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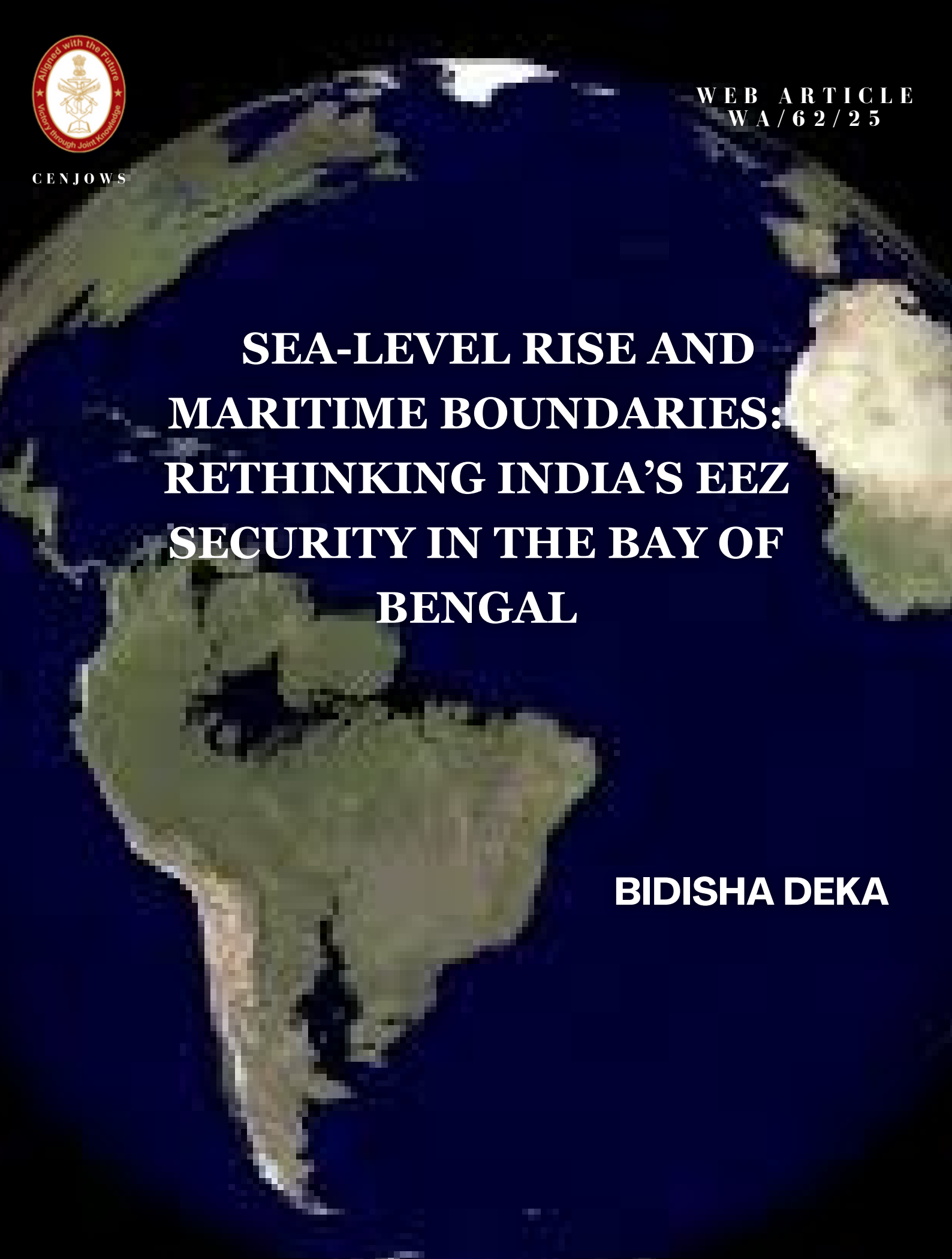

SEA-LEVEL RISE AND MARITIME BOUNDARIES: RETHINKING INDIA'S EEZ SECURITY IN THE BAY OF BENGAL

BIDISHA DEKA

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Bidisha Deka is a Research Intern at CENJOWS

