

Blue Economy for Sustainable Development in Bangladesh: Empirical Insights, Sectoral Contributions, and Policy Pathways

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Abstract

The blue economy has gained prominence as a development paradigm that integrates economic growth with the sustainable use of ocean and coastal resources. For Bangladesh, a lower-middle-income coastal country with a vast maritime jurisdiction in the Bay of Bengal, the blue economy represents both an opportunity and a necessity for achieving Sustainable Development Goal 14 (Life Below Water). Unlike much of the existing literature that remains largely conceptual, this article draws on secondary quantitative data, sectoral statistics, and documented indicators to empirically assess the contribution of the blue economy to Bangladesh's economy. Using gross value added (GVA), employment shares, export earnings, and sectoral composition data, the study analyzes fisheries and aquaculture, maritime trade and shipping, tourism, energy, and emerging marine industries. The findings show that the marine economy contributes approximately 3.3% of national GVA, supports millions of livelihoods, and underpins nearly 90% of external trade, yet remains constrained by governance fragmentation, technological gaps, and climate vulnerability. The article argues that evidence-based policy, integrated marine spatial planning, and ecosystem-based management are essential to transform Bangladesh's blue economy into a driver of sustainable and inclusive development.

Keywords: *Blue economy; Sustainable development; SDG 14; Marine economy; Bangladesh; Bay of Bengal*

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1. Introduction

The increasing pressure on land-based resources, combined with climate change and rapid population growth, has renewed global attention on oceans as a frontier for sustainable development. The concept of the blue economy, first articulated by Pauli (2010) and later mainstreamed through the Rio+20 Conference, emphasizes the sustainable use of marine and coastal resources to promote economic growth, social inclusion, and environmental integrity. Oceans already account for nearly 70% of the Earth's surface and facilitate around 90% of global trade by volume, making them central to the contemporary global economy. For Bangladesh, the relevance of the blue economy is particularly pronounced. The country possesses a 710 km coastline and sovereign rights over an Exclusive Economic Zone (EEZ) of 200 nautical miles in the Bay of Bengal, following the resolution of maritime boundary disputes with Myanmar (2012) and India (2014). These legal settlements expanded Bangladesh's access to marine living and non-living resources across approximately 118,813 square kilometers. Despite this strategic advantage, Bangladesh's marine resources remain underutilized, and their contribution to long-term sustainable development is far from optimal. This article seeks to bridge the gap between conceptual discussions and empirical evidence by incorporating

sectoral data, tables, and figures derived from existing national and international sources. It evaluates how the blue economy currently contributes to Bangladesh's economy, identifies structural constraints, and proposes policy pathways aligned with SDG 14.

2. Objectives of the Study

The study aims to examine the linkage between the Blue Economy and SDG 14, and to assess the current status of sea-based economic activities in Bangladesh. The specific objectives are:

01. To clarify the concept and scope of the Blue Economy.
02. To review global Blue Economy trends and performance.
03. To analyze the relationship between the Blue Economy and SDG 14.
04. To evaluate the contribution of Blue Economy sectors—such as fisheries, aquaculture, and tourism—to Bangladesh's economy.
05. To analyze the relationship between the Blue Economy and SDG 14.

3. Need for the Study

This study is motivated by the need to develop a comprehensive understanding of the Blue Economy and its potential contribution to Bangladesh's economic development. Many countries—including the United States, United Kingdom, Canada, China, Japan, and Australia—as well as members of the European Union, have effectively harnessed their marine resources to drive substantial economic growth. In contrast, despite possessing significant maritime potential, Bangladesh has historically underutilized its Blue Economy due to limited policy focus, institutional capacity, and coordinated initiatives. Recent efforts to develop this sector have highlighted both new opportunities and emerging challenges. This study therefore seeks to clarify how the Blue Economy aligns with United Nations SDG 14 (Life below Water) and to examine how strategic development of sea-based resources can contribute to sustainable national growth.

