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BLUE ECONOMY AND BANGLADESH: LESSONS AND POLICY IMPLICATIONS

Abstract

In recent times, Blue Economy is emerging as an alternative development paradigm that balances economic use of oceans with environmental sustainability. With the depletion of land-based resources, countries around the world are turning their attention to the oceans as a new source of economic development and growth. Following the settlement of its maritime territory, Bangladesh is also working on utilizing oceanic resources with a view to becoming a developed country. In this backdrop, the paper is an attempt to examine the initiatives taken by different countries around the world to develop Blue Economy and identify important lessons that Bangladesh can learn from those experiences. The lessons include formulating a well-articulated Blue Economy plan, developing robust legal and institutional frameworks, emphasizing indigenous capacity development, prioritizing ocean research and innovation, protecting ocean environment as well as pursuing 'Blue Diplomacy' among others.

Keywords: Blue Economy, Ocean Economy, Ocean-based Development, Marine Resources, Environmental Sustainability

1. Introduction

In the 21st century, the increased global population and the fast dwindling of earth's land-based resources have renewed interest in ocean's economic potential. However, with the growing need and increased capacity to industrialize the oceans, there is a concern that oceanic resources will soon deplete if not handled properly. Thus, a need to reinterpret how oceans can be measured, monitored and managed more effectively has emerged. Against this reality, the concept of Blue Economy was introduced to respond to the new economic demands, ecological needs and the dynamics of global climate change.¹ Contrary to previous practices which focused on resource extraction and financial benefits, Blue Economy tries to strike a balance

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¹ Mark J. Spalding, "The New Blue Economy: the Future of Sustainability", *Journal of Ocean and Coastal Economics*, Vol. 2, Issue 2, February 2016, pp. 1-21.

between ocean-based development and environmental protection. As Gunter Pauli suggests, the aim of Blue Economy is to ensure that “ecosystems can maintain their evolutionary path so that all can benefit from nature’s endless flow of creativity, adaptation and abundance.”²

Since its introduction after the United Nations (UN) Conference on Sustainable Development or Rio+20 in 2012, Blue Economy is rapidly emerging as development paradigm that provides solution to the limits of growth.³ Blue Economy is a broad concept that encompasses wide variety of issues relating to ocean and coastal economy. Study of numerous documents shows that there are over 25 sectors that have been listed under the Blue Economy. Scholars from a variety of background including natural science, economy, law, engineering and international relations, etc., have dwelled on the issue, resulting significant variation in how the concept is perceived. However, at its core, Blue Economy is based on principles of equity, well-being, low carbon development, resources efficiency and social inclusion.

Countries all over the world are increasingly recognizing the importance of the Blue Economy. Some of the world’s fastest growing economies such as China, India, Australia and South Africa are already actively pursuing Blue Economy, while supra-national authorities like European Union (EU) also has their own Blue Economy strategy. It is not only the major actors; small countries are embracing the concept wholeheartedly as well. The Small Island Developing States (SIDS) have been pioneering number of innovative Blue Economy initiatives. Besides, global governing bodies, e.g., the World Bank and the UN are promoting Blue Economy through financial and policy support.

Following the settlement of its maritime dispute with neighbouring India and Myanmar, Bangladesh has now got 118,813 km² of territorial sea, 200 nautical mile of Exclusive Economic Zone (EEZ) and a substantial share of the extended continental shelf.⁴ Thus, Bangladesh has maritime zone almost the size of the country itself which has created huge opportunities for ocean-based economic growth and development. The Government of Bangladesh (GoB) has stated its interest to pursue the Blue Economy concept as part of country’s growth strategy. Prime Minister Sheikh Hasina has remarked, “Blue Economy is a concept which can significantly contribute in the socio-economic development of Bangladesh. The role of marine resources in poverty alleviation, acquiring autarky in food production, protecting environmental balance, facing adverse impacts of climate change and other economic activities is

² Gunter A. Pauli, *The Blue Economy 10 Years, 100 Innovations, 100 Million Jobs*, New Mexico: Paradigm Publications, 2010, p. xxix.

