act) to provide specific exception/ relaxation for entities engaged in ship financing from the restrictions in so far as all in cost and minimum average maturity are concerned. Further, offshore branches of Indian banks may be permitted to refinance domestic debt through ECBs.	MoPSW to discuss with RBI for enabling ECB for financing ship acquisitions and ship leasing.	Q1, 2025	
					With the powers conferred under Section 11 of the FEMA Act, 1999, the RBI may liberalize the ECB guidelines so as to relax the requirements in respect of the allin- cost ceiling, minimum average maturity period and to enable ECB re-financing of domestic debt by offshore branches and subsidiaries of Indian banks	Q2, 2025	
		Mutual funds are not allowed to invest more than 10%-12% of its NAV in rated debt instruments, 10%-25% of their NAV in unrated debt instruments and 5%-10% of their NAV in unlisted equities.	Regulatory	Introduce amendments to the existing framework for mutual funds, permitting greater exposure to target companies that are ship leasing companies (for instance, special or separate schemes).	MoPSW to hold discussions with MoF and SEBI to increase the cap and provide greater exposure to target companies that are ship leasing companies or create a separate category of mutual funds for investments in ship leasing companies	Q3, 2025	
					SEBI to amend the SEBI (Mutual Funds) Regulations, 1996 to create a separate category of mutual funds for investments in ship leasing	Q4, 2025	

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					companies OR to permit greater concentration of investments in entities engaged in ship financing/ leasing in an IFSC.		
		SEBI (IFSC) Guidelines do not clarify the categories of investors permitted to invest in Mutual Funds Further, Eligible resident individuals are permitted to invest upto USD 250,000 per annum in an overseas mutual fund as per Liberalised Remittance Scheme. These limits restrict the ability of mutual funds located in IFSC to raise funds from domestic HNIs, and consequently their participation in ship financing.	Regulatory	Clarify the categories of investors that would be permitted to invest in mutual funds. Given the limitation on domestic investors investing into a mutual funds based out of IFSC as described herein, further liberalize the options for Indian HNIs to invest in mutual funds targeting ship leasing in IFSC. Given the limitation on domestic investors investing into a mutual funds based out of IFSC as described herein, further liberalize the options for Indian HNIs to invest in mutual funds targeting ship leasing in IFSC.	MoPSW to hold discussions with MoF, RBI and SEBI to seek clarification on categories of investors permitted to invest in Mutual Funds	Q1, 2026	
					SEBI to provide clarification on types of institutional investors contemplated under the SEBI (International Financial Services Centre) Guidelines, 2015.	Q2, 2026	
		While NBFCs can set up a finance company under the IFSCA (Finance Company Regulations) 2021, **prior approval** of RBI is required for setting up opening of Branch/ Subsidiary/ Joint Venture/ Representative office or Undertaking Investment Abroad by NBFCs	Regulatory	Setting up of a branch office in IFSC by an NBFC in India should be permitted. ODI investment by NBFC should be under automatic route.	MoPSW to discuss with RBI and IFSCA to permit the non-banking financial companies to open branch office overseas	Q1, 2026	
					Setting up of a branch office in IFSC by an NBFC in India to be permitted by RBI	Q2, 2026	
		Vessel leasing is not identified as a financial product	Regulatory	Vessel leasing (including chartering) needs to be notified as a 'financial product' by notification of the Central Government under Section 3(d)(vi) of the IFSCA Act. Financial entities located in IFSC can undertake such activities if their home country regulator does not expressly bar it.	MoPSW to hold discussion with IFSCA on inclusion of Vessel leasing as a financial product under IFSCA Act	Q3, 2026	
					Vessel leasing (including chartering) will need to be notified as a 'financial product' by the Central Government under Section 3(d)(vi) of the IFSCA Act, 2019.	Q4, 2026	
2	The RoFR policy has been a success but the validity till 2026 is an issue	ROFR Policy	Policy/ Taxation/ Regulatory	This Right of First Refusal gives local companies the right to accept or deny contracts before the offer is extended to other companies. This proves to be a facilitating provision for the growth of indigenous shipping and repair companies	Prepare a proposal with the rationale behind the suggested action and send it to the MoPSW for approval	Q1, 2024	DG Shipping
					Post approval, issue a circular with full disclosure of terms and conditions	Q2, 2024	MoPSW
3	The policy prescribing Imports on "Free on Board" basis (FoB policy) and exports on the basis of "Cost Insurance and Freight" is followed in default with a large number of imports being carried out on CIF basis.	Government of India's Cargo Transportation Policy of 1957	Policy	Strict adherence to Imports on "Free on Board" basis (FoB) and exports on "Cost Insurance and Freight" (CIF) basis	Conduct a study to assess the impact of strict adherence to Imports on "Free on Board" basis (FoB) and exports on "Cost Insurance and Freight" (CIF) basis	Q3, 2024	INSA
					Conduct stakeholders' discussion to understand their views on the suggested action	Q3, 2024	INSA

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
					Prepare a proposal with detailed SOP and issue it to all relevant stakeholders to get their consensus	Q4, 2024	INSA
					Issue of proposal and SOP to MoPSW for approval	Q4, 2024	INSA
					Approval of MoPSW & issue of notification with full disclosure of terms and conditions and the penalty involved for non-compliance	Q1, 2025	MoPSW
4	The actual outcomes of the general orders 1, 2 & 3 of 2018 were opposite of the envisaged effects	General order no. 1 of 2018 dated 21 May, 2018 General order no. 2 of 2018 dated 22 May, 2018 General order no. 3 of 2018 dated 22 June, 2018	Policy	Reversal of the General Orders Nos. 1, 2 and 3 2018 by the DGS	Conduct a study to assess the impact of strict adherence to Imports on "Free on Board" basis (FoB) and exports on "Cost Insurance and Freight" (CIF) basis	Q4, 2023	INSA
					Conduct stakeholders' discussion to understand their views on the suggested action	Q4, 2023	INSA
					Prepare a proposal with detailed SOP and issue it to all relevant stakeholders to get their consensus	Q4, 2023	INSA
					Issue of proposal and SOP to MoPSW for approval	Q4, 2023	INSA/ DG Shipping
					Approval of MoPSW & issue of notification with full disclosure of terms and conditions and the penalty involved for non-compliance	Q1, 2024	MDG Shipping/ oPSW
5	The manning rules for Indian and foreign vessels is skewed towards favoring foreign flag vessels	The Merchant Shipping Act Projects already identified under the initiative: - (Source: **MIV 2030**) 1 Implement specific changes in key legislation to address issues in the sector–Merchant Shipping Bill	Policy	Safe manning for Indian ships should be on par with Whitelist MOU flag vessels	Prepare a proposal with the rationale behind the suggested action and send it to the MoPSW for approval	Q4, 2023	DG Shipping
					Approval of MoPSW & issue of notification with full disclosure of terms and conditions and the penalty involved for non-compliance	Q4, 2023	MoPSW/ DG Shipping
6	OSVs & PSVs awaiting employment in EEZ pending clearance by Indian Navy	Directorate General of Hydrocarbons (DGH) circular dated 15th January 2021	Policy	Reducing timeline for Indian Navy clearance (preferably 3 days) for DGS registered Indian flag OSVs and PSVs/ or with Indian citizen crew to maintain smooth movement	Issue request to the Indian Navy and Ministry of Defense for exempting Indian flag OSVs and PSVs which are registered with DG Shipping and manned with Indian citizens to seek clearance with detailed rationale. If request is not accepted, send a counter request to stick to the earlier process which had a timeline of 3-4 days	Q4, 2023	INSA/ MoPSW
					Approval from Ministry of Defence	Q4, 2023	MoD

