

The Delineation of Maritime Economy in Bangladesh's Development Dream

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Abstract

As a novel economic concept, "maritime economy" or "blue economy" refers to all ocean economic activities. As indicated in 'Vision 2041', researchers are investigating whether or not an ocean economy may assist Bangladesh in its transformation from a middle-income economy to a developed country. Economic progress in Bangladesh might be substantially accelerated if the country effectively uses its maritime assets. An EEZ (Exclusive Economic Zone) extends 200 nautical miles into the Bay of Bengal from Bangladesh's 710-kilometer coastline. Oceans cover approximately three-quarters of our atmosphere, which is why they play a vital role in the lives of our blue planet. When it comes to communication and transportation, there is no better medium than water. For both food and drug substances, the Ocean is the world's most prolific producer, according to the World Health Organization. Consequently, many maritime countries are already adopting a more proactive approach to the present and future issues that their businesses face.

Evidence from the E.U. and around the world supports Bangladesh's efforts to resolve maritime boundary disputes and initiate cooperation in the Bay of Bengal, investment in mega infrastructure projects such as deep sea ports and transport networks, and identification of a set of blue economic functions suitable for the nation, development of adequate policy and strategy, the establishment of institutions, creation of jobs, environment protection, thriving for good governance, spatial planning, and quality management in maritime economic activities for a developed Bangladesh.

Keywords: *Maritime Economy, Blue Economic Functions, Maritime Transportation, Developed Bangladesh, Bay of Bengal Maritime Regionalism, Sustainability Discourse.*

1. Maritime Economy and Blue Economic Functions

The transition of national economies from former land-based agricultural and industrial economies alone to an inclusive water-borne economic activities on our Blue Planet is recognized by the elaboration of the phrases Maritime Economy, Ocean Economy, and Blue Economy.

About 30 million people were employed full-time in ocean-related industries in 2010, and this sector is expected to generate value equivalent to 3% of global GDP annually by 2020. (The Ocean Economy to 2030, OECD, 2016). This exemplified the need to disseminate information and inspire strategic consideration of the Ocean's economics on a global scale.

A "Blue Economy" is one that "sustainably uses ocean resources for economic growth, improved livelihoods, and jobs while protecting the health of the ocean ecosystem," as defined by the World Bank. As noted at the 2015 World Ocean Summit, sustainable ocean economies develop when economic activity is in sync with the support that ocean ecosystems need to be resilient and healthy. (Blue economy; blue growth) World Ocean Summit 2015 The Oitavos, Cascais, Portugal (June 3–5, 2015) When nations began to contemplate using their marine resources, the concept of Nautical Economy emerged. It opens up a new chance for maritime states to expand their economies by using their existing workforce on all fronts, from citizenship to international. The concept developed by the maritime sector is now an integral part of ecological preservation. Resources found in the Ocean are crucial to expanding the maritime economy. For national ocean economic growth, each country or maritime region needs to identify, prioritize, and implement a set of blue economic functions based on the diversity and uniqueness of her maritime zones, which include the territorial sea, exclusive economic zone, continental shelf, adjacent deep seas, and superjacent aerospace. (MARITIME 2050: Mapping Out the Long-Term Future, United Kingdom Department of Transport)

In its 2018 report, the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) named the nine (9) core sectors of the Blue Economy as follows:

1. Ports, Shipping, and Marine o Transport o Fisheries and Aquaculture o
2. Coastal, resort, and tourism
3. Development;
4. Gas and Oil;
5. Oceanic Manufacturing
6. Seafloor Mining
7. Alternative Energy.
8. Marine biotechnology is also used.
9. Oceanographic Technology and
10. Services for the environment.

(Blue Economy for Business in East Asia: Towards an Integrated Understanding of Blue Economy, www.pemsea.org)

The E.U.'s blue economy comprises seven enterprises: marine living and non-living assets, sustainable marine power, port tasks, shipbuilding and fix, oceanic vehicle, and waterfront travel industry. These seven deeply grounded businesses generally give 1.5 percent of gross worth added to the European Union's economy and utilize over 2.2 percent of the E.U.'s labor force.

