



# BLUE ECONOMY AND THE OPENING OF NEW PROSPECTS IN BANGLADESH

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## Abstract

*The concept of the blue economy is gaining importance globally as ocean-based resources are becoming an increasingly important source of economic growth and development. As a maritime nation, Bangladesh has vast potential for blue economy development. This research paper examines the prospects of the blue economy in Bangladesh and its potential to open a new era of economic development. The paper discusses the current state of the country's maritime sector, identifies the potential areas for blue economy development, and analyzes the challenges and opportunities ahead. The study asserts that the blue economy has the capacity to stimulate economic expansion, generate job prospects, and guarantee sustainable development in Bangladesh.*

**Keywords:** Blue economy, Marine Resources, Maritime sector, Economic development, Sustainable development

## 1. INTRODUCTION

The blue economy is a relatively new concept emphasizing the sustainable use of ocean-based resources for economic development. It encompasses various economic sectors, including fisheries, tourism, renewable energy, and shipping. As the world's population grows, the demand for resources, especially food and energy, also increases. The blue economy offers an alternative to land-based resources, which are becoming increasingly scarce. As a maritime nation, Bangladesh has vast potential for blue economy development. The country's 710 km long coastline, extensive river system, and exclusive economic zone (EEZ) covering an area of 118,813 square kilometers provide ample opportunities for developing various economic sectors.

The idea behind the Blue Economy (BE) is to increase economic growth by using technology to sustainably use ocean resources in order to fulfil the increasing need for jobs while also improving living standards and preserving the health of the ocean environment. The blue economy has enormous promise for increasing employment and economic growth. (Sarker et al., 2018)

## 2. OBJECTIVES OF THE RESEARCH:

This research is intended to explore methods, strategies, and ways of approach that may aid law-making in a challenging establishing blue economic zone for sustainable development under the provisions of international law and "the United Nations Convention on the Law of the Sea." This is in the context of delimitating maritime boundaries to establish a blue economic zone, as previously described (UNCLOS). With these objectives in mind, this project's main goals are as follows:

- a) To encourage intelligent, sustainable, and inclusive growth as well as job opportunities in Bangladesh's marine economy for the short, medium, and long term.
- b) To provide a framework of blue economy that significantly contributes to eliminating poverty, providing adequate food and nutrition, mitigating and adapting climate change, and creating inclusive and sustainable livelihoods.
- c) To encourage synergies and environment-friendly frameworks that enable certain maritime economic activities and their value chains. The thorough research and analysis of the potential for blue growth have proved the potential of the blue economy as an untapped resource.
- d) The Blue Economy has the potential to significantly contribute to the nation's economic development by reducing poverty, guaranteeing food and nutrition security, mitigating the effects of climate change, and emphasizing the Blue Economy as a development window.
- e) While seeking growth for the country's people, it is essential to conserve and balance the development of natural resources while maintaining the integrity of environmental and biological features. Additionally, the research will analyze how various legislative tactics may affect the problems and how they are resolved.



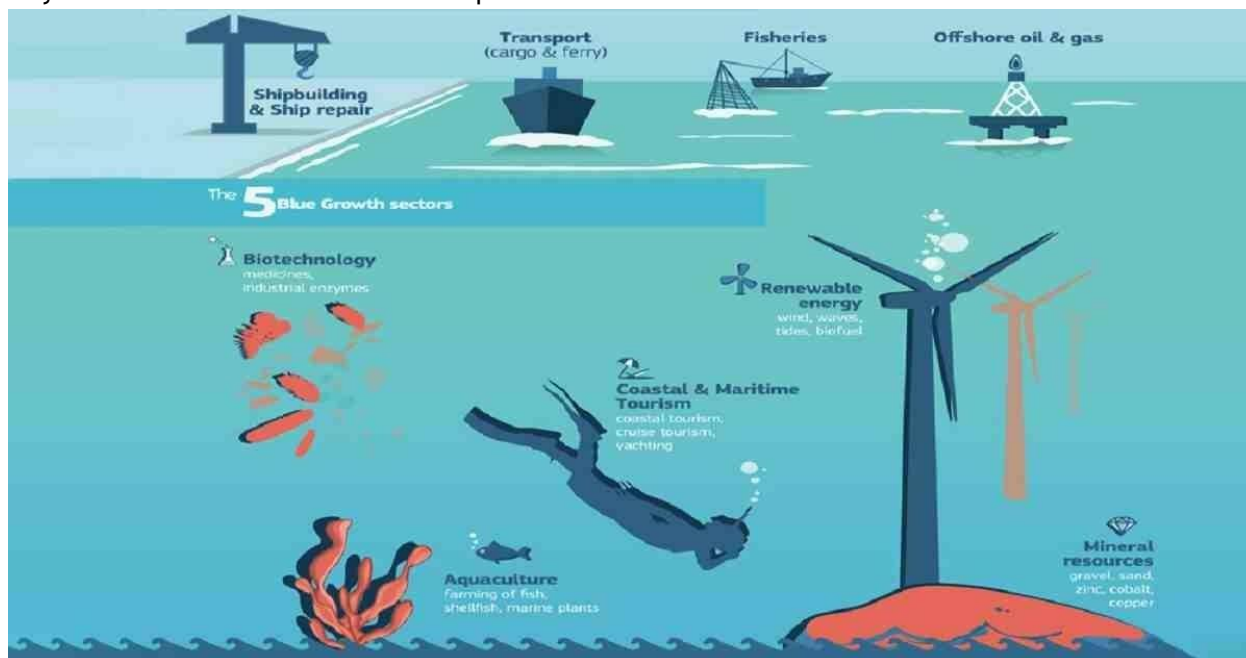
f) To contribute to filling the research gap and provide valuable insights into Bangladesh's practical challenges and opportunities for establishing a blue Economic Zone.

