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"India's Maritime Outlook Towards Climate Change Law and Ocean Science"

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Abstract

Climate change poses a serious threat to the health and sustainability of the oceans, which are essential for human well-being and global development. India, as a large coastal state and a major maritime actor in the Indian ocean region, has a vital interest in addressing the impacts of climate change on the oceans ensuring the conservation and sustainable use of marine resources. This paper will examine India's legal and policy framework for ocean governance in light of the challenges and opportunities arising from climate change. It will further analyze India's participation in the relevant international and regional instruments, such as the United Nations Convention on the Law of the Sea (UNCLOS), the United Nations Framework Convention on Climate Change (UNFCCC), the Indian Ocean Rim Association (IORA), etc. Furthermore, it explores India's domestic initiatives, such as the National Action Plan on Climate Change, the Coastal Regulation Zone Notification, and the Sagarmala Project. The paper will critically argue that India has taken some positive steps to integrate climate change considerations into its ocean governance, but also faces some gaps and challenges, such as the lack of a comprehensive ocean policy, the need for better coordination among different stakeholders, and the need for more investment in ocean science and technology. In conclusion, the paper will conclude with some recommendations for enhancing India's role and contribution to the global efforts to address the complex and interrelated issues of climate change and ocean governance.

Keywords: Climate change, India's maritime policy, maritime law, ocean science and regulatory bodies.

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Introduction

At present, maintaining marine resources and ensuring maritime security are top priorities for the Indian Navy. India should be gradually looking to the oceans to satisfy its sustainable development goals, which include obtaining clean energy from wind, wave, and tidal resources. This is because the country's limited land-based resources are under stress and technological advancements are opening up new maritime frontiers. The countries surrounding the Indian Ocean have presented a compelling case for the blue economy and have played a significant role in the formulation of the national marine strategy.

Climate change affects marine security in a significant way because rising sea levels and more acidic oceans are the results of the Arctic Sea ice melting faster due to global warming and fossil fuel emissions. Having a substantial impact on trade and marine security, particularly when it comes to natural disasters and the disruption of maritime operations. In addition, new polar sea routes linking the Pacific and the Arctic have been made possible by the melting of Arctic ice. These routes have long been sought after by explorers, and while they are advantageous to shipping businesses, they present significant changes in the landscape.

The Indian government updated Nationally Determined Contribution (NDC), committing to reduce emissions intensity of its GDP by 45% by 2030, from 2005 level.[1] Also, proposing a mass movement for 'LIFE' – "Lifestyle for Environment' as a key to combating climate change.[2] The 80th meeting of Marine Environment Protection Committee (MEPC) addressed a myriad of technical issues, but the paramount takeaway for India lies in the formal acknowledgment by IMO of concerns particularly towards greenhouse gas (GHG) emission control from the maritime sector. Furthermore, India's maritime security strategy focuses on all aspects of challenges that is impacting the health and the future of the oceans.

In addition, investing in marine renewable energy sources will be essential to the country's energy security. Technologies for ocean energy are being developed, but they need a lot of work before they can be made widely accessible for use. India is prepared to face challenges, whether they come from widespread piracy or maritime terrorism at sea. Although the main purpose of navigators is to counter conventional threats, they also have to deal with non-traditional threats that are unpredictable. The same being addressed through the new age 'Maritime Anti-Piracy Act, 2022', 'Merchant Shipping Act, 1958', notifications and circulars of Directorate General of Shipping.

Fighting for naval dominance is only one aspect of maritime power; as a nation, India is developing itself as a maritime power by developing its own make in India shipping fleet, shipbuilding and maintenance ports, high-end technology at ports and deep-sea mining, to sustainably utilise oceanic resources. Through the maritime policies like SAGAR and Sagarmala project the nation is developing and addressing any concern present in the Indian Ocean Region (IOR).