At factor cost, coastal tourism, marine transportation, and related enterprises have the highest value-added. Coastal tourism contributes 45 percent of the blue economy's total value added at cost, while maritime transport and allied businesses (shipbuilding, maintenance, and port operations) provide roughly 40 percent (Figure 1).

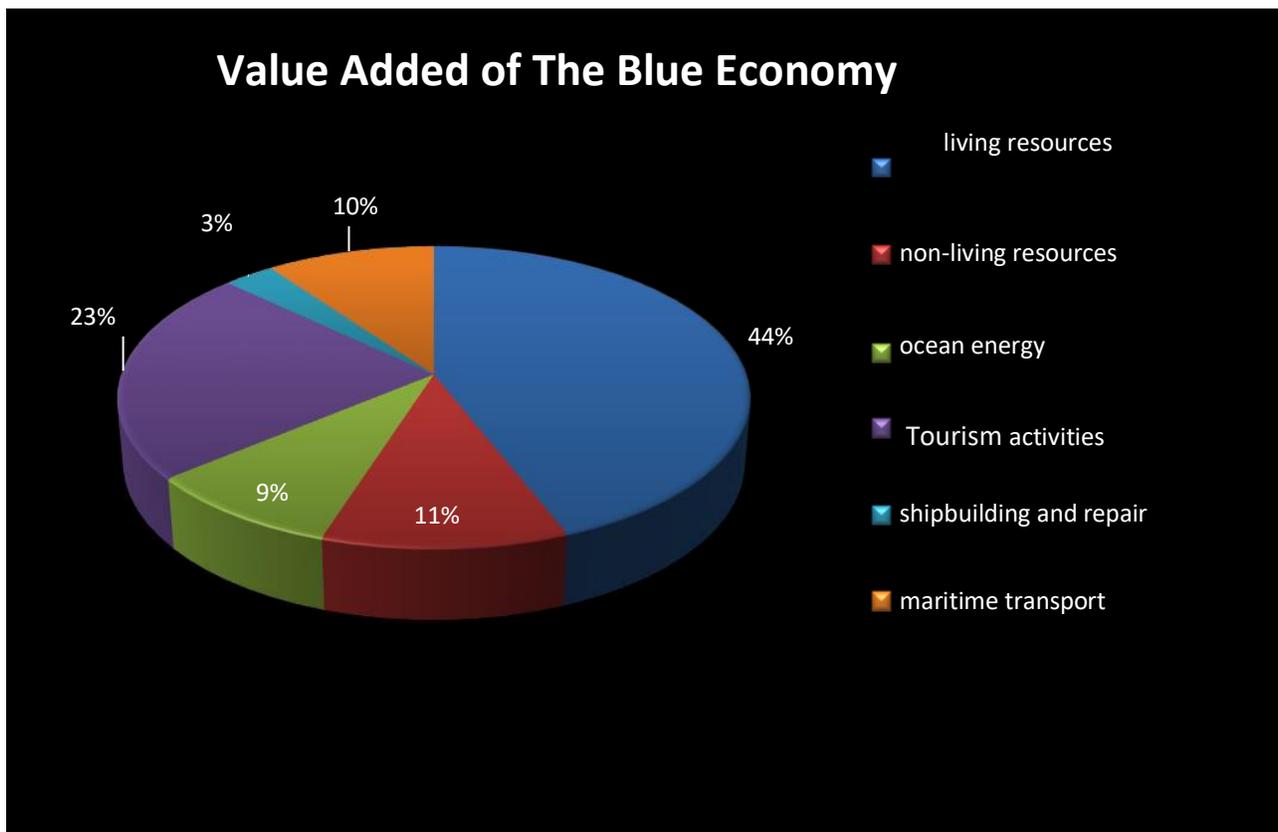


Figure 1. Value is added at fixed pricing (percent of total value added of the blue economy, 2019). The calculations are based on Eurostat data.