S no.	Issues/ challenges	Current legal / regulatory / policy standing	Category	Proposed consideration in the legal / regulatory / policy standing	Action Plan for implementation	Timeline for Implementation	Implementing Agency
7	High rate of tax on income OR Tonnage tax + training obligation		Tax	Any foreign flag ship employed by an Indian charterer for more than six months should be asked to flag in India Foreign flag ships employed for more than six month should also be required to comply with training obligations	INSA to send representation to DG Shipping	Q4, 2023	INSA
					DG Shipping to review and approve the requirement Amendment	Q4, 2023	DG Shipping
8	Uncertainty of operations due to varying Customs procedures	Difficulties faced in respect of conversion of vessels. Difficulties faced in respect of First entry (Import) of vessels Differing practices in respect of import of Spares for ships Requirement to file Shipping Bill in respect of already imported spares, stores and provisions on coastal vessels. Treating an imported vessel as 'Out of charge' regardless of completion of formalities under the Merchant Shipping Act, 1958. Dispensing with requirement of obtaining Port Clearance from the Customs in respect of Indian flag vessels. Baggage of Indian crew working on coastal vessels is made subject to examination of customs while on pure coastal voyages	Policy/ Regulatory	Simplification of custom procedures in timebound manner	Conduct a study on current custom related challenges which need to be relaxed or amended for simplification	Q4, 2023	INSA
					Prepare a proposal with the rationale behind the suggested action and send it to the MoPSW for approval	Q1, 2024	INSA
					MoPSW to extend the proposal to the CBIC, Ministry of Finance for approval	Q1, 2024	MoPSW
					Approval of CBIC and issue of notification	Q3, 2024	CBIC
9	Unlike cargo carrying vessels which are freely allowed to be taken out of India for rendering services, non-cargo carrying Tugboats and offshore vessels are currently required to get a GR waiver for deploying the vessel abroad on contract. The condition of obtaining GR waiver is needless and cumbersome and delaying Indian companies from being competitive and place their businesses worldwide.	Merchant Shipping Act 1952, Regulation 4 of FEMA 23(R) issued under the Foreign Exchange Management (Export of Goods and Services) Regulations, 2015.	Policy	Insert "Tug and Tug Boats including vessels used for providing offshore support services registered under the Merchant Shipping Act, 1952" under Regulation 4 of FEMA 23(R) issued under the Foreign Exchange Management (Export of Goods and Services) Regulations, 2015.	Prepare a proposal with the rationale behind the suggested action and send it to the MoPSW for approval	Q4, 2023	INSA
					DG Shipping to review and approve the proposal with issue of notification	Q4, 2023	DG Shipping

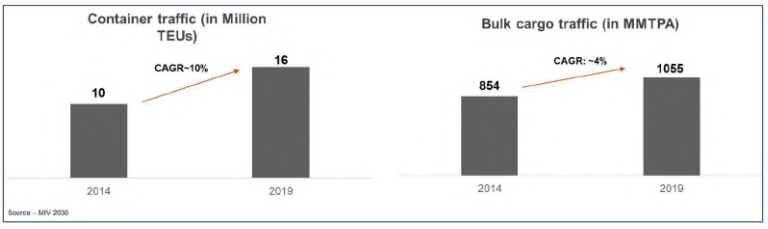
ANNEXURE 1: CARGO TRAFFIC PROJECTIONS

Cargo traffic projection

Top-down approach has been followed to project cargo traffic at ports:

A Nominal GDP of 32 trillion by 2047 has been taken into consideration along with Nominal GDP growth rate as 10% (2022-2047) and the Real GDP growth is assessed considering inflation forecast (2% to 6%) provided by DEA.

Growth assessment of past 5-year Container and Bulk Cargo traffic is done as below:



Total Cargo Traffic handled at Indian ports in 2019 was 1,290 MMPTA

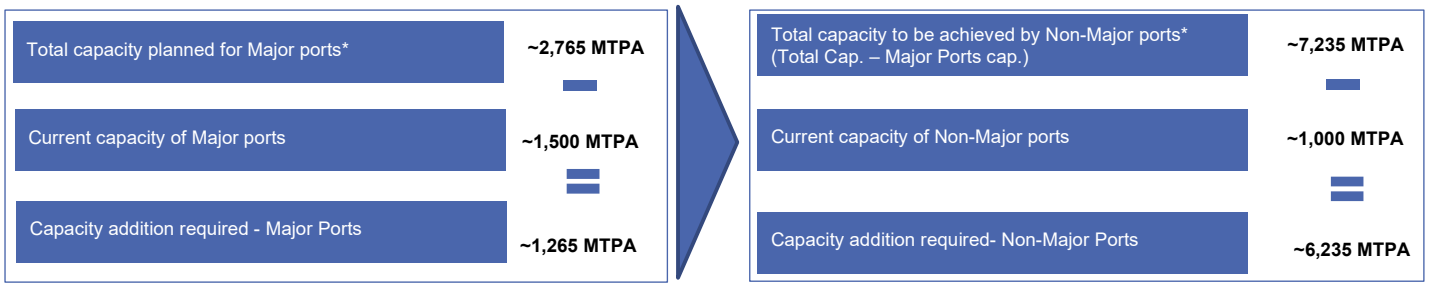
Cargo traffic forecast by analyzing correlation between cargo traffic and Real GDP growth as shown below:

1. **Container Traffic Projections**[75]
    - Container traffic growth is highly correlated (COR -0.95) to Real GDP growth
    - As per MIV, container growth multiplier is 1.2-1.5 under different scenarios – High, Low and Base Case[76]
2. **Bulk Cargo Traffic Projections**
    - Growth of bulk traffic is also linked with the economic growth
    - Bulk cargo growth multiplier is 0.4-0.7 under different scenarios – High, Low and Base Case\

Below table shows the projected traffic under different scenario:

Scenario	High	Low	Base
Container Traffic (Mn TEUs)	218	130	175
Bulk Traffic (MMTPA)	3,548	2,020	2,895
Total Traffic (MMTPA)	6,788	3,925	5,468
Capacity (MMTPA)	10,442	6,039	8,412

Hence, the total capacity estimated to meet the support the trade for USD 32 Tn Economy by 2047 is **~10,000 MTPA.** The total capacity expansion plans by 2047 have been shared by major ports **(2,765 MTPA)**. Therefore, the remaining capacity (10,000 – 2,765 = **7,235**) is to be develop by non-major ports as shown below.



Capacity development by non-major ports:

Currently there are 68 operational non-major ports and 21 non-major ports under various stages of development as shown below. All of these non-major ports to contribute in capacity expansion and development to reach the target of 6,235 MTPA by 2047.

[75] *Note -Conversion – 1 TEU = 14.7 Tons

[76] *Note -Scenarios are High, Low and Base cases basis increase in manufacturing, containerization rate and push by infrastructure projects such as Dedicated Freight Corridor

Table 65: Snapshot of 21 greenfield non-major ports

Port	State	Capacity (mt)	Cost (Rs billion)	Current status
Astaranga	Odisha	17.70 (eventually 70)	74.17	Awarded
Azhikkal	Kerala	4.05 (Phase I)	20.00	Announced
Beypore	Kerala	-	1.60	Announced
Bhavanapadu*	Andhra Pradesh	40.00	36.67	Announced
Chudamani	Odisha	3.00 (Phase I)	15.00 (Rs 6 billion for Phase I)	Stalled
Dahej	Gujarat	41.00	40.60	Stalled
Devbhumi Dwarka	Gujarat	100.00	106.00	Awarded
Kulpi	West Bengal	-	30.00	Announced
Machilipatnam	Andhra Pradesh	40.00 (Phase I)	58.35 (Phase I)	Announced
Nargol	Gujarat	1.20 million TEUs	41.00	Stalled
Ponnani	Kerala	4.00 (Phase I)	20.00	Under construction
Kakinada*	Andhra Pradesh	30.00	30.00	Under construction
Ramayapatnam	Andhra Pradesh	138.54 (for three phases)	100.09	Announced
Rewas	Maharashtra	66 (eventually 457)	20.00 (Phase I)	Announced
Riverine port on Mahanadi River	Odisha	54.00	40.62	Announced
Subarnarekha	Odisha	10.00 (Phase I)	28.00 (Phase I)	Awarded
Tadadi	Karnataka	34.25 (eventually 62.36)	38.13	Announced
Tajpur	West Bengal	-	150.00	Announced
Vijaydurg	Maharashtra	75.00	25.00	Awarded
Vizhinjam	Kerala	1 million TEUs	55.52	Under construction
Yogayatan	Maharashtra	4.50	2.50	Awarded