4. Statement of the Problem

In Bangladesh, the concept and potential of the Blue Economy remain poorly understood among the public and insufficiently integrated into policy and planning. While many maritime nations have advanced economically by strategically utilizing ocean resources, Bangladesh has not translated its significant marine endowments into comparable economic gains. The core problem lies in the gap between resource potential and effective utilization—driven by limited policy coherence, weak institutional coordination, inadequate investment, and low public awareness. As a result, sea-based sectors such as fisheries, aquaculture, tourism, and marine services remain underdeveloped, and their contribution to national growth is below potential. This study addresses the need to identify these structural and knowledge gaps and to examine how aligning Blue Economy development with SDG 14 can support sustainable economic progress.

5. Research Methodology

This study adopts a quantitative research design based entirely on secondary data due to limited availability of primary data. It evaluates the role of the Blue Economy in promoting sustainable development and its socio-economic impact in Bangladesh through systematic analysis of existing datasets, reports, and scholarly literature.

Data Sources: Secondary information is collected from government publications—particularly reports of the Bangladesh Bureau of Statistics and national SDG reports—along with peer-reviewed journals, books, and credible newspaper reports related to the Blue Economy and sustainable development. Data were compiled from (BBS), Ministry of Foreign Affairs (MoFA), Food and Agriculture Organization (FAO), World Bank reports, and peer-reviewed academic studies. Sectoral indicators such as gross value added (GVA), employment shares, export earnings, and production volumes were synthesized to assess the economic significance of the blue economy.

Data Collection Method: A systematic review of relevant literature and datasets is conducted to extract quantitative evidence on the performance and potential of Blue Economy sectors.

Ethical Considerations: All data are drawn from reliable sources and properly cited, ensuring compliance with data-use policies and academic integrity.

6. Literature Review

The Blue Economy emphasizes the sustainable use of ocean and marine resources to foster economic growth, environmental integrity, and social well-being. For Bangladesh, endowed with an extensive maritime zone in the Bay of Bengal, this framework offers substantial potential to advance sustainable development. This review synthesizes findings from over ten scholarly studies on Bangladesh's Blue Economy, highlighting key sectors, challenges, opportunities, and pathways for aligning marine resource development with the United Nations Sustainable Development Goals.

1. **Concept and Scope of the Blue Economy:** Islam, M.S., et al. (2021): The study defines the blue economy and highlights its potential to transform Bangladesh's economic landscape by addressing SDGs such as poverty alleviation, food security, and climate action.
2. **Rahman, A.A. (2020):** Explores the interconnection between coastal and marine resources and their strategic importance for the national economy. The blue economy in Bangladesh encompasses diverse sectors, including fisheries, maritime transport, renewable energy, and marine tourism. The studies emphasize the critical role of an integrated approach to fully realize the economic and environmental benefits of marine resources.
3. **Marine Fisheries and Aquaculture:** Hossain, M.A., et al. (2019): Highlights the sustainable management of marine fisheries as essential for maintaining biodiversity and ensuring long-term economic gains.
4. **Ahmed, N., et al. (2021):** Discusses the rapid expansion of aquaculture in coastal areas and its implications for livelihoods and food security. Marine fisheries contribute significantly to Bangladesh's GDP, but overfishing and habitat degradation pose serious challenges. Innovative aquaculture practices, aligned with environmental sustainability, are proposed to enhance productivity and ensure ecological balance.
5. **Maritime Transport and Trade:** Chowdhury, S., et al. (2020): Analyzes the impact of port infrastructure on maritime trade and economic growth in Bangladesh.