Role of Climate Change on Ocean Health

The UN has suggested the Sustainable Development Goal 14 (SDG) to address the concerns of the seas or "life below the water," acknowledging the significance of non-traditional threats. There are 10 main goals that must be accomplished by 2030, the NITI Aayog, has the authority to set policies and recommend

[1] Ministry of Environment, Forest and Climate Change (MoEFCC) (India's long-term low-carbon development strategy, 2022) <https://unfccc.int/sites/default/files/resource/India_LTLEDS.pdf> accessed 18 April 2024.
[2] Ibid.

responsible ministry to carry out the necessary activities to achieve these goals. Marine pollution is one of the four main areas of responsibility for the Ministry of Earth Sciences.

The main source of marine pollution is floating plastic waste from land, which poses a far greater threat to the environment than climate change if it is allowed to drift unchecked, ending up in the ocean because it takes millions of years to decompose. The protection of the highly overworked coastal ecology is the second goal. The third goal to be met by the Ministry of Earth Sciences is ocean acidification, which is a significant rising worry that requires further investigation since it raises the pH of the seas due to high levels of carbon emissions in the air and water bodies. The fourth goal being the creation of scientific knowledge and technological transfer for capacity development.

The scope and extent of oceanic contamination are being attempted to be covered by the Ministry of Earth Sciences. Based on these goals, the ministry has identified three primary missions: advancing ocean science and technology research; offering the finest services feasible; and conducting scientific research, managing marine resources, and assessing them. These goals and missions state that the ministry has five distinct institutions pursuing various goals. Over the past 15 years, the ministry has been successful in building a robust global network since oceanic research requires the strongest observation skills.

While 1300 islands in the nation have access to coastal monitoring, some are not able to farm or have access to resources, thus the ministry is working to provide opportunities and coastal protection measures for these islands. Changes in marine ecology and the effects of climate change are examples of non-traditional maritime dangers. The regional, state, and federal levels of society must all take action to counter these threats.[3]

The melting of ice in the Arctic is opening up access to vast resources and 40% of the world's energy reserves. First off, the Arctic Circle's ecosystem is altered by ocean warming, making it possible for a variety of species to survive there that otherwise might not have been able to. This raises concerns about the ecosystem's long-term viability. Second, when the ice melts and warms, non-living resources like petrol and oil become accessible and simple to use. It is predicted that 3.68 trillion non-living resources—nearly 30% of all hydrocarbon resources worldwide—will become accessible.[4]

One of the largest risks is global warming; warmer seas are rapidly altering the ocean environment and modifying a variety of ocean species, all of which require further detailed research. The ocean currents are transporting pollutants, animals, and plastics throughout the globe, severely impacting the receiving oceans' natural balance. The globe is looking for cooperative solutions, with unanimous effort of nations to ban globally, irrespective of economic, political, and social problems making it difficult. Because of the warming of the seas, marine life has been most impacted by climate change.

As traditional and military concerns in maritime security gave way to non-traditional security challenges, security issues likewise underwent a shift. These days, minerals play a major role in propelling economic growth. In the Indian Ocean region, the two most active countries are China and India. China has been investigating minerals near the border with India to the southwest. As a result, there are a tonne of prospects, but there is still a lot of uncertainty surrounding mineral development due to the potential for significant

[3] Juneja M and Ganeshan S, 'The Emerging Global Maritime Order - India's Strategy' (*The Energy and Resource Institute (TERI)*) <https://www.teriin.org/sites/default/files/2019-08/maritime-strategy.pdf> accessed 30 March 2024.
[4] *Ibid.*

contamination. More investigation is required to fully comprehend how deep sea mining affects the ecology and ecosystem of the ocean.

Another factor threatening the ocean ecology is Illegal Unreported and Unregulated (IUU) fishing. Although checks and balances have been put in place to address IUU fishing, the current international legal framework still lacks strong barriers and strict measures to deal with this growing issue. The maritime regime is likewise concentrated, with a small number of nations holding the largest ship registries (flags of convenience), the largest ship demolishers, the largest ship builders, the largest ship owners, and the nations with the coast guard and navy strategically positioned to address non-traditional security threats.

