



BLUE WATERS

Newsletter

On Marine Environment Protection

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From the Director General's Desk



Dear Reader,

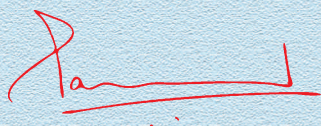
Over the past decade, the Indian economy has witnessed remarkable growth and is poised to become the world's third-largest economy in the coming years. Owing to its geostrategic location in the central Indian Ocean, between the Strait of Hormuz and the Pacific Ocean, India is well positioned to explore new avenues of sea trade and maritime development. The nation's growth trajectory will inevitably drive an increase in seaborne trade and commerce, with corresponding impacts on the marine ecosystem.

Further, India's marine ecosystem, coastal communities, and industries particularly fisheries and tourism are increasingly vulnerable to accidental oil spills. Recent incidents off the coasts of Kerala and Karnataka, including the sinking of *MV ELSA 3* and fires aboard *MV Wan Hai 503* and *MV Maersk Frankfurt*, underscore the requirement of a robust and coordinated response mechanism for Hazardous and Noxious Substances (HNS) spill at sea. The timely and effective assistance rendered by all stakeholders during these operations were noteworthy, demonstrating the importance of a swift and calibrated response in averting major ecological disasters near the Indian coast.

India must therefore prioritize the development of a dedicated HNS incident management policy and enhance port-level capacity building. This should include integrated chemical risk assessments, mandatory transparency of HNS cargo data, regular multi-stakeholder drills, and the deployment of real-time detection and containment technologies.

I extend my best wishes to all readers and stakeholders - **Happy Reading!**

Vayam Rakshamah. Jai Hind.



(S Paramesh)
Director General
Indian Coast Guard

24 Oct 2025
New Delhi

EDITORIAL

India's maritime trade continues to expand, driven by its extensive coastline and strategic initiatives such as Sagarmala and PM GatiShakti. While much of domestic and international shipping still depends on heavy fuel oil, the country is actively exploring cleaner alternatives. Efforts are underway to harness abundant renewable energy sources to support green hydrogen production, expand LNG terminals across major ports, enhance biofuel production from agricultural residue, and strengthen shipbuilding capabilities for retrofitting and innovation.

However, several challenges threaten to slow India's maritime growth. These include an over-reliance on fossil-fuel-powered vessels for coastal shipping, limited availability of alternative bunkering facilities, an urgent need for crew training and robust safety regulations, and the absence of clear fuel transition policies tailored to the shipping sector.

This edition features discussions on the enactment of domestic legislation for OPRC 1990 and the OPRC-HNS Protocol, deliberations on whether India should ratify the Biodiversity Beyond National Jurisdiction (BBNJ) High Seas Treaty, and perspectives on transforming Sea Lines of Communication into Freight Corridors to strengthen pollution response mechanisms. It also explores the transformation of low-carbon emission carriers through the adoption of alternative fuels and future technologies. The sinking of MV MSC ELSA 3 and the fire onboard MV Wan Hai 503, which led to pollution response operations, are featured in the India Watch section.

A warm thanks to all contributors to this edition of Blue Waters. We also invite continued support and valuable contributions from stakeholders dedicated to the protection of the marine environment.



(Kundan)
Commandant
Joint Director (FE)

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Annual Calendar of Pollution Response Training and Exercise: 2025

Website : www.indiancoastguard.nic.in

EVENTS

AREA LEVEL POLLUTION RESPONSE EXERCISE OFF NEW MANGALORE

An Area Level Pollution Response Exercise was successfully conducted by Coast Guard District Headquarters No. 3, New Mangalore, on 19 May 2025, in coordination with the New Mangalore Port Authority. The exercise was conducted at the Single Point Mooring (SPM) of M/s MRPL off New Mangalore.

The event witnessed active participation from various Oil Handling Agencies and representatives of key stakeholders. The primary objective of the exercise was to enhance inter-agency coordination and build synergy among stakeholders & resource agencies to ensure an effective response to potential oil spill incidents.

This exercise reaffirms the Indian Coast Guard's commitment to environmental protection and maritime safety, while fostering a collaborative approach in combating marine pollution.



Figure 1. Demonstration of PR equipment

The New Mangalore Port Authority (NMPA) acted as the overall coordinator for mobilizing the Port's pollution response (PR) resources whereas a Coast Guard team was deputed as observers for the Area Level Pollution Response Exercise demonstration.

A total of 12 representatives from various organizations, including NMPA, MRPL, HPCL, IOCL, RIL, Aegis, and other key stakeholders participated in the exercise.

The lessons learnt during the exercise were briefed to the concerned stakeholders viz need for better coordination and communication between control post and upper deck of PR vessel to avoid inadvertent damage to boom and requirement for periodic maintenance of PR equipment for smooth operation.

OPERATION OLIVIA : 2024-25

Operation Olivia

Operation Olivia is a coordinated annual initiative aimed at safeguarding the Olive Ridley turtles during their nesting season along the Odisha coast. Indian Coast Guard has been conducting dedicated operation "Op Olivia" since 1991 to support the effort of Govt of Odisha to protect olive Ridley turtles during their nesting season every year from 01 Nov to 31 May along the coast of Odisha.

Recent Ops-Olivia was conducted from 01 November 24 to 31 May 25 and coordinated by Coast Guard District Headquarters No. 7 (Odisha), under the overall control of the Commander, Coast Guard Region (North East).

Objectives for the Protection of Olive Ridley Turtles

The primary objective of Operation Olivia is to ensure the safe arrival, mass nesting, and return of Olive Ridley turtles along Odisha's coast, with special focus on the nesting grounds at Gahirmatha Sanctuary, Devi River mouth, and Rushikulya coast. These areas are among the most important mass nesting sites for the species, often referred to as "arribadas." To support this goal, the operation enforces various legal measures and notifications issued by the Government of Odisha that are specifically designed to protect the turtles and their habitat. Among these regulations, the compulsory use of TED by trawlers stands out as a critical step toward reducing turtle mortality caused by fishing nets.