Since waterfront, the travel industry requires broad utilization of friendliness administrations, which utilize an enormous number of individuals, the area uses a considerable level of the blue economy's labor force (64%). However, only 24 percent of the workers in the blue economy are employed in marine transport and allied industries (shipbuilding and repair, port operations) (Figure 2).

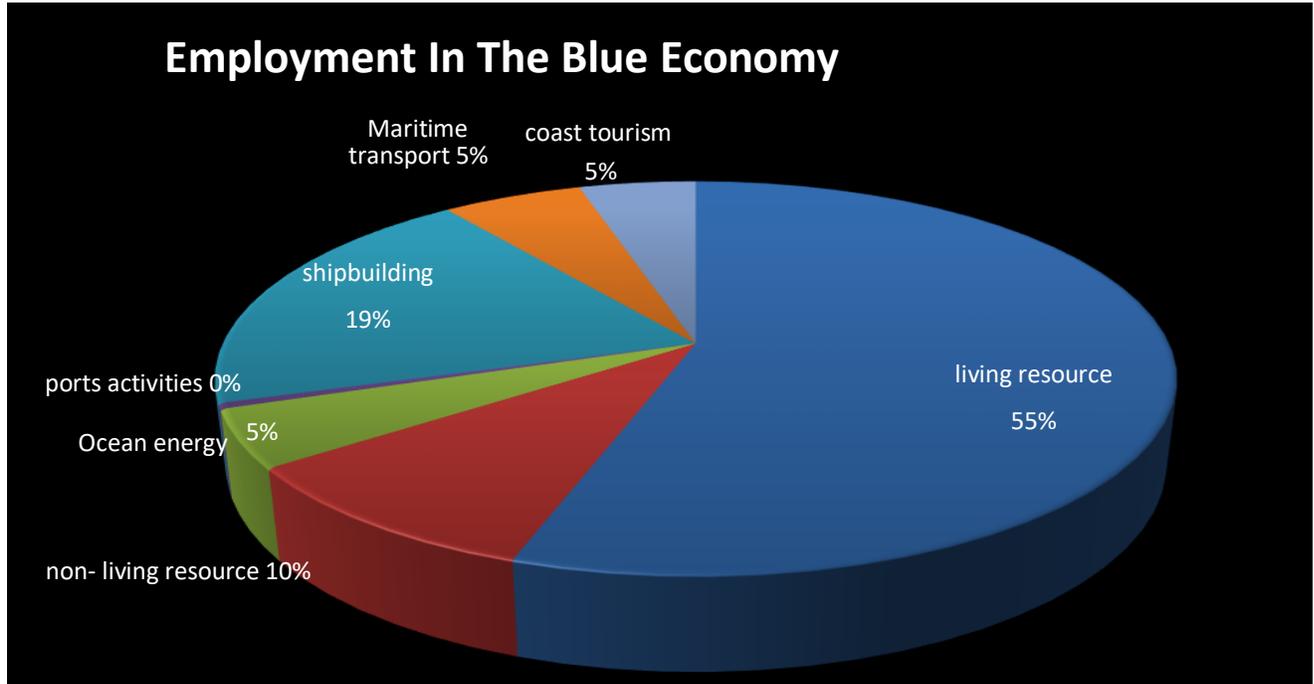


Figure 2. Personnel working in various industries (percent of total employment in the blue economy, 2019). The estimations made by the authors are based on data from Eurostat.

| Country/Region | Reference |
|--------------------------|---|
| Australia | AIMS (2018), The AIMS Index of Marine Industry, Australian Institute of Marine Science, Australian Government |
| Canada | DFO (2020), Marine sectors in Canada methodology, Department of Fisheries and Oceans, Government of Canada |
| France | INSEE (2019), Économie maritime - Des activités à forte valeur ajoutée et des emplois qualifiés, INSEE Flash Provence-Alpes-Cote d'Azur |
| Ireland | SEMURU (2019), Ireland's Ocean Economy, NUI Galway Whitaker Institute Socio-Economic Marine Research Unit (SEMURU), June 2019 |
| Korea | KMI (2020), Korea's Ocean Economy 2020, Korea Maritime Institute, Busan, Korea |
| Portugal | INE (2020), Satellite Account for the Sea 2016-2018, Government of Portugal |
| Scotland | Marine Scotland (2019), Scotland's Marine Economic Statistics, Marine Scotland, Scottish Government |
| United States of America | BEA and NOAA (2020 ₁₄₀₁) <i>Defining and Measuring the U.S. Ocean Economy</i> , Bureau of Economic Analysis, United States Government |
| European Union | DGMAF (2019), The EU Blue Economy Report 2019, Directorate-General for Maritime Affairs and Fisheries (European Commission) |

