



The Blue Economy in Bangladesh: Legal Strategies for Sustainable Coastal Development

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ABSTRACT

The Blue Economy presents transformative opportunities for Bangladesh's coastal development by balancing economic growth with environmental sustainability. As a nation endowed with significant maritime resources, Bangladesh stands at a critical juncture where its legal and institutional frameworks must evolve to unlock this potential responsibly. This article explores the interplay between national laws, international commitments, and policy gaps shaping the country's approach to marine resource management. Through a legal lens, the article analyzes existing frameworks such as the Territorial Waters and Maritime Zones Act, Environment Conservation Act, and Marine Fisheries Ordinance, alongside international obligations under UNCLOS, CBD, and SDGs. Drawing comparative insights from the Philippines, Kenya, and Sri Lanka, this study highlights governance challenges, institutional overlaps, and enforcement shortcomings that hinder Bangladesh's Blue Economy ambitions. Special attention is given to the case of Saint Martin's Island, illustrating the urgent need for marine-specific conservation laws. The article concludes with actionable recommendations for strengthening Bangladesh's legal architecture to ensure equitable, ecologically sound, and economically viable coastal development.

1. Introduction

Bangladesh, located in the northern apex of the Bay of Bengal, possesses vast and diverse marine resources that remain largely underexplored. Following the resolution of its maritime boundary disputes through international tribunals in 2012 and 2014, the country secured sovereign rights over approximately 118,813 square kilometers of maritime space (MOFA, 2015). This development marked a pivotal moment for Bangladesh, creating both opportunities and responsibilities in managing its ocean-based resources. The concept of the Blue Economy has since emerged as a strategic framework to guide this growth, promoting sustainable use of ocean resources for economic development, livelihoods, and ecosystem health (World Bank, 2017).

For a developing, densely populated, and climate-vulnerable country like Bangladesh, the Blue Economy offers an unprecedented chance to diversify the national economy, alleviate poverty, and strengthen resilience.

Coastal Bangladesh, comprising 19 districts and home to over 35 million people, is already a hub for fisheries, shipping, tourism, and offshore energy exploration (Nasreen *et al.*, 2023; Blue Economy in Bangladesh, 2025). Yet, this coastal frontier is equally defined by its ecological fragility, hosting globally significant biodiversity such as the Sundarbans and Saint Martin's Island. Against this backdrop, ensuring sustainable marine resource management has become a national imperative.

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However, the journey toward a sustainable Blue Economy is riddled with legal and institutional challenges. Bangladesh's existing legal frameworks, while comprehensive in some areas, remain fragmented, outdated, and poorly enforced in others. The governance of marine resources is dispersed among multiple ministries, often leading to overlapping mandates and conflicting policy objectives (Rahman *et al.*, 2021). Moreover, emerging Blue Economy sectors like marine biotechnology, offshore renewable energy, and deep-sea mining operate in a legal vacuum, raising concerns about unregulated exploitation and environmental degradation.

This article aims to critically assess Bangladesh's legal preparedness to operationalize the Blue Economy concept, drawing attention to both national legislation and international obligations under treaties such as the United Nations Convention on the Law of the Sea (UNCLOS), the Convention on Biological Diversity (CBD), and the International Maritime Organization (IMO) frameworks. Additionally, the article engages in a comparative analysis of international best practices, particularly the marine governance models of the Philippines, Kenya, and Sri Lanka, offering valuable lessons for Bangladesh.

This study is based on doctrinal legal research conducted between 2023 and 2025, drawing on national legislation, international legal instruments, policy documents, and comparative practices relevant to marine and coastal governance.

Through this analysis, the article identifies gaps and inconsistencies in the current legal regime and proposes strategies to harmonize economic aspirations with ecological integrity and social equity. In doing so, the study underscores the central role of law and governance in transforming Bangladesh's Blue Economy from an aspirational policy narrative into a practical framework for sustainable coastal development.

Understanding the Blue Economy: Concepts and Global Context

The term Blue Economy has gained significant prominence in global policy discourse as coastal nations seek to balance economic development with marine conservation. At its core, the Blue Economy promotes the sustainable use of ocean resources for economic growth, improved livelihoods, social inclusion, and the long-term health of marine ecosystems (World Bank, 2017). Unlike conventional ocean-based economies, which often prioritize resource extraction and industrial use, the Blue Economy model

emphasizes ecological stewardship and equitable resource distribution.

The United Nations first formally introduced the Blue Economy concept at the 2012 Rio+20 Conference, positioning it as an essential component of sustainable development. Since then, the idea has evolved to integrate multiple economic sectors including fisheries, marine transport, coastal tourism, renewable offshore energy, biotechnology, and deep-sea mineral extraction. Importantly, the Blue Economy seeks to extend beyond economic considerations to address environmental protection, community participation, and social equity (United Nations, 2014).

Globally, the Blue Economy is estimated to be worth over USD 1.5 trillion annually, supporting the livelihoods of approximately three billion people, many of whom live in developing coastal states (OECD, 2016). As the global population increases and coastal urbanization accelerates, the sustainable governance of marine resources has become both a development opportunity and an ecological necessity.

From a legal perspective, the Blue Economy concept is deeply rooted in international law, particularly the United Nations Convention on the Law of the Sea (UNCLOS), which establishes the jurisdictional and environmental obligations of states over their maritime zones. Additionally, agreements such as the Convention on Biological Diversity (CBD) and the Paris Agreement on Climate Change further underscore the need for nations to align their marine development strategies with global sustainability objectives.

In practice, the Blue Economy offers a multidimensional approach to marine resource management. It encourages states to look beyond short-term economic gains and instead adopt policies that safeguard marine ecosystems for future generations. This requires the establishment of clear legal rules, enforcement mechanisms, marine spatial planning, and strong institutional collaboration among state and non-state actors.

For Bangladesh, a nation endowed with rich but vulnerable coastal and marine resources, the Blue Economy represents both an economic frontier and a governance challenge. The integration of Blue Economy principles into national law is essential for ensuring that marine resource exploitation does not compromise environmental sustainability or social justice.

As this article will explore, the success of the Blue Economy in Bangladesh will depend heavily on its

ability to develop coherent legal frameworks that reflect both global best practices and local realities.