Additionally, the operation enforces a prohibition on



Figure 2. Olive Turtles

the use of gill nets along turtle migratory and nesting routes, which are known to cause entanglement and fatalities. By regulating fishing practices, the initiative aims to create a safer environment for the turtles during their vulnerable nesting phase.

Finally, a key objective of Operation Olivia is to curb poaching activities. Through intensified surveillance and enforcement, the operation works to deter illegal capture and killing of turtles, ensuring that conservation laws are respected and implemented effectively.

Salient Features of Op Olivia

There has been significant (four times) increase in number of nests and hatchlings observed as compared to previous year.



Figure 3. Eggs of Turtles

The 2024–25 operations were strategically focused on preventing illegal fishing activities in turtle congregation and nesting zones, particularly near

ecologically sensitive areas like the Gahirmatha Marine Sanctuary. This effort plays a crucial role in ensuring the safety and conservation of one of the world's largest nesting populations of Olive Ridley turtles.

To ensure effective implementation, the operation involved synchronized patrolling in collaboration with the Forest Department, Fisheries Department, and other key stakeholders. These coordinated efforts were designed to monitor and respond swiftly to any violations or threats to turtle habitats, thereby enhancing protection during the critical breeding and nesting periods.

Another significant component of the operation was to regulate maritime activity in designated turtle nesting corridors. Seaward protection was strengthened to provide safe passage for the turtles during their migration and nesting journeys. This included strict monitoring of vessel movement and fishing practices in sensitive zones.



Figure 4. Olive Turtles

Community engagement formed a core part of the operation, with a focus on enhancing awareness among local fishing communities about turtle conservation. Fishermen were encouraged and educated on the mandatory use of Turtle Excluder Devices (TEDs) in trawl nets to minimize accidental bycatch. The operation also emphasized real-time data collection and intelligence sharing regarding turtle movement, environmental conditions, and potential threats. This information was shared with relevant authorities to facilitate timely conservation measures.

ARTICLES

SIGNIFICANCE OF ENACTING DOMESTIC LEGISLATION ON OPRC 1990 AND OPRC HNS PROTOCOL

(Dy Comdt Virendra Kumar Yadav, ICGS Rajdoot)

Introduction

Marine pollution, particularly from oil and hazardous and noxious substances (HNS), poses a grave threat to the fragile marine environment, economic livelihoods, and human health. With India's extensive coastline of approximately 11,098 km and a rapidly expanding maritime economy, the risk of pollution incidents remains ever-present. The Indian Coast Guard (ICG), as the central coordinating authority for marine pollution response, recognizes the urgent need for a robust legal and institutional framework to address these challenges effectively.

Background

The International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990, adopted under the auspices of the International Maritime Organization (IMO), establishes a global framework for dealing with oil pollution incidents. The OPRC–HNS Protocol (2000), which entered into force in 2007, extends this framework to cover hazardous and noxious substances other than oil.

Both instruments oblige States Parties to establish and maintain measures for pollution preparedness and response including national contingency plans, designated authorities, response capabilities, and international cooperation mechanisms. These conventions emphasize preparedness, prompt response, and collaboration at the national and international levels.

India is a party to OPRC 1990; however, their

implementation has so far relied largely on National Oil Spill Disaster Contingency Plan (NOSDCP), limited rules covered under Merchant Shipping Act and executive instructions, rather than a consolidated legislative framework. The absence of an enforceable domestic law limits accountability, resource allocation, and institutional clarity, thereby constraining effective implementation.

Need for Domestic Legislation: Bridging the Gap

Legal Mandate and Clarity. A dedicated law will provide clear statutory authority for pollution response operations, delineating the powers and responsibilities of national and state agencies, ports, and industry actors.

Compliance with International Obligations.

Enacting domestic legislation fulfills India's treaty obligations under OPRC 1990 and the OPRC–HNS Protocol, ensuring alignment with IMO Conventions and global best practices.

Enhancing Preparedness and Response Mechanisms.

Legislation will institutionalize national contingency planning, equipment stockpiles, and training systems, ensuring a coordinated and timely response to marine pollution incidents.

Clear Jurisdictional Responsibilities. Defining the roles of central ministries, coastal states, and local authorities avoids overlaps, confusion, and delays during emergencies.

Polluter Pays Principle and Liability Framework.

A statutory basis for liability and cost recovery mechanisms will ensure that polluters bear the cost of cleanup and restoration, strengthening deterrence and accountability.

Integration of HNS in National Planning.

Expanding existing frameworks beyond oil to include HNS will address chemical spill risks from

ports, terminals, and transiting vessels, ensuring comprehensive coverage.

Case Studies and Global Best Practices.

Countries such as the **UK, Australia, and Japan** have enacted domestic OPRC implementation laws, demonstrating the benefits of codified national systems in ensuring rapid, well-coordinated response and effective cost recovery.

Operational Gains for the Indian Coast Guard

Strengthened Command Authority. Clear legislative backing will enhance the authority of the ICG Commander during pollution emergencies, enabling swift mobilisation and inter-agency cooperation.

Formalised Training and Certification. Legislation can mandate standardised training programmes, response certifications, and audits, promoting professionalism and operational readiness.

Budgetary Allocations and Resource Planning. A statutory framework ensures that marine pollution preparedness and response are integrated into national and state budget cycles, facilitating timely acquisition of response assets such as dispersants, booms, skimmers, and HNS detection systems.

Technology Adoption and R&D Promotion. The law can encourage research funding and pilot projects in emerging areas such as satellite-based spill detection, AI-driven modelling, and eco-friendly dispersants.

Public and Stakeholder Engagement. Legislation can mandate stakeholder consultations, public awareness campaigns, and periodic drills with shipping companies, ports, and coastal communities to foster a culture of maritime environmental responsibility.

