India’s Maritime Sector in Transformation

This editorial is based on “India’s recent maritime reforms need course correction” which was published in The Hindu on 04/09/2025. The article brings into picture India’s 2025 maritime reform package, including the Indian Ports Act and Merchant Shipping Act, which seeks to modernize outdated laws, improve ease of business, and strengthen global competitiveness.

For Prelims: Sagarmala Programme, Paradip Port, Harit Sagar Green Port Guidelines , Green Tug Transition Program, Project 17A frigates, Project 15B destroyers, India-Middle East-Europe Economic Corridor, Indian Ocean Region.

For Mains: Major Advancements have been Made in India’s Maritime Sector, Major Issues Associated with India’s Maritime Sector.

India's comprehensive maritime reform package of 2025, including the **Coastal Shipping Act, 2025, the Carriage of Goods by Sea Bill, 2025, and the Merchant Shipping Act, 2025,** marks a significant step toward modernizing the country's century-old shipping regulations and aligning them with global standards. These reforms aim to streamline governance, promote ease of business, and enhance India's position in international maritime trade. However, the legislation has sparked concerns about the **balance between central coordination and state autonomy**, particularly regarding the **new Maritime State Development Council's** oversight powers. While the intent to modernize India's maritime sector is commendable, ensuring these reforms strengthen rather than complicate the regulatory landscape will be crucial for their long-term success.

What Major Advancements have been Made in India’s Maritime Sector?

- **Port Infrastructure and Modernization: India’s port infrastructure has seen transformative advancements under the Sagarmala Programme, aiming to reduce logistics costs and boost port capacity.**
    - The development of deep-draft ports like Vadhavan and Paradip Outer Harbour is key to improving India's handling of larger vessels, promoting smoother logistics and expanding global trade reach.
    - For instance, **Paradip Port handled 145.38 MMT of cargo in FY 2023-24,** showing significant throughput capacity.
        - Additionally, the turnaround time of Indian ports dropped from **93.59 hours in 2013-14 to 48.06 hours in 2023-24.**
- **Focus on Sustainability and Green Shipping: The Indian maritime sector is shifting towards sustainable practices, with initiatives like the Harit Sagar Green Port Guidelines and the Green Tug Transition Program promoting eco-friendly operations.**
    - This transformation is critical as the global maritime sector faces increasing environmental scrutiny.

        - The emphasis on using renewable energy and alternative fuels helps India align with global climate goals while enhancing port and shipping efficiency.
    - For example, India launched the **India–Singapore Green & Digital Shipping Corridor** to facilitate sustainable shipping practices, and green hydrogen hubs are being developed in **Paradip, Kandla, and Tuticorin.**
        - These initiatives reinforce India's commitment to reducing maritime emissions, which is vital as the **IMO mandates net-zero emissions by 2050.**
- **Technological Integration and Digitalization: The integration of advanced technologies like AI, IoT, and blockchain is reshaping India's ports.**
    - The "One Nation One Port Process" is enhancing operational efficiency by reducing paperwork and facilitating faster cargo handling.
        - Real-time data collection on container and vessel movements has significantly optimized port operations.
    - Additionally, **Jawaharlal Nehru Port Authority is one of the first ports in India to implement the Port Community System (PCS),** a digital platform that integrates all stakeholders in the logistics chain, enhancing transparency and efficiency.
        - With a target to streamline regulatory processes and improve logistics, this digital overhaul is **key to India becoming a global maritime leader.**
- **Infrastructure Financing and Private Sector Participation: A crucial development in India's maritime sector has been the growing private sector participation, encouraged by favorable policies such as 100% FDI permitted under the automatic route in** shipping and shipbuilding.
    - Public-private partnerships (PPP) are now a core strategy to modernize port facilities, with the government's $82 billion investment plan to expand port capacity by 2035.
    - Under the Sagarmala Programme, **116 initiatives have been identified to unlock more than 100 million metric tonnes per annum (MTPA)** capacity across 12 major ports.
        - This includes projects like the **New Dry Dock at Cochin Shipyard and the Vizhinjam International Deepwater Seaport, India's first dedicated container transshipment port,** set to reduce foreign port dependency.
- **Expansion of Coastal and Inland Waterways: India is increasingly tapping into its coastal and inland waterways for sustainable and cost-effective cargo transport.**
    - Coastal shipping, an energy-efficient alternative, is expected to play a crucial role in reducing the burden on road and rail transport.
        - While the sector faces regulatory challenges, recent policy changes are streamlining operations and boosting trade via these routes.
    - India achieved a **record 145.5 million tonnes cargo movement on inland waterways in FY 2024–25**, up from 18.1 MMT in FY 2013–14
        - The **Jal Marg Vikas Project is** enhancing inland navigation along the Ganga.
    - This rapid growth, alongside the government's focus on multimodal connectivity, is expected to further strengthen India's logistics network.
- **Shipbuilding and Maritime Security Initiatives: India is focusing on bolstering its shipbuilding industry and maritime security to enhance its global presence.**
    - This emphasis on shipbuilding aims not only to meet domestic requirements but also to establish India as a maritime hub.
        - Significant strides have been made with the development of the International Ship Repair Facility in Cochin and new dry dock facilities.
    - The **Indian Navy is a primary driver of the shipbuilding industry.** Projects like the **Project 17A frigates and Project 15B destroyers,** being built by companies like **Mazagon Dock Shipbuilders Ltd (MDL),** are a testament to this.
- **Strengthened International Partnerships and Trade Routes: India's maritime sector is strengthening international relationships to secure strategic access to global trade routes.**
    - The landmark 10-year agreement with Iran to operate the Shahid Beheshti Port at Chabahar is a strategic move to access Central Asia.
    - Moreover, India's participation in the India-Middle East-Europe Economic Corridor (IMEC) promises to revolutionize regional trade and logistics efficiency.
    - This partnership, alongside signed MoUs with countries like **Norway, UAE, and South Korea, aims to reduce logistics costs by 30% and transit time by 40%.**