³ Vishva Nath Attri and Narnia Bohler-Muller (eds.), *The Blue Economy Handbook of the Indian Ocean Region*, Pretoria: Africa Institute of South Africa, 2018, p. 1.

⁴ Md Shahidul Hasan, “Maritime Verdicts and Resource Exploration for Bangladesh”, *BISS Journal*, Vol. 35, No. 3, July 2014, p. 227.

unlimited.”⁵ Experts believe that if Bangladesh utilizes her marine resources actively, it is quite possible for her to be a middle-income country within short time.⁶ With a view to achieving Blue Economy objectives, the GoB is hosting and joining high level international dialogues. In fact, Bangladesh has been very proactive among the Bay of Bengal littorals to develop Blue Economy. As Vijay Sakhuja observes, “Bangladesh merits a leadership role for the development of Blue Economy in the Bay of Bengal.”⁷ However, Bangladesh is still in the early stages of embracing the concept and confronts a number of technological and financial constraints to realize the Blue Economy aspirations. So, for Bangladesh, there is scope of learning from the practices of other countries in developing its Blue Economy.

Against this backdrop, the paper seeks to understand, what are the major Blue Economy initiatives around the world and what lessons can be learnt by Bangladesh from those experiences? In order to answer the questions, the paper reviews existing literatures on Blue Economy that include books, journal articles, government and non-government policy papers and documents, newspaper and internet-based articles, etc. Data and information used in the paper are based on secondary sources. In addition, data and ideas have been collected through expert interviews.

The paper is divided into six sections including the introduction. The second section provides a conceptual understanding of Blue Economy and its components. The third section examines the state of Blue Economy in Bangladesh. The fourth section evaluates major Blue Economy initiatives taken by different countries using an analytical framework. The fifth section provides suggestions for Bangladesh based on the Blue Economy experiences of other countries. The last section concludes the paper with remarks.

2. Blue Economy: Conceptual Understanding

Although the Blue Economy has entered the arena of regular international debate and discourse for the past several years, no commonly accepted definition has emerged so far.⁸ Diversity of views is noteworthy. Therefore, Blue Economy term can be understood as buzzwords.⁹ In literature, Blue Economy has been used synonymously to ‘marine economy’, ‘coastal economy’, ‘ocean economy’, ‘green economy’ and so

⁵ Sheikh Hasina, Prime Minister’s address at the *International Workshop on Blue Economy* in Dhaka, Bangladesh, 31 August 2014.

⁶ Md. Monjur Hasan, B. M. Sajjad Hossain, Md. Jobaer Alam, K. M. Azam Chowdhury, Ahmad Al Karim, Nuruddin Md. Khaled Chowdhury, “The Prospects of Blue Economy to Promote Bangladesh into a Middle-Income Country”, *Open Journal of Marine Science*, Vol. 8, 2018, p. 355-369.

⁷ Vijay Sakhuja, “Harnessing the Blue Economy”, *Indian Foreign Affairs Journal*, Vol. 10, No. 1, 2015.

⁸ Federation of Indian Chambers of Commerce and Industry (FICCI), *Blue Economy Vision 2025: Harnessing Business Potential for India Inc and International Partners*, New Delhi: Federation House, April 2017.