- 6. **Das, S., et al. (2021):** Discusses policies aimed at promoting sustainable shipping practices to reduce carbon emissions and enhance trade efficiency. Modernizing port facilities and adopting green shipping technologies are essential for positioning Bangladesh as a regional trade hub. These measures also align with global commitments to reducing maritime carbon footprints.
- 7. **Renewable Energy:** Islam, M.R., et al. (2018): Assesses the potential for offshore wind energy development along the coastline of Bangladesh.
- 8. **Rahman, S., et al. (2020):** Explores opportunities for wave and tidal energy generation to diversify the energy mix. Harnessing renewable energy from marine sources is pivotal for reducing dependency on fossil fuels. Despite promising prospects, the high initial investment and technological gaps remain significant barriers.
- 9. **Marine Tourism:** Kabir, R., et al. (2021): Highlights the potential of marine tourism in generating revenue and creating employment in coastal regions.
- 10. **Rahman, T., et al. (2019):** Explores the environmental considerations necessary for developing sustainable marine tourism. Marine tourism offers a dual opportunity to boost the economy and raise awareness about marine conservation. Implementing eco-tourism initiatives is vital to preserving fragile ecosystems while benefiting local communities.

7. Conceptual Linkage between Blue Economy and SDG 14

SDG 14 emphasizes the conservation and sustainable use of oceans, seas, and marine resources. Targets under SDG 14—including the reduction of marine pollution, sustainable fisheries management, and marine protected areas, and enhanced scientific cooperation—closely align with the core principles of the blue economy. In the context of Bangladesh, operationalizing SDG 14 through a blue economy framework allows the country to simultaneously address food security, employment generation, export diversification, and climate resilience.

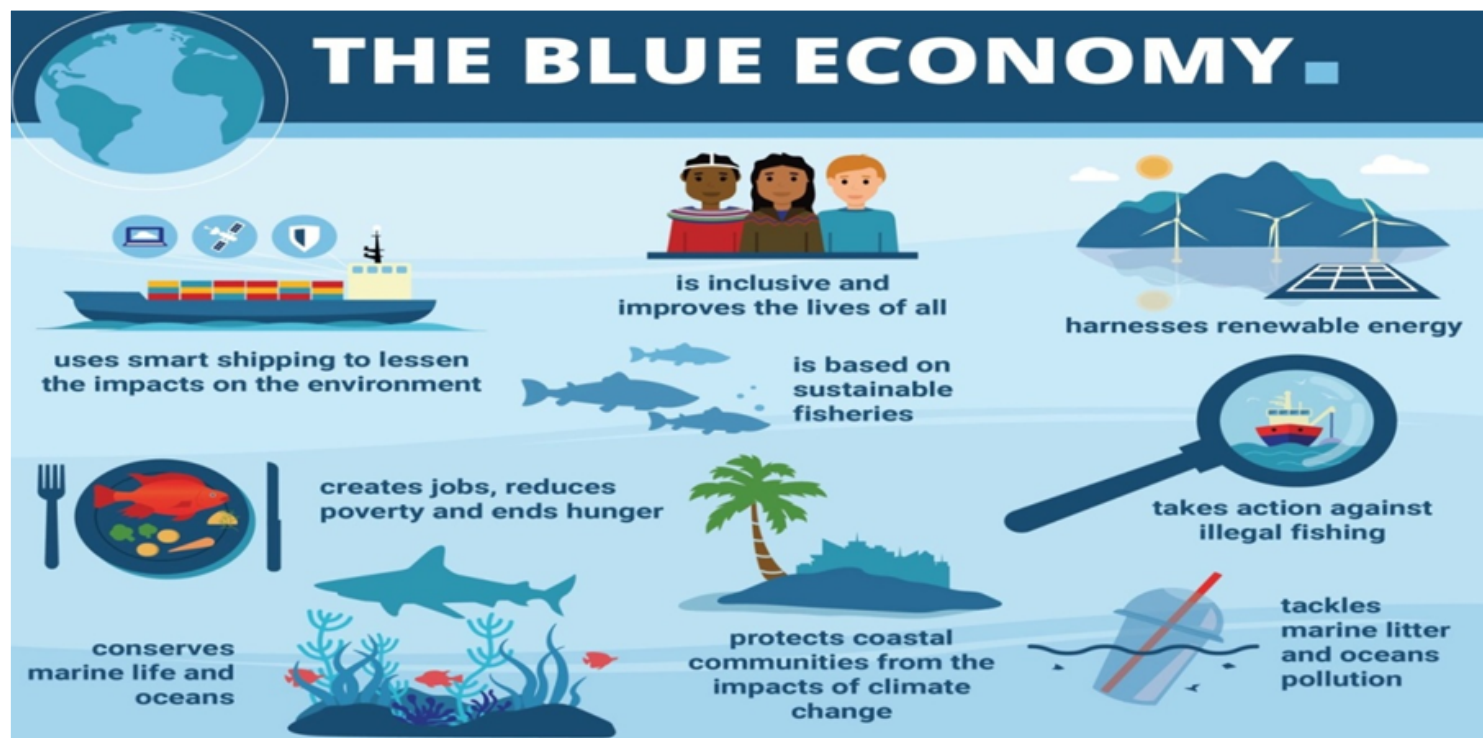
8. Empirical Overview of the Blue Economy: Global Context