Inter-Agency Coordination and Governance.

Enacting a dedicated law allows for establishing a Marine Pollution Management Authority or National Coordination Committee comprising the Ministry of Shipping, Ministry of Environment, Port Authorities, Coastal States, and industry representatives. This will ensure a unified, whole-of-government approach.

Challenges to Implementation and the Way Forward

Legislative Overlaps. Existing frameworks under the Water (Prevention and Control of Pollution) Act, 1974, and the Environment (Protection) Act, 1986 may overlap with new provisions. Careful drafting, with explicit delineation of scope, can prevent conflict.

State Capacity. Coastal states may lack adequate expertise and resources. The law should therefore include capacity-building provisions, funding mechanisms, and training support through the ICG.

Stakeholder Resistance. Some port and industry stakeholders may resist stringent compliance obligations. Early consultation, transparent cost-benefit analysis, and phased implementation can mitigate resistance.

Drafting Expertise. Drafting must be precise, implementable, and consistent with India's constitutional framework. Collaboration between legal drafters, environmental experts, and ICG practitioners is essential to produce effective legislation.

Conclusion

India's expanding maritime activities, strategic geographic position, and ecological vulnerability underscore the need for a comprehensive and unified legal framework for marine pollution preparedness and response.

Enacting domestic legislation aligned with the OPRC 1990 and OPRC HNS Protocol is not merely a matter of treaty compliance - it is a strategic imperative for national environmental security and maritime governance. As the lead agency for marine pollution response, the Indian Coast Guard is well positioned to guide and support this legislative initiative.

Such a law will not only strengthen India's operational capacity and institutional accountability but will also reaffirm the nation's commitment to sustainable maritime development and international environmental stewardship.

HIGH SEAS TREATY (BBNJ AGREEMENT): INDIA'S PATH TO RATIFICATION

(Deputy Commandant Abhishek Pant, CGAE Goa)

Introduction

The world's oceans are in crisis especially the high seas, which lie beyond national jurisdiction and cover nearly two-thirds of the ocean's surface. These waters absorb about one-third of global CO₂ emissions and produce half of the planet's oxygen, yet remain largely unregulated. This governance gap leaves them vulnerable to overfishing, marine pollution, deep-sea mining, and bio-prospecting.

To address this, the Agreement on Biodiversity Beyond National Jurisdiction (BBNJ) commonly called the High Seas Treaty was negotiated under the framework of the United Nations Convention on the Law of the Sea (UNCLOS). The final text was adopted in June 2023, establishing legally binding obligations to conserve marine biodiversity beyond national borders through mechanisms for Marine Protected Areas (MPAs), Environmental Impact Assessment (EIA), equitable sharing of Marine Genetic Resources (MGR), and capacity building with technology transfer.

Background

The UNCLOS, finalized in 1982 and effective from 1994, provides the foundational legal framework governing maritime rights and responsibilities. It grants coastal states control over resources within Exclusive Economic Zones (EEZs) extending up to 200 nautical miles, while high seas remain outside national jurisdiction.

However, Articles 87–90 which outline freedoms of navigation, fishing, scientific research, and cable laying—do not offer coordinated mechanisms for biodiversity conservation. The BBNJ Treaty therefore

fills this critical legal gap by building a cooperative framework for the sustainable management of international waters.

The BBNJ Treaty : Evolution and Core Pillars

Evolution & Entry. Negotiations began in 2004 under the UN Ad Hoc Open-ended Informal Working Group on BBNJ, culminating in the treaty's adoption in June 2023. Entry into force will occur 120 days after 60 ratifications.

Core Pillars

Marine Protected Areas (MPAs) & Area-Based Management Tools (ABMTs). Establish frameworks to conserve ecologically significant high-seas areas.

Environmental Impact Assessments (EIAs). Mandate prior assessments for activities with potential adverse impacts.

Marine Genetic Resources (MGRs). Introduce mechanisms for equitable access and benefit-sharing.

Capacity Building & Technology Transfer. Facilitate scientific collaboration and resource-sharing for developing nations.

Institutions and Decision Making. Establish a Conference of Parties (COP) and subsidiary bodies for governance.

Comparison with Paris Agreement. Similar in spirit to the Paris Climate Agreement, emphasizing global cooperation, national implementation, and iterative progress through COPs.

Significance

With less than 3% of the oceans currently protected, despite covering nearly two-thirds of the planet, the BBNJ Treaty closes a vital policy gap. It sets enforceable standards for biodiversity preservation, equitable resource sharing, and sustainable governance of high-seas activities including deep-sea mining, bio-prospecting, and marine research.

India's Journey: From Signing to Pending Ratification

Formal Signature. India signed the BBNJ Agreement at the **UN General Assembly on 25 September 2024**, following Cabinet approval earlier that month. The signature expresses intent but does not yet bind India legally.

Institutional Process. The Ministry of Earth Sciences (MOES) serves as the nodal body, coordinating alignment with domestic frameworks like the Biological Diversity Act, Environment Protection Act, and fisheries regulations, and conducting inter-ministerial consultations.

International Engagement. At the Third UN Ocean Conference (UNOC-3) in Nice (June 2025), India reaffirmed its intent to ratify and announced a six-point Ocean Action Plan covering marine research expansion, MPA enlargement, pollution reduction, community integration, and coastal resilience under SDG 14. However, ratification awaits finalization of legal frameworks for MGRs and benefit-sharing.

Outlook

India is expected to pursue ratification during late-2025 parliamentary sessions, aligning legal and institutional frameworks and consulting stakeholders. Its ratification would bolster global momentum toward the treaty's entry into force by early 2026.

Rationale for Ratification

Strategic Ambitions & Regional Leadership. Ratification aligns with India's SAGAR Doctrine (Security and Growth for All in the Region), strengthening its Indo-Pacific leadership and enabling participation in BBNJ decision-making and COP negotiations.