** Projects are being implemented under the Sagarmala programme*

Source: Compiled by India Infrastructure Research from various sources

ANNEXURE 2: NATIONAL WATERWAYS' PRIORITIZED PROJECTS

2.1 Enhancement, sustenance, and development of infrastructure at 23 priority NWs Operationalizing National Waterways

S. No.	Key Activities
1	**Operationalize 23 waterways by 2030 through infrastructure enhancement (10 out of 16 functional and 7 new waterways), fairway development, navigational aids and RIS provisioning**
1.1	National Waterway 1 –
	Construction & operationalization of Haldia multi-modal terminal
	Signing of Concessionaire agreement of Haldia & Varanasi MMT
	Development of navigation lock at Farakka along NW 1
	Completion of Dredging Farakka – Kahalgaon section (Mar-22)
	Navigational Aids deployment & RIS stations operationalization
	Concessionaire agreement for Sahibganj MMT and Gaighat Terminal
	Completion of Dredging Sultanganj – Mahendrapur section (Mar-23)
	Completion of Dredging Mahendrapur – Barh section (Mar-23)
	Development of an integrated vessel repair and maintenance complex near Sahibganj multi modal terminal
	3 intermodal cargo terminals to enhance connectivity and reduce cost of cargo –Kalughat, Tribeni, Ghazipur
	Completion of Freight Village at Varanasi and ICLP at Sahibganj
1.2	National Waterway 2 and 16 –
	Award of work for construction of Jogighopha terminal
	PPAC approval of Pandu Ship repair facility
	Award of work for construction of Jogighopha terminal
	Award of work for Pandu ship repair facility
	Boundary wall at IWAI parcels at Pandu, Neamati & Dibrugarh
	Signing of Concessionaire agreement of Pandu & Dhubri Terminal
	Upgradation of Badarpur & Karimganj
	Award of Karimganj & Badarpur terminals on PPP basis
	Construction & Operationalization of Pandu Ship repair facility
	Completion of work for construction of Jogighopha terminal
	Widening of road from Pandu to NH including land acquisition
	Award for improvement of existing approach road for Dhubri Terminal
	Completion of improvement of existing approach road for Dhubri Terminal
1.3	Other 14 National Waterways (NW5, NW9, NW86, NW8, NW-27, NW68, NW111, NW3, NW97, NW10, NW44, NW4, NW57 & NW52)
	SFC approval for undertaking development of proposed waterways
	Operationalization of four nos of floating pontoon on NW-4
	Providing Floating pontoons in Goa Waterways and additional navigational aids if required (NW-27,68 & 111)
	Facilitation of navigational aids in NW-4 (Phase-I: 80 Kms)
	River Information System on Goa Waterways (NW-27,68 & 111)
	Providing floating pontoons on NW-97 along with additional navigation aids and River information system
	Providing floating pontoons on NW-10, 86, 57 & 52 (one pontoon on each waterway)
	Providing navigational aids and River Information System on NW-8 & 9
	Establishing river information system on NW-3
	Development of Four Ro-Ro terminals on NW-4 along with River information system (need basis)
1.4	Techno-economic feasibility for development of additional waterways
	Award for improvement of existing approach road for Dhubri Terminal
	Completion of improvement of existing approach road for Dhubri Terminal
2	**Enhance cargo movement across NWs through demand promotion and activation**
2.1	Outreach to 20 potential PSUs and private sector identified in handling 9 key commodities to develop specific action plan
2.2	Provision of dedicated financial and fiscal incentives by DPIIT and States for promoting industrial set-ups near NWs
2.3	Capitalize additional cargo and ferry potential by building multi-modal connectivity with 4 neighboring countries through infrastructure development, fairway development and ecosystem development
2.3.1	Bangladesh
	Fairway development from Sirajganj to Daikhowastretch in Jamuna River, and from Ashuganj to Zakiganjstretch in Kushiiyara
	Award of work for construction of Maia Terminal
	Award of work for construction of SonamoraTerminal

	Completion of study for undertaking Maia–Arichafairway development
	Construction & operationalization of Maia Terminal
	Construction & operationalization of Sonamora Terminal
2.3.2	Nepal (Ecosystem development)
	Proposal to get MMTs at Varanasi and SahibganjCustoms notified
	Bhutan (Ecosystem development)
2.4	**Develop 10 Ro-Ro terminals in partnership with State government**
2.4.1	Tender document finalization and NIT/RFQ issue
2.4.2	Bid evaluation, NOC approval and LOA issue
2.4.3	Construction completion and operationalization
2.50	**Develop Ferry terminals across 60+ locations in partnership with State government on Arth Ganga model**
2.5.1	Tender document finalization and NIT/RFQ issue
2.5.2	Bid evaluation, NOC approval and LOA issue
2.5.3	Construction completion and operationalization
2.60	**Leverage private participation for terminal development and operations-Ro-Ro (OMT model); Ferry (DBFOT model) and Inter-modal/Multi-modal terminals (EOT/OMD models)**
2.6.1	Establish dedicated PPP cell
2.6.2	Award of terminals for Haldia MMT, Varanasi MMT on EOT Basis
2.6.3	Award of 3 terminals for Sahibganj MMT on OMD basis & Pandu terminal, Dhubri terminal.
2.6.4	Award of Gaighat terminal on EOT basis
2.6.5	Award PPP concession for upcoming cargo terminals across 15 waterways basis detailed assessment
2.70	**Reduction in GST rate on input services availed by IWT operators to enable lower mismatch in GST input credit and reduce overall cost of operations**
2.80	**Enhance integration of inland waterway movement with coastal traffic through modification in vessel policy regulations**
2.8.1	Modify qualifications of Inland vessels that can move at 2m wave height to enhance availability of vessels for inshore
2.8.2	Re-evaluate "Fair weather" and "non-fair" weather conditions for SOC compliance for integrated coastal and inland water movement
2.90	Leverage private participation in dredging operations on royalty-based PPP model to promote sustainable development and "Waste to wealth'

Source: MIV 2030

2.2 Capacity expansion across major ports

S. No.	Key Activities
1.10	**Drive capacity expansion across major ports in phases basis traffic growth forecasts –**
	Phase – I
	Extension of ICTT terminal with ~4.5 MTPA container capacity at Cochin port 2022
	Extension of BMCT container terminal with ~30 MTPA capacity on DBFOT basis at JNPT port
	Modification of Iron ore terminal to ~12 MTPA coal terminal (SIOTL) at Kamarajar port
	~18 MTPA coal handling capacity addition through CB-3 & berths at Kamarajar port
	~11 MTPA coal handling capacity addition through Multi-cargo and Bulk terminal at Kamarajar port
	Rejuvenation of KPD berths for ~5.5 MTPA container capacity at Kolkata Dock Complex
	Setup floating cranes, RMQCs, etc. for ~8.5 MTPA container capacity addition at Kolkata DC
	Mechanization of Berth No. 3 (~3.5 MTPA bulk capacity) on DFBOT basis at Haldia Dock
	Berth mechanization (EQ-1, EQ-2, EQ-3, CQ-1, & CQ-2) for ~23 MTPA coal capacity at Paradip
	New ~10 MTPA bulk berth development for coal imports at Paradip port
	Conversion of Berth 9 to handle container traffic (12 MTPA capacity) at V.O.Chidambaranar port
	Mechanization of Berth 3 & 4 for ~16 MTPA container capacity at V.O.Chidambaranar port
	Phase - II
	Pipeline rationalization for 4 Oil jetties for ~16 MTPA capacity addition at Deendayal port
	Construction of 6 Oil jetties at Deendayal dock, 1 SBM at Vadinar, and 2 product jetties at Vadinar for ~44 MTPA POL and liquids capacity at Deendayal port
	4 MTPA Fifth Oil berth addition at Mumbai port
	Setup of Floating Storage Regasification Unit for 5 MTPA capacity expansion at Mumbai port
	Re-development of 1 Iron Ore & 3 barge berths to handle general cargo (14 MTPA) at Mormugao port
	Setting up ~2 MTPA coastal cargo berth at Mormugao port
	Extension of container terminal with ~9.5 MTPA capacity on DBFOT basis at Vishakapatnam port