Globally, the ocean economy contributes trillions of US dollars annually. Table 1 summarizes selected country-level contributions of the blue economy to GDP, illustrating the scale of marine-based economic activities.

Table 1: Contribution of Blue Economy to GDP in Selected Countries

Country/Region	Contribution to GDP	Employment (Approx.)	Source
United States	US\$359–373 billion (2–3%)	3 million	NOAA, 2020
European Union	€500 billion (3.5%)	5 million	EC, 2017
China	10% of GDP	9 million	Zhao et al., 2014
Australia	AU\$47.2 billion (3%)	—	NMSC, 2015

The global evidence demonstrates that countries with coherent marine policies, advanced technology, and strong institutions extract significantly higher economic value from their oceans.



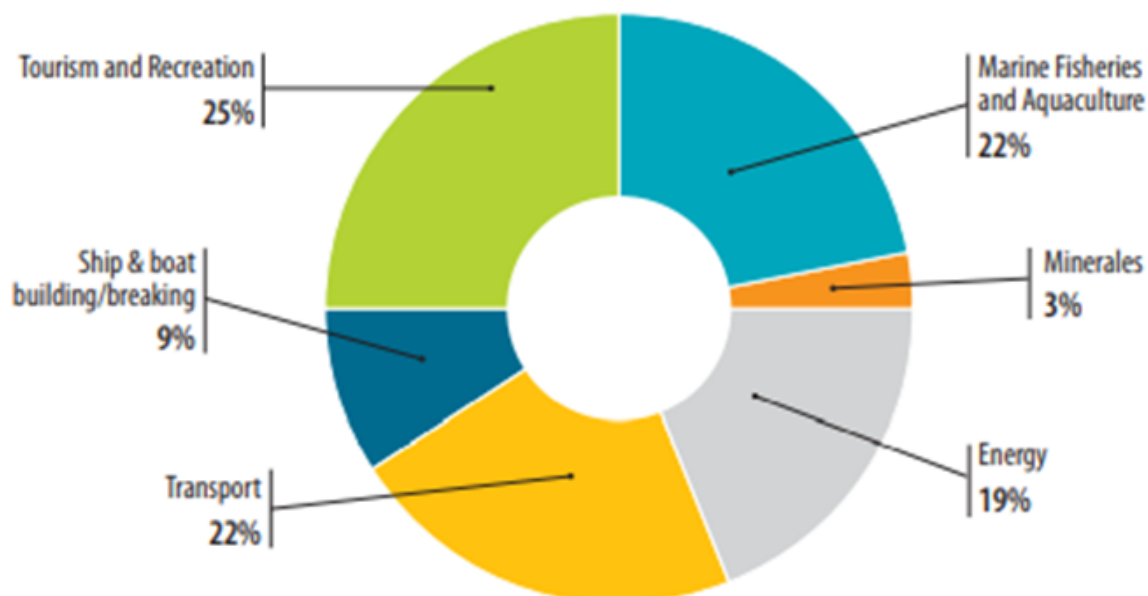
(Source- the UNDP report; 26th November, 2018)

9. Blue Economy in Bangladesh: Sectoral Contributions

9.1 Overall Contribution

In fiscal year 2014–15, Bangladesh’s marine economy generated approximately US\$6.2 billion in gross value added, accounting for about 3.3% of national GVA. Figure 1 illustrates the sectoral composition of the blue economy.