Biodiversity & Environmental Imperatives. As a party to the CBD and Nagoya Protocol, and a supporter of the Kunming–Montreal "30×30" goal, India's

ratification extends its conservation commitment beyond national waters and reinforces SDG 14.

Scientific Gains & Capacity Synergies. The treaty enhances opportunities for India's marine research community through capacity-building funds, technology access, and collaboration platforms like SAHAV and the Deep Ocean Mission.

Economic & Equity Benefits. India's biotech and marine innovation sectors stand to benefit from fair frameworks for marine genetic resource access and benefit-sharing, promoting equitable global cooperation.

Legal Consistency & Global Reputation. Ratification consolidates India's reputation as a rule-based, multilateral actor, consistent with UNCLOS and other biodiversity instruments.

Ethical & Environmental Leadership. By joining early, India would champion global biodiversity justice and stewardship of shared resources for future generations.

Challenges

- **Legislative Complexity.** Harmonizing BBNJ with existing Indian laws.
- **Sovereignty & Compliance Concerns.** Balancing national interests with global obligations.
- **Regulatory Overlap.** Coordination among multiple agencies.
- **Implementation Capacity.** Ensuring adequate technical and financial readiness.
- **Timing & Political Sensitivities.** Navigating domestic priorities and global expectations.

Comparative Analysis: Global Adoption & India's Position

By June 2025, 49 countries had ratified the treaty, with 18 new ratifications during UNOC-3, nearing the 60-country threshold required for entry into force.

Signatories include small island states like Fiji and Tuvalu, as well as European and African nations. Major powers such as the US, Australia, and Germany have signed but not yet ratified.

Synergies with Other Global Instruments

CBD & Nagoya Protocol. Shared principles of access and benefit-sharing.

Kunming Montreal Biodiversity Framework. Supports the “30×30” target for ocean conservation.

UNCLOS & Implementing Agreements. Complements maritime governance structures.

Regional Fisheries & Seabed Governance. Aligns conservation and resource management regimes.

Broader Environmental Conventions. Reinforces multilateral cooperation under SDGs.

Conclusion & Roadmap

India’s ratification of the BBNJ High Seas Treaty will mark a strategic, environmental, and ethical milestone. It integrates national maritime ambitions with global biodiversity goals, strengthens legal coherence, and elevates India’s international standing.

Next steps:

- Parliamentary approval post-monsoon session (late 2025).
- Implementation regulations for EIA and MGR benefit-sharing.
- Institutional coordination among MOES, MEA, MOEFCC, and scientific bodies.
- Enhanced capacity building through SAHAV and Deep Ocean Mission.
- Regional diplomacy to encourage wider Indian Ocean participation.

Once 60 ratifications are achieved, the BBNJ will enter into force after 120 days, likely enabling COP-1 by early 2026. India’s leadership in that

forum could help shape equitable, science based ocean governance transforming the high seas from zones of exploitation to spaces of shared protection for future generations.

**CONVERTING SEA LINES OF
COMMUNICATION INTO FREIGHT
CORRIDORS FOR ENHANCED
POLLUTION RESPONSE MECHANISMS**

*(Capt. RV Rajesh Nambiar, Dock Master,
Chennai Port Authority)*

Introduction

Sea Lines of Communication (SLOC) are the arteries of global trade, carrying approximately 90% of its volume. However, the increasing maritime traffic on these routes heightens the risk of environmental disasters, such as oil spills and the release of hazardous and noxious substances (HNS). It is therefore imperative to convert SLOC into managed freight corridors. This transformation aims to optimize cargo efficiency while embedding robust, cooperative pollution response mechanism among member states, moving from a reactive to a proactive model for protecting our marine ecosystems.

Traditional SLOC lack the integrated structure needed for swift, coordinated pollution response, often leading to delays that magnify environmental damage. By redesigning them as structured freight corridors with predefined protocols, advanced monitoring, and shared resources, nations can significantly improve their collective preparedness and response capabilities.

From Unmanaged Routes to Smart Corridors.

Converting a SLOC into a freight corridor involves designating a maritime route as a specialised channel with advanced navigational aids, vessel traffic services

(VTS), and environmental safeguards. Similar to terrestrial freight corridors, this segregation boosts efficiency and reduces emissions.

Key distinctions of a maritime freight corridor include:-

- **Regulated & Sustainable Access:** Unlike conventional SLOC that prioritise navigational freedom under UNCLOS, freight corridors focus on managed access with an emphasis on sustainability.
- **Technological Integration:** They incorporate green shipping technologies (e.g., LNG or hydrogen propulsion), which can reduce greenhouse gas emissions.
- **Standardised Procedures:** Digitised cargo manifests for rapid hazard assessment and harmonised emergency protocols across different national jurisdictions.

This structured approach transforms a simple transit path into a managed ecosystem with built-in resilience, improving logistical efficiency while tackling the complex environmental challenges of the open sea.

Amplified Pollution Response & Environmental Benefits. Freight corridors primarily improve pollution response by enabling central coordination and following frameworks like the OPRC 1990.

Key benefits include:-

- **Unified Contingency Planning.** Corridors enable the establishment of unified plans with stockpiled equipment and trained personnel, allowing for rapid mutual aid between member states.
- **Drastic Emission Reductions.** By optimising vessel speeds and routes, maritime corridors can slash carbon footprints greatly compared to road transport alternatives.

➤ **Rapid Incident Response.** Real-time monitoring via satellite and drones allows for the early detection of spills, cutting response times from days to mere hours. Specialised teams can be deployed swiftly for complex HNS incidents.

➤ **Cost Savings & Conservation.** Proactive management can reduce spill-related cleanup expenses significantly. Corridors also allow for the designation of Particularly Sensitive Sea Areas (PSSAs) as no-go zones to protect biodiversity.

Fostering Regional Cooperation. Effective pollution response requires strong regional cooperation, as incidents often cross borders. Freight corridors serve as a geographical framework for implementing OPRC Convention principles.