The legal significance of sustainability in marine resource use.

Sustainability is a foundational principle in both international and national environmental governance, and its relevance is particularly pronounced in the management of marine resources. In the context of the Blue Economy, sustainability ensures that the exploitation of ocean-based resources meets present socio-economic needs without compromising the health, productivity, and biodiversity of marine ecosystems for future generations (World Commission on Environment and Development (WCED, 1987).

Legally, the principle of sustainability is embedded in numerous international instruments, starting with the United Nations Convention on the Law of the Sea (UNCLOS). UNCLOS, often referred to as the "constitution of the oceans," obligates coastal states to ensure the conservation of living marine resources under their jurisdiction (Art. 61-62), and to adopt measures necessary for maintaining or restoring populations of harvested species at levels consistent with their maximum sustainable yield. This legal provision underscores that economic interests must be balanced against ecological limits. Moreover, the Convention on Biological Diversity (CBD) reinforces sustainability through its commitment to the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from genetic resources (Art. 1). For coastal and marine ecosystems, this translates into legally binding obligations for states to develop national strategies, laws, and practices that prevent resource overexploitation and habitat degradation.

Sustainability is a core principle of marine and environmental law, reflected internationally through the Precautionary Principle, which requires preventive action even when scientific certainty is limited. This is particularly important for marine ecosystems due to their complexity. In Bangladesh, laws such as the Environment Conservation Act (1995) and the Biodiversity Act (2017) support sustainability through EIAs and sustainable resource use, but they require better integrated governance to address cumulative and cross-border marine impacts. Sustainability in the Blue Economy also encompasses social justice, ensuring the rights, participation, and benefit-sharing of coastal communities and future generations. Overall, sustainability functions as both a guiding legal norm and a practical standard for balancing economic development with marine ecosystem protection.

Aim and Scope of the Research

The aims of this research are to:

- Examine the existing legal and institutional frameworks governing the Blue Economy in the coastal areas of Bangladesh.
- Assess the effectiveness of national laws in ensuring sustainable and equitable use of marine and coastal resources.
- Analyze the level of alignment between Bangladesh's domestic legal regime and international marine and environmental law obligations.
- Evaluate the legal readiness of Bangladesh to regulate emerging Blue Economy sectors such as offshore energy, coastal tourism, marine biodiversity conservation, and marine spatial planning.

Research and Legal Gaps

This study identifies several key gaps in the current legal and governance framework:

- The absence of a comprehensive and integrated marine legal framework, resulting in fragmented and sector-specific regulation.
- The continued reliance on outdated legislation that does not adequately reflect contemporary environmental risks, technological advancements, or sustainability principles.
- Overlapping mandates and weak coordination among key government institutions involved in marine and coastal governance.
- Limited legal recognition of community participation, stakeholder engagement, and equitable benefit-sharing in Blue Economy initiatives.

Contribution of the Study

This research seeks to address these gaps by:

- Conducting a doctrinal analysis of national legislation in light of international legal obligations, including UNCLOS, the CBD, and relevant IMO conventions.
- Drawing comparative legal insights from selected coastal States to identify best practices applicable to Bangladesh.
- Proposing legal and institutional reforms based on Integrated Coastal Zone Management

(ICZM) and Marine Spatial Planning (MSP) approaches.

- Advancing the case for a unified Marine Act to strengthen governance, improve enforcement, and support a sustainable Blue Economy framework in Bangladesh.

Materials and Methods

This article adopts a qualitative doctrinal research methodology, supplemented by comparative and policy-oriented analysis. The research primarily relies on secondary sources, including national legislation, international legal instruments, policy documents, institutional reports, and peer-reviewed academic literature relevant to marine and coastal governance.

Research Design

The research follows a doctrinal legal research design, focusing on the systematic analysis and interpretation of statutory laws, regulations, and international treaties governing marine and coastal resources in Bangladesh. The study evaluates the coherence, adequacy, and effectiveness of existing legal frameworks in advancing a sustainable Blue Economy.

In addition, a comparative legal approach is employed to examine selected coastal jurisdictions namely the Philippines, Kenya, and Sri Lanka to identify best practices in community-based resource management, integrated coastal governance, and biodiversity protection. The comparative analysis provides contextual insights and reform-oriented lessons applicable to Bangladesh.

Data Sources

The materials used in this study include:

- National laws and regulations, such as the Maritime Zones Act, Environment Conservation Act, Marine Fisheries Ordinance, and Biodiversity Act.
- Draft policies and government strategies relating to the Blue Economy and coastal development.
- International legal instruments, including UNCLOS, the Convention on Biological Diversity (CBD), relevant International Maritime Organization (IMO) conventions, and the Sustainable Development Goals (SDGs).
- Reports from international organizations (e.g., United Nations, World Bank) and governmental agencies.

- Peer-reviewed journal articles and scholarly analyses on marine governance, climate change, and sustainable coastal development.

Analytical Framework

The study applies principles of international environmental law such as sustainability, precaution, ecosystem-based management, and polluter-pays to assess the strengths and weaknesses of Bangladesh's legal framework. Institutional analysis is conducted to evaluate governance structures, overlapping mandates, and enforcement capacity among key ministries and agencies.

Furthermore, the research integrates concepts of Integrated Coastal Zone Management (ICZM) and Marine Spatial Planning (MSP) as normative benchmarks to assess whether existing laws support coordinated and ecosystem-based governance.

Scope and Limitations

The study focuses on the legal and institutional dimensions of the Blue Economy in coastal Bangladesh and does not undertake empirical field surveys or quantitative economic modeling. While the research provides a comprehensive review of relevant laws and policies up to 2025, practical implementation outcomes may evolve over time. Nevertheless, the doctrinal and comparative methodology provides a robust foundation for evaluating legal reform needs and proposing sustainable governance pathways.

Coastal Bangladesh: Economic and Ecological Value

The coastal region of Bangladesh stands as both an economic engine and an ecological stronghold, offering immense potential for national development while presenting significant environmental challenges. Stretching across 19 districts and covering approximately 30% of the country's land area, the coastal zone serves as a critical intersection where human well-being, biodiversity conservation, and national economic growth converge. Understanding this dual significance is fundamental to framing effective legal and policy responses in the context of the Blue Economy.