Figure 3: Selected Ocean Economy studies developed at different sea areas, OECD, www.oecd.org

Here we need to identify a relevant set of blue economic functions suitable for the Bay of Bengal maritime coastal region, particularly the potential for Bangladesh's sustainable growth plan. Bangladesh Government, in a policy paper, has identified the following maritime economic functions as a priority: -

- Maritime Trade and Shipping
- Food and Livelihood
- Marine Biotechnology
- Energy
- Tourism
- Coastal Protection
- Human resource and Spatial planning
- Maritime safety and surveillance,

2. Maritime Transportation, Trade and National Growth

As a rule, an advanced transportation foundation guarantees returns using macroeconomic efficiency drivers, for example, "extension of business movement, advancements, speculations, work market, contest, homegrown and worldwide exchange, and worldwide versatile action, provincial financial turn of events, populace prosperity, ecological wellbeing, and wellbeing." Maritime transportation is a fundamental part of the transportation framework, representing a massive piece of worldwide exchange. Besides, participating in the worldwide marine business is critical in drawing global money.

In a few Caspian Sea countries (Russia, Azerbaijan, Turkmenistan, Kazakhstan, and Iran), Akbulaev and Bayramli investigate the relationship between marine transport development and economic growth factors. They argue that improved sea transport executives promote long-term financial developments.

Gherghina et al. (counting oceanic vehicles) examined the economic effects of various transportation foundation frameworks. They used board information relapses with fixed effects for E.U. nations from 1990 to 2016.

Khan et al. found a relationship between container port traffic and per capita income using a panel of 40 countries.

Saidi et al. showed that transportation infrastructure development promotes economic growth using the generalized approach of moments.

To build an integrated assessment tool for contrasting maritime transport with other regional drivers, Navis et al. used a value estimation approach to assess the importance of marine transport for the economy, society, and environment of the Adriatic-Ionian region. Following beach tourism as the main cause of change in the Adriatic-Ionian region, the authors feel that maritime transport is the second most significant source of change in the region.

Path and Pretes examine the effects of five key components on the maritime economy's dependence on financial development. They discover significant correlations between marine dependency and GDP per capita. "A country's potential to join in oceanic exchange as proven by its geographic admission to global streams and exchange reliance," according to the designers, is what they refer to as sea dependence.

Hong, Chu, and Wang found that investments in water transport infrastructure are advantageous to economic development, but only once a particular threshold has been crossed after examining 31 different Chinese provinces.

Badulla and Guillotreau assess the impact of various air toxins and ozone-depleting substance discharges (SO₂, NO_x, CO₂, PM_{2.5}, and PM₁₀) beginning with delivery and transportation, and they conclude that all other things being equal, SO₂ and NO_x are the most harmful air toxins with the most significant multipliers. According to the designers, calculating the gas discharges from marine vehicles is crucial for imposing more detailed regulations governing the delivery area's SO₂ outflows, such as establishing SO₂ Emission Control Areas restrictions.

To look into the connections between marine transportation, environmental pollution, and economic growth in Iran, Taghvaei *et al.* developed a dynamic log-linear model. The Pollution Haven Hypothesis was supported by the author's discovery of a connection between marine traffic, corruption, and economic growth.

The waterfront and maritime climate have become increasingly important in achieving the country's vital goals for social and economic development, according to M.S. Hossain (2001). However, the evaluation gave fishing assets a special emphasis—an essay by Creel (2003) on the demographic connection to the water. The study's findings indicate that the environment in coastal regions, where a sizable and rising portion of the world's population resides, is deteriorating. Additionally, this trend is anticipated to persist. Developing countries face a particularly challenging situation in this regard.