	Phase - III
	New ~31 MTPA Container terminal (in phases) at Kamarajar port
	~3 MTPA IOCL captive jetty at Kamarajar port
	Addition of ~3 MTPA Marine Liquid Terminal on PPP basis at Kamarajar port
	Additional ~5 MTPA LNG Terminal in Kukrahati at Kolkata port
	Setup of liquid cargo jetties for ~4.5 MTPA capacity at Kolkata port
	2 MTPA Chemicals capacity expansion in Pir Pau at Mumbai port
	Mechanization of Berth No. 14 for ~6 MTPA container capacity addition at NMPT
	Construction of new berth No. 17 for ~7 MTPA POL capacity addition at NMPT
	New ~10 MTPA iron ore berth development at Paradip port
	Development of ~0.6 MTPA LPG terminal at Paradip port
	Deepening & Optimization of Inner Harbour facilities for ~25 MTPA cargo capacity at Paradip port
	Development of Mahanadi Riverine Port (Phase-I) for ~21 MTPA capacity at Paradip port
	Development of additional ~5.3 MTPA oil handling facility at Vishakapatnam port
	NCB III berth mechanization for ~9 MTPA bulk capacity under PPP mode at V.O.Chidambaranar port
1.20	**Develop Vadhavan – JNPT cluster (in phases) on West Coast with 20m deep draft and ~10,000 hectares of land to drive industrialization**
	Vadhavan Port
1.2.1	Vadhavan-EC and CRZ clearance finalization
1.2.2	Submission and clearance of PIB/PPPACPROPOSAL
1.2.3	Award and commencement of EPC and PPP bids
1.2.4	EPC works completion (breakwater, road connectivity, power, etc.)
1.2.5	10,000 hectares of land mass acquisition and approval for SEZ status
1.2.6	PPP commissioning and container terminals 1 to 4 operationalization
1.2.7	Complete Phase-I (LNG berths, Ro-Ro, etc.) operationalization
1.2.8	Phase-II capacity operationalization
	JNPT Port
1.2.9	Capacity augmentation projects:
	Construction of Coastal Berth
	Development of Container Terminal by BMCT(Phase-II)
	Additional Liquid Cargo Terminal -Phase 1
1.2.10	Hinterland connectivity projects:
	6 to 8 laningof NH-4B-SH-54 and Amra Marg
	Expressway from Dighi Industrial Cluster -Pune to JNPT
	Expressway from Sanathnagarindustrial cluster -Hyderabad to JNPT
	3rd line rail connectivity from Jasaito JNPT
	Development of DFC compliant rail yard at JNPT
1.30	**Develop Paradip as World-class Dry bulk port on East Coast**
1.3.1	Capacity augmentation projects:
	Mechanization of EQ-1,2 & 3 (3 Berths) for handling export Coal Cargo (Till date: 715 Cr; 2021: 720 Cr)
	LPG Terminal at South Oil Jetty (Till date: 350 Cr; 2021: 340 Cr)
	Development of New Coal Berth for handling Import Coal Cargo (Till date: 460 Cr; 2021: 195 Cr)
	Mechanization of SQB Berth
	Optimization of Inner Harbour facilities –(Till 2024: 630 Cr; 2025-2027: 2370 Cr) (CCEANote underway)
	Mechanization of CQ-1 & 2 (2 Berths)
	Mahanadi Riverine Port (Phase-I)
1.3.2	Hinterland connectivity projects:
	Rail -Haridaspur-Paradip New line, MGRBOT line and EQ Rail Infrastructure (Till date: 3040 Cr; 2021: 160 Cr)
	Road-Concrete Road building, uniflow and 2nd exit establishment (Till 2022: 90 Cr; 2023: 60 Cr)
1.3.3	MMLP setup: Rail facilities & warehousing (Till date: 130 Cr; Till 2024: 2270 Cr)
	MMLP setup: 100% port land industrialization (2025-2027: 4000 Cr)
1.40	**Develop Deendayal –Tuna Tekra (in phases) on West Coast with 19m deep-draft**
1.4.1	Techno-economic feasibility study to expand Tuna Tekra terminal
1.4.2	Capacity addition projects:
	Pipeline rationalization of Oil jetty 1 to 4 (Till 2022: 40 Cr; 2023-2024: 130 Cr)

	Conversion of general cargo berth to mechanized fertilizer handling facility (Till 2022: 60 Cr; 2023-2024: 240 Cr)
	Oil jetty cum bunkering complex
	Container terminal at Tuna Tekra (Till 2024: 3000 Cr; 2025: 2200 Cr)
	Mechanized Bulk terminal at Tuna Tekra(Till 2024: 1000 Cr; 2025: 1000 Cr)
	Construction of Oil Jetties - 7,8,9,10 and 11 (Till 2022: 100 Cr; 2023-2024: 350 Cr; 2025: 300 Cr)
	1 SBM and 2 product jetties at Vadinar (Till 2024: 330 Cr; 2025: 118 Cr)
1.50	**Evaluate and develop Kamarajar (in phases) on East Coast**
1.5.1	Capacity addition projects:
1.5.2	Modification of Iron ore to coal terminal (SIOTL)
1.5.3	Container Terminal (Phase-1, Stage-II)
1.5.4	Coal Berths -3 & 4 (TNEB)
1.5.5	General Cargo berth 2
1.5.6	IOCL Captive Oil Jetty
1.60	**Develop a Transshipment Hub in Southern India**
1.6.1	**Vizhinjam Port**
1.6.1.1	Support from Central Govt. to facilitate EoDB and infra development
1.6.2	**Kanyakumari region**
1.6.2.1	Re-evaluate business feasibility as per TS study post traffic commencement at Vizhinjam
1.6.2.2	Conduct tender process and develop TS hub in Kanyakumari region on PPP basis
1.6.2.3	Collaborate or partner with 1-2 anchor liners for success of transshipment hub
1.6.3	**Campbell Bay – Development of TS hub on PPP basis**
1.6.4	**Enhance Transshipment volumes at Cochin Port**
1.70	**Landlord model acceleration for Major Ports**
	Phase 1: Landlord model adoption for 38 identified berths across major ports
1.7.1	DPT
	Berth 13, 14, 15, 16
1.7.2	JNPT: Covered in 1.1.2.1
1.7.3	MoPT
	Conversion of berth 9 and 3 barge berths
	Berths 10 & 11
1.7.4	NMPT
	Berth 14
	Berths 9, 10, & 11
1.7.5	VoCPT
	Berths 9 and NCB III
	Conversion of 1, 2, 3, & 4 berths
	Conversion of 5 & 6 bulk berths
1.7.6	VPT
	Berth EQ7
	Berths WQ7 & WQ8
1.7.7	PPT: Covered in 1.1.3.1
1.7.8	CoPT: NCB berth
1.7.11	SMP Kolkata
	Berth 2
	Berth 5 & 10
	Berth 11 & 12
	Berth 1, 9 & 14
1.7.12	Phase-2: Re-evaluation of remaining berths potential for landlord model