Figure 1: Sectoral Composition of Bangladesh’s Blue Economy (GVA Share, %)



(Source- Composition of the Ocean Economy in Bangladesh, Percent of Gross Value)

This graph shows that Tourism sector contributes 25%), Fisheries & Aquaculture 22%, Transportation & Shipping 22%, Energy 19%, others contributes 12% of GVA.

9.2 Fisheries and Aquaculture

Marine fisheries constitute nearly 19.4% of Bangladesh's total fish production and provide livelihoods for approximately 17 million people directly and indirectly. However, despite an estimated 8 million tons of fish potential in the Bay of Bengal, annual marine catch remains below 1 million tons, indicating significant underexploitation.

Table 2: Marine Fisheries Indicators in Bangladesh

Indicator	Value
Share in total fish production	19.40%
Estimated potential catch	8 million tons
Actual annual catch	0.7 million tons
Employment (direct & indirect)	17 million people

9.3 Maritime Trade and Shipping

Nearly 90% of Bangladesh's international trade is conducted by sea, underscoring the strategic importance of ports, coastal shipping, and logistics services. Expansion of domestic shipping capacity and modernization of ports such as Chattogram and Mongla remain critical priorities.

9.4 Tourism and Coastal Economy

Coastal tourism accounts for a substantial share of marine GVA, with Cox's Bazar alone attracting over 80% of international tourists visiting Bangladesh. Sustainable tourism development across offshore islands presents opportunities for employment and foreign exchange earnings, provided environmental safeguards are enforced.

10. Results: Empirical Evidence from Bangladesh's Blue Economy

This section presents empirical findings derived from secondary quantitative data to illustrate the current contribution of the blue economy to Bangladesh's economic structure. The analysis focuses on gross value added (GVA), sectoral composition, employment generation, and trade dependency.

10.1 Contribution to Gross Value Added (GVA)

Available national statistics indicate that Bangladesh's marine economy generated approximately US\$6.2 billion in GVA during the 2014–15 fiscal year, accounting for about 3.3% of total national GVA. Although this share may appear modest, it is significant when compared with other emerging coastal economies at similar stages of development.

Table 3: Contribution of Blue Economy to Bangladesh's GVA (2014–15)

Indicator	Value
Total Marine GVA	US\$6.2 billion
Share of National GVA	3.30%
Estimated EEZ Area	118,813 sq. km

10.2 Sectoral Composition

The marine economy of Bangladesh is dominated by tourism, fisheries and aquaculture, maritime transport, and energy-related activities. Tourism accounts for approximately one-quarter of marine GVA, followed by fisheries and aquaculture (22%), transportation and shipping (22%), and energy (19%). This distribution highlights the dominance of service-oriented activities over capital-intensive offshore industries.

10.3 Employment and Livelihoods

The blue economy supports millions of livelihoods, particularly in coastal and near-coastal regions. Fisheries and aquaculture alone provide direct and indirect employment to an estimated 17 million people. In addition, port services, shipbuilding, ship recycling, and coastal tourism create substantial employment opportunities, often for low- and semi-skilled labor.

10.4 Trade Dependency

Empirical trade data reveal that nearly 90% of Bangladesh's international trade by volume is conducted through maritime routes. This underscores the strategic importance of ports, shipping services, and coastal infrastructure in sustaining export-led growth.