Ecological Value: Contains mangrove forests, estuaries, tidal wetlands, seagrass beds, and coral ecosystems supporting rich marine biodiversity.

- The Sundarbans provides protection against cyclones and storm surges, while sustaining fisheries and wildlife.

- Saint Martin’s Island hosts rare coral ecosystems critical for ecological balance and fisheries productivity.
- Coastal ecosystems contribute to shoreline stabilization, carbon sequestration, and overall climate resilience.
- Threats include overfishing, pollution, habitat loss, and climate change, necessitating strong legal and governance measures.

Economic Value:

- Supports livelihoods through fisheries, aquaculture, and tourism.
- Contributes significantly to local and national economies.
- Provides ecosystem services essential for food security, disaster risk reduction, and sustainable development.

Coastal Resources and Livelihoods

Bangladesh’s coastal zone supports a diverse range of economic activities that contribute directly to national income, food security, and employment. Millions of people depend on the region’s rich marine and coastal resources, particularly in sectors such as artisanal and industrial fisheries, aquaculture, port and shipping services, salt production, shipbuilding, and coastal tourism (Islam and Ahmad, 2004). Marine fisheries alone provide a critical share of both nutrition and economic subsistence, while the shipping and logistics industries underpin the country’s external trade.

The potential for emerging industries including offshore renewable energy, deep-sea mineral exploration, marine biotechnology, and eco-tourism offers new pathways for sustainable economic diversification under the Blue Economy paradigm. However, these opportunities can only be fully realized through the establishment of robust legal mechanisms that align development objectives with ecosystem stewardship. Without clear regulatory frameworks, unregulated exploitation of these resources may threaten long-term sustainability, eroding both biodiversity and community resilience.

Environmental Vulnerabilities and Policy Urgency

Despite its economic promise, the coastal zone of Bangladesh remains one of the country’s most environmentally vulnerable regions. Characterized by complex ecosystems such as mangrove forests, coral reefs, tidal flats, estuaries, and barrier islands this region is highly sensitive to anthropogenic pressures and the accelerating impacts of climate change. Coastal

erosion, saline intrusion, habitat degradation, unsustainable fishing, and marine pollution are only a few of the pressing challenges undermining the ecological integrity of these areas (Hossain *et al.*, 2020).

The consequences of unchecked environmental degradation are severe, not only for biodiversity but also for the human populations whose food security and livelihoods depend on healthy marine ecosystems. The loss of critical habitats such as mangroves or coral reefs reduces the natural protection against storm surges, weakens fisheries productivity, and increases socio-economic vulnerability among coastal communities.

This convergence of economic importance and ecological fragility creates a compelling case for legal and policy reform. There is an urgent need to move beyond fragmented regulatory approaches toward integrated coastal zone management, marine spatial planning, and legally enforceable environmental safeguards. Strengthening the institutional and legal frameworks governing coastal resource use will be central to ensuring that economic development within the Blue Economy does not come at the expense of long-term ecological stability.

In this context, Bangladesh’s ability to implement effective governance systems, adopt precautionary legal principles, and align national frameworks with international environmental standards will determine whether its Blue Economy aspirations evolve as a model of sustainable development or become another chapter in resource depletion and ecological loss.

Legal Framework for Marine and Coastal Governance

The governance of marine and coastal resources in Bangladesh is shaped by a combination of national legislation and international legal obligations, designed to regulate economic activities, safeguard ecological integrity, and align the country’s maritime ambitions with global environmental standards. An effective legal framework is essential for managing the complex interactions between human activities and marine ecosystems, especially in the context of the Blue Economy, where sustainable use of ocean resources must be balanced with long-term environmental protection.

National Legal Instruments

Bangladesh has developed an evolving body of national laws and regulations that provide the backbone for marine and coastal governance. These instruments collectively aim to define jurisdictional boundaries,

regulate resource exploitation, and ensure environmental conservation, although the need for more integrated and coordinated implementation remains a persistent challenge.

The Maritime Zones Act (2019): This act defines Bangladesh's sovereign rights over its internal waters, territorial sea, exclusive economic zone (EEZ), and continental shelf, following the principles of the United Nations Convention on the Law of the Sea (UNCLOS). The act forms the legal foundation for asserting jurisdiction over marine resources and activities in the country's maritime territory, including fishing, mineral exploration, and energy development.

The Bangladesh Environment Conservation Act (1995): One of the key environmental statutes, this act empowers authorities to declare Ecologically Critical Areas (ECAs), impose environmental clearance requirements, and regulate pollution. Its provisions apply to coastal and marine zones, supporting biodiversity conservation and pollution control in marine ecosystems.

The Marine Fisheries Ordinance (1983): This ordinance provides the legal structure for the regulation, conservation, and management of marine fisheries within Bangladesh's territorial waters. It addresses licensing, vessel registration, gear restrictions, and the protection of fish stocks against overexploitation, while promoting sustainable fishing practices.

The Bangladesh Biodiversity Act (2017): This act seeks to implement the principles of the Convention on Biological Diversity (CBD) at the national level, offering legal protection for biological diversity, including marine genetic resources. It promotes conservation, sustainable use, and equitable benefit-sharing arising from biodiversity use, particularly important for coastal and marine habitats.

Draft Blue Economy Policy: Currently under development, this policy is expected to provide a strategic framework for the sustainable exploitation of ocean resources in a manner that integrates environmental protection with economic development. The draft policy envisions a cross-sectoral approach to marine governance, aligned with international best practices. Despite the existence of these instruments, challenges persist in enforcement, harmonization, and the incorporation of adaptive management practices, especially in light of emerging Blue Economy activities and accelerating climate change impacts.

International Legal Obligations

Bangladesh is also party to a number of international treaties, conventions, and frameworks that shape its

responsibilities and rights in marine and coastal governance. These global instruments complement national legislation by embedding principles of sustainability, environmental protection, and international cooperation into the country's legal system.

United Nations Convention on the Law of the Sea (UNCLOS, 1982): Often referred to as the "Constitution of the Oceans," UNCLOS defines the legal framework for maritime zones, navigational rights, and resource sovereignty. It obliges Bangladesh to manage its marine resources responsibly and to protect the marine environment.