Regional Cooperation involves:

- **Shared Resources & Data.** Establishing shared databases for incident reporting and resource inventories to enable seamless cross-border assistance.
- **Joint Training & Drills.** Conducting joint exercises, often with IMO support, to test interoperability and refine response protocols among neighbouring countries.
- **Harmonised Policies.** Integrating corridor management with regional bodies like the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) to create a harmonised network of safe and efficient maritime routes.

This collaborative model builds economies of scale, reduces the burden on individual nations, and strengthens diplomatic ties, making corridors an instrument of both regional stability and environmental stewardship.

Challenges and Strategic Recommendations.

Implementing freight corridors faces hurdles like regulatory differences, high initial costs, and varying national responses. Inefficient procurement and inventory mismanagement under current plans can worsen cost.

To overcome these challenges, the following recommendations are proposed :-

- **Phased Implementation.** Begin with pilot corridors, leveraging the IMO's Integrated Technical Cooperation Programme for funding and expertise.
- **Establish Regional Response Centres.** Create outsourced response centres at strategic coastal locations. Funded by shared contributions from ports and stakeholders. These centres would manage a centralised, up-to-date inventory of pollution response equipment. This eliminates redundancy, reduces costs, and ensures a high state of readiness.
- **Embrace Technology and Partnerships.** Champion digital integration with AI-driven pollution tracking and leveraging of existing space technology, and foster public-private partnerships to secure the necessary financing for infrastructure.
- **Ensure Quality through Audits.** Implement regular international audits to ensure all participating members adhere to the agreed-upon standards for safety and environmental protection.

Conclusion

Converting SLOC into managed freight corridors is a paradigm shift for proactive marine protection. It optimises trade and builds a cooperative framework for pollution response. Success depends on multilateral commitment, phased implementation, and innovative financing like regional response centres. These steps help policymakers create sustainable maritime routes to protect oceans.

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TRANSFORMATION OF LOW CARBON EMISSION CARRIER USING ALTERNATE FUEL AND FUTURE PROSPECTIVE

(Dy Comdt Chandru B, ICGS Meera Behn)

Introduction

India's shipping sector forms a vital component of the nation's economic infrastructure, facilitating a significant portion of domestic and international trade through its extensive coastline and vast network of inland waterways. As one of the world's fastest-growing economies and an emerging global trade hub, India faces the dual challenge of sustaining economic growth while addressing the pressing issue of greenhouse gas (GHG) emissions from the sector, which remains heavily dependent on residual and distillate fuels. With cargo and passenger traffic projected to at least triple by 2030, emissions from shipping are expected to rise

considerably unless decisive and transformative measures are implemented.

As a signatory to the Paris Agreement, India has committed to reduce the emissions intensity of its GDP by 45% from 2005 levels by 2030 and achieving net zero emissions by 2070. Decarbonizing the shipping sector is therefore integral to meeting these national climate commitments.

Carbon Emission Contribution

The total emissions from India's shipping activities amount to less than 5 million metric tonnes (MT) annually (excluding military operations), of which 2.56 million MT arise from international voyages. This represents roughly 1% of India's total GHG emissions. According to the IMO's Fourth GHG Study (2018), international shipping as a whole emitted 740 million MT of CO₂, indicating that India's international shipping contributes approximately 0.3% of global maritime emissions.

Although this share appears modest, it still represents a significant quantity of CO₂ released each year. Consequently, decarbonising even this fraction is essential for India's broader effort to achieve its Paris Agreement targets, as meaningful progress requires emissions reductions across all major sectors including shipping.

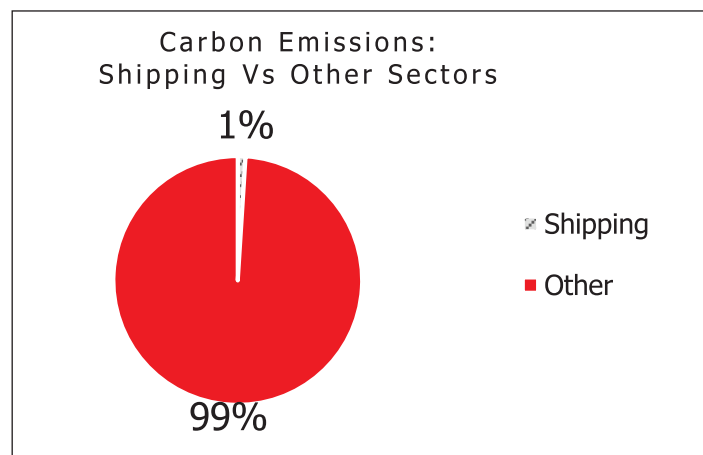


Figure 5. Carbon Emissions

Carbon Emission Pattern of Indian Shipping Industry by Ship Size. The carbon emission profile of India's shipping industry reveals a significant disparity based on ship size.

Large vessels (>5,000 gross tonnes, GT) account for approximately 3.89 million metric tonnes (MT) of CO₂ emissions annually nearly 80% of the sector's total emissions (DG Shipping, 2025).

Smaller vessels (<5,000 GT) contribute around 0.92 million MT of CO₂, representing the remaining 20%.

These figures underscore the urgent need to prioritise the decarbonisation of large ocean-going vessels in national policy frameworks and investment strategies to achieve meaningful reductions in maritime carbon intensity.