Source: MIV 2030

ANNEXURE 3: KEY ASPIRATIONS FOR MIV 2030 AND AMRIT KAAL VISION 2047

S. No.	Initiative	Unit	As of 31st March 2022	Target MIV 2030	Target 2047
1	Capacity of Major Ports	MMT	1,597.59	1,958	10,000+
2	Turnaround Time for containers (excluding SMP & HDC)	In Hrs	27.22	< 20hrs	< 1 day
3	Average Berth Day output	Tonnes	16,158	> 30,000	-
4	Average draft in various ports	Meters	14.50	18*	• • DPA, Vadhavan, VoCPA, Glathea Bay and PPA to have draft in the range of 18 meters to 23 meters by 2030. Further, 3 ports NMPA. CoPA and JNPA would have draft in the range of 20 meters to 23 meters by 2047
5	Total cruise call	Nos.	451**	1,000	At least 4 ports among top 20 ports ranked by total cruise calls in Asia Pacific
6	Number of cruise passengers in a year	Nos.	4,68,000**	>15,00,000	50,00,000

NOTE:

(*) Container: 18m+ draft at terminal with mainline calls; Minimum 1 berth with 16m+ draft &**Bulk**: 18m+ draft for ports with Cape-size calls; Maximize berths with 14m+ draft

(**): Data available for 2020

Response to comments shared by the members of the Group on Draft Report and Presentation on Overall Action Plan for Amrit Kaal Vision 2047

S. No.	Comment From	Comment Description	Response
1	Indian Navy	Proposed International Maritime Arbitration Center (IMAC): The IMAC has been envisaged to be an institutional arbitration system that would cater for resolution of domestic as well as international maritime disputes in a time bound/ expeditious manner, It is anticipated that majority of the disputes that are expected to be adjudicated by IMA would pertain to commercial maritime arbitration, salvage services rendered by IN vessels to merchant vessels, compensation/ claims arising out of collision of merchant vessels with IN warships, etc. IN could facilitate its expertise to IMAC in these aspects.	Noted and update in the report under Section 5.3.2.6 (Proposed plan of action under IMAC), Page no. 160
2	Indian Navy	Education, Research and Training in Maritime Law: The 'Vision Document' emphasizes strengthening the institutionalization of maritime training and research. The emphasis is primarily on the courses/ training covering the subject such as shipping, navigation and technical curriculum and to bring innovation in maritime sector. However, the legal aspects of maritime domain/ operations have not been adequately covered in the training curriculum, Hence, it is recommended that specialized courses on Maritime Law could also to be considered under the action plan being prepared for the training curriculum.	Research and training activities in the field of maritime law has been suggested in the report under section 5.3.2.6. (Advantages of establishment of IMAC, Page no. 163-164). However, the term "specialized courses" is now added in the same to emphasize more on the specialized courses on Maritime Law
3	Indian Navy	Warship Construction: Section 6.3 of draft report states that "Indian Navy has placed several large orders with ship building centers in Italy (Fincanteri) and Russia (Yantar), This dependence on foreign shipyards is a strategic security risk as it provides foreign shipyards with design of our critical naval assets". In this regard, it is to be noted that 37 of 39 warships currently under construction are being - built in Indian Shipyards, Therefore, the same may be reconciled in the draft report.	Noted and update the text in the report under Section 6.3 (Necessity of Strong Shipbuilding Industry), Page no. 180
4	Indian Navy	Commercial Shipbuilding: Section 6.7.3 of draft report has stated that ABG, Bharati and Pipavav are main shipyards in Private sector in India and the same may be reconciled as all the three shipyards are under insolvency proceedings	Noted and update the text in the report under Section 6.7.3 (Limited number of Shipyards in India), Page no. 185
5	Indian Navy	Recommendations may also be considered for inclusion in the report in section 6.8 Formation of "Apex National Authority on Shipping and Shipbuilding" for synergic vision and policy making to evolve long term strategies for increasing India's global shipbuilding market share and act as a centralized business development unit for Indian shipbuilding industry for export of defense/commercial ships and shipboard equipment.	Included in the report under Section 6.8.7 (Setting up Ship building & repair Centre of Excellence), Pg 188
6	Indian Navy	Formulation of a 30 year "National Shipping and Shipbuilding Strategy (NSSS)" with consistent and long-term policy focus and enactment of suitable legislation (for consistency in policy) for shipbuilding to be a "Strategic infrastructure industry'	Included in the report under Section 6.8.7 (Setting up Ship building & repair Centre of Excellence), Pg 188
7	Indian Navy	Setting up of National Bank for Shipbuilding arid Shipping Development (NABSSD) under the Ministry of Shipping for low interest funding of Shipyard and associated industries for facilitating easy availability of working capital. Shipbuilding Cess of 0.1% to 0.2% may be levied on Shipping Cargo similar to Road Cess to generate funding for NABSSD.	The report mentions formation of Maritime Development Fund (MDF) which will cater to low interest funding of Shipyard and associated industries for facilitating easy availability of working capital. The details on Maritime Development Fund are discussed under Section 5.6.2.1 (Creation of Dedicated Maritime Development Fund), Page no. 171
8	Indian Navy	Reduction In Berthing Charges. This would incentivize many Friendly Foreign Countries warships to consider India as a preferred destination for Operational turn around and also would support India's vision for being à transshipment hub of the world	In the report, under Section 9.3.1.3 (Cost competitiveness) on page no. 257 discusses the lowering of vessel related charges at the Major Ports in the country. The vessel related charges discussed in the report also includes the berthing charges.
9	Indian Navy	Renewable/ Green Energy, Impetus on tapping various renewable and green energy sources have been provided in the document. However, contents on storing these energy / excess energy produced have not been elaborated in the vision document. It is imperative that in longer run to store the energy or excess energy produced, new methods of storage also be factored.	Under section 1.3 (Key Initiatives - Green Ports), Page no. 21 onwards there are many green energy sources which are suggested as an alternative and adoption of any one or more depends upon various factors such as viability, suitability, etc. Hence, at this stage the report does not mentions about storage of these fuels and focuses primarily on providing various alternative green energy source options.
10	Indian Navy	Hydrogen as an Energy. The potential of hydrogen as an energy source is already covered in the document, however, the hydrogen storage part can be further amplified in the document, Few methods suggested for hydrogen storage are enumerated below'- (a)Most common method to store hydrogen is physical storage which aims to increase the storage density of hydrogen either by high pressure or by cooing or combination of both. Gaseous storage technique may also be utilised which involves storage of hydrogen to à corlain desired pressure that can be safely withheld by storage containers. (b) Liquefied Hydrogen storage which involves storage of hydrogen as cryogenic liquid, most widely used commercially. (c) Cryo-compressed hydrogen storage which implies that compression and cooling of hydrogen can be combined together to have more efficient storage. (d) Slush Hydrogen storage in which liquefied hydrogen is cooled to its melting point so that hydrogen changes to a gel or slush like material).	Under section 1.3 (Key Initiatives - Green Ports), Page no. 21 onwards As rightly mentioned in the comment that potential of hydrogen as an energy source is already covered in the document. However, the storage part of it is not included considering that there are many green energy sources which are suggested in the report as an alternative to conventional fuels and adoption of any one or more depends upon various factors such as viability, suitability, etc. Hence, the report does not mention about storage of these fuels and focuses on the first step which is providing alternative green energy source options.
11	Indian Navy	Recommendation for Inclusion in Theme 8: Strengthen Global Maritime Presence. Though this section covers India's initiatives in the IOR, important initiatives of the IN like the Information Fusion Centre- Indian Ocean Region (IFC- IOR) have not been mentioned. It is recommended that para 8.8.6 be added to include the following:- IFC-IOR. To address maritime security challenges in the IOR, and promote regional collaboration, the Information Fusion Centre Indian Ocean Region (IFC-(OR) has	Noted and included in the report under Section 8.6 (Current Landscape), Page no. 237