Convention on Biological Diversity (CBD, 1992): The CBD commits Bangladesh to conserve biological diversity, sustainably use its components, and share the benefits of genetic resources equitably. This includes protecting marine and coastal biodiversity and integrating ecosystem-based approaches into governance.

International Maritime Organization (IMO) Conventions: Bangladesh, as a member of the IMO, is bound by several conventions related to marine pollution prevention, maritime safety, and the regulation of shipping activities, including the MARPOL Convention (Prevention of Pollution from Ships) and the Ballast Water Management Convention.

Sustainable Development Goals (SDGs): Particularly relevant is Goal 14; Life Below Water, which calls for the conservation and sustainable use of oceans, seas, and marine resources. Bangladesh's commitments under the SDGs reinforce the need for integrated legal and policy measures for marine governance.

Together, these national and international legal instruments provide the structural framework necessary for Bangladesh to pursue sustainable coastal development and a responsible Blue Economy. However, successful implementation depends on effective coordination across legal, institutional, and governance domains and the capacity to adapt to evolving ecological, technological, and economic realities.

Comparative Legal Insights

Examining the legal and institutional frameworks of other coastal nations provides valuable perspectives for strengthening Bangladesh's approach to marine governance and the Blue Economy. Countries such as the Philippines, Kenya, and Sri Lanka offer instructive examples of how tailored legal tools, community engagement, and ecosystem-based management can

support sustainable development in coastal and marine environments.

The Philippines: Community-Based Resource Management and Marine Protected Areas

The Philippines, as a maritime nation with rich marine biodiversity, has pioneered several legal and institutional approaches that empower local communities in marine conservation. The Philippine Fisheries Code (1998) mandates community participation through mechanisms such as co-management and local government oversight of coastal resources. Additionally, the country has established an extensive network of Marine Protected Areas (MPAs), backed by both national legislation and local ordinances, which are designed to balance biodiversity protection with the sustainable use of fisheries and coastal resources.

This decentralized, community-based legal framework has proven effective in fostering stewardship, reducing conflicts over marine resources, and improving ecological resilience offering potential lessons for Bangladesh in promoting local governance of marine ecosystems.

Kenya: Integrated Coastal Zone Management and Blue Economy Law

Kenya has adopted a comprehensive Integrated Coastal Zone Management (ICZM) framework, which is supported by a combination of sectoral policies, national legislation, and regional cooperation under the

Nairobi Convention. The framework promotes harmonized planning and regulation of coastal resources across various sectors, including fisheries, tourism, port development, and conservation.

In addition, Kenya has introduced national strategies to integrate the Blue Economy into its long-term economic planning. These strategies emphasize sustainable ocean governance, inclusive economic growth, and environmental protection illustrating the value of legal integration and cross-sectoral coordination, which remains a pressing challenge for Bangladesh’s own Blue Economy agenda.

Sri Lanka: Coastal Resource Governance and Biodiversity Protection

Sri Lanka’s legal system provides another valuable point of reference, particularly in balancing development with biodiversity conservation in coastal zones. The Coast Conservation and Coastal Resource Management Act (1981, amended 2011) sets out a clear framework for the regulation of coastal development activities and designates protected coastal buffer zones to minimize ecosystem disruption.

Additionally, Sri Lanka has aligned its national biodiversity strategy with global commitments under the Convention on Biological Diversity (CBD), placing legal emphasis on the protection of sensitive habitats, including coral reefs, mangroves, and seagrass beds all of which are highly relevant to the context of coastal Bangladesh.

Table 1. Comparative Legal Frameworks for Blue Economy: Philippines, Kenya, Sri Lanka

Country	Key Legal Instruments and Policies	Governance Approach / Institutions	Key Focus Areas for Blue Economy	Lessons for Bangladesh
Philippines	Philippine Fisheries Code (1998), Local Government Code, MPA ordinances	Community-based management, LGU-led Marine Protected Areas (MPAs)	Fisheries sustainability, community participation, biodiversity protection	Empower local communities in resource management; strengthen MPAs
Kenya	Integrated Coastal Zone Management (ICZM) Policy, Blue Economy Strategy	Centralized coordination with sectoral integration, regional cooperation	Multi-sectoral planning: fisheries, tourism, ports, conservation	Adopt ICZM approach; enhance cross-sector coordination and planning
Sri Lanka	Coast Conservation and Coastal Resource Management Act (1981, amended 2011), Biodiversity Strategy	Regulatory oversight through central authority with buffer zones	Coastal development regulation, habitat protection, biodiversity conservation	Strengthen ecosystem protection, establish clear coastal buffer zones and legal safeguards

Source: Compiled from Islam and Bhuiyan (2018), Rahman and Mahmud (2019), Khan and Haque (2020), and comparative analysis of national legislation.

Lessons for Bangladesh

The experiences of the Philippines, Kenya, and Sri Lanka highlight several critical legal insights for Bangladesh's evolving marine governance strategy:

Decentralization and Community Engagement: Empowering local communities in resource management enhances compliance and ecological stewardship, as demonstrated in the Philippines' MPA model.

Integrated Legal and Policy Frameworks: Kenya's ICZM experience underlines the importance of cross-sectoral coordination for avoiding fragmented marine governance.

Strong Biodiversity Safeguards: Sri Lanka's regulatory emphasis on coastal ecosystem protection illustrates how legal clarity can reconcile development pressures with conservation needs.

Incorporating these lessons into Bangladesh's legal and policy frameworks could enhance the country's capacity to ensure sustainable use of marine resources, strengthen ecosystem resilience, and realize the full potential of its Blue Economy vision.

Institutional Roles and Governance Models

Effective governance of Bangladesh's marine and coastal resources depends not only on strong legal frameworks but also on well-coordinated institutional structures. However, the existing institutional landscape often suffers from fragmented mandates and overlapping jurisdiction, creating regulatory gaps and inefficiencies that hinder the implementation of a sustainable Blue Economy.