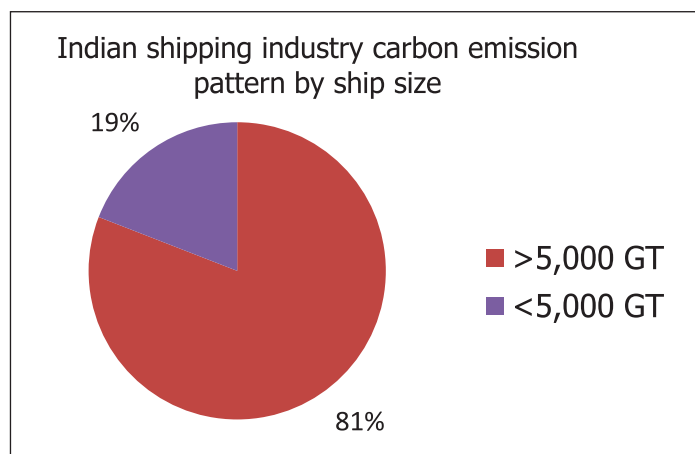


Figure 6. Carbon Emissions

Key Alternate Fuels in the Shipping Sector

The decarbonisation of carriers in the shipping industry depends on transitioning away from conventional heavy fossil fuels toward low- or zero-carbon alternatives. The primary alternate fuels and propulsion options currently under exploration or active deployment include:

- **Liquefied Natural Gas (LNG).** Offers immediate greenhouse gas (GHG) advantages over heavy fuel oil. While not a zero-emission option, LNG serves as an important transitional fuel

as green infrastructure and technologies mature.

- **Methanol.** Can be used in modified existing engines. When produced from renewable sources, methanol offers significant reductions in lifecycle emissions and is gaining traction as a practical low-carbon marine fuel.
- **Green Hydrogen and Ammonia.** Considered the ultimate zero-carbon marine fuels, these hold long-term potential for emission-free combustion or use in fuel cells. However, their widespread adoption requires substantial technological advancements and supporting infrastructure.
- **Biofuels.** Derived from sustainable biomass and waste, biofuels can serve as drop-in replacements in existing ship engines. They offer considerable emission reductions, though their scalability is limited by feedstock availability and supply chain constraints.
- **Electric Propulsion.** Most suitable for short-sea shipping, ferries, and inland waterway vessels. Electric and hybrid-electric propulsion powered by renewable energy sources shows strong potential for decarbonising smaller and regional operations.

Way Forward

The Indian shipping industry stands at a pivotal juncture in its decarbonisation journey. Transitioning toward low-carbon operations using alternate fuels is essential for ensuring a sustainable maritime future. Achieving this vision will require a coordinated approach encompassing technological upgrades, infrastructure development, operational innovation, and robust policy support. The roadmap ahead includes:-

- Vessel Retrofitting and Green Shipbuilding.
- Infrastructure Development.
- Green Corridors.

- Pilot Projects and Innovation demonstrations.
- Policy Support and Incentives.

Future Prospective

India's shipping sector is poised for significant decarbonisation by 2070, aligning with the nation's net-zero commitments. Strategic investments in port infrastructure, domestic shipbuilding, and the establishment of green corridors will play a critical role. Scaling up pilot projects and adopting alternate fuels and hybrid technologies will help reduce emissions, enhance energy security, and lower operating costs.

Together, these measures will foster a clean, competitive, and climate-resilient maritime industry, reinforcing India's leadership in sustainable global shipping.

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REPORTS

WORLD WATCH

**PERIL ON THE HIGH SEAS:
A CHINESE BOXSHIP ABANDONED
AMID EXPLOSIVE CRISIS**

Source: <https://www.tradewindsnews.com/casualties/explosion-hits-ship-carrying-hazardous-cargo-in-redsea-crew-abandon-vessel-after-fire/2-1-1770799>

In a dramatic turn of events, the crew of a Chinese boxship has been forced to abandon their vessel following a perilous cargo explosion and fire in the southern Red Sea. The Hong Kong flagged ship was reportedly drifting approximately 122 nautical miles (226 km) northwest of Hodeidah, Yemen, en route to the Suez Canal, according to maritime experts at Diaplous Maritime Services.



Figure 7. The 1,930-teu ASL Bauhinia (built 2022) matches Diaplous Maritime Services' description of the vessel on fire in the Red Sea

Security firm Ambrey revealed that the blaze was linked to an explosion involving dangerous cargo, with striking images showing a thick plume of smoke rising from the ship's forward section. The vessel, now abandoned and adrift, saw its crew rescued without any reported injuries. While the exact cause remains undisclosed, Ambrey has urged merchant vessels to steer clear and report any unusual or suspicious activity, as the ship poses a navigational hazard to

others in the area.

Speculation surrounds the vessel's identity, with AIS data pointing to two Hong Kong flagged container ships in the vicinity. The nearest match to Diaplous' description is the 1,930 teu ASL Bauhinia, managed by Asean Sea Lines, whose commercial manager has yet to comment. Notably, the ASL Bauhinia continues to broadcast its status as a Chinese vessel with an all-Chinese crew, still underway and utilizing its engines despite the chaos.

This incident unfolds against a backdrop of escalating tensions, with Houthi attacks in the region stretching back to late 2023. Initially targeting Israeli-linked ships, the Houthis have since broadened their scope. However, Chinese vessels have largely escaped such aggression, with operators from the nation increasingly stepping in to safeguard key waterways. A notable exception came in December 2023, when the Hong Kong flagged 10,100 teu Maersk Gibraltar operated by AP Moller-Maersk and owned by Seaspan narrowly evaded a missile strike.

As the maritime world watches closely, the abandoned boxship serves as a stark reminder of the unpredictable dangers lurking on these vital sea lanes.

**BATTLING THE PLASTIC PLAGUE:
A GLOBAL CALL TO ACTION
ON WORLD ENVIRONMENT DAY**

Source: <https://news.un.org/en/story/2025/06/1164046>

In our modern world, plastic production has skyrocketed to a staggering 400 million tons annually, with half of it designed for single use convenience and shockingly, only about 10 percent ever gets recycled, according to United Nations data. This disposable mindset is fueling a crisis: between 19 and 23 million tons of plastic waste seep into rivers, lakes, and oceans

each year, a number projected to surge by 5 percent by 2040 without swift intervention.