**3. RESEARCH METHODOLOGY:**

This research will be doctrinal in nature through theoretical analysis and empirical evidence. This research's primary source of empirical data will be various forms of national and international laws and by-laws, rules, and case studies. A survey of numerous documents, books, newspapers, magazines, and research articles from prominent national and worldwide journals and websites relevant to the topic will be used to gather secondary data. A field survey will be carried out to gather opinions about current national and international marine laws from representatives of coastal states, legislators, ministers, judges, attorneys, and warring nations.

**4. CONCEPT OF BLUE ECONOMY**

The concept of the blue economy is still in its infancy; there is no definitive description of it as of yet; nonetheless, when viewed from a pragmatic perspective, this would make perfect sense. The Blue Economy says that the oceans and seas are "Development Spaces" where marine transportation, oil and minerals extraction, bioprospecting, biodiversity protection, and using living resources in a way that doesn't harm them can all be planned.



**Figure 1: Opportunity of the Blue Economy**

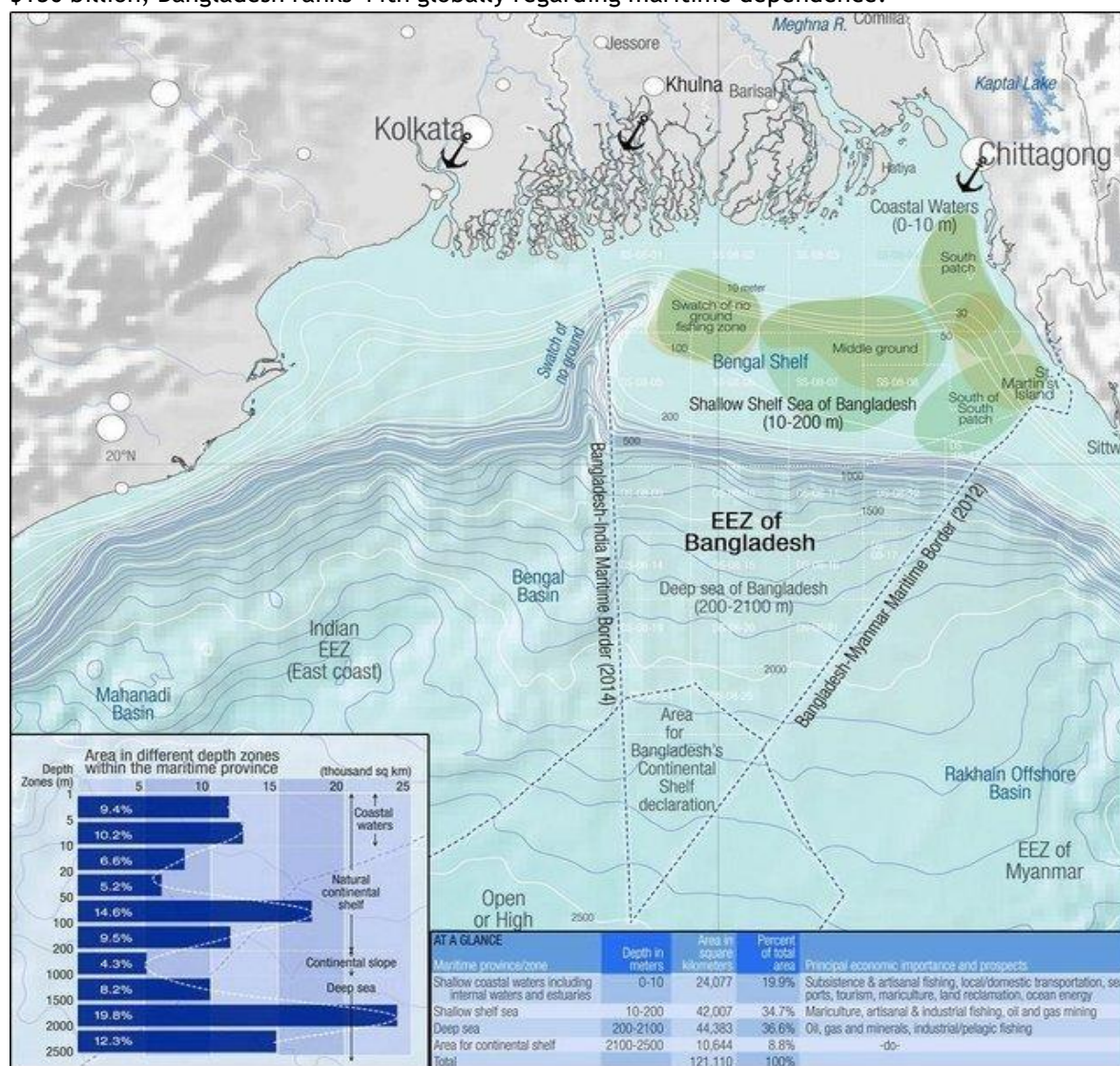
The development of the ocean economy combined with the ideas of social inclusion, environmental sustainability, and creative, dynamic corporate structures is known as the "blue economy." With the goal of "improving human well-being and social fairness while dramatically lowering environmental dangers and ecological scarcities," the blue economy was perceived as an ocean economy. The "Future We Want" result document highlights the ocean's role in growth. "We emphasize how crucial it is to preserve the oceans, seas, and their resources while using them sustainably for sustainable development." Fundamentally, the ocean economy is about severing the link between environmental deterioration and socioeconomic progress. Effectiveness and resource optimization of natural marine resources within ecological bounds are crucial in this context." (United Nations Conference on Trade and Development, 2014)