		been setup at Gurugram under the aegis of the Indian Navy The centre has been at the forefront to strengthen maritime securily in the region and beyond, by building a common coherent maritime situation picture and acting as a maritime security information sharing hub for the region, To enable better correlation, compressed information cycles and timely inputs, the contre also hosts International Liaison Officers (IL Os] from partner nations (like Australia UK, USA, France, Japan, Maldives, Mauritius, Myanmar, Seychelles, Singapore,etc).	
12	Ministry of Environment, Forest and Climate Change	The draft action plan aims to significantly enhance the contribution of the Blue Economy to India's GDP. Therefore, the proposed plan would be a crucial step toward unlocking the potential for economic growth and welfare of the country.	Not Applicable as it is not a comment but the MoEF&CC's inference of the report
13	Ministry of Environment, Forest and Climate Change	The action plan is robust and exhaustive and it has been meticulously prepared with copious consultations and assessments involving all stakeholders and international benchmarks.	Not Applicable as it is not a comment but the MoEF&CC's inference of the report
14	Ministry of Environment, Forest and Climate Change	The identified actionable points and the ten overarching themes have been envisioned seamlessly to achieve strategic aspirations.	Not Applicable as it is not a comment but the MoEF&CC's inference of the report
15	Ministry of Environment, Forest and Climate Change	While implementing the action plan, MPSWW should ensure sustainable functioning of the coastal and ocean resources following EPA,1986, Water Act., 1974, Air Act., 1981, Noise pollution (Regulation and Control) Rules, 2000; Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008; National Ambient Air Quality Standards, 2009 CRZ, 2019, and EA,2006 and its amendments and guidelines of MoEF&CC shall be followed.	Noted and included in the report as a note to all stakeholders in the Executive Summary section of the report, Page no. 11
16	Ministry of Environment, Forest and Climate Change	Zero waste and circular economy approach has been suggested for reducing pollution In the environment.	Initiatives such as circular economy (Section 1.3.1.1.3, Page no. 27) have been discussed in the report
17	Ministry of Environment, Forest and Climate Change	All proposed developmental activities under this action plan may have a comprehensive risk management plan to avoid pollution in coastal and ocean environments.	Noted and included in the report as a note to all stakeholders in the Executive Summary section of the report, Page no. 11
18	IWAI	On page 4 of the Executive Summary under the following head correction is required- Enhance modal share of coastal shipping & Inland Waterways 1. No of operational waterways: 19 (instead of 16) 2. Cargo volume handled by waterways in MTPA: 108.79 (instead of 96)	Updated in the document in the Executive Summary and under the Section 3.4 (Current Landscape, Page no. 97) and 3.7 (Key Performance Indicators, Page no. 112)
19	Ministry of Micro, Small and Medium Enterprises, Government of India	This Ministry Supports the Initiatives to promote the Blue Economy as proposed by MoPSW. For the development of the Clusters, the proposal may be sent to this Ministry under MSE-CDP Scheme. The scheme guidelines may be referred at http://www.dcmsme.gov.in/schemes/New-Guidelines.pdf	The MSE--CDP Scheme has already been mentioned in the report in Table 25 under Section 4.3.2.4 (Incentive Mechanism, Page no. 128)
20	Ministry of Micro, Small and Medium Enterprises, Government of India	As you are aware that, there are many MSMEs operating their business across the coastal States. The details of the MSMEs registered on Udyam portal of this Ministry is enclosed for your ready reference and therefore, requested to prepare development plan accordingly with the view of the concentration of MSMEs.	As part of the report, the Maritime Industrial Clusters have been proposed in this vision document. These clusters are proposed to have manufacturing units including MSMEs. The development plan for these industrial clusters will be developed by the respective State Departments
21	Ministry of Micro, Small and Medium Enterprises, Government of India	It is to mention here that, higher cargo traffic, lack of availability of containers, increased shipping cost through waterways have been massively affecting MSMEs. Therefore, in order to sensitize the utilization of water transport among the MSMEs, suitable provision for subsidized rates/incentives/ reservation for allotment of container to the MSMEs may be done.	A Maritime Industrial Cluster Incentive scheme has been suggested in the report along with various incentive/subsidy mechanisms for various manufacturing units in India under Section 4.3.2.4 (Incentive Mechanism- Table 25, Page no. 128)
22	Government of Andhra Pradesh- Green ports and Green Shipping	Incentives to port operators / port users (mainly shippers and consignees) to adopt practices to transform ports to Green ports to be provided. Business models to be suggested with participation from private sector.	The report mentions 'Green Port Policy' which will have an incentive mechanism for transforming ports to Green ports. This report constitutes the vision for the maritime sector and provides the guidance through the proposed initiatives to be implemented in the sector. The determination of business model would only be finalized post assessing the feasibility of the initiative
23	Government of Andhra Pradesh- Green ports and Green Shipping	Promote manufacturing of battery operated/ low carbon emitting port equipment. Large number of port equipment are being imported at current scenario.	As part of the report, maritime industrial clusters have been proposed as part of this vision document. The establishment of manufacturing units relating to manufacture of `battery operated port equipment at these clusters would be dependent on the availability of focused incentive mechanism. The formulation of such focused incentive is a downstream task that would be undertaken by the Central/State Government's concerned departments
24	Government of Andhra Pradesh- Green ports and Green Shipping	Benchmark to be set on energy efficiency of renewable sources of energy like solar, wind, wave etc,.	This vision document provides various alternatives of energy that can be used in place of conventional energy sources in the maritime sector
25	Government of Andhra Pradesh- Green ports and Green Shipping	Induction of tugs, pilot launches and other vessels operating on non-conventional energy in both major and non-major ports.	The inclusion of various vessels based on non-conventional sources of energy have been mentioned under Section 1.5.1.2 (Launch over 20 pilot projects under India's Green maritime shipping programme), Page no. 48
26	Government of Andhra Pradesh- Green ports and Green Shipping	Viability gap funding by Govt/Quasi Govt agencies for adopting green technology in ports and vessels.	This report constitutes the vision for the maritime sector and provides the guidance through the proposed initiatives to be implemented in the sector. The determination of viability gap funding by Govt/Quasi Govt agencies for adopting green technology in ports and vessels would only be finalized post assessing the feasibility of the initiative(s)