Introduction & Context

Climate change, at present, is not limited to a critical ecological discussion; it is now a major non-traditional security threat with immediate ramifications for territorial integrity and autonomy, natural resources, food security, and geostrategic approaches.[1] In contrast to traditional challenges, climate change is fragmented, cross-regional, and slowly escalating; yet, its effects are significantly catastrophic and disruptive in nature.[2] For New Delhi, whose maritime identity and economic stability are firmly connected to the Indian Ocean region (IOR), climate change is not merely an environmental challenge but a threat multiplier and catalyst of geopolitical destabilisation.[3]

The Bay of Bengal (BoB) highlights a climate-security dilemma. Considering one aspect, it has been a space of growth opportunities, including high-yield fishing grounds, critical maritime corridors, hydrocarbon reserves, and a pivotal gateway connecting South and Southeast Asia. [4] On the contrary, it ranks among the most climate-sensitive maritime zones in the world, experiencing a rapid temperature increase that exceeds the global average, resulting in more severe cyclones,

accelerated coastline degradation, and a continuous rise in sea levels.[5] The transitions are not only developmental concerns or ecological issues; they are high-impact events that can rewrite the boundaries, relocate communities and ignite fresh versions of competition in the BoB region.

What makes this strategic concern more significant is that maritime boundaries and Exclusive Economic Zones (EEZs), the legal framework of ocean governance, are grounded in climate-vulnerable landscapes that are presently exposed to threats.[6] Islands might disappear, coastal fronts may erode landward, and alongside them, the legal geographical maritime baselines that define jurisdictional rights under UNCLOS. For New Delhi, this is not merely conceptual; its 2014 maritime boundary settlement with Bangladesh demonstrated how disputed maritime areas can impact the ability to utilise the critical resources.[7] If sea-level rise continues to increase at a more rapid rate, such differences and disagreements may reappear in more complex patterns, challenging the equilibrium of India's EEZ in the BoB.

Therefore, the challenge is not simply about climate change, however also regarding, compromising strategic stability. Global climate crisis is disrupting the very cartography of power in maritime space, posing challenging queries about how New Delhi can protect its resources, safeguard naval facilities, and maintain its regional influence in the BoB amid turbulent waters.

Academic/Theoretical Angle

The jurisprudential and conceptual framework for India's maritime claims is embedded in the United Nations Convention on the Law of the Sea (UNCLOS), which establishes regulations for "the five maritime zones: Internal Waters, Territorial Sea, Contiguous Zone, Exclusive Economic Zone (EEZ), and High Seas".[8]

Under "UNCLOS's Part V (EXCLUSIVE ECONOMIC ZONE) - Article 56 (Rights, jurisdiction and duties of the coastal State in the exclusive economic zone), the coastal State has the"[9],

"Sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and about other activities for the

economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds".[10]

And “Article 57 (Breadth of the exclusive economic zone)” [11]clearly specifies,

“*The exclusive economic zone shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured.”*[12]

Although climate change reveals inherent challenges within this conceptual architecture, the shifting versus fixed baseline debate has evolved into a crucial legal dispute: should baselines be shifting, indicating shrinking or encroaching coastlines, or maintained to uphold historical entitlements? UNCLOS was formulated in the period of 1980-90s, when climate-induced sea level rise and immersion were minute and insignificant, and it does not clearly address the perpetual or partial submergence of islands[13]. This opens the possibility of “areas of legal ambiguity”, where a submerging island could obstruct a nation’s sovereign maritime rights, placing EEZs at risk of legal disputes.

Also, UNCLOS Article 121 specifies the legal standing of islands with three pivotal clauses:

1. “An island is a naturally formed area of land, surrounded by water, which is above water at high tide.”[14]
2. “Islands, in principle, generate maritime zones just like continental land, territorial seas, contiguous zones, EEZs, and continental shelves.”[15]
3. “Rocks which cannot sustain human habitation or economic life of their own shall have no exclusive economic zone or continental shelf.”[16]

The third clause, often overlooked, becomes the core notion of friction in a world reshaped by climate change. Amid elevation of sea levels, erosion-induced displacement, and coastal salinisation, which adversely affect the inhabitation and long-term economic sustainability of vulnerable islands, the risk is not only territorial submersion but also loss of legal recognition. An island that becomes less populous or a stable financial structure might be recategorised as a “rock,” removing it from EEZ and continental shelf claims.[17]