The term "blue economy" refers to all commercial endeavours that impact the world's waterways. This encompasses the nearest direct and indirect supporting activities required for the operation of

various economic sectors, regardless of their location, even in nations that are landlocked in landlocked countries”.

**5. BLUE ECONOMY IN BANGLADESH:**

In Bangladesh, discussions have shifted towards the blue economy following the resolution of the maritime border delimitation dispute involving Myanmar and India. The verdict on the delimitation dispute with Myanmar was officially declared by the International Tribunal for the Law of the Sea (ITLOS) of Germany on March 14, 2012. As a result of the award, Bangladesh now has full control over all resources, living and nonliving, located in the Bay of Bengal inside its 200 nautical mile EEZ and on the continental shelf beyond. In this way, the ruling between India and Bangladesh was made public on July 7, 2014, and it bestowed upon Bangladesh sovereign rights over all mineral and living resources spanning 354 nautical miles along the Continental Shelf. With a gross domestic product of \$130 billion, Bangladesh ranks 44th globally regarding maritime dependence.



**Figure-2: Maritime areas of Bangladesh after historic Judgem(Chowdhury, 2014)**

There is no way to separate Bangladesh from the Bay of Bengal, its third neighbour. Sea-related issues will shape the development and growth of Bangladesh's economy in the future. These include increasing international trade, safeguarding marine environments and biodiversity, managing marine fisheries appropriately, and using marine mineral resources for energy security in the long run. The majority of the nation's trade involves the transportation of commodities by water. Bangladesh's economy is significantly impacted by the fish, populations, and other inorganic resources that are found in the Bay of Bengal. Exporting marine seafood generates substantial earnings for Bangladesh.

The "blue economy" model of managing and using ocean resources is highly relevant.

### 6. DIVISIONS AND ACTIVITIES OF BLUE ECONOMY:

The term "blue economy" can be interpreted in various ways depending on the activities, geographic regions, and sector coverage. Below is a list of possible sectors and the actions that fall under each category.



**Figure 3: Division and Activities of Blue Economy**

- a) **Fishing:** This includes the capture fishery, aquaculture, seafood processing, etc.
- b) **Marine Biotechnology:** This includes pharmaceuticals, chemicals, harvesting seaweed, seaweed products, and bioproducts generated from marine sources, among others.
- c) **Explore and exploit Minerals resources.** This also includes oil and gas and deep-sea mining exploration of rare earth metals, hydrocarbon, etc.
- d) **Marine Renewable Energy:** This includes Offshore wind, wave, and tidal energy production.
- e) **Marine Manufacturing:** This includes the manufacturing of sails, nets, boats, and ships, maritime instruments, aquaculture geo-technologies building of water bodies, and marine industrialengineering.
- f) **Port, Shipping, and Maritime Logistics:** The services encompassed in this category are container shipping, stevedoring, roll-on roll-off operations, customs clearance, freight forwarding, safety and training, shipbuilding and repair, ship ownership and operation, shipping agency and brokerage, ship management, liner and port agency, port companies, and ship supply.
- g) **Recreation & Marine Tourism:** This encompasses Engaging in activities such as sailing, boating, water skiing, jet skiing, surfing, sail boarding, sea kayaking, scuba diving, swimming in thesea, observing birds in coastal areas, watching whales and dolphins, exploring coastal nature reserves, and visiting the beach, seaside, and islands all entail interactions with the ocean.
- h) **Marine Construction:** This includes Marine construction and engineering.
- i) **Marine Commerce and Trade:** Services such as marine insurance, ship financing and related



services, charterers, media and publication, and maritime legal services are all part of this category.

- j) **Marine ICT:** This includes Consultancies in marine engineering, meteorology, the environment, hydro survey, project management, ICT solutions, geoinformatics services, boat design, and submarine telecom.
- k) **Education and Research:** This includes education and training and R&D.

## 7. DEVELOPMENT OF THE BLUE ECONOMY IN BANGLADESH:

The blue economy strategy prioritizes the importance of its ideals, values, and standards in order to mitigate climate change, ensure food security, alleviate poverty, and foster sustainable and equitable livelihoods. In order to foster a thriving marine economy, preserve healthy marine ecosystems, and increase national value and employment, the blue economy necessitates a harmonious coexistence of development, conservation, and utilization of marine and coastal ecosystems, marine resources in general, and marine services. For the majority of developing countries to transition to the blue economy, particularly Bangladesh, fundamental and systemic adjustments must be made to their policy, regulatory, management, and governance frameworks, as well as the identification of diverse maritime economic functions. According to the World Bank, the blue economy comprises novel and developing ocean sectors, including aquaculture, offshore renewable energy, seabed extractive activities, marine biotechnology, and bioprospecting. (Hussain et al., 2018) In addition, well-known maritime sectors, including fishing, tourism, and marine transportation, are part of the blue economy. Based on World Bank analysis, three primary issues limit the possibility for a blue economy to emerge. It is necessary to adopt new or modified economic practices and behaviors in place of the current tendencies and behaviors that unfairly exploit the ocean. Overcoming entrenched interest arguments requires investing in human capital, which presents the second barrier. Realizing the benefits of investing in innovative blue economy sectors for employment and development requires educating people on how to work in the area.