Key Agencies and Overlapping Mandates

In Bangladesh, several government ministries and agencies share responsibility for marine and coastal management, often with intersecting and sometimes conflicting mandates:

- Ministry of Environment, Forest and Climate Change (MoEFCC) tasked with biodiversity conservation, marine ecosystem protection, and climate adaptation.
- Ministry of Fisheries and Livestock (MoFL) oversees marine fisheries management, licensing, and enforcement under the Marine Fisheries Ordinance.

- Ministry of Shipping (MoS) responsible for port development, maritime safety, and shipping regulations.
- Bangladesh Navy and Coast Guard enforce maritime sovereignty, security, and fisheries protection.
- Ministry of Power, Energy and Mineral Resources (MoPEMR) administers offshore energy exploration and exploitation.
- Ministry of Land and Local Government authorities regulate land use, including coastal land and estuarine areas.

This multi-agency approach, without a unified coordination mechanism, often results in regulatory overlap, inconsistent enforcement, and policy conflicts particularly at the intersection of economic development and ecological protection.

The Need for Integrated Governance: ICZM and MSP

The complex nature of marine and coastal ecosystems demands an integrated governance approach rather than sector-specific regulation. Models such as Integrated Coastal Zone Management (ICZM) and Marine Spatial Planning (MSP) provide internationally recognized pathways for ensuring coordinated and sustainable use of marine resources.

The successful realization of the Blue Economy in coastal Bangladesh depends heavily on the coordinated actions of multiple government agencies. Among these, the Ministry of Fisheries and Livestock (MoFL), the Ministry of Shipping (MoS), and the Ministry of Power, Energy and Mineral Resources (MoPEMR) play particularly significant roles. While each ministry contributes to specific sectors of the Blue Economy, overlapping mandates and fragmented legal authority often limit policy coherence and effectiveness.

Ministry of Fisheries and Livestock (MoFL)

The Ministry of Fisheries and Livestock is the primary authority responsible for the governance, conservation, and sustainable exploitation of marine living resources. Its mandate covers marine fisheries management, licensing, conservation measures, and livelihood protection for fishing communities under instruments such as the Marine Fisheries Ordinance, 1983 and related rules.

From a Blue Economy perspective, MoFL's contribution is central to ensuring food security, employment generation, and export earnings,

particularly through capture fisheries and mariculture. The ministry has introduced seasonal fishing bans, gear restrictions, and hilsa conservation programs, which reflect sustainability principles embedded in international fisheries law. However, legal challenges persist due to outdated regulatory frameworks, limited monitoring capacity within the Exclusive Economic Zone (EEZ), and insufficient incorporation of ecosystem-based fisheries management. Strengthening MoFL's legal authority and aligning fisheries governance with marine spatial planning would significantly enhance its contribution to a sustainable Blue Economy.

Ministry of Shipping (MoS)

The Ministry of Shipping plays a crucial role in advancing the maritime transport, port development, and shipping components of the Blue Economy. As the authority responsible for seaports, inland waterways, ship registration, and maritime safety, the MoS directly influences Bangladesh's position as a maritime trading nation in the Bay of Bengal.

Legally, the ministry operates within the framework of international maritime conventions adopted under the International Maritime Organization (IMO), including MARPOL and SOLAS, which aim to ensure navigational safety and prevent marine pollution. The expansion and modernization of ports such as Chattogram, Mongla, and Payra demonstrate MoS's contribution to Blue Economy growth through trade facilitation and logistics development. Nevertheless, port expansion and increased shipping activities pose environmental risks, highlighting the need for stronger environmental impact assessment requirements and coordination with environmental authorities. Integrating shipping governance with coastal and marine environmental law remains a critical legal necessity.

Ministry of Power, Energy and Mineral Resources (MoPEMR)

The Ministry of Power, Energy and Mineral Resources contributes to the Blue Economy through offshore energy exploration, including natural gas, oil, and emerging renewable energy sectors such as offshore wind and tidal energy. Its mandate aligns with Bangladesh's economic development objectives and long-term energy security goals.

From a legal standpoint, MoPEMR's activities intersect with maritime jurisdiction under the Maritime Zones Act and international obligations under UNCLOS relating to continental shelf resource exploitation and environmental protection. While offshore energy exploration presents substantial economic

opportunities, Bangladesh currently lacks a comprehensive legal framework governing environmental safeguards, liability, and decommissioning of offshore installations. The absence of sector-specific marine energy regulations raises concerns regarding environmental risks, marine biodiversity protection, and disaster preparedness. Strengthening legal oversight and harmonizing energy laws with marine environmental governance are essential to ensure that offshore resource development aligns with Blue Economy sustainability principles.

Need for Inter-Ministerial Coordination

Although MoFL, MoS, and MoPEMR each make vital contributions to the Blue Economy, their effectiveness is constrained by fragmented governance and overlapping jurisdictions. The absence of a centralized coordinating authority or comprehensive marine governance law often results in policy conflicts and regulatory gaps. An integrated governance framework supported by Marine Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM) would enable these ministries to operate within clearly defined legal boundaries while pursuing shared sustainability objectives.

In conclusion, strengthening institutional coordination, updating sector-specific legislation, and embedding environmental and social safeguards across all relevant ministries are critical steps toward realizing a legally sound and sustainable Blue Economy in Bangladesh.

- ICZM promotes collaboration across agencies, stakeholders, and levels of government, ensuring that coastal development and conservation goals are balanced.
- MSP offers a scientific and legal framework to map and allocate ocean space for different uses (e.g., fishing, tourism, shipping, conservation) to reduce conflict and optimize sustainable exploitation.

Adopting these integrated governance models in Bangladesh would help bridge existing institutional silos and enable a more coherent response to the challenges of climate change, biodiversity loss, and Blue Economy expansion.

Suggestions for Reform

To strengthen the governance of marine and coastal zones in Bangladesh, the following reforms are recommended:

1. Establish a Central Marine and Coastal Authority: Create an umbrella institution to

coordinate policies and enforcement across sectors, ensuring alignment of environmental, economic, and security interests.

2. **Legally Mandate Integrated Planning Mechanisms:** Enact legislation that formalizes the ICZM and MSP frameworks, defining clear roles for agencies and establishing dispute-resolution and cooperation procedures.
3. **Enhance Stakeholder Engagement:** Institutionalize local community participation and industry consultation in the planning and management of marine resources, following successful international examples.
4. **Capacity Building and Data Sharing:** Strengthen institutional capacity for marine spatial data collection, monitoring, and enforcement, with a focus on transparent inter-agency collaboration.