- These developments underline **India’s growing role as a central maritime player in the Global South.**

What are the Major Issues Associated with India’s Maritime Sector?

- **Underdeveloped Inland Waterways and Connectivity Gaps: Despite advancements, India’s inland waterways remain underutilized, with inadequate infrastructure and connectivity to major ports.**
  - The lack of a robust, interconnected network hampers the growth of coastal and inland shipping as a viable alternative to road and rail transport.
  - Although India has 14,500 km of navigable waterways, only a small portion is operational, contributing merely around 3.5% to the country’s trade movement.
    - **India’s reliance on road and rail,** which are often congested and costly, continues to undermine the full potential of inland water transport.
- **Insufficient and Inefficient Infrastructure:** India's ports often suffer from inadequate infrastructure, leading to **poor operational efficiency and high logistics costs.** While major ports have seen improvements, **many non-major ports lack modern equipment and deep drafts,** limiting their ability to handle large vessels.
  - This forces India to rely heavily on neighboring transshipment hubs, costing it a substantial amount in revenue.
  - For instance, currently**, India handles 75% of its transshipment cargo** at foreign ports, leading to an estimated annual loss of **USD 200-220 million in potential revenue.**
- **Maritime Security and Geopolitical Challenges: India's vast coastline and strategic location make it vulnerable to a range of maritime security threats, including piracy, drug trafficking, and illegal fishing.**
  - The Indian Ocean Region (IOR) is a hotbed of geopolitical rivalry, particularly with the expanding naval presence of China.
  - The government's Project 75-I for indigenous submarine construction has faced delays and India's warship construction takes 85 months, while Japan takes 27 and France 46.
- **Regulatory Fragmentation and Centralization Concerns:** One of the major issues hindering India’s maritime sector is the fragmentation of regulations and growing centralization under recent reforms like the Indian Ports Bill, 2025.
  - Critics argue that this limits the autonomy of state governments in port development and regulatory frameworks.
    - While centralization can streamline operations, it risks undermining local priorities and creating bottlenecks in decision-making.
  - For instance, the **Maritime State Development Council’s control over port development,** with central approval required for state maritime boards, is seen as diminishing the flexibility of coastal states.
- **Environmental Impact and Sustainability Challenges: The growing focus on green shipping and sustainability is marred by the high environmental impact of port operations and shipping activities.**
  - While initiatives like the Harit Sagar Green Port Guidelines aim to reduce emissions, India faces significant challenges in implementing sustainable practices across the sector.
  - The adoption of green technologies is costly, and there are concerns about the financial burden on smaller players.
    - The Directorate General of Shipping estimates that by 2030, **India’s annual compliance costs could reach $87–100 million,** resulting in a 14% rise in fuel expenses and a 5% increase in freight rates.
- **Fleet Ageing and Lack of Shipbuilding Capacity: India’s merchant fleet faces the challenge of ageing vessels, with 39.1% of the fleet over 20 years old.**
  - This not only impacts the efficiency of the fleet but also poses risks to safety and sustainability.
    - While the government has pushed for modernization, shipbuilding capacity remains underdeveloped, making it harder to meet the growing demands of global trade.
  - **India's share in the global shipbuilding market is extremely low, at less than 1%** . In contrast, **China, South Korea, and Japan** collectively control the majority of the global

shipbuilding market.

- **Insufficient Skilled Workforce and Gender Inequity: India's maritime sector suffers from a significant skills gap, especially in high-tech areas like smart port management and digitalization.**
    - Despite the push for modernization, there is a shortage of professionals equipped to handle advanced technologies like AI, IoT, and blockchain.
        - This gap slows down the integration of new technologies and limits operational efficiency.
    - Also, India's maritime industry has largely remained a male-dominated field in India. According to the **2021 Women in Maritime survey, less than 2$ of the seafarers in India are female.**

What Measures can India Adopt to Enhance Efficiency of India;s Maritime Sector?