## 8. SEGMENTS OF BLUE ECONOMY IN BANGLADESH:

For the growth of the blue economy in Bangladesh, maritime economic functions, including those related to fishing, maritime trade and shipping, energy, tourism, coastal protection, and safety and surveillance at sea, have been identified. In order to enjoy the benefits of the blue economy, it is necessary to cultivate the following maritime economic activities:

**8.1 Trade and shipping in the maritime sector:** There are three pillars of sustainable development that are contributed to by international shipping, which are as follows:

- a) To facilitate global commerce or trade,
- b) To ensure that all countries and peoples enjoy material success,
- c) The objective is to generate a diverse range of employment opportunities both at sea and on land, so directly and indirectly enhancing the economic well-being of individuals.

In contrast to alternative modes of transportation, it offers the most ecologically sustainable and energy-efficient approach to conveying goods and individuals. The International Maritime Organization (IMO) established the global regulatory framework, which has ratified fifty-two treaties pertaining to the design and operation of ships. The two most significant ones, which pertain to environmental protection and maritime safety, are presently enforced on 99 percent of the global merchant fleet (Kerr, 2022).

The majority of Bangladesh's external freight commerce, over 90%, is carried out through maritime channels. The importance of this trade has been amplified as a result of globalization. Because of its large coastline and rich maritime heritage, Bangladesh has experienced significant expansion in marine services that support maritime trade and transportation. Feeder services and coastal shipping refer to the transportation of goods and passengers between smaller ports and coastal areas. This pertains to the transportation of goods on a domestic and global level using vessels of moderate size, both within and between neighboring nations.

**8.1.1 Transportation using inland waterways:** Bangladesh has a 24,000-km inland water transport network with 1000 landing stations and 21 river ports. Since November 2013, the Pangoan



Inland container terminal has 55,000 sq m of container yards, 2400 TEU capacity, and two jetties. Chittagong Port handles 3 million TEUs annually, 80% of which go to Dhaka and 10% by train. Inland container transport is cheaper now. Bangladesh can increase GDP by 1% and foreign trade by 20% if the IWT logistics system is efficient and competitive, according to an Asian Development Bank assessment. The Department of Shipping registers around 10,000 inland vessels, 75 coastal vessels, and 6500 inland ships, most of which are produced in Bangladesh. River ports, including “Dhaka, Narayanganj, Chandpur, Bhairab, Barisal, Chittagong, and Khulna”, serve Bangladesh's main navigation routes. The economy relies on port access, especially in waterways. Keeping the country's waterways navigable will create jobs and be cheaper than building roads.

**8.1.2 Building of Ships:** Shipbuilding provides the required equipment, including ships and marine equipment, which our businesses can play a significant part in. Bangladesh has 300+ shipyards and workshops. These yards build nearly all inland vessels, fast patrol boats, dredging barges, passenger vessels, landing craft, tugs, supply barges, deck loading barges, speed boats, cargo coasters, troop-carrying vessels, hydrographic survey vessels, survey boats, pilot boats, water taxi, and pontoons. The shipyards are currently producing seagoing ships with a deadweight tonnage (DWT) of 10,000 for the purpose of exporting. They have the ambition to enhance their production capability to 25,000. The shipbuilding industry generates and preserves foreign currency reserves., while road and rail transportation imports nearly all vehicles/rolling stocks. All aspects of it, including its horizontally and vertically integrated businesses, should be fostered and encouraged to expand. Ship repair facilities and other manufacturing and engineering areas should also be investigated.

**8.1.3 Industries devoted to ship recycling-** In 2023, Bangladesh ranked first in ship scrapping with over 9000 ships, the largest number in six years. Scrap steel makes up 70-75% of Steel and Re-rolling factories' raw material, saving foreign cash. This industry provided furniture, household equipment of all sorts, boilers, lifesaving boats, generators, and jobs. About 125 shipbreaking yards generate USD 2.4 billion annually. Ship recycling must become a contemporary sector with eco-friendly infrastructure and international conventions.