27	Government of Andhra Pradesh- Promote Ocean, Coastal & River Cruise Sector	Relaxation of regulations regarding entertainment- eg: casinos	This report constitutes the vision for the maritime sector and provides the guidance through the proposed initiatives to be implemented in the sector. Relaxation of regulations regarding entertainment activities such as casinos, etc would be undertaken by the Central/State Government's concerned departments
28	Government of Andhra Pradesh- Promote Ocean, Coastal & River Cruise Sector	Identification of destinations suitable for coastal tourism in consultation with state governments according to the requirement of cruise operators.	Incorporated in implementation plan pg 341, Initiative No 2 which mention need for conducting study for identification of additional cruise tourism locations
29	Government of Andhra Pradesh- Promote Ocean, Coastal & River Cruise Sector	Multiple cruise tourism circuits to be developed according to the tastes & preferences and spending power of cruise tourists.	Pg 341 has identified development of new cruise locations apart upgradation of existing cruise facilities
30	Government of Andhra Pradesh- Promote Ocean, Coastal & River Cruise Sector	Private islands and private beaches to be made available for cruise tourism	Incorporated in implementation plan pg 341, Initiative No 2 which mention need for conducting study for identification of additional cruise tourism locations
31	Government of Andhra Pradesh- Promote Ocean, Coastal & River Cruise Sector	Effective and convenient practices to be used by immigration authorities by leveraging AI and IoT technologies.	IoT and next generation technology have been considered in Ports digital technology roadmap on lines of global benchmarks and will include digital initiatives for Ports, customs & immigration
32	Government of Andhra Pradesh- Promote Ocean, Coastal & River Cruise Sector	Kochi/Thiruvananthapuram to Maldives route can be considered for international ferry service.	The O-D pairs mentioned in the report have been identified based on stakeholder's interest for development of international ferries. Remarks have been provided against each of the 6 identified roots along with their viability (Section 2.6.1.2, Page no. 69). However, the scope is not limited to only these 6 routes and the possibility of Kochi/ Thiruvananthapuram to Maldives route can be explored based on detailed market study
33	Government of Andhra Pradesh- Promote Ocean, Coastal & River Cruise Sector	Enhance ease of doing business by minimizing interventions from customs for coastal shipping.	Under Section 3.1 (Current Landscape, Page no. 84) of the report mentions that the government has taken certain initiatives for enhancing ease of doing business for coastal shipping such as green channel clearance from existing berths which minimizes interventions from customs for coastal shipping. Green channel enables faster evacuation of coastal cargo
34	Government of Andhra Pradesh- Promote Ocean, Coastal & River Cruise Sector	Design and construction of bridges over rivers/canals to be undertaken in a manner which do not affect the air draught of IWT vessels.	Inland Waterways Authority of India provides guidelines for height (vertical) clearances on rivers and canals so that bridges etc., to be constructed on them, do not cause any hindrance to the movement of IWT vessels
35	Government of Andhra Pradesh- Maritime cluster development	Provide Status of SIPCs envisioned under Sagaramala at Paradip and Kandla and enlist measures to improve already identified SIPCs.	The theme 4 on Maritime industrial clusters highlights the same
36	Government of Andhra Pradesh- Maritime cluster development	Provide reasons behind proposing Maritime industrial clusters at Kandla, Tuticorin, Haldia and A&N islands.	Kandla, Haldia and Tuticorin already have a maritime cluster, the report suggests further expanding these clusters. A&N islands is suggested because development of a ship repair facility is suggested in report and the location also has an existing repair facility under the Administration of the Union Territory of Andaman & Nicobar Islands. Apart from this, A&N islands also has a proposal for transshipment hub so in order to reduce the overall logistics cost a maritime industrial cluster is suggested in A&N island
37	Government of Andhra Pradesh- Maritime cluster development	Geo spatial mapping to be integrated with land records for coastal districts to identify different kinds of land suitable for industrialization.	The identification of land suitable for industrialization via different means such as integration of Geo spatial mapping with land records is being parallelly undertaken in PM Gati Shakti program
38	Government of Andhra Pradesh- Maritime cluster development	Offer better compensation to land holders in the form of equity/preferential shares or other lucrative financial instruments.	The report highlights the new RAFCTLARR act which has provided more flexibility and safeguards and Pg 369 under promotion of Maritime cluster proposed Ports to take on board the key feature with SDCL playing nodal role for port specific land initiatives
39	Government of Andhra Pradesh- Ship Building & repair	Assistance can be provided by Government of India in procuring low-cost loan from multinational development banks for ship building & repair activities.	The report mentions formation of Maritime Development Fund (MDF) which will cater to Shipyard and associated industries for facilitating low-cost loan for ship building and repair activities. The details on Maritime Development Fund are discussed under Section 5.6.2.1 (Creation of Dedicated Maritime Development Fund), Page no. 171
40	Government of Andhra Pradesh- Leadership position in regional forums -Enhancing maritime cooperation with BIMSTEC	Participation of representatives from state governments from India can be made part of BIMSTEC delegations.	The report highlights enhancing corporation in BIMSTEC at various levels which will ensure participation of Ports, IWAI and State Maritime Boards.

41	Government of Andhra Pradesh- Leadership position in regional forums -Enhancing maritime cooperation with BIMSTEC	Events can be conducted to connect officials of state governments, business organizations, trade associations, logistics service providers, shipping lines etc,.	Under the report an Investment Facilitation Center is proposed which will be single platform for facilitation and corporation by various mechanism like investor roadshows for maritime sector
42	Government of Karnataka	Development of Non-Major Ports across Western Coast	The vision document discusses development of port clusters under Section 9.2.2. (Key initiatives, Page no. 274) to cater the increased traffic with the growth in the economy. The proposed cluster along the east and west coast would include creation of capacities at the existing major and non-major ports
43	Government of Karnataka	Development of Maritime Clusters in Karnataka	Noted and included in the report under Section 4.3.1 (4.3.1. Infrastructure Initiatives, Page no. 121)
44	Government of Karnataka	Development of Hubli-Ankola Rail Line for providing vital linkage	The report provides the 2047 vision for Maritime Sector providing the key infrastructure developments. Prioritization of major connectivity projects for port clusters has been highlighted.
45	Directorate of Ports and IWT Odisha	Vessel Traffic Management System (VTMS) for Non- Major ports of Odisha should be considered.	The section 7.3.2.1 discusses about development of Innovation labs in the country. The point 6 at pg. 219 discusses the development of VTMS indigenously as part of the Atmanirbhar Bharath program and the introduction of this system at all the Indian ports (Major and Non-Major Ports).
46	Directorate of Ports and IWT Odisha	Capacity building for handling Hydrogen/Ammonia based Fuels.	The section 1.3.1.4 at pg. 38 discusses about the transportation and storage of hydrogen/ Ammonia based fuels. The section also focuses on meeting the targets set under National Hydrogen Mission and how the Indian Ports can be developed as international hubs for hydrogen production, storage, bunkering and EXIM trade.
47	Directorate of Ports and IWT Odisha	Introduce Hybrid (LNG-Diesel) Ro-Ro vessel.	The section 1.5.1.2 at pg. 48-49 discusses the launch of 20 pilot projects such as Hybrid electric Ro-Ro ferry, Dual-fuel container Ro-Ro ferry, etc. and pilot runs of LNG - Diesel/ LNG - Electric/ LNG –Battery – Solar Ro-Ro and cargo carriers.
48	Directorate of Ports and IWT Odisha	Transforming current ports and developing upcoming ports into Carbon Neutral and Circular ports.	The section 1.3.1.1.3 discusses about increasing recycling through circular economy and consequent development of the Circular Ports at page no. 35.
49	Directorate of Ports and IWT Odisha	Astaranga Port (NW-5) near Puri, might be included for the development of River Cruises.	The section 2.3.1.1 discusses about improvement of infrastructure of the current and potential new ports for river cruise facility. The figure 47 under this section shows the potential locations for cruise facility. The location near Puri is already shown in this figure.
50	Directorate of Ports and IWT Odisha	Dhamara, Gopalpur and upcoming ports may be considered for coastal shipping at pg. 89	The section 3.3.1.3 discusses the possibility of developing coastal berths at locations which are nearest to the production/demand centers having all the facilities required for handling/ storage of cargo. This will eventually reduce the first/last mile cost. The Port and State Government may conduct a study to identify the possibility of developing coastal berth near the ports of Dhamra, Gopalpur and other upcoming ports.
51	Directorate of Ports and IWT Odisha	• Road Connectivity to the State and National Highways to be upgraded to four-lane • Rail connectivity to be improved for efficient and faster evacuation	The section 9.2.2.1.2 discusses the importance of multimodal connectivity at the ports to the important hinterlands. The section also focuses on prioritizing and implementation of projects which are in line with the National Logistics Policy and PM-Gati Shakti Master Plan to achieve good connectivity at the ports.
52	Directorate of Ports and IWT Odisha	Development of world class Ship Building and Recycling Facilities along the East Coast of Odisha.	The Shipbuilding and Recycling facilities have been discussed in detail under Theme- 6 of the report. The identification of the potential location of these facilities depends upon the location-demand assessment and is a subject to be undertaken by Central and State Government.
53	Directorate of Ports and IWT Odisha	Upgradation of the existing Crew Training Institute at Chandbali, Odisha.	Section 7.2.6 discusses the Maritime Training Institute and provides corresponding initiatives under section 7.3.2 to improve the overall infrastructure of the training institutes. The same initiatives are applicable to all the institutes of the country.
54	Directorate of Ports and IWT Odisha	Development of Maritime University, Odisha.	Section 7.3.2 provides the initiatives required for improving the infrastructure of Maritime Universities. The development of a new Maritime University at a particular location is to be taken up by the Central and State Government depending upon the location-demand assessment.