Marine transportation is available in 22 of the E.U.'s member states. As a direct result, European shipping firms have direct control over more than 40% of the world's fleet and some of the major maritime clusters. The 1.8 billion tonnes of the gross weight of cargo carried by E.U. short sea transportation attest to the economic recovery following the 2009 financial crisis. Eurostat's figures.

Recent research from Eurostat indicates that the blue sector in the E.U. accounts for about 40% of the value and 24% of the labor in the oceanic vehicle and related companies (including shipbuilding, repairs, and port activities). The marine industry encompasses a wide range of activities that, when combined with port operations and key hubs, impact the development of maritime businesses and commerce, resulting in economic growth and the creation of jobs. Without established seaports and maritime transportation, Bangladesh could not reach its export goal of 50 billion USD in a single fiscal year in 2022. The nation's economic development is directly impacted by Bangladesh's seaports' 15% yearly rise in the processing of container TEUs.

3. Bangladesh at the Apex of Bay of Bengal Development Pyramid

There is a possibility that by the year 2030, the Ocean's yearly contribution to the global economy will have increased by more than 50% from its current level. Ocean-based businesses are valued by offshore oil and gas production, which accounts for one-third of the total, followed by marine and coastal tourism, and then marine equipment and ports (Revitalizing The Maritime Industry Through Blue Economy, MIDA, Malaysia). <https://www.mida.gov.my/revitalising-the-maritime-industry-through-blue-economy>

The Bay of Bengal, which is a north-eastern arm of the Indian Ocean, may be found roughly between the latitudes of 0°N and 22°N and the longitudes of 70°E and 110°E, which has the Islands of Maldives and Singapore on its west and east limits in mid-Indian Ocean region, at the north having the deltaic vicinity of the Ganges-Brahmaputra-Meghna river system. The Bay occupies a place of approximately 2.5 million sq. km, and the common depth intensity is 2,600m, with the most intensity of 5,258m. Bangladesh is located at the pinnacle of the Bay of Bengal. It is surrounded by the littorals of Maldives, India, Bangladesh, Myanmar, Sri Lanka, Indonesia, Thailand, Malaysia, and Singapore, which has land-locked areas on the west and the east of the Himalayas; in eastern India, Nepal, Bhutan, and South-west China, within her hinterland. (Banglapedia 2018; Tanaka, 2011; Jared, 2011; Frost, 2017; Chaudhury, 2021).

3.1 Maritime Regionalism in the Bay of Bengal

Economic regionalism refers to the institutional structures that aim to enable the free movement of goods and services and coordinate international economic policies among nations located in the same geographic area. The rapid expansion of global economic relations since the conclusion of World War II has resulted in both possibilities and limitations, both of which need to be managed effectively if economic regionalism is to be considered a successful strategy. Free-trade zones, customs unions, common markets, and economic unions are all types of economic regionalism. Other examples include. (Chung in Moon, 1999).

After experiencing land-based regional cooperation effort in South Asia SAARC not functioning at the desired level, Bangladesh, at the break of the current century, quickly changed focus to maritime

regionalism and resolved her maritime boundary disputes with both neighbors Myanmar and India in an attempt to achieve sustainable peace and cooperation in the Bay of Bengal. Identifying country strength by using KRA positive index (Chowdhury et al., 2022) and building cooperation among non-global player countries for sustainable regionalism is essential. Only successful regional organizations can proceed further to engage in win-win dialogue with any Global Player country.