## **8.2 Food and livelihood**

**8.2.1 Fishery:** In the exclusive economic zone (EEZ) of Bangladesh, there are around 475 fish species, while only 250 are found on land. The protein requirements of our people are still met by fish. Up to sixty kilometers (within forty meters of the shore), around seventy thousand hand-operated and non-automated wooden vessels and two hundred and fifty commercial steel-hulled trawlers fish in coastal seas, but they are ill-equipped to capture pelagic fishing shoals near the surface (Islam, 2003). A large quantity of fish is dried and salted, mostly for human consumption. Along those lines, as fish and poultry farming becomes more intensive, dried fish is being used more and more as a source of fishmeal. With an annual capture of more than 4,96,417 mt and the provision of employment and income for 2.5 million people, estimated at \$1.3 billion, Hilsa shad (*Tenulosa Elisha*) is the most valuable and largest species. (Hossain et al., 2014). Currently, 86% of the world's hilsa catch occurs in Bangladeshi coastal and marine waters, 4% in Myanmarian waters, 8% in Indian waters, and 2% in other nations. (Rahman et al., 2020). In the fiscal year 2022-23, the total production of fish was 49.15 lakh Mt (Pieal, 2024). The majority of these materials are transported directly to the processing facility before being distributed to the markets of the United States, European Union, and Japan. Live estuarine eels (*Muraenesox bagio*) and giant mud crabs (*Scylla serrata*) have been exported to East Asian nations over the past ten to fifteen years. The marginal cultivators along the coasts of Satkhira, Bagerhat, and Cox's Bazar fatten crab, which accounts for less than 20% of the live crab exported (Khan, 2023). Furthermore, in addition to drying the catch of juvenile and diminutive sharks and rays, sizable sharks are discarded overboard after removing their fins and certain other anatomical components. Coast-caught phaisa (*Setipinna phasa*) is predominantly used to produce fermented fish products.

**8.2.2 Aquaculture:** Aquaculture is a significant and growing contributor to aquatic food production in both coastal and offshore areas. Additionally, it functions as a significant means of employment and revenue for many coastal areas. Efficiently organized and supervised mariculture operations can also have a beneficial impact on the integrity of coastal environments. The future



development of the area will need to occur on the coastal waters of the Bay due to the growing population and the escalating rivalry for coastal resources. Consequently, a considerable amount of attention will need to be devoted to improving the environmental management of aquaculture. This can be achieved by adopting ecologically sustainable technology and implementing better management practices, supported by suitable policy and planning initiatives, as well as legislation. The experience in coastal resource management demonstrates the significance of involving the cooperation of local government units and other "on-the-ground" institutions, such as NGOs and people's organizations, in order to effectively implement social and technological interventions that benefit the community.

Bangladesh's national economy heavily depends on the Bay of Bengal and its surrounding coastal areas. These places are home to a vast array of plants and animals, including fish, shrimp, mollusks, crabs, mammals, seaweeds, and more. Production of fish has reached 3.68 million tons, which accounts for 3.69 percent of GDP. Of the entire fish production, 1.0 million tons (28%) come from the catch fishery, 2.2 million tons (56%) from aquaculture, and 0.6 million tons (16%) from marine fisheries. Additionally, (Shamsuzzaman et al., 2020).

**8.2.3 Aquatic products from the sea:** The term "marine aquatic products" refers to the result of primary processing operations that include farming aquatic organisms for human consumption. Marine shellfish (such as oysters and mussels), marine finfish (such as trout, carp, eel, etc.), and freshwater finfish (such as oysters, mussels, and prawns) are the three main categories of aquatic animals that could be farmed in the future. Rural residents of poor nations often rely only on fish and other aquatic resources.

**8.3 Marine Biotechnology:** Marine biotechnology opens up new avenues for exploring ocean resources. (Hussain et al., 2018). The major focus of biotechnology is the practical application of scientific and engineering principles to process marine biological materials in order to produce various products and services. (Zilinskas et al., 1995). The goal is to unlock a specific earth compartment's biodiversity for the economy. Much of the underwater environment is undiscovered and understudied. Thus, the ability of marine species other than fish and shellfish to contribute to the blue economy is now being realized, mainly through modern gene sequencing technology. Exploration of sea biodiversity is helping us understand how organisms that can resist extreme temperatures and pressure and grow without light could be utilized to generate new industrial enzymes or medications. Bio-sourced anti-fouling and anticorrosive coatings for maritime transport and shipbuilding are available. Blue biotechnology can also generate biopolymers and bio membranes that boost desalination efficiency. Bioremediation following major pollutions, like the Exxon Valdez oil spill, can be promoted via bio stimulation. Oil spill bioremediation is another example. This example shows that the marine industry as a whole wants to promote new (bio-) technology, cross-cutting services, and suppliers that can benefit several sectors and provide unanticipated benefits. Marine biotechnology and biotechnology-based industries are overdue. Universities and research institutions should be funded and supported to open this promising field for economic growth.

**8.4 Mining for minerals, Oil, and gas:** The upstream offshore oil and gas value chain consists of exploration (involving drilling rigs and research & specialized support ships), field development (building of platforms), production, and exploitation. Downstream activities are refining and distribution to the consumer markets. Fossil fuels are those resources that can be extracted and processed in order to be used in various ways, especially in our energy supply, which includes mostly natural gas and a potential new segment of Oil at sea. Bangladesh has yet to assess the true potential of its offshore oil and gas prospects. Some 26 Tcf (trillion cubic feet) of gas reserves have so far been discovered in Bangladesh, of which only about 1 Tcf is located in the offshore areas (-Rear Admiral Md. Khurshed Alam (Retd.), n.d.). Only two gas discoveries—the Sangu and the Kutubdia—with modest reserves were produced from the nineteen exploration wells drilled in the Bay of Bengal until 2014. The 0.8 Tcf of Sangu reserves have been used up, whereas the 0.04 Tcf of Kutubdia reserves have not been produced yet. Not to mention that neither the Magnama (3.5 Tcf) nor the Hatia (1.0 Tcf) wells have yielded commercial quantities of hydrocarbons despite drilling. Some blocks in Bangladesh may have geological features and gas/oil prospects similar to those in Myanmar, where gas reserves



have been found.