⁹ Young Rae Choi, “The Blue Economy as Governmentality and the Making of New Spatial Rationalities”, *Dialogues in Human Geography*, Vol. 7, No. 1, 2017, pp. 37-41.

on. While the basic tenets and goals of these competing paradigms nearly similar, there are basic differences in the approaches and treatment of various elements, e.g., resource management, growth objectives, sustainability and social equality.¹⁰

The concept of Blue Economy has emerged in response to the 2012 UN Conference on Sustainable Development or Rio+20. The concept has its roots in the earlier 1992 Rio Earth Summit, which focused on fostering the growth of a 'green economy' — "an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities."¹¹ In response to an international push to 'green' the global economy, SIDS began emphasizing the importance of the ocean and marine economy, promoting the concept of a Blue Economy.¹² The term "Blue Economy" itself was first introduced in 1994 by Professor Gunter Pauli.¹³ The introduction of Blue Economy was part of the global transition from traditional economic path to human-centric development, which focused harmony with nature and sustainability.

At the heart of the concept, there is a separation of socio-economic development from environmental degradation.¹⁴ In this regard, efficiency and optimization of natural marine resources within ecological limits become paramount.¹⁵ Therefore, Blue Economy can maximize the economic value of the marine environment in a sustainable manner that preserves and protects the sea's resources and ecosystems.¹⁶ *The Economist*, in a report titled 'The Blue Economy: Growth, Opportunity and a Sustainable Ocean Economy', provides a working definition as follows: "A sustainable ocean economy emerges when economic activity is in balance with the long term capacity of ocean ecosystems to support this activity and remain resilient and healthy."¹⁷ The Government of Australia in its report titled 'Marine Nation 2025: Marine Science to Support Australia's Blue Economy' defines that "a Blue Economy is one in which our ocean ecosystems bring economic and social benefits that are efficient, equitable and sustainable".¹⁸ Research and Information

¹⁰ S.K. Mohanty, Priyadarshi Dash, Aastha Gupta and Pankhuri Gaur, *Prospects of Blue Economy in the Indian Ocean*, New Delhi: Research and Information System for Developing Countries, 2015, p. 5.

¹¹ United Nations Environment Programme (UNEP), *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*, Nairobi: UNEP, 2011.

¹² Jennifer J. Silver, Noella Gray, Lisa Campbell, Luke Fairbanks and Rebecca Gruby, "Blue Economy and Competing Discourses in International Oceans Governance", *The Journal of Environment & Development*, Vol. 24, No. 2, 2015, pp. 135-160.

¹³ Gunter A. Pauli, op. cit.

¹⁴ Simon Smith-Godfrey, "Defining the Blue Economy", *Maritime Affairs*, Vol. 12, No. 1, 2016, p. 2.

¹⁵ United Nations Conference on Trade and Development (UNCTAD), *The Oceans Economy: Opportunities and Challenges for Small Island Developing States*, New York and Geneva: United Nations, 2014, p. 2.

¹⁶ The Commonwealth Secretariat, *The Blue Economy and Small States*, London: The Commonwealth Secretariat, 2016.

¹⁷ "The Blue Economy: Growth, opportunity and a sustainable ocean economy", *The Economist Intelligence Unit*, 2015.

¹⁸ Oceans Policy Science Advisory Group (OPSAG), *Marine Nation 2025: Marine Science to Support Australia's*

System for Developing Countries (RIS), a well-known think tank, defines the term as follows:

As a sub-set of the economy, Blue Economy covers all ocean-related activities including direct and indirect supporting activities required for functioning of these economic sectors, while adjusting to the costs of environmental damage and ecological imbalance caused due to exploitation of ocean resources for consumption. Therefore, the scope of Blue Economy is much wider and inclusive.¹⁹

One of the earliest attempts to explore the competing discourses around the Blue Economy was conducted by Jennifer J. Silver et al.²⁰ A more recent study by Michelle Voyer et al. has made a cluster analysis of key components of the Blue Economy and identified four dominant discourses through which the Blue Economy is interpreted.²¹ This study is built upon by earlier analysis conducted by Silver et al. The discourses are: oceans as natural capital, oceans as livelihoods, oceans as good business and oceans as driver of innovations (see Table 1).