ICM and MPAs can provide insights for building Maritime Clustering

Since there are many physical, social, and legal barriers in coastal areas, it is challenging to control population pressures. Coastal regions Additionally, a wide range of economic sectors are interested in coastal areas, including those that compete with one another, such as tourism, fishing, agriculture, aquaculture, forestry, manufacturing, oil and gas extraction, waste disposal, marine transportation, and real estate development. If governments regulate anything at all, it is typically an isolated industry. As a result, the coasts of some coastal nations have experienced rapid and uncontrolled expansion. Managers of coastal zones in an increasing number of nations are moving toward using integrated, interdisciplinary resource management strategies. These methods consider all parties' viewpoints, including governmental bodies, businesses, NGOs, and individuals. The integrated coastal management (ICM) approach to resource management, which is based on the Coastal Zone Management Act of the United States of America, which was passed in 1972, allows policymakers and planners to consider population issues when analyzing the pressures, threats, and opportunities that face coastal areas. ICM has gotten much support at numerous international gatherings, including the World Summit on Sustainable Development held in Johannesburg, South Africa, in 2002 and the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil, in 1992. Thirty-two countries may use ICM to address the depletion of coastal and Ocean resources, deal with the pollution that threatens public health, spread the economic benefits of exploitation of the coast and Ocean, or develop and manage coastal and marine regions.

At least 107 of the 134 developing nations with coasts worldwide are involved in integrated coastal management at the national or subnational level.

Develop a good grasp of the state and pressures on certain marine and coastal ecosystems, the possibility that MPAs can address them, and the variety of stakeholders involved, according to the OECD working paper on MPAs: Economics, Management, and Effective Policy Mixes. to calculate the MPAs' anticipated costs and advantages. To create an MPS management strategy with effective ways for compliance, monitoring, reporting, and enforcement. (<https://doi.org/10.1787/9789264276208-en>)

There is an Exclusive Economic Zone within the 121,110 square kilometers of marine space that Bangladesh controls in the Bay of Bengal (EEZ).

In the past, the government has made several crucial measures, such as organizing to develop a strategy or executing effectively as soon as a border has actually begun to be crossed. Utilizing marine resources effectively and practically is a key tool for sustainable development. Bangladesh is a coastal and riverine nation that depends on marine resources and canals.

3.2 Marine Biodiversity and Resources

Bangladesh is affluent not just because of its enormous waterways but also because of its ecological variety. Bangladesh's coastline area is one of the most prolific in the world due to its geographic location and climatic conditions. The influence of mangrove forests is one of the important aspects of coastal areas, which maintain many fish and other valuable aquatic species from a commercial standpoint. One of the primary variables that significantly influence the worldwide economy is shipping. Businesses transporting goods through ships impact the country's economy (Liu et al., 2019; Wuthnow, 2012).

A delta plain shapes the country of Bangladesh. There are several rivers in Bangladesh that flow over international boundaries. The mountain range known as the Himalayas can be found north, while the Bay of Bengal can be south. The coastline of Bangladesh, which is about 710 kilometers long and begins at the tip of St. Martin's Island and continues to the Indian Ocean, is home to various ecosystems that have important ecological and economic importance.

3.3 Sector-astute accentuation is given:

Bangladesh authorities and researchers have identified the following blue economic functions suitable for the country in the Bay of Bengal maritime zone.

- 1) Shipping, Maritime Logistics, and Port Facilities
 - a. International Shipping
 - b. Coastal shipping/Feeder services
 - c. Inland waterway transport
 - d. Passenger ferry services
- 2) Shipbuilding
- 3) Ship recycling industries
- 4) Dredging and reclaiming
- 5) Marine Fishery
- 6) Maritime Tourism
- 7) Marine Aquaculture
- 8) Food from Ocean and sea
- 9) Renewable Marine Energy
- 10) Maritime surveillance
- 11) Maritime Education and Research
- 12) Maritime Labor or Ship crewing
- 13) Maritime Legal and Financial services
- 14) Maritime Investment and Asset owning
- 15) Maritime Trade facilitation and Administrative services
- 16) Marine Environment and Conservancy
- 17) Biodiversity, Coastal zone, and Marine protected area
- 18) Marine Biotechnology and Marine medicine
- 19) Sea salt and Submarine mining

(source: Authors formation from Rear Admiral K Alam,2019; Humayun et al., 2021 and others)

4. Sustainability Discourse

The three core elements of sustainability, Environment protection, Economic growth & Social well-being could not be ignored for long-term ocean economic success at national and global levels.