Figure 8. : Plastic pollution in freshwater habitats – lakes & rivers – is detrimental to health and survival of the local biodiversity

The fallout from this pollution is insidious, infiltrating every nook of our planet from remote ecosystems to our daily lives. Micro plastics, those tiny fragments, have been detected in our food supplies, drinking water, and even the air we breathe. Experts estimate that the average individual unwittingly consumes more than 50,000 of these particles every year, with even higher intake when inhalation is factored in. Left unchecked, this could spell disaster air pollution driven by plastics might climb 50 percent within the next decade, while contamination in marine and freshwater habitats could triple by 2040.

United Nations Environment Programme (UNEP) is spearheading the charge with the 52nd annual World Environment on Jun 5 – the planet’s premier platform for raising awareness and inspiring change. This year’s event, hosted by the scenic island of Jeju in the Republic of Korea, rallies under the banner #BearPlasticPollution. Launched back in 2018, this UNEP-driven initiative champions a fair and inclusive shift away from our heavy reliance on plastics.

World Environment Day unites a diverse coalition - governments, corporations, local communities, and everyday people – in a collective effort to safeguard our world. It propels progress toward the Sustainable Development Goals (SDGs), zeroing in on those tied to climate resilience and responsible consumption patterns.

Pushing for a Landmark Pact

A centerpiece of this year’s observance is the urgent drive toward a worldwide treaty to eradicate plastic pollution. Nations are deep in discussions for an international, enforceable accord, with the upcoming round of negotiations set for August. UN Secretary – General Antonio Guterres has thrown his weight behind the cause, advocating for a bold, trustworthy, and equitable deal that tackles the entire lifespan of plastics – from production to disposal. Such an agreement, he emphasizes, would mirror community priorities, harmonize with the SDGs, and be rolled out efficiently and comprehensively.

Echoing this sentiment, UNEP Executive Director Inger Anderson stresses the need for collective innovation and fresh alternatives to traditional plastic use. She calls on countries to band together in pursuit of sustainable solutions that can replace our plastic habits once and for all.

As a springboard for momentum, World Environment Day paves the way for the UN Environment Assembly later this year, where expectations run high for tangible advancements. With the spotlight on curbing plastic waste and confronting the wider climate crisis, this could mark a pivotal moment in turning the tide against one of humanity’s most pressing environmental threats.

NORTH SEA NIGHTMARE: JET FUEL SPILL THREATENS UK COASTLINE AFTER DRAMATIC SHIP COLLISION

Source: <https://www.thechemicalengineer.com/news/north-sea-oil-spill-may-take-two-months-to-clear-following-ship-collision-expert/>

On 10 March 2025, the container ship MV Solong collided with oil tanker MV Stena Immaculate, which was at anchor in the North Sea off the coast of East Yorkshire. In a stark reminder of the perils lurking in our busy shipping lanes, a significant jet fuel spill has contaminated the North Sea following a collision off the coast of Hull, UK. Experts warn that it could take as long as two months to fully remediate the environmental fallout from this maritime mishap.



Figure 9. HM Coast Guard

Jonathan Paul, a senior lecturer in the Department of Earth Sciences at Royal Holloway, University of London, emphasizes the urgency of the situation. “Rapid intervention is crucial to contain the spill before it infiltrates the marine ecosystem and climbs the food chain through bioaccumulation,” he explains. Paul anticipates that complete cleanup might span one to two months, depending on the response efforts.

The incident’s impact is already unfolding in real time. Jet fuel, classified as a tenacious oil pollutant,

doesn’t simply vanish – it lingers without dispersing through the water column or dissolving easily. “The contamination begins right away,” Paul notes. “Over time, the slick could expand, potentially blanketing larger swaths of the UK’s shoreline.” The real danger lies in the fuel’s toxic additives, such as anti-icing compounds, which pose severe risks if marine life ingests them, leading to widespread ecological harm.

The UK’s Maritime and Coastguard Agency (MCA), the lead authority in managing such crises, is focusing first on dousing the flames that erupted after the crash.

Officials confirmed the fuel leak on 10 March 2025, assuring that no additional pollution has been detected from other vessels involved.

Adding to the relief amid the chaos, the MCA reports that visible flames on the tanker have been extinguished, while fires on the Solong persist but at a much diminished level. With the immediate blaze under control, attention can soon shift to safeguarding the delicate North Sea environment from this oily intruder.

As investigations continue, this event underscores the fragile balance between global trade and ocean health – a balance that, once tipped, demands swift and decisive action to restore.

BLACK SEA BLUES: RUSSIA’S MASSIVE OIL SPILL LINGERS AS CLEANUP BATTLES RAGE ON

Source: <https://www.themoscowtimes.com/2025/02/25/oil-still-washing-ashore-in-southern-russia-2-months-after-black-sea-spill-a88164>

In the sun-drenched but now shadowed shores of Russia’s southern Krasnodar region, the scars of a devastating environmental catastrophe are proving stubbornly persistent. Emergency teams have uncovered remnants of fuel oil at 11 out of 41 inspected cleanup locations along the coastline, according to

BLUE WATERS

updates from the regional crisis center. Even in the Crimea, authorities have noted similar traces of oil pollution washing up on beaches in recent days, signaling that the spill's reach may be broader than initially feared.



Figure 10. New oil slicks have appeared along the coastlines of southern Russia

Russia's Ministry of Emergency Situations announced on Monday that a herculean effort by workers and volunteers has already cleared away a staggering 148,000 metric tons of tainted sand from the beleaguered beaches. This grim tally underscores the scale of the response to an incident that unfolded on 15 December 24, when fierce storms battered two outdated Russian tankers off Krasnodar's coast. The vessels ruptured, unleashing thousands of tons of thick, viscous heavy fuel oil into the churning Black Sea waters. In the weeks since, dedicated squads of volunteers and rescue crews have been toiling nonstop to stem the tide of contamination.