Finding potential gas and oil fields and reserves in the Bay requires a well-planned strategy and a multiline survey using state-of-the-art technology. Gas and oil deposits, including those in Myanmar and India, are expected to be divided among the first movers in the drilling race. These resources may lie on either side of the maritime boundary, making their extraction potentially difficult if exploration is postponed. Massive drilling and exploration projects are required to increase the nation's overall gas production. Collaboration between public and private organizations and the sharing of data, information, monitoring, best practices, evaluation methodologies, and results will be crucial for future oil and gas exploration and extraction efforts.

**8.5 The manufacturing of sea salt:** Traditional sea salt production has been carried out along the Bangladeshi coast of Cox's Bazar for many centuries. The salt growers may harvest around 20 tons per hectare over a prolonged dry season. In comparison to Thailand's Samut Sakhon, which produces 43MT of salt per year, Bangladesh's Cox's Bazar coastline region generates 22MT. (Hossain et al., 2006). The vast majority of salt farms are on a modest scale, employing locally sourced equipment that is run manually and lease the property from landowners or, in certain cases, the government on an annual basis. Salt output can be increased by implementing land leasing systems centred on the community, providing enough financing facilities, utilizing mechanical equipment (water pump, leveller, etc.), and accurate weather forecasting. In addition, the establishment of salt farmer's cooperatives can guarantee the farmers' ability to bargain and maximize the economic return (i.e., the price of salt) for their level of life.

**8.6 Sustainable energy from the ocean:** Marine renewable energy sources, including wind, wave, tidal range, and currents, have the capacity to substantially contribute to the provision of low-carbon energy in regions that possess suitable coastal characteristics. Offshore wind encompasses all operations associated with the construction and development of wind parks in marine environments and the offshore generation of electricity using wind energy. Nevertheless, it is imperative to identify the most optimal onshore wind turbine sites and connect the windiest offshore locations to the primary transmission infrastructure. The most advanced form of energy conversion is tidal energy, which includes both tidal range and tidal current. Ocean Thermal Energy Conversion (OTEC) utilizes the thermodynamic potential difference between the warmer upper and frigid deeper water layers. Activities offer significant synergies with renewable energies in the ocean; for instance, wave energy converters have the potential to generate electricity while mitigating wave assaults. Renewable energy sources derived from the ocean can offer viable employment alternatives, especially for coastal communities that have historically depended on fishing industries. Governments must implement consistent long-term policies and provide targeted financial assistance in order to surmount technical obstacles and reduce costs. In order to accomplish this, tax credits, grants, and subsidies must be provided to private investors to encourage them to invest in the substantial, costly infrastructure required to transition from tiny prototypes to pilot plants.

**8.7 Osmosis, a form of blue energy, and biomass:** One of the key components of osmotic energy is the difference in salinity between salty and fresh water. A combination of factors, including agricultural run-off and inadequate or untreated sewage, has caused nutrient loads to the coastal zone and oceans to increase by a factor of three compared to pre-industrial levels. Ocean life is precarious due to the low oxygen levels. One of the most important factors in ensuring a steady food supply for the world's expanding population during the past sixty years has been synthetic nutrient fertilizers, such as nitrogen and phosphorus, which have been manufactured in large quantities for industrial use. Simultaneously, groundwater and marine ecosystems worldwide are deteriorating due to the overabundance of nutrients that have seeped into rivers, aquifers, coastal regions, and seas due to inefficient agricultural practices and inadequate wastewater processing. In order to keep up with the demands of human society in the long run, phosphorus, which has limited reserves, should be recycled more often through improved nutrient recovery and reuse.

**8.8 Aggregates mining (sand, gravel, etc.):** Sand, a beach staple, can be any shade from dark brown to light brown, grey to black, and golden to silvery white. The sandy beaches of Bangladesh have been the site of multiple maritime explorations in search of heavy materials. From Patenga to





Teknaf, along a 250 km coastal stretch, you can find sands that contain important heavy minerals at irregular intervals. Throughout the entire coastal belt, 17 deposits of minerals such as zircon, rutile, ilmenite, leucosene, kyanite, garnet, magnetite, and monazite have been found through exploration (Alam MK, 2014). The country's paper, glass, ceramic, welding electrode, and chemical and industrial sectors might all benefit from the efficient extraction and commercialization of beach sand minerals. Therefore, it may be able to provide a great deal of jobs for the locals by establishing mineral extraction businesses in the coastal area.

**8.9 Genetic resources from the ocean:** The marine genetic resource can generate employment opportunities, medical advancements, and domestic biotechnology industry growth if managed appropriately. One of the least studied parts of our world is the deep-sea environment. However, little is known about these areas' ecosystem services, which allows us to begin researching ways to put marine genetic resources to use.