11. Discussion: Interpreting the Results in a Sustainable Development Context

The empirical findings suggest that while Bangladesh's blue economy already plays a measurable role in national income and employment, its performance remains below potential when benchmarked against global and regional comparators. The relatively low GVA share reflects limited diversification beyond traditional sectors such as fisheries and shipping.

From an SDG 14 perspective, the dominance of fisheries highlights both opportunity and risk. On the one hand, marine fisheries contribute significantly to food security and livelihoods; on the other hand, overfishing, habitat degradation, and weak regulatory enforcement threaten long-term sustainability. Similar concerns arise in coastal tourism, where rapid growth without environmental safeguards risks ecosystem degradation.

The results also reveal a structural imbalance between Bangladesh's vast maritime jurisdiction and its limited capacity to exploit offshore resources such as renewable ocean energy, marine biotechnology, and seabed minerals. This gap can be attributed to technological constraints, insufficient investment, and fragmented institutional governance.

Comparative evidence from countries such as China, Norway, and Australia demonstrates that higher returns from the blue economy are closely linked to integrated marine policies, sustained investment in research and development, and ecosystem-based management approaches. For Bangladesh, translating marine potential into sustainable economic outcomes requires moving beyond sector-specific interventions toward a coordinated blue economy strategy.

12. Policy Implications and Recommendations

The empirical evidence suggests that Bangladesh requires an integrated blue economy strategy anchored in marine spatial planning, ecosystem-based management, and institutional coordination. Priority actions include investment in marine research and human capital, strengthening fisheries governance, promoting renewable ocean energy, and ensuring inclusive participation of coastal communities through public–private partnerships.

Bangladesh's maritime potential is not limited merely to the abundance of natural resources; it is a matter of strategic policy, good governance, and integrated management. Recent research and evidence-based analysis indicate that to harness the full potential of the blue economy, isolated initiatives are not enough—rather, adopting an integrated and long-term strategy is essential—one grounded in marine spatial planning, ecosystem-based management, and institutional coordination.

In this context, the following recommendations are particularly important:

1. Formulation and implementation of Marine Spatial Planning (MSP): Adopting scientific mapping and planning to ensure the balanced use of maritime zones.
2. Strengthening Ecosystem-Based Management (EBM): Ensuring sustainable use of resources while protecting biodiversity.
3. Increasing institutional coordination: Establishing effective coordination among relevant ministries, agencies, and research institutions.
4. Investment in marine research and human resources: Long-term investment in marine science, technology, and skilled workforce development.
5. Strengthening good governance in the fisheries sector: Controlling overexploitation, enhancing surveillance, and ensuring sustainable fisheries management.
6. Development of marine-based renewable energy: Policy support and investment for offshore wind, wave, and tidal energy.
7. Expanding Public–Private Partnership (PPP): Increasing private sector engagement while ensuring the participation of coastal communities.

13. Conclusion

This article demonstrates that Bangladesh's blue economy already makes a measurable contribution to national income, employment, and trade, yet remains far below its potential. By aligning sectoral development with SDG 14 and grounding policy decisions in empirical evidence, Bangladesh can transform its marine resources into a sustainable engine of long-term growth. The challenge is not the absence of resources, but the need for coherent governance, strategic investment, and ecological stewardship.

References

1. Barrister Harun ur Rashid. (2018, May 14). *Blue economy: Are we ready for it?* *The Daily Star*.
2. Bhattar, P. (2018, October 10). *Navigating through China's blue economy*. *Wärtsilä*.
3. Bir, J., Golder, M. R., Al Zobayer, M. F., Das, K. K., Chowdhury, S. Z., Das, L. M., & Paul, P. C. (2020, October 27). *A review on blue economy in Bangladesh: Prospects and challenges*. SSRN. <https://doi.org/10.2139/ssrn.3719055> (or appropriate retrieval source)