Implementing these reforms would help address institutional fragmentation, reduce conflicts over resource allocation, and advance Bangladesh's vision for a sustainable and legally resilient Blue Economy.

Legal Challenges and Gaps

Despite the significant economic potential of Bangladesh's Blue Economy, the country's legal and regulatory frameworks face a range of structural and operational challenges. These gaps hinder sustainable development, undermine environmental protection, and leave new sectors underregulated.

Outdated Laws and Enforcement Weakness

Many of Bangladesh's primary legal instruments for marine and coastal governance were developed in response to older economic and environmental realities. Laws such as the Marine Fisheries Ordinance (1983) and the Bangladesh Environment Conservation Act (1995), though foundational, lack the scope and precision to address modern sustainability challenges, such as ecosystem-based management, blue carbon conservation, or marine renewable energy regulation.

Moreover, enforcement remains a persistent weakness, due to limited institutional capacity, resource shortages, jurisdictional conflicts, and corruption. As a result, illegal fishing, unregulated tourism, and environmentally harmful practices continue to undermine both ecological health and economic opportunity.

Underregulation of Emerging Blue Economy Sectors

The growth of emerging sectors such as offshore renewable energy, deep-sea mining, biotechnology, and

sustainable coastal tourism has outpaced the development of tailored legal frameworks in Bangladesh. Current laws often fail to cover key aspects of these industries, including environmental safeguards, corporate accountability, benefit-sharing mechanisms, and adaptive licensing procedures.

This legal vacuum leaves ecosystems vulnerable to overexploitation and social systems exposed to inequitable development, particularly in the absence of robust environmental and social impact assessments.

Lack of Community Participation

Another critical gap is the absence of strong legal provisions mandating community participation in marine and coastal governance. Local fishing communities, coastal residents, and indigenous knowledge holders are often sidelined in policy design and enforcement processes, even though their lives and livelihoods are directly affected.

Globally, community-based management and stakeholder inclusion have proven essential for achieving compliance, fostering stewardship, and improving the effectiveness of conservation policies. Bangladesh's legal framework needs clearer pathways for embedding participatory governance at all levels.

Climate Change and the Blue Economy

The impacts of climate change present one of the greatest threats to coastal and marine ecosystems, especially for low-lying deltaic countries like Bangladesh. Rising sea levels, coastal erosion, ocean acidification, and increasing frequency of extreme weather events not only endanger biodiversity but also jeopardize the economic viability of marine sectors that are central to the Blue Economy.

Coastal Vulnerability Under International Climate Law

Bangladesh's coastal regions are particularly vulnerable to the adverse effects of climate change, which amplifies existing socio-economic risks and ecological stresses. Under the framework of international climate law notably the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement Bangladesh is recognized as a climate-vulnerable country entitled to international support for adaptation and resilience-building.

Additionally, climate-related risks are closely linked to the sustainable use of marine resources, as outlined in UNCLOS (Art. 192) and the Convention on Biological Diversity (CBD), both of which emphasize state obligations to preserve and protect marine

environments against anthropogenic threats, including those driven by climate change.

Legal Tools for Resilience and Adaptation

The effective integration of climate change considerations into Blue Economy strategies requires a coherent set of legal and policy instruments. These may include:

1. Climate-Smart Marine Spatial Planning (MSP): Developing legally binding spatial plans that account for sea-level rise projections, critical habitats, and vulnerable coastal communities.
2. Ecosystem-Based Adaptation (EbA): Embedding the protection of natural buffers such as mangroves, salt marshes, and coral reefs into law to reduce coastal vulnerability.
3. Disaster Risk Reduction (DRR) Legislation: Strengthening national laws to mandate climate risk assessments and resilience strategies for coastal infrastructure and marine industries.
4. Adaptive Governance Mechanisms: Enabling laws and policies to evolve in response to new climate science and emerging risks through periodic review and flexible regulation.

Climate change poses significant risks to the Blue Economy in Bangladesh, particularly given the country's low-lying deltaic geography and dense coastal population. Rising sea levels, increased frequency and intensity of cyclones, ocean acidification, saline intrusion, and coastal erosion threaten both marine ecosystems and the economic activities that depend on them. Fisheries, aquaculture, coastal tourism, and port infrastructure are highly vulnerable, jeopardizing livelihoods, food security, and national revenue.

The Blue Economy, which aims to sustainably harness marine resources for economic growth, is thus directly affected by these environmental stresses. Unsustainable exploitation of resources under climate pressure can accelerate biodiversity loss, degrade ecosystems, and reduce long-term economic returns. For example, coral bleaching and mangrove loss diminish fish habitats, undermining fisheries productivity, while erosion and saline intrusion compromise aquaculture and agriculture in coastal zones.

Legal and Policy Measures for Restoration and Resilience

Restoring coastal ecosystems and building resilience within the Blue Economy requires integrated legal and policy frameworks:

- Ecosystem-Based Adaptation (EBA): Protecting and restoring mangroves, tidal wetlands, seagrass beds, and coral reefs to buffer communities from storms, maintain biodiversity, and enhance carbon sequestration.
- Marine Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM): Allocating space for conservation, fisheries, tourism, and energy sectors while minimizing conflicts and ecosystem degradation.
- Climate-Smart Legal Instruments: Updating laws to include resilience criteria, enforce environmental impact assessments (EIAs), and mandate sustainable practices in emerging Blue Economy sectors.
- Community Engagement: Involving local populations in ecosystem restoration programs, such as mangrove planting, reef rehabilitation, and sustainable fishing practices, to ensure compliance and long-term stewardship.
- Monitoring and Adaptive Management: Establishing legal mechanisms for continuous monitoring of ecological health, fisheries stocks, and climate impacts, allowing adaptive responses to changing conditions.

By embedding these strategies within national and local legal frameworks, Bangladesh can enhance biodiversity conservation, support coastal livelihoods, and promote a resilient Blue Economy in the face of climate change.

Aligning marine governance with international climate commitments will further strengthen the protection of coastal ecosystems and ensure the long-term sustainability of the Blue Economy.