While exploring Blue economic functions need to ensure environmental protection, marine biodiversity, and conservancy through introducing environmental accounting, including a satellite-based accounting framework. The maritime industry also expels toxic substances that result in air and ocean pollution. According to Okereafor et al.(2020), releasing toxic material and carcinogens destroys aquatic life and negatively impacts the air.

The labor force is necessary to ensure the smooth movement of the cargo. Besides other care & social wellbeing, health care of the maritime industry workforce is essential for sustainable blue economic functions. For health management to be effective, it needs to consider the likelihood and specific risks of toxic agents in waters polluted by chemical spills, biotoxins, waste, sewage, and water-borne

pathogens. Even though we have made much progress in quickly testing water for a wide range of chemicals and pathogens, we have not done much to adapt toxicity measurements for the maritime industry (Timothy et al., 2019).

Ocean economic activities, including maritime transportation, directly impact the national economy. UNCTAD Review of Maritime Transportation 2021 suggested that Higher transportation costs will also harm low-value-added items, such as furniture, textiles, clothing, and leather. Smaller economies that manufacture many of these items might lose the competitive edge. These nations will find it harder to acquire high-tech equipment and industrial materials to progress up the value chain, diversify their economy, and fulfill the Sustainable Development Goals (SDGs).

High container freight charges and marine transport disruptions impede recovery in key economies. In the U.S. and euro area, a 10% rise in container freight charges may reduce industrial productivity by 1%, according to UNCTAD.

The maritime industry involves workers from a diverse cultures willing to rely on the management for better packages and safety measures. The case for diversity, equity, and inclusion (DEI) has never been stronger. Organizations that effectively bring together a range of voices and perspectives across their teams are better able to innovate, take risks, solve problems creatively, turn challenges into opportunities, and attract and retain employees and other external stakeholders. (Camille et al., 2022, We need to do more to improve diversity, equity, and inclusion in the global maritime industry).

Innovation, Circular economy, and universal accessibility dimensions of sustainability are to be incorporated while policy adaption, strategic decision-making implementation of blue economic functions for sustainable national economic growth, and SDG achievement.

From the Eurostat data, a sample of 20 E.U. countries with liner shipping activity includes Brussels, Bulgarian, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovenian, Finland, and Sweden. Given the lack of data, Cyprus and Moldova were dropped from the investigation. The British United Kingdom had also been removed as it was no longer a member of the European Union. Europe is already disrupting all maritime shipping interests of the E.U., and some shipping lanes that historically would include the U.K. are all being reconstructed minus Ireland.

As anticipated, the industrialized markets of the E.U. have greater concentrations of maritime traffic or similar activities, including marine port infrastructure investment. Country specialties and economic factors considerably impact maritime transportation operations and efficiency. Throughout 2007 and 2018, the Netherland had the most significant average annual values for the maximum tonnage of products transported throughout all countries; still, Due to the use of more visible and less-polluting vessels, it emits far less NO_x from maritime transport than other E.U. member states, suggesting that it is more environmentally friendly.

According to Eurostat statistics, Spain has the greatest NO_x emissions from marine transport in the E.U., more than twice as much as the most polluting nations, Greece, Italy, and France (Figure 6).

Espuma, followed by the United States, Germany, and France, had the largest average asset value in container ships among E.U. member states between 2007 and 2018. On the other hand, no data are available for Cyprus, Latvia, Poland, or the Netherlands.