Corresponding cases highlight these challenges strikingly. The Maldives have been facing the most significant impacts of global warming and increasing sea temperature

with little assistance from international actors.[18] The nation is responsible for only 0.003% of global emissions, yet it ranks among the leading countries to witness the existential threats of global warming.[19] The Maldives, being the lowest-lying nation in the world, comprises 1,200 islands with an average elevation of just 1.5 metres above sea level, which creates spatial disadvantage at the forefront of climate challenges. [20] The Government of the Maldives has already advocated and appealed to the global community to acknowledge fixed baselines to uphold maritime jurisdictions.[21] Also, at the same time, Parties to the Nauru Agreement, eight Pacific nations have come forward to protect 200 nautical mile EEZs, before territorial loss as a result of climate change.[22] These island nations are advocating for maritime zones to be maintained under sovereign jurisdiction, to protect their resources (which are predominantly declining because of fishing grounds) and communities (which are being affected by migration due to climate change), even if the islands are submerged.[23], emphasising the conflicts between geospatial and legal aspects.

Certain cases have already shown the attempts made by nations, particularly Small Island Developing States (SIDS), to uphold their EEZs from the risks posed by environmental changes and disruptions.[24] Their actions often merge diplomatic initiatives, legal proceedings and regional sustainability approaches. In 2024, the Alliance of Small Island States (AOSIS) presented a ‘Declaration on Sea Level Rise and Statehood’ at the United Nations High-Level Meeting on the Threats of Sea Level Rise, emphasising that rising coastal waters do not compromise sovereign status, national autonomy, and jurisdictional maritime areas. [25] The formal announcement expands upon previous AOSIS pledges that EEZs continue to be immutable regardless of climatic shifts. With the help of the International legal framework and consultative rulings from the International Tribunal for the Law of the Sea and the International Court of Justice, AOSIS is protecting Small Island Developing States' maritime rights in light of rising sea levels.[26] [27] For many island nations, their EEZs are approximately 28 times the country's terrestrial land area; therefore, it becomes essential for the nations to protect their maritime sovereignty, which is significant for rich fishing grounds and to preserve their national identity.[28]

For New Delhi, these cases and clauses provide insightful lessons. The BoB region is severely threatened by climate change, facing higher sea levels, recurrent cyclones, and coastal erosion, which endanger maritime order in the IOR.[29] India’s Andaman &

Nicobar Islands, which constitute a crucial component of its coastal baselines, experience persistent erosion and the effects of storm surges.[30] This creates a risk-prone position in terms of strategic weakness for the nation. Although these islands will remain in existence, intensified storms, environmental vulnerability, and climate-induced displacement might lead to legal issues from regional and extra-regional powers. In contrast to continental land, which is comparatively steady, island-dependent EEZs are subject to evolving legal interpretations under Article 121(3).

Without forward-looking legal and diplomatic measures, India may suffer a segmental loss of EEZ claims and control over key resources, such as fish stocks and offshore hydrocarbons. Crucially, this convergence of climate research and international law highlights entrenched structural unfairness in oceanic governance, benefiting nations with stable landscapes while disadvantaging those with climate-risk coastal areas, a concern New Delhi must manage both analytically and strategically.

Practical and Strategic Implications of Sea-Level Rise for India

Sea-level rise in the BoB is more than just an ecological risk; it reveals profound economic, legal and geostrategic ramifications for New Delhi. The erosion or inundation of coastal and island regions could heighten the risks for India regarding claims to its EEZ, challenging its maritime sovereignty at a time when struggles over resource geopolitics and strategic power contests are increasing in the region.

- **Legal Vulnerabilities in the EEZ**
  India's EEZ currently encompasses 200 nautical miles extending from its coast, as defined under UNCLOS, constituting underlying structure of its maritime jurisdiction along with availability of marine resources. Currently, India's EEZ extends up to 200 nautical miles from its coastline, spanning an aggregate of 2.3 million square kilometres of area.[31] In the year 2009, New Delhi provided proof to the UN commission, providing six thousand pages of researched scientific data, compiled over a period of ten years, aiming to expand the EEZ of 200 nautical miles to 350 nautical miles spanning the area of Bob, the Indian Ocean and Arabian Sea, according to the natural extension of its continental shelf.[3233] Although this extension would substantially increase India's sovereign sea areas, it also increases the risks: climate-driven coastal erosion of environmentally vulnerable islands and shifts in maritime baselines could

expose India to legal challenges, possibly compromising both current and suggested EEZ rights. Under the framework of UNCLOS Article 121, islands need to persist above water at high tide to secure an EEZ and continental shelf. [34] Any damage to physical form, whether eventual submergence or severe weather effects, could thus be invoked by other nations to challenge New Delhi's maritime claims.