#### **8.10 Tourism and Hospitality**

**8.10.1 Coastal tourism:** Globally, it accounts for 6-7% of jobs and 5% of GDP, making it the largest market category. One of the top five exporters in sixty countries and first in fifty more. It is the main source of foreign money for 50% of the world's poorest nations. Coastal tourism includes beach vacations, water attractions, marinas, and other marine boating activities. Sustainable tourism creates jobs and reduces poverty. Tourism needs lots of people. Tourism creates 1.5 employment for every primary business position. (Islam, 2003) More individuals in the value chain can boost local economies and reduce poverty. Sustainable tourism will prosper if the business sector is encouraged and able to invest in green activities.

**8.10.2 Yachting, marinas, and water sports for recreation:** The development of a variety of water sports for recreational purposes, the building and maintenance of seaworthy pleasure boats, and the establishment of the necessary supporting infrastructure, which may include marina ports, could all contribute to the expansion of coastal tourism.

**8.10.3 Tourism by cruise:** Tourists visit several coastal islands and tourist hotspots onboard smaller cruise ships. Much of this expansion hinges on the industry's capacity to fix security issues, build long-term business models, and invest in port infrastructure. 'Customized experiences' will be in high demand due to an aging population and an increase in the proportion of education-level individuals.

**8.11 Creating Artificial islands:** Bangladesh should implement a suitable plan to transform the unstable new islands in its internal water and territorial sea and exclusive economic zone as permitted by UNCLOS 1982 (The United Nations Convention on the Law of the Sea (UNCLOS), 1982), in order to alleviate the demographic pressure on land. Planting salt-tolerant/mangrove plants is the only surefire way to make the 75 maritime islands already in existence or any future natural islands a reality. Improving current crop varieties is the way to go for agricultural development on salty soils. A potential solution might be the desalination of saltwater for use as potable water on land, in irrigation systems, and in domestic and commercial uses on islands in the ocean or farther offshore.

**8.12 Delta and coastal region greening planning:** Cyclone wind pressure and the solidification of newly discovered land can be alleviated. About 7.5 million people rely on lumber, wood, rafts, garan, honey, wax, and other products made from mangroves in the Sunderbans, which cover 577,040 hectares. Many species use the mangrove's internal canals and creeks as a place to spawn and reproduce. In recently accreted intertidal areas, mangrove afforestation has been ongoing for quite some time. In order to ensure the continued viability of its agricultural sector, riverine corridor, and intrusion salt waters, among other things, Bangladesh is actively engaged in delta planning.

**8.13 Human resource:** Human capital that is educated, competent, and well-trained is the driving force behind economic development; such personnel can actively engage in the technological revolution that accompanies the globalization of commerce. Sustainable and dynamic development is impossible in the absence of a competent labor force. In addition, Maritime University and the Bangladesh Oceanographic Research Institute (BORI) were established recently to develop human resources and coastal and oceanic research.

**8.14 Safety and surveillance at sea:** In general, there is a need for enhanced maritime safety

and surveillance systems to heighten situational awareness regarding all maritime activities that have an effect on maritime economic activities.

## 9. POSSIBLE OBSTACLES TO BLUE ECONOMY UTILIZATION.

There are several obstacles to establishing a blue economy in Bangladesh. The main obstacles are a lack of investment, an insufficient legal framework, and insufficient infrastructure. Chittagong and Mongla, two of the country's ports, need upgrades to increase their capacity and efficiency. Furthermore, substantial investments in infrastructure and marketing are necessary for the development of renewable energy and tourism. Effective Ocean Governance Legislation in Bangladesh is One of the Obstacles to Blue Economy Mismanagement and harmful fishing practices, Bay of Bengal pollution, maritime security concerns, etc.

**9.1 An Efficient Legislative Structure for Ocean Administration:** Bangladesh has signed several international treaties, conventions, and regional agreements, including UNCLOS, BWM, MARPOL, and UNEP Regional Seas Convention. (Rahman & Mahmud, 2018), However, they have not yet been standardized with government rules. Actually, no formal legislation at the national level exists to deal with or guarantee adherence to international law. 'The Coastal Zone Policy-2005', 'The Coastal Development Strategy-2006', 'the Port Act-2006', 'the Marine Fisheries Ordinance and Rules 1983', 'National Energy Policy-2004', etc. are among the laws and regulations that the government of Bangladesh has previously enacted for the purpose of maritime and ocean governance. However, most of them were passed quite some time ago. The legal framework is now unable to address new issues due to the fast changes occurring in social, economic, cultural, and environmental contexts. Therefore, the most important thing to do to ensure the ocean is well-governed is to enact new policies or revise the current ones.

**9.2 Concerns Regarding Maritime Area Security:** Bangladesh has several obstacles in its quest for marine security despite its advantageous location in the Bay of Bengal. The Navy and Coast Guard, the country's national security system, are capable, although extra security for marine operations in the Bay of Bengal is still required. The majority of the Bangladesh Navy's and Coast Guard's current activities are coastal patrols. As a result, a lot of dangers are not taken seriously. As such, increasing capacity is difficult at the moment.

**9.3 Inappropriate management and fishing practices create damage:** The main difficulty in this sector is the lack of coordination between the respective institutions and insufficient capacity in terms of physical assets and labor. There is no actual connection or collaboration between the Department of Fisheries (DOF) and the Coast Guard in terms of utilizing their workforce and resources to implement regulatory measures in coastal waters. The absence of tangible resources, such as patrol boats and a chronic shortage of trained human resources, constrains the capacity of Depth of Field (DoF).

**9.4 The absence of knowledge or comprehension of scientific concepts:** Research funding is inadequate at graduate institutions, which constitutes a missed opportunity for a nation at the forefront of knowledge development.

**9.5 Human resource deficiencies:** One of the major challenges to creating a blue economic zone in Bangladesh is the lack of qualified workers, especially in the following industries: (i) shipping, hatchery operations, etc. A small group of individuals oversees the Marine Fisheries Department, and the sheer volume of work is well beyond their capabilities; (ii) a significant number of foreign nationals are employed as experts in this field.

**9.6 Insufficient funding:** Insufficient funding for expanding blue economy endeavors, such as those in the petroleum and mining sectors.

**9.7 Misallocation of responsibilities and failure to identify key individuals:** Another vital obstacle is the misallocation of responsibilities and failure to identify key individuals. For example,

- a) The Water Resources Planning Organisation (WARPO), consisting of civil and water engineers, is responsible for the intricate and multidisciplinary task of managing Coastal Zone (CZ) resources.;
- b) The Fisheries Research Institute is the organization that represents the Bay of Bengal Large Marine Ecosystem (BOBLME) project.



c) BIWTA is the organization that represents the International Hydrographic Office (IHO), which does not have any presence of its own in the ocean;

d) In accordance with the mandate that is outlined in the Rules of Business of the Government of Bangladesh, the Intergovernmental Oceanographic Commission (IOC) is represented by the Ministry of Education rather than the Ministry of Science and Technology.

**9.8 A lack of determination:** Ocean development has mainly remained unmoved, at least in part, because governments have not shown sufficient political resolve to move on.

**9.9 Intersectional contact is nonexistent:** Inadequate contact between different sectors, particularly regarding marine policy issues.

**9.10 Active participation of stakeholders:** The public and other stakeholders (including tourism, provincial and state governments, communities, the private sector, fishers, and others) are not adequately included in the process.

## 10. APPROACHES TO ADDRESSING THE OBSTACLES TO THE BLUE ECONOMY'S DEVELOPMENT AND IMPLEMENTATION:

The preceding explanation suggests that, as long as marine habitats and resources are protected sustainably, Bangladesh has a great chance of boosting her economy with sea-based resources. The following, however, are a few suggestions for how the Blue Economy idea might be put into practice effectively:

a) Bangladesh must prioritize ocean governance as part of its all-encompassing maritime strategy. In order to make the most efficient use of her ocean resources, these plans should be founded on discussions with relevant stakeholders and strong institutions.

b) In compliance with national and international law, the government of Bangladesh should enact new legislation that establishes a unified policy and legal framework to address all issues.. For example, The Marine Resources Conservation and Sustainable Uses Act.

c) Priority should be given by policymakers to protecting the exclusive economic zones (EEZ) and continental shelf against any potential maritime security threats.. Hence, it is imperative to modernize the Bangladesh Navy. Therefore, a firm dedication is required for the integration of a new battleship into the naval fleet(Sharwar et al., n.d.).

d) To ensure the preservation of marine biodiversity in Bangladesh, the government should collaborate with local and international experts to enforce appropriate rules and regulations. For the sake of future generations, this will help improve our marine resource pool and promote sustainable practices in marine fishing.

e) Sufficient funds should be granted to establish comprehensive surveillance systems across the whole Maritime area of the Bay, therefore enhancing monitoring capabilities.

f) Govt should establish a national pollution prevention policy. In order to prevent and significantly decrease marine pollution—which includes land-based activities, marine debris/litter, and nutrient pollution—by 2026, the Ministry of Water Resources has been appointed as the lead ministry. Policy and plan for coastal zones, port trash reception facilities, etc., are identified in order to accomplish targets.

g) The MARPOL convention laws oversee the global discharge of sewage, waste, and oil from ships. By implementing a comprehensive survey, certification, and monitoring system, as required by relevant international legal agreements like the MARPOL Convention, the government should take the necessary measures to ensure that vessels authorized to fly the Bangladeshi flag respect environmental regulations.

h) In order to encourage individuals to become ocean-minded rather than ocean-blind, the maritime community may launch an awareness drive through workshops, seminars, and media coverage on platforms such as television, radio, YouTube, and Facebook.

i) The government should provide incentives to encourage private enterprises to participate in sectors of the Blue Economy. The private sector is crucial in facilitating the transformation of the blue economy. Its offshore zones should also be attractive to foreign investors looking to explore for Oil and gas.

## 11. CONCLUSION:

The Bay of Bengal and the coastal areas give Bangladesh abundant resources and create new economic opportunities. The blue economy has a number of areas with development potential that could help achieve goals related to food security and economic development. At this point, it is clear that Bangladesh must raise public awareness of the benefits of using marine resources and implement socioeconomic measures that would improve the socioeconomic standing of its citizens. The blue economy is one of Bangladesh's finest options for sustaining economic growth. In this study, I attempted to characterize Bangladesh's current state of blue economy. An encouraging finding from the investigation was the rise in aquaculture and sea productivity. However, regular flooding harms our blue industry. Our personnel resources in the various marine businesses are not educated, trained, or skilled. In order to ensure the development of the blue economy, the government should adopt future policy frameworks. This framework might be centred on structural cooperation, incorporating research into goods, taking a comprehensive approach to the Blue Economy, and inspiring and educating the next generation.

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