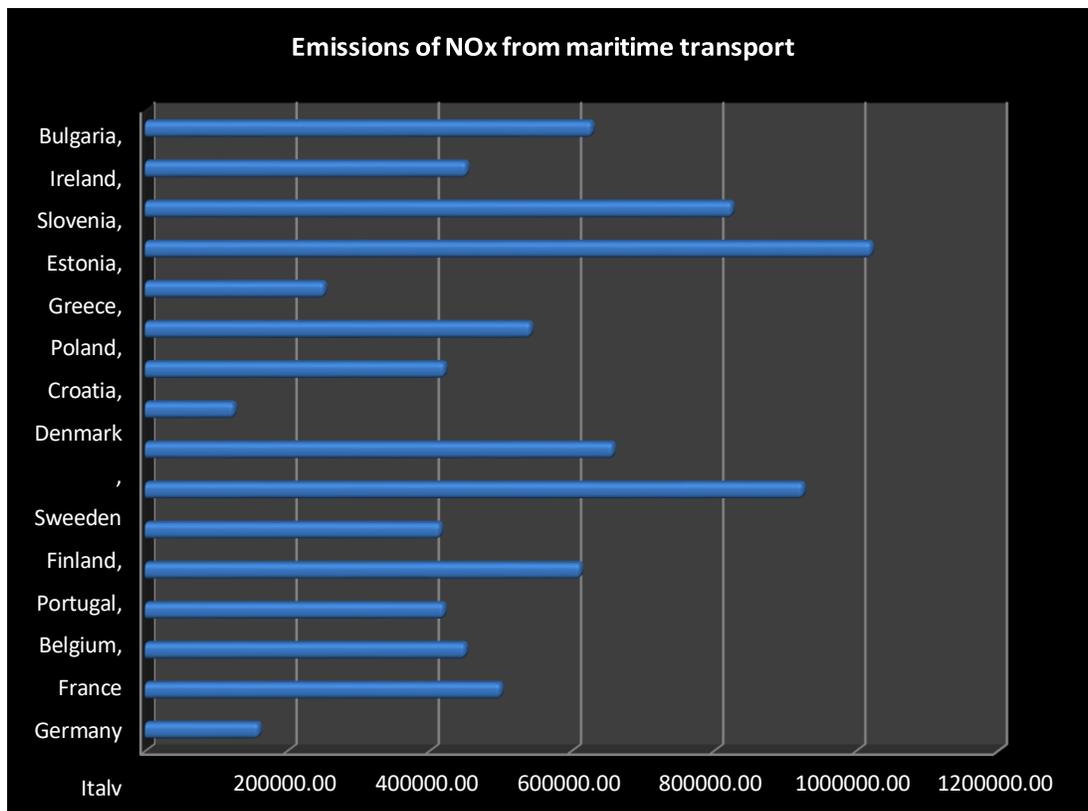


Figure: 6 NO_x emissions from marine transportation (average values). The authors' calculations are based on Eurostat data.

The E.U.'s emerging economies have a significantly lower intensity of marine travel, which means that NO_x emissions from maritime transport are much lower. When calculating the number of tons of NO_x per ton of products moved, however, Greece appears to be the least efficient in terms of marine pollution, followed by industrialized nations like Spain, Sweden, Portugal, and Denmark (Figure 6).

5. Conclusion

The study's findings suggest that if Bangladesh's marine resources are managed and utilized well, the country may achieve its goal of becoming a developed nation ahead of schedule. Nonetheless, there is an urgent need for greater research into the potential role that the "Maritime Economy" may play in the growth of the Bangladeshi economy through the measurement of economic metrics, potentially including introducing satellite data with A.I., ML, B.I., and N.N. Suppose Bangladesh can find a good middle ground between preserving marine ecosystems and exploiting marine resources. In that case, it stands a great chance of expanding its economy by using sea-based resources. Bangladesh requires increased employment possibilities to reach its objective of being a middle-income nation by 2021 and a developed country by 2041; adopting ocean economic methods could help this problem.

Similar to other industrialized regions of the world, Europe relies heavily on the resources and services provided by its blue economy. Maritime transportation and related industries comprise more than forty percent of the European economy. One would hope that with today's politically stable economy and technologically advanced society, transportation networks would improve efficiency, security, and friendliness to the environment. Maritime transport is vital to the global economy, value chains, resource allocation, and overall economic growth and development. It affects numerous industries both immediately and indirectly. It is believed to have less of an impact on the environment than other forms of transportation, such as driving. This fact lends support to Bangladesh's efforts to resolve maritime boundary disputes and cooperate with other countries in the Bay of Bengal, invest in massive infrastructure projects like deep sea ports and transportation networks, and determine what kind of blue economic functions are best suited to the country, craft a suitable policy and strategy, create the necessary institutions, and hire the necessary workers.

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