Toward Legal Reform for a Sustainable Blue Economy

For Bangladesh to fully realize the potential of the Blue Economy while safeguarding its coastal and marine ecosystems, a strong and adaptive legal framework is essential. Existing laws offer only fragmented protection and lack the coherence and capacity to address emerging marine industries, climate risks, and ecosystem conservation. A comprehensive legal reform agenda is therefore urgently needed.

Proposal for a Comprehensive Marine Act

One of the most significant steps toward modernizing Bangladesh's marine governance would be the

introduction of a dedicated Marine Act. Such legislation should provide a unified legal basis for the management of all marine and coastal activities, integrating principles of sustainable use, ecosystem protection, and equitable benefit-sharing. The Act could incorporate modern tools such as Marine Spatial Planning (MSP), Integrated Coastal Zone Management (ICZM), and adaptive governance provisions to respond to changing ecological conditions.

Strengthening Enforcement and Stakeholder Rights

Reform must also address chronic weaknesses in enforcement and the marginalization of local communities in decision-making. Strengthening institutional capacity, clarifying jurisdictional overlaps, and ensuring stricter penalties for illegal exploitation of marine resources are vital for effective governance. Equally important is embedding community rights and participation in the legal framework, ensuring that coastal populations who are often the first to bear the burden of ecological decline have a meaningful role in marine planning and resource stewardship.

Aligning National Laws with International Best Practices

Bangladesh's legal framework should also be better harmonized with its international commitments under UNCLOS, the CBD, IMO Conventions, and the Sustainable Development Goals (SDGs). Legal reform must reflect evolving global standards on biodiversity protection, responsible marine resource management, climate resilience, and blue growth. Adopting a rights-based, ecosystem-centered approach, as demonstrated by comparative best practices from countries like the Philippines, Kenya, and Sri Lanka, will allow Bangladesh to navigate the complex relationship between development and conservation more effectively.

Findings: Role of Legal Reform in Advancing a Sustainable Blue Economy

The study reveals several critical findings regarding the legal and institutional requirements for a sustainable Blue Economy in Bangladesh:

1. Legal Fragmentation Limits Effectiveness

Current marine and coastal governance is governed by multiple sector-specific laws, including the Maritime Zones Act, Marine Fisheries Ordinance, Environment Conservation Act, and Biodiversity Act. While each law addresses specific aspects of marine use, the lack of an overarching legal

framework results in overlaps, inconsistencies, and enforcement challenges. Legal reform is therefore essential to create a unified and coherent regulatory system.

2. Emerging Blue Economy Sectors Are Underregulated

Sectors such as offshore renewable energy, marine biotechnology, and sustainable coastal tourism are either inadequately covered or entirely absent in the current legal framework. Without updated laws, these sectors risk unsustainable exploitation of resources and environmental degradation.

3. Legal Reform Can Strengthen Environmental Protection

Integrating ecosystem-based management, Marine Spatial Planning (MSP), and Integrated Coastal Zone Management (ICZM) into national law can ensure that resource use aligns with conservation objectives. A dedicated Marine Act can codify these approaches and provide clear guidelines for sustainable development.

4. Enforcement and Compliance Are Key Bottlenecks

Weak institutional capacity, limited monitoring tools, and overlapping mandates among agencies (e.g., MoFL, MoS, MoPEMR) hinder effective enforcement. Legal reform can define agency responsibilities clearly, strengthen compliance mechanisms, and introduce accountability measures for violations.

5. Community Participation Enhances Sustainability

Coastal communities are currently marginalized in decision-making, despite being primary stakeholders. Legal reform that embeds participatory governance, rights to resource access, and benefit-sharing mechanisms can improve compliance and promote social equity in the Blue Economy.

6. Alignment with International Best Practices Is Critical

Incorporating international obligations UNCLOS, CBD, IMO conventions, and SDGs into domestic law ensures that Bangladesh's

Blue Economy remains sustainable, legally compliant, and globally credible.

Overall Finding:

Legal reform is not merely procedural; it is a foundational tool that can harmonize economic development, environmental protection, and social equity. A modernized, integrated legal framework will provide clarity, strengthen enforcement, enable emerging sectors to develop sustainably, and ensure that Bangladesh's Blue Economy can thrive in the long term while safeguarding coastal ecosystems and livelihoods.

A modernized and coherent legal framework will not only strengthen marine governance but also enhance Bangladesh's global standing as a responsible steward of the ocean and ensure the long-term sustainability of its Blue Economy.

Discussion: Legal Coherence, Sustainability, and Governance Reform in Bangladesh's Blue Economy

The analysis of Bangladesh's marine and coastal governance framework reveals a structural tension between economic ambition and legal preparedness. While the Blue Economy has been embraced as a national development priority (World Bank, 2018), the legal architecture underpinning marine resource governance remains fragmented, sector-driven, and only partially aligned with sustainability principles (Rahman and Mahmud, 2019). This disjunction raises fundamental questions about the capacity of existing laws to regulate expanding maritime activities in an ecologically vulnerable and climate-sensitive context.

Fragmented Governance and the Limits of Sectoral Regulation

One of the most significant findings of this study is the persistence of sectoral governance. Fisheries, shipping, energy exploration, environmental protection, and biodiversity conservation are regulated under separate statutes, including the Maritime Zones Act, the Marine Fisheries Ordinance, and the Environment Conservation Act. Although each instrument addresses specific aspects of marine use, there is no overarching legislative framework ensuring coherence across sectors (Rahman and Mahmud, 2019).

Marine ecosystems are inherently interconnected, and decisions in offshore energy, port expansion, or fisheries management inevitably affect biodiversity and coastal resilience (Islam and Shamsuddoha, 2018). Without an integrated legal structure such as a comprehensive Marine Act Bangladesh risks managing interconnected systems through regulatory silos.

Marine Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM) offer governance models capable of addressing this fragmentation. MSP, in particular, has been identified as a viable approach for aligning economic development with environmental sustainability in Bangladesh (Khan and Haque, 2020). However, these approaches remain policy-oriented rather than fully embedded within binding legislation.