4. CRI Bangladesh. (n.d.). *Blue economy*. Centre for Research and Information (CRI). Retrieved from [URL if available]
5. Dev, A. K. (1998). *Fake blue revolution: Environmental and socio-economic impacts of shrimp culture in the coastal areas of Bangladesh*. *Ocean & Coastal Management*, *41*(1), 63–88. [https://doi.org/10.1016/S0964-5691\(98\)00084-X](https://doi.org/10.1016/S0964-5691(98)00084-X)
6. Gallaudet, T., & Christopherson, R. (2020, June 2). *America's blue economy worth nearly \$373 billion*. NOAA Press Release. National Oceanic and Atmospheric Administration.
7. Hossain, M. S. (2001). *Biological aspects of the coastal and marine environment of Bangladesh*. *Ocean & Coastal Management*, *44*(3–4), 261–282. [https://doi.org/10.1016/S0964-5691\(01\)00049-4](https://doi.org/10.1016/S0964-5691(01)00049-4)
8. Hudson, A. (2018, November 26). *Blue economy: A sustainable ocean economic paradigm*. United Nations Development Programme (UNDP).
9. Hunt, B., & Vincent, A. C. J. (2006). *Scale and sustainability of marine bioprospecting for pharmaceuticals*. *AMBIO: A Journal of the Human Environment*, *35*(2), 57–64. [https://doi.org/10.1579/0044-7447\(2006\)35\[57:SASOMB\]2.0.CO;2](https://doi.org/10.1579/0044-7447(2006)35[57:SASOMB]2.0.CO;2)
10. Investment Insights Centre – Investing. (2021, March 25). *The blue economy in numbers*. [Investing.com](https://www.investing.com).
11. National Oceanic and Atmospheric Administration. (2021, January 19). *NOAA finalizes strategy to enhance growth of American blue economy*. U.S. Department of Commerce.
12. Patil, P. G., Viridin, J., Colgan, C. S., Hussain, M. G., Failler, P., & Vegh, T. (2015). *Toward a blue economy: A pathway for sustainable growth in Bangladesh*. World Bank.
13. Pauli, G. (2010). *The blue economy: 10 years, 100 innovations, 100 million jobs*. Paradigm Publications.
14. Roy, A. (2019, January 18). *Blue economy in the Indian Ocean: Governance perspectives for sustainable development in the region*. Observer Research Foundation.
15. Sarker, S., Hussain, F. A., Assaduzzaman, M., & Failler, P. (2019). *Blue economy and climate change: Bangladesh perspective*. In *Proceedings of the International Conference on Marine Resources (or appropriate source)*. [Publisher].
16. Shamsuzzaman, M. M., Mozumder, M. M. H., Mitu, S. J., Ahamad, A. F., & Bhyuiian, M. S. (2020). *The economic contribution of fish and fish trade in Bangladesh*. *Aquaculture and Fisheries*, *5*(4), 174–181. <https://doi.org/10.1016/j.aaf.2020.01.001>
17. Snelgrove, P. V. R., Berghe, E. V., Miloslavich, P., et al. (2016). *Global patterns in marine biodiversity*. In *United Nations, World Ocean Assessment (Vol. 1, Chap. 34)*. United Nations.
18. Tasneem, F. (2019, July 10). *Blue economy in Bangladesh: Paving the way for sustainable development*. *The Independent*.
19. *The Daily Star*. (2019, February 20). *Blue economy worth \$6.2bn*. *Star Business Report*.
20. *The Financial Express*. (2021, January 27). *Blue economy of Bangladesh: Prospects and challenges*. *The Financial Express*. (Based on Bangladesh Bank Annual Report, July 2019–June 2020)
21. World Bank. (2012). *The living oceans: Toward sustainable ocean resource management*. World Bank.
22. Zhao, X., Zhang, W., & Fan, X. (2014). *Measuring the contribution of the marine economy to national economy: Evidence from China*. *Marine Policy*, *44*, 1–8. <https://doi.org/10.1016/j.marpol.2013.07.003>