- **Risks to Maritime Resources**

The BoB possesses significant economic prospects for New Delhi, supporting the financial security of maritime communities and playing a significant role in the nation's food self-sufficiency. [35] Its fishing grounds provide economic stability to the fishing communities across eastern India; catches from the entire Indian Ocean, with an approximate total of 3.47 million tonnes in 2024, decreased by 2% due to the impact of severe cyclones and warming seas. [36]This highlights the vulnerabilities that the region's marine resources are facing. Such climate-related impacts undermine the accessibility of fish and the financial stability of coastal populations that depend on them. Beyond fisheries, the BoB region contains large hydrocarbon reserves, particularly in the Krishna-Godavari Basin, where deepwater fields like KG-DWN-98/2 are expected to produce up to 45,000 barrels of oil per day upon reaching full capacity.[37] Elevated Ocean levels, more severe cyclones, and extreme storm tides could destroy offshore operational assets, exposing dangers to India's energy security.

Additionally, BoB offers substantial opportunities for seabed minerals and growth in renewable energy. New Delhi has begun research on deep-sea mining tests in the Andaman Sea to extract value from polymetallic nodules, [38]While also initiating projects on mapping offshore wind capacity across the southeastern tip of the BoB region to reduce CO2 emissions over a period of twenty-five years.[39] However, climate change presents both jurisdictional and physical ambiguities: the depletion or modification of baselines may put these resources at a vulnerable State to contention under UNCLOS, mainly as India aims to increase its EEZ from 200 to 350 nautical miles. Safeguarding these resources, thus, necessitates a synthesis of sustainable infrastructure, rigorous

scientific observation and forward-looking legal initiatives to protect New Delhi's economic and security imperatives in the BoB region.

India's Strategic Stakes in the Bay of Bengal: A Critical Assessment

The BoB holds a pivotal position in New Delhi's maritime strategy, operating concurrently as a conduit to Southeast Asia, a buffer against non-regional naval forces and a hub of strategic resources. [40]Approximately 95 per cent of India's external trade, by volume, and 70 per cent by value, traverses through the Indian Ocean region, emphasising the BoB's significance as both an economic vitality and an essential transit route.[41] For India, maintaining equilibrium in the Bay is thus not just a regional strategic goal but also a foundational aspect of its Indo-Pacific approach.

- **Security and Naval Considerations**

  The Andaman & Nicobar Islands function as India's forward-deployed stronghold, providing geostrategic monitoring of the Malacca Strait, one of the globe's critical maritime chokepoints.[42] However, climate change poses a risk to this strategic leverage. Increasing sea levels, seawater intrusion, and frequent cyclone threatens coastal military facilities, military airstrips and supply chains.[43] These issues may lead New Delhi to reroute naval assets for humanitarian relief or high-maintenance costs, possibly affecting mission readiness. In light of growing Chinese naval presence in the Bob region, these challenges undermine New Delhi's capability to assert influence and maintain deterrence.

- **Geopolitical Vulnerabilities**

  Even though New Delhi has addressed significant disagreements over the maritime boundary with Bangladesh (2014)[44] and Sri Lanka (1974) [45], climate-impacted coastal erosion and altered baselines could reintroduce uncertainties and grey areas; modest shifts in maritime geography can stimulate renewed disputes over fish stocks, energy resources or deep-sea mineral deposits, especially where economic sustenance is immediately impacted. Additionally, the BoB is a ground of growing major-power competition. Beijing's Maritime Silk Road programs, along with Washington's Indo-Pacific approach, overlap with New Delhi's zone of strategic influence. Given the intense competition, climate

change acts as a 'risk amplifier,' heightening ambiguity and increasing the likelihood of resource-induced tensions.