Furthermore, some nations have ratified international conventions, while others have not. A logistical issue and problem in international relations are highlighted by this uneven application of international law and its clustering. The regulation of IUU and other illegal activities, like migration and trafficking, becomes difficult in international waters because national forces are not permitted to conduct hot pursuit beyond their borders. Nevertheless, coordination between international agencies and national governments is a laborious process in and of itself. Transnational criminals have devised ways and means to circumvent technologies such as Automatic Identification Systems and special licences to collect specific fish species, despite their existence.

Biodiversity Beyond National Jurisdiction (BBNJ) under UNCLOS

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) governs the terms of the BBNJ Agreement. The parties are required to abide by and carry out the terms of both UNCLOS and the BBNJ Agreement since they are legally binding agreements. UNCLOS grants all nations the freedom to fish freely on the high seas, subject to some very broad general obligations for the conservation of marine living resources. This is true even though it elaborates provisions for the management of non-living resources of the seabed areas beyond national jurisdiction through the International Seabed Authority.[5]

BBNJ Agreement is also known as the “Treaty of the High Seas”, having the following goals[6]:

- Protect the ocean
- Promote equity and fairness
- Tackle environmental degradation
- Fight climate change
- Prevent biodiversity loss in the high seas

Over 60% of the biodiversity found in regions outside of national borders needs to be controlled and regulated by a legal framework with the goal of conservation. This biodiversity is still an essential resource found in the world's oceans. The health of the ocean, the welfare of those who live along the coast, and the planet's overall sustainability all depend on biodiversity in areas that are outside of national borders.

[5] Karim MS and Cheung WWL, ‘The new UN high seas marine biodiversity Agreement may also facilitate climate action: a cautiously optimistic view’ (2024) 3(1) npj Climate Action <http://dx.doi.org/10.1038/s44168-023-00088-9> accessed 18 April 2024.

[6] Ocean and Fisheries EC, ‘Protecting the ocean, time for action’ (Oceans and fisheries, 31 January 2022) <https://oceans-and-fisheries.ec.europa.eu/ocean/international-ocean-governance/protecting-ocean-time-action_en?fbclid=IwAR3EaiM-yGRY_gTaMG6mzFmhFCqwXhdj9t_BnXxnUkYRgd4F5Zur7l3QskE> accessed 18 April 2024.

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The UN Convention on the Law of the Sea is much outclassed by the High Seas Treaty, which provides the first legal framework addressing the triple concerns of pollution, biodiversity loss, and climate change. Moreover, 70–90% of coral reefs worldwide will disappear if global warming surpasses the 1.5°C barrier. Strong conservation measures are intended to counteract this trend through the High Seas Treaty. India, one of the most populous and quickly developing nations in the world, has a big interest in preserving the environment for coming generations. By signing the High Seas Treaty, we should take advantage of this chance to spearhead international efforts and capitalise on the promise of nature-based solutions (NbS).[7]

Since healthy marine ecosystems operate as carbon sinks, removing substantial amounts of carbon dioxide from the atmosphere, the High Seas Treaty presents a chance to mitigate climate change. In addition to meeting the nutritional needs of over 3 billion people, the marine ecosystem sustains the livelihoods of an estimated 60 million people through the fishing and aquaculture industries. This lofty objective is necessary to preserve vital habitats, conserve biodiversity, and defend livelihoods. The Treaty also fills in important gaps in the current international frameworks, giving nations a forum to work together, pool resources, and devise plans of action to tackle the urgent problems facing our seas.

Other Countries

Throughout several BBNJ Agreement negotiation rounds, Indonesia's commitment to enhancing developing nations' participation in the sustainable exploitation of genetic resources in international waters has been made evident. The Coordinating Ministry for Maritime Affairs and Investment, the Ministry of Foreign Affairs, the Ministry of Maritime Affairs and Fisheries, the Ministry of Environment and Forestry, the Permanent Representative of the Republic of Indonesia in New York, and experts from the National Research and Innovation Agency and the Indonesian Navy Hydrographic and Oceanographic Centre comprised the Indonesian National Team that negotiated the BBNJ Agreement. The team actively engaged in the negotiations to ensure that Indonesia's position was taken into account in the agreement.[8]

Additionally, the Indonesian National Team made a concerted effort to ensure that biotechnology was included in any technological transfer to poor nations. After being contested at first by developed nations, the Indonesian delegation intervened and this suggestion was eventually approved in the meeting. The National Team also included scholars from Universitas Padjajaran, Universitas Parahyangan, and Universitas Indonesia in preparing for the government's position. Apart from championing equitable prospects for developing nations, Indonesia has also managed to guarantee that the greatest genetic resource in the ocean, fish, which is employed in biotechnology endeavours, is not excluded from the benefit-sharing agreement that applies to all nations, but especially to developing nations.

The U.S. Department of State has indicated that it intends to sign the new marine protected area agreement, even though the country is not a signatory to UNCLOS. Aiming to achieve 17 goals pertaining to ending poverty and hunger, safeguarding human rights, and protecting the environment, all U.N. member nations have adopted the Sustainable Development Goals (SDG), which includes the High Seas Treaty. The 2030

[7] Wadhawan S and Bajpai A, 'By Embracing the High Seas Treaty, India Can Cement Role in Ocean Governance' <https://www.ceew.in/blogs/how-can-india-boost-its-role-in-ocean-governance-with-high-oceans-treaty> accessed 2 April 2024.

[8] Coordinating Ministry for Maritime Affairs and Investment, 'Through BBNJ Agreement Indonesia Pushes to Accelerate Global Ocean Protection and Utilisation: Portal Kementerian Luar Negeri Republik Indonesia' (*Through Bbnj Agreement Indonesia Pushes To Accelerate Global Ocean Protection And Utilisation | Portal Kementerian Luar Negeri Republik Indonesia*, 22 June 2023) <https://kemlu.go.id/portal/en/read/4872/view/through-bbnj-agreement-indonesia-pushes-to-accelerate-global-ocean-protection-and-utilisation> accessed 5 April 2024.

Agenda for Sustainable Development is a 15-year implementation plan that accompanies the goals that the United Nations established in 2015.[9]

Concurrent promises made by the US at the Panamanian Our Ocean Conference in 2023 are pertinent to the US's intention to ratify the treaty. The US committed $6 billion in support for ocean-related initiatives. Of that, $800 million has been set aside for the protection of the ocean and helping developing nations accomplish the goals and projects agreed upon at the conference. These include aiding in the establishment of marine protected areas, assisting nations in securing marine resources, and enhancing the ability of coastal regions to withstand the effects of climate change.[10]

Initiatives taken by India and Road Ahead

India aligns with global principles of biodiversity management: conservation, sustainable use, and equitable benefit sharing. It supports the early conclusion of the BBNJ under UNCLOS, and advocated for its implementation at the 2023 G20 meeting, despite not ratifying the treaty yet. The High Seas Treaty's key intervention is creating area-based management tools like marine protected areas, crucial for achieving the '30 by 30' goal of the Kunming Montreal Global Biodiversity Framework. While ocean-based NbS extent is unclear, India stands to benefit significantly from ratifying the treaty, given studies on coastal NbS like coral reef management and mangrove conservation in South and Southeast Asia.

India will benefit economically. The blue economy in India is estimated to be worth 4% of the nation's GDP and provides transport assistance for 95% of the nation's enterprises. The preservation and responsible utilisation of marine resources can yield income via fishing, ecotourism, and the growth of blue economy industries. One of the industries in India and the world with the fastest growth rates is marine tourism. The overall number of jobs generated by the sector between 2009 and 2012, both directly and indirectly, came to be approximately 23% of all occupations, especially in coastal regions like Kerala.[11]

Additionally, in May 2020, the Indian government launched the Pradhan Mantri Matsya Sampada Yojana (PMMSY), investing INR 20,050 crore (USD 2.5 billion) to expand the nation's fisheries sector responsibly and sustainably, with the goal of bringing about a Blue Revolution. Consequently, there is great potential for job creation and economic progress in India by investing in the preservation and sustainable growth of the blue economy.

France and India are committed to upholding international maritime law and its application in all seas and oceans. The International Seabed Authority, the International Maritime Organisation, regional sea conventions pertaining to maritime affairs and in which they are both Parties, or the Intergovernmental Conference on an international legally binding instrument under the UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ), among others, are some of the multilateral bodies and negotiations with which they will coordinate their positions in order to strengthen the international law of the sea and adapt to new challenges. In particular, as part of the

[9] Myers L, 'United States: State Department Signals Intent to Sign International Agreement on Marine Protection' (*The Library of Congress*, 3 April 2023) <https://www.loc.gov/item/global-legal-monitor/2023-04-02/united-states-state-department-signals-intent-to-sign-international-agreement-on-marine-protection/> accessed 7 April 2024.
[10] *Ibid.*
[11] *Supra Note 3.*

negotiations on the next global framework for biodiversity, they will hold discussions on the creation and reinforcement of marine protected areas worldwide.[12]

India's ratification of the High Seas Treaty aligns with its Sustainable Development Goals (SDGs), G20 initiatives, Mission LiFE, and National Determined Contributions (NDCs). The Blue Economy, worth USD 25 trillion, produces goods and services valued at USD 2.5 trillion annually, with key Asian players being China, India, Korea, and Japan. India can represent developing countries' perspectives in global debates and demonstrate the Blue Economy's necessity for development. The High Seas Treaty and seascape restoration offer a unique opportunity to protect oceans and address pollution, biodiversity loss, and climate change. India, by signing the pact, can lead international efforts, protect its economy and biodiversity, and ensure a better future for aquatic ecosystems.

Concluding Recommendations

- To handle non-traditional security risks including climate change, IUU, piracy, and environmental degradation, coordination across all governmental and non-governmental organisations working on maritime issues is necessary.
- Cooperation in technology through bilateral and multilateral agreements between nations, necessary to fully realize the potential of the Blue Economy.
- In regard to the blue economy, further study in oceanic sciences, technology, and policy is required. Building an information repository using a transdisciplinary framework for inter-governmental cooperation.
- Increased collaboration of government, industry and academia to exchange scientific technology and create instruments and systems to tackle climate change and environmental deterioration, which are essential for the accomplishment of ocean development that is sustainable.
- Formulate a comprehensive Indian maritime policy that integrates social, economic, environmental, and security aspects in consultation with relevant stakeholders on regular intervals.
- Generating efficiency in the degree of cooperation and networking amongst all maritime agencies on a local, national, and international level through the position of National Maritime Security Coordinator (NMSC).
- It would be advantageous to form alliances and partnerships with commercial maritime industry participants to guarantee more coherence in the formulation and execution of maritime policies.
- For the marine industry to succeed, capacity building and training beyond scientists and technologists are crucial. It is imperative to educate stakeholders from the banking and insurance sectors, academia, think tanks, and commercial organisations on the evolving ocean ecosystem. This will enable them to make valuable contributions to the Blue Economy discourse and its practical application.

[12] Ministry of External Affairs, Government of India (*INDIA-FRANCE ROADMAP ON THE BLUE ECONOMY AND OCEAN GOVERNANCE*, 20 February 2022) <https://www.mea.gov.in/bilateral-documents.htm?dtl/34882/> accessed 7 April 2024