Table 1: Conceptual Analysis of Blue Economy

	Oceans as Natural Capital	Oceans as Livelihoods	Oceans as Good Business	Oceans as a Driver of Innovation
Primary Objectives	Ecosystem protection and restoration	Poverty alleviation and food security	Economic growth and employment	Technological or technical advances
Actors	Conservation agencies/ NGOs	Development agencies, SIDS	Industry, larger global economies (EU, OECD, China, etc.)	Academic institutes and governments
Sectors	Carbon intensive industries (e.g., oil and gas). Focus on economic benefits from conservation (e.g., tourism, blue carbon, etc.)	Primarily focus on Small-Scale Fisheries (SSF), eco-tourism with aspirations for diversification, especially aquaculture	All sectors included but primarily focusing on large multi-national corporations and sectors (e.g., shipping, oil and gas, renewable, etc.)	All sectors but particularly emerging industries like renewables, biotechnology and deep-sea mining

Blue Economy, Canberra: Government of Australia, 2013.

¹⁹ S.K. Mohanty, Priyadarshi Dash, Aastha Gupta and Pankhuri Gaur, op. cit, p. 9.

²⁰ Jennifer J. Silver et al., op. cit.

²¹ Michelle Voyer, Genevieve Quirk, Alistair McIlgorm, Kamal Azmi, Stuart Kaye and Michael McArthur, *The Blue Economy in Australia*, Canberra, Australia: Sea Power Centre, 2017.

Scale	Small-scale, locally based	Small-scale, locally based	Global/ regional and national	Sub-national districts or provinces
Tools	Marine Protected Areas (MPA), ecosystem-based management	Community manages fisheries, Marine Spatial Planning (MSP)	MSP, economic valuation studies, targeted investment and growth strategies	Innovation hubs/ research institutes, innovation or competitions, investment/ financing strategies

Source: Michelle Voyer et al., *The Blue Economy in Australia*, Canberra, Australia: Sea Power Centre, 2017, p. 20.

The notion of the Blue Economy as a development model central to the livelihoods of coastal communities is favoured by developing countries and development organizations. It places human well-being and livelihood as a central objective of the Blue Economy, with heavy emphasis on the goal of poverty alleviation. The UN has recognized the potential of the Blue Economy as a development model which it defines as follows: “Blue Economy is a marine-based economic development that leads to improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. At its core, the ocean economy refers to the decoupling of socio-economic development from environmental degradation.”²² The Blue Economy in this context provides developing countries (particularly SIDS) with a framework through which they can diversify their economic base into alternative and emerging sectors and increase their resilience to external shocks. Therefore, SIDS in the Indian and Pacific oceans and the Caribbean have been at the forefront of this interpretation of the Blue Economy.²³ On the contrary, among conservation NGOs, Blue Economy has provided a useful conceptual framework through which economic and development objectives can be tied to environmental considerations. The World Wide Fund for Nature (WWF), defines Blue Economy as follows:

Blue Economy is a marine based economy that provides social and economic benefits for current and future generations, by contributing to food security, poverty eradication, livelihoods, income, employment, health, safety, equity, and political stability. It restores, protects and maintains the diversity, productivity, resilience, core functions, and intrinsic value of marine ecosystems — the natural capital upon which its prosperity depends. It is based on clean technologies, renewable energy and circular material flows to secure economic and social stability over time, while keeping within the limits of one planet.²⁴

Larger economies, organizations (i.e., EU, OECD), industry and business groups favour a growth-centric interpretation of the Blue Economy. The primary focus

²² United Nations Conference on Trade and Development (UNCTAD), op. cit., p. 2.

²³ Meg R. Keen, Anne-Maree Schwarz and Lysa Wini-Simeon, “Towards Defining the Blue Economy: Practical Lessons from Pacific Ocean Governance”, *Marine Policy*, Volume 88, 2018, p. 333-341.

²⁴ World Wide Fund for Nature, *Principles for a Sustainable Blue Economy*, Gland: World Wide Fund for Nature, 2015.

of this interpretation appears to be securing