Sustainability as a Legal Normative Imperative

The Blue Economy discourse often emphasizes economic growth and resource exploitation. However, sustainability must operate as a binding legal norm rather than a policy aspiration. Bangladesh's obligations under the United Nations Convention on the Law of the Sea (UNCLOS) require the protection and preservation of the marine environment (Secretariat of UNCLOS, 1982). Similarly, the Convention on Biological Diversity mandates conservation and sustainable use of biological resources (Convention on Biological Diversity, 1992).

The precautionary principle and ecosystem-based management are increasingly recognized as core elements of marine governance (Islam and Shamsuddoha, 2018). In the absence of rigorous environmental impact assessments and enforceable conservation standards under the Environment Conservation Act, economic expansion may generate cumulative ecological harm. Given Bangladesh's fragile coastal ecosystems, legal permissiveness toward high-risk marine activities could undermine long-term Blue Economy objectives.

Therefore, sustainability principles must be codified through enforceable standards within domestic legislation, aligning national law with global commitments under the Sustainable Development Goals (United Nations, 2015).

Comparative Insights and Contextual Adaptation

Comparative experiences provide valuable lessons. The Philippines demonstrates the effectiveness of community-based marine protected areas in promoting participatory fisheries governance (Islam and Bhuiyan, 2018). Kenya's ICZM framework illustrates how multi-sectoral coordination can support sustainable coastal planning, while Sri Lanka's coastal regulatory regime emphasizes zoning and habitat protection.

However, comparative models require contextual adaptation. Bangladesh's deltaic geography, high population density, and climate vulnerability create governance conditions distinct from other coastal states. While community-based governance may enhance

compliance and stewardship, institutional capacity and regulatory oversight must be strengthened to ensure accountability (Rahman and Mahmud, 2019).

Thus, comparative insights underscore the need for integrated planning, legal clarity, and stakeholder participation rather than wholesale replication of foreign models.

Climate Vulnerability and the Blue Economy Nexus

Climate change intensifies the urgency of reform. Bangladesh is among the most climate-vulnerable countries globally, facing sea-level rise, saline intrusion, and intensified cyclones (Government of Bangladesh, 2018). These impacts directly threaten fisheries productivity, aquaculture, tourism, and port infrastructure core components of the Blue Economy (World Bank, 2018).

Ecosystem-based adaptation, particularly mangrove conservation and coastal wetland restoration, offers both climate mitigation and economic benefits (Islam and Shamsuddoha, 2018). Yet current legal frameworks insufficiently integrate climate resilience into marine planning. Aligning domestic marine governance with international climate and sustainability commitments under the SDGs strengthens the normative basis for resilience-oriented legislation (United Nations, 2015).

Mandatory climate risk assessments, stronger environmental compliance mechanisms, and adaptive governance structures are therefore essential to ensure that economic expansion does not exacerbate ecological vulnerability.

Structural Reform and Institutional Accountability

A recurring theme across the analysis is the necessity of structural legal reform. Policy strategies such as the Blue Economy roadmap (World Bank, 2018) provide direction but lack binding enforceability. A consolidated Marine Act could harmonize sectoral legislation, clarify institutional mandates, and codify sustainability principles.

Overlapping responsibilities among ministries such as fisheries, shipping, and energy create coordination deficits (Rahman and Mahmud, 2019). Establishing a centralized ocean governance coordination mechanism would enhance transparency and accountability. Furthermore, embedding public participation and judicial review mechanisms within marine legislation would strengthen democratic legitimacy and compliance.

Toward a Coherent Legal Future

The sustainability of Bangladesh's Blue Economy ultimately depends on legal coherence, institutional capacity, and ecological foresight. Economic development without regulatory integration risks undermining biodiversity, climate resilience, and social equity. Conversely, harmonizing domestic legislation with international legal standards including UNCLOS, CBD, and the SDGs can transform the Blue Economy into a framework for sustainable coastal development (Convention on Biological Diversity, 1992; Secretariat of UNCLOS, 1982; United Nations, 2015).

Legal reform is therefore not peripheral but foundational. By embedding sustainability, resilience, and institutional coordination within a unified legislative structure, Bangladesh can reconcile economic ambition with environmental stewardship and ensure the long-term viability of its coastal and marine resources.

Conclusion and Policy Recommendations

The promise of the Blue Economy offers Bangladesh a transformative pathway toward economic growth, social development, and environmental stewardship. However, realizing this potential depends fundamentally on the strength, coherence, and forward-looking nature of the country's legal and institutional frameworks for marine and coastal governance.

This paper has highlighted the critical role that law plays in balancing economic exploitation with ecosystem preservation. While Bangladesh has made strides in defining its maritime boundaries and enacting several important pieces of environmental legislation, significant gaps remain particularly in integrating sustainability principles into all stages of marine resource planning, use, and conservation.

To chart a path toward a resilient and equitable Blue Economy, the following policy priorities are recommended:

Enact a Comprehensive Marine Act

Bangladesh urgently needs a modern, unified legal framework that consolidates fragmented marine and coastal regulations, addresses emerging sectors, and enforces ecosystem-based management through tools like Marine Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM).

Strengthen Enforcement Mechanisms

Laws and policies must be supported by robust enforcement infrastructure, clear institutional mandates,

and improved coordination across agencies to tackle illegal, unregulated, and harmful activities at sea.

Promote Community Participation and Stakeholder Rights

Legal reform should empower coastal communities through inclusive governance mechanisms, ensuring their participation in planning, decision-making, and benefit-sharing, which are essential for sustainable marine resource management.

Align National Frameworks with Global Best Practices

Bangladesh must harmonize its domestic laws with international legal instruments such as the United Nations Convention on the Law of the Sea (UNCLOS), the Convention on Biological Diversity (CBD), International Maritime Organization (IMO) regulations, and the Sustainable Development Goals (SDGs).

Incorporate Climate Resilience and Adaptive Management

Future legal and policy strategies must recognize the growing risks of climate change and embed resilience, adaptation, and ecosystem-based responses into marine governance systems.

A legally sound and future-proof governance model will ensure that Bangladesh's coastal and marine ecosystems can continue to provide for the nation's prosperity while protecting biodiversity, enhancing climate resilience, and securing the well-being of current and future generations.

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