The fallout has sparked outrage and demands for accountability. Russia's environmental oversight agency is gearing up for legal proceedings against the culprits behind the disaster. The tankers were managed by Volgotransneft, while the spilled cargo was the property of the colossal state owned oil

behemoth, Rosneft-putting corporate giants squarely in the crosshairs.

The human and non-human toil is heartbreaking. Advocacy groups focused on the environment have documented mass die-offs among marine creatures and seabirds, with dire warning that as many as 10 million additional birds could face peril if the pollution isn't contained swiftly. The Black Sea's delicate ecosystem, a vital hub for biodiversity, hangs in the balance.

Beyond the wildlife woes, the spill is casting a long shadow over the region's economic lifeline: tourism. Yet, in a poignant twist amid the turmoil, Russian officials have pressed forward with plans for spring and summer getaways in the impacted zones – specifically tailored for children with disabilities, offering a glimmer of normalcy in the face of adversity.

As cleanup crews soldier on, this Black Sea saga serves as a stark wake-up call about the vulnerabilities of aging infrastructure and the enduring price of environmental neglect. Will the waves ever run clear again? Only time and unrelenting effort will tell.

INDIA WATCH

SINKING OF MV MSC ELSA 3

Figure 11. Sinking of Vessel MSC ELSA 3

On 23 May 25, the container ship MSC ELSA-3 departed Vizhinjam port of Kerala bound for Kochi carrying 640 containers including hazardous material and several hundred tons of fuel & lube oil. At 01:25 PM on 24 May 25, MRCC Mumbai received information about distress call made from Vessel reporting 260 list to starboard about 39 Nm south west of Kochi. Due to severe list, several containers were lost overboard. Indian Coast Guard launched swift rescue operation evacuating 21 crew except Captain, Chief Engineer and Second Engineer who chose to remain onboard to assist in salvage efforts. In early hours of 25 May 25 in worsening sea conditions, remaining 03 crew were also rescued. On 25 May 25, at 07:50 AM, MSC ELSA 3 capsized and sank.

Originally launched as general cargo ship, the ship had undergone several retro fitment and name changes in nearly 30 years of service.

The sinking of MSC ELSA-3 caused release of approximately 500 tonnes of nurdles spread along the coast to Kerala and Tamil Nadu which entailed extensive shoreline cleanup for months.

Following the incident, ICG deployed Dornier fitted with MSS 6000 for detection of oil spill and extensive monitoring of adrift containers for alerting mariners about navigational hazard. A close liaison was established with state administration for contingency management ashore including shoreline cleanup.

FIRE ONBOARD MV WAN HAI 503

Figure 12. Fire Onboard MV WAN HAI 503

A critical incident involved the MV Wan Hai 503, where an onboard explosion triggered a large-scale fire. At approximately 0920 hours on 09 Jun 25, the Singapore-flagged container vessel reported an explosion in one of its containers while positioned about 130 nautical miles northwest of Kochi, India. The vessel was en route from Colombo, Sri Lanka, to Nhava Sheva, Mumbai, with 22 crew members on board. The explosion led to an uncontrollable fire, forcing the crew to abandon ship. With thousands of tonnes of fuel and hazardous cargo onboard, the threat of a major environmental disaster was imminent. However, timely response action by ICG and other stakeholders saved the situation. The incident posed a significant test of our maritime pollution response capabilities, including firefighting, towing, and pollution response operations.

Indian Coast Guard Annual Calendar of Pollution Response Training and Exercise - 2025

Date	Venue	Exercise/Training	(a) Coordinator (b) Participants
08-09 Oct 25	CG DHQ-16	Area Level PR Exercise	(a) CG DHQ-16 (b) VOCPA & Stakeholders
13-17 Oct 25	CG PRT(E), Chennai	OPRC Level 1	(a) CG PRT (E) (b) Stakeholder
24 Oct 25	Vizhinjam	PR Workshop	(a) ICGS Vizhinjam (b) Kerala State Pollution Control Board, Kerala Maritime Board and Adani International Port
10-14 Nov 25	Vadinar	OPRC Level 1	(a) CG PRT (NW) (b) ICG Personnel & Stakeholders
10-11 Nov 25	CG DHQ-5	Area Level PR Exercise	(a) CG DHQ-5 (b) Chennai Port & Stakeholders
10-14 Nov 25	Sri Vijaya Puram	OPRC Level 1	CG PRT (A&N)
11-13 Nov 25	Paradip	Regional Level PR Exercise	(a) CG RHQ (NE)/CGDHQ-7 (b) ICG, PPA, OHAs and Coastal State Authorities of Odisha and West Bengal.
12-14 Nov 25	CG DHQ-2/ Off Mumbai	Regional Level PR Exercise	(a) CG DHQ-2 (b) ICG and Stakeholder
13-14 Nov 25	CG DHQ-11	PR Seminar/ Workshop/ Table top Exercise	(a) CG DHQ-11 (b) ICG and Stakeholder
17-28 Nov 25	RMPPRC, Chennai	OPRC Level 1 & 2	(a) RMPPRC (b) FFC
19-20 Nov 25	Kavaratti Island	PR Seminar/ Workshop/ Table top Exercise and Mock Drill	CG DHQ-12
24-28 Nov 25	CG PRT (W), Mumbai	OPRC Level 1	(a) CG PRT (W) (b) ICG Personnel (Officers/ SOs/ EPs)
11-12 Dec 25	CG DHQ-16	PR Seminar/ Workshop/ Mock Drill	(a) CG DHQ-16 (b) VOCPA & Stakeholders
08-12 Dec 25	CG PRT(E), Chennai	OPRC Level 3	(a) CG PRT(E) (b) ICG Officers
08-10 Dec 25	Sri Vijaya Puram	Regional Level PR Exercise	CG RHQ (A&N)
16-17 Dec 25	JSW Port Jaigad	PR Seminar/Workshop/ Table Top Exercise	(a) ICGS Ratnagiri (b) ICG and Stakeholders

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