- **Strengthening Multimodal Connectivity: To enhance efficiency, India must focus on integrating its ports with rail and road networks through dedicated multimodal corridors.**
    - This integration can help streamline cargo movement from ports to inland destinations, reducing congestion and improving overall logistics efficiency.
    - Establishing seamless last-mile connectivity for both freight and passenger traffic will be critical to avoiding bottlenecks and ensuring timely delivery of goods.
        - Collaborative planning between central, state, and private entities can expedite the implementation of these projects.
- **Implementing Smart Port Infrastructure:** India must accelerate the digital transformation of its ports by investing in smart port technologies such as AI-driven cargo tracking, IoT-enabled automation, and predictive maintenance systems. These technologies can optimize operations, reduce human error, and enhance real-time decision-making.
    - Automated container handling, digitized customs procedures, and data-driven optimization of berth allocation would streamline port activities and reduce turnaround times, significantly boosting operational efficiency.
- **Simplifying Regulatory Frameworks:** The government should streamline and harmonize regulatory frameworks across states and central agencies to minimize delays and inconsistencies in the approval process.
    - Simplifying documentation, reducing compliance burdens, and standardizing port procedures will help make India's maritime sector more competitive.
    - A single-window clearance system could facilitate faster approval for both infrastructure development and cargo handling, promoting ease of business and attracting greater private sector investment.
- **Investing in Green and Sustainable Technologies:** To improve the environmental sustainability of the maritime sector, India should incentivize the adoption of green technologies such as renewable energy solutions for port operations, emission control systems for vessels, and electric-powered cranes and cargo handling equipment.
    - Fostering green innovation through subsidies, tax breaks, and public-private partnerships will reduce emissions and align India's maritime sector with global sustainability goals.
    - Green ports and eco-friendly shipping practices will also enhance the country's appeal in international markets that are increasingly prioritizing environmental responsibility.
- **Enhancing Skill Development and Workforce Capacity:** Investing in skill development programs tailored to the needs of the maritime sector will be essential to bridging the existing workforce gap.
    - Specialized training in advanced maritime technologies, digital port management, and sustainable practices can build a skilled workforce for modern port operations, while prioritizing greater inclusion of women.
    - Collaborating with educational institutions, maritime training centers, and industry stakeholders to create a robust talent pipeline will ensure that India has a skilled workforce capable of managing cutting-edge infrastructure and maintaining global competitiveness.
- **Strengthening Disaster Management and Resilience:** India's maritime sector must

implement more robust disaster management protocols to handle extreme weather events, such as floods and cyclones, that impact port operations.
    - This includes upgrading infrastructure to withstand climate-related disruptions, improving port evacuation systems, and investing in real-time climate monitoring and early warning systems.
    - By integrating resilience planning into the maritime sector's development strategy, India can mitigate the impact of natural disasters on trade and ensure the continuity of operations.
- **Expanding and Upgrading Shipbuilding Capabilities:** India must focus on upgrading its domestic shipbuilding industry to reduce dependency on foreign shipyards. This includes fostering innovation, improving infrastructure, and creating favorable policies to support domestic production of vessels.
    - With an emphasis on building eco-friendly, energy-efficient ships, India can position itself as a global leader in shipbuilding and reduce its reliance on imports for fleet expansion, strengthening its maritime security and global trade presence.
- **Streamlining Customs and Port Clearance Processes:** To reduce delays and enhance efficiency, India should fully automate customs and clearance procedures at ports.
    - Introducing AI-based systems for faster documentation processing, inspection, and clearance can minimize human intervention and improve turnaround times.
    - Streamlining these processes will not only reduce congestion but also create a more predictable and transparent environment for businesses, ultimately improving India's competitiveness in the global shipping market.
- **Promoting Regional Maritime Cooperation:** India should strengthen regional maritime cooperation with neighboring countries to enhance cross-border shipping and logistics networks.
    - Establishing joint ventures, collaborative port development, and shared technological initiatives can foster smoother regional trade flows.
    - By improving regional maritime connectivity, India can position itself as a central hub in the Indo-Pacific, capitalizing on increased trade routes and fostering economic growth through stronger partnerships with neighboring nations.

Conclusion:

India's maritime reforms and modernization drive mark a pivotal step toward achieving **Maritime India Vision 2030** and **aligning with SDG 9 (Industry, Innovation, and Infrastructure) and SDG 14 (Life Below Water).** By addressing infrastructure gaps, sustainability challenges, and workforce inequities, India can strengthen its position as a global maritime hub. Balanced **governance, green shipping, and digital integration** will be key to building resilience.

Drishti Mains Question:

India's maritime sector, with its vast coastline, strategic location, and ambitious reforms under Maritime India Vision 2030, holds the potential to drive economic growth, sustainability, and global connectivity. Examine the key opportunities it offers while analyzing the major challenges that need to be addressed to make India a global maritime hub

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q. With reference to 'Indian Ocean Rim Association for Regional Cooperation (IOR-ARC)', consider the following statements: (2015)

1. It was established very recently in response to incidents of piracy and accidents of oil spills.
2. It is an alliance meant for maritime security only.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans: (d)

Q. What is blue carbon?

(a) Carbon captured by oceans and coastal ecosystems
(b) Carton sequestered in forest biomass and agricultural soils
(c) Carbon contained in petroleum and natural gas
(d) Carbon present in atmosphere

Ans: (a)

Mains:

Q. Defining blue revolution, explain the problems and strategies for pisciculture development in India. (2018)