55	Mormugao Port Authority	Increase usage of Clean fuel/ reduce air emission — Use of alternate fuels (LNG/CNG)as fuel source for the vehicles: As a part of the MIV 2030 initiatives, Port had explored setting up LNG/CNG facility and also earmarked five (5) acres land inside the Port operational area, behind berth no. 8. However, the same was observed to be not feasible to be setup in the 5 acres land at Port in line with the OISD guidelines. Port is constrained as it has limited land parcel to offer. However, Port shall conduct a study to estimate number of diesel-based trucks carrying goods from/ to ports and operating inside port remises to estimate market size for conversion.	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
56	Mormugao Port Authority	Increase usage of Clean fuel/ reduce air emission — Use of battery-operated equipment: No proposal to purchase a new cargo handling equipment at present. However, while hiring of cargo handling equipment will mandate electrification depending on availability.	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
57	Mormugao Port Authority	Increase usage of Clean fuel/ reduce air emission LNG bunkering: Email in this regard has been sent to concerned companies	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
60	Mormugao Port Authority	Accelerate adoption of Renewable Energy — Wind energy: The proposal of adoption of wind energy was explored with the State Govt. in the year 2015 and the same was found to be not feasible. Hence it was dropped.	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
58	Mormugao Port Authority	Increase usage of Clean fuel/ reduce air emission Shore to Ship Power Supply: As regards to obtaining of license for commercial power transmission, distribution and trading from power commission under State Govt., MoPSW to align with Ministry of Power so as to allow Ports for commercial power distribution. MoPA will initiate the process on receipt of order from MoPSW. Shore to ship power supply provided by MoPA at 50HZ is meeting the requirement of the Port Users. MoU has been signed with Indian Coast Guard for supply of Power on 25.02.2019. MoPA is moving towards landlord model Port, hence there is no plan for providing additional shore to ship power supply in near future. As regards to extending the shore power supply to bigger vessels, (EXIM Vessels), the guidelines for implementation of shore to ship power supply at 60 Hz are yet to be finalized by the central Govt. Construction of International Cruise Terminal is in progress at MoPA. Upon finalization of the guidelines by central Govt. and commissioning of International Cruise Terminal at MoPA, possibility of extending shore supply to EXIM vessels will be explored.	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
59	Mormugao Port Authority	Accelerate adoption of Renewable Energy - Solar Power Generation: MoPA had installed 200kW Solar Power Plant in 2016 and is exploring the possibility of augmenting the overall capacity of renewable energy. Port had appointed M/S Solar Energy Corporation of India (SECI) to study the feasibility of increasing share of renewable energy at the Port. However, MoPA does not have adequate land parcel to accommodate Solar Power Plant. Port is now in a process of exploring purchase of Solar power through "Open Access Arrangement".	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
61	Mormugao Port Authority	Adopting the Maritime Rescue Sub-centres (MRSCs) to aid Port Emergencies: Based on the decision taken during the meeting of Ministry of Ports, Shipping & Waterways and Coast Guard, an agreement will be signed with the Indian Coast Guard	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
62	Mormugao Port Authority	Policy to promote faster adoption of Green Initiatives Port Operations: Existing PPP operators will be informed to initiate action to develop implementation framework to promote faster adoption of Green initiatives as per the guidelines. It has been indicated in the Action Plan in the above item that 'Govt. may cover 50% of the cost of the initiatives to attain cost neutrality in the form of discount on revenue share'. The same needs to be reviewed. In this regard it is submitted that the Port is in a poor financial condition and cannot afford to share any cost. Therefore, Instead of offering discount on revenue share, Govt. may consider providing suitable Grant/subsidy to the PPP operators	The report suggests that 'Govt. may cover 50% of the cost of the initiatives to attain cost neutrality in the form of discount on revenue share. If a port is unable to provide the same, then the Port Authority may this up with the MoPSW in order to come up with a suitable alternative. The provision of a suitable Grant/subsidy to the PPP operators on account of poor financial condition of the port may be proposed by MoPA to the MoPSW as an alternative.
63	Mormugao Port Authority	Promote usage of Green fuel in Vessels: Regarding offering discounts to ship liners which have complied with the shortlisted 4-5 key rating/ certification programs the same needs to be reviewed. In this regard it is submitted that the Port is in a poor financial condition and cannot afford to offer any discounts. Therefore, Govt. may consider providing suitable subsidy to the Ship liners	The report mentions offering discounts to ship liners which have complied with the shortlisted 4-5 key rating/ certification programs in order to promote Green fuel usage. If a port is unable to provide the same on account of poor financial condition, then the Port Authority may take this up with the MoPSW in order to come up with a suitable alternative.
64	Mormugao Port Authority	Setting up a Conciliation &Settlement Committee (CSC): Indian Ports Association has already constituted the Conciliation and Settlement Committee having 5 members and MoPA has also obtained approval of the Board for appointment of the said Committee	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.

65	Mormugao Port Authority	Establishment of Independent Maritime Arbitration Centre (IMAC): There is an immense need for establishment of the IMAC and the same should be formed based on the guidelines of LMAC, SMAC and HKIAC. Further, in accomplishing this target, first and foremost, the concerned Officers of the Major Ports are required to be trained.	Not Applicable as it is not a comment but Mormugao Port Authority's inference of the report.
66	Mormugao Port Authority	Creation of Fund pool by Major Ports to help improve the capacity in the insurance sector: Regarding the contribution of Major Ports to the fund pool through their internal resources the same needs to be reviewed. In this regard it is submitted that the Port is in a poor financial condition and cannot afford to contribute to the fund pool. Therefore either Govt. may consider contributing on behalf of the financially weak Ports or the contribution may be taken only from the financially sound Ports	The report suggests Creation of Fund pool by Major Ports to help improve the capacity in the insurance sector. If a port is unable to contribute the same on account of poor financial condition, then the Port Authority may take this up with the MoPSW in order to come up with a suitable alternative.
67	Mormugao Port Authority	Optimise Marine Operations — Maintain adequate number of Pilots and Pilot Launches: In this respect, MPA has sufficient Pilots to carry out all shipping operations in time.	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
68	Mormugao Port Authority	Optimise Marine Operations — Maintain adequate number of Tugs: Port has already conducted a survey in 2020 thorough an independent third part agency to assess the optimum number of tugs required and the requirement has been met and is operating satisfactorily	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
69	Mormugao Port Authority	Optimise Marine Operations — Maintain Night Navigation facilities: Port has only one way movement of vessels in the approach channel, of length 2.5 nautical miles, marked by 6 buoys which is adequate for the movement of vessels.	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
70	Mormugao Port Authority	Optimise Marine Operations — Maintain adequate skilled mooring gangs: There has been no delay as far as mooring gangs are concerned in the Port	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
71	Mormugao Port Authority	Optimise Terminal Operations — Simultaneous lashing/unlashing of container cargo: Necessary guidelines will be issued to the trade	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
72	Mormugao Port Authority	Optimise Terminal Operations — Explore usage of Tandem Spreader and maximize twin lift operations: At present MoPA handles negligible numbers of containers with a small container vessel transporting containers from MoPA to JNPA	Not Applicable as it is not a comment, but the current container cargo handling scenario at MoPA
73	Mormugao Port Authority	Customs/PHO clearance — Advance submission of documents and related approvals: Port will arrange to conduct stakeholders' meetings to discuss the feasibility of submitting soft copy of documents and advance approval for inward entry, in respect of PHO, Customs and Immigration in advance and shall then issue guidelines for submitting the documents and the mode of submission email/web/portal	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
74	Mormugao Port Authority	Streamlining Vessel Operations — Feasibility of doing survey at anchorage prior to berthing of vessel to be explored: Port will arrange to conduct stakeholders' meetings to discuss the impact of submitting vessel related documents, IGM, berthing and unberthing application, vessel readiness and any other related documents in advance. Necessary guidelines for the same shall then be issued by the Port	Not Applicable as it is not a comment, but the measures taken/ to be taken by Mormugao Port Authority as suggested in the report.
75	Tamil Nadu Maritime Board	Tamil Nadu Maritime Board is requesting the inclusion of "Cuddalore New Port" with the "ChPA-KPL Port Cluster" (Chennai Port Authority - Kamarajar Port Limited).	As per the suggestion, Cuddalore New Port has been included in 'ChPA-KPL Port Cluster' under section 9.2.2.1.1 of the report and other sections as applicable.