- **Interplay of Law, Climate, and Geopolitics**

  The BoB demonstrates how jurisdictional uncertainties, ecological sensitivity, and geopolitical rivalries intersect. In one respect, international law under UNCLOS doesn't explicitly mention the durability of maritime sovereignty when coastal areas are submerged. On the other hand, climate research anticipates that the BoB will be one of the areas most severely affected by rising sea levels, increased flooding vulnerability, and intense weather events. For New Delhi, this two-fold exposure means that the protection of its EEZ and the reliability of its maritime position are concurrently at risk. The risk extends beyond territorial loss to also include a diminution of strategic position in a zone where non-regional actors are keen to expand their presence.

Policy Recommendations: Strategic Priorities for India

- **Enhancing Climate-Conscious Maritime Domain Awareness (MDA)**

  Considering the evolving and climate-vulnerable ecosystem of the BoB, India should strengthen its maritime domain awareness (MDA) by embedding climate-sensitive intelligence. Space-based monitoring, oceanographic surveys, and dynamic hydrological surveys should be employed to continually monitor coastal erosion zones, riverine deltas, and marine habitats. These capacities not only predict the physical ramifications of environmental change but also give credible proof for securing India’s EEZ rights under UNCLOS. With approximately ninety-five per cent of India's trade passing through the Indian Ocean, strong MDA is crucial for economic stability, strategic operations planning and early detection of climatic or geostrategic upheavals.

- **Strengthening Infrastructure and Building Resilience**

  India’s strategic outposts, especially in the Andaman and Nicobar Islands, face extreme climate threats, including tropical storms, severe weather changes, and a continuous increase in sea levels. Strengthening naval and dual-role facilities through climate-adaptive development, advanced drainage

infrastructure, and ecological rehabilitation, which includes the preservation of mangroves and coral reefs, can help mitigate these risks. Infrastructure fortification ensures that India's strategic bases continue to function during severe circumstances and minimises the diversion of maritime security resources to relief operations, keeping itself prepared amidst expanding regional strategic power contestation.

- **Safeguarding Maritime Resources and Normative-Legal Engagement**

  The BoB region supports New Delhi's economic and geostrategic priorities through its rich maritime resources, including fisheries, hydrocarbons, and deep-sea mineral resources. Therefore, it becomes significant for India to must take an active role in regional dialogue frameworks, such as, IORA, BIMSTEC and IONS, to support resilient blue governance and set the legal standards for baselines asserted by maritime nations to protect both its legal claims and resources. Establishing norms to protect EEZs and maritime rights, as well as mitigating the repercussions of increasing sea-levels, will support in any foreseeing potential from neighbouring countries or external forces. Thus, developing a legal standard of fixed baselines in national legislation, along with effective monitoring, is vital to safeguard India's accessibility and avoid conflicts, thereby protecting the security of its resources.

- **Incorporating Climate Change into Strategic Formulation**

  Climate change should be incorporated into India's maritime doctrine. Undertaking climate resilience evaluations for naval operations, integrating HADR missions into practical implementation, and formulating future resource conflict in critical domains like deep-sea mining or offshore renewable energy are of vital necessity. Forward-looking inclusion of climate risks in long-term planning assures that dangers from climate change do not convert into operational or strategic weaknesses.

Conclusion

The BoB exists at the intersection of climate vulnerabilities, fisheries, and rich oceanic resources, as well as geostrategic priorities for New Delhi. Rising sea levels, tropical cyclones, and coastal erosion present threats to significant infrastructure, sovereignty claims, and naval missions. While UNCLOS serves as the cornerstone for maritime claims, it offers minimal guidance on climate- driven changes, advancing the development of climate-resilient strategies especially important. The Bay of Bengal's geographical and geostrategic significance, from marine resources to projecting naval influence, makes it a region where environmental, legal and security challenges overlap. To safeguard its priorities, India must adopt a holistic approach that integrates climate-resilient MDA, well-structured infrastructure, jurisdictionally established baselines, and Joint regional efforts. India has the potential to transform possible threats into a space by taking regional command, developing norms for adaptive oceanic governance while safeguarding its EEZ and geostrategic advantage in the Bay of Bengal and the broader Indo-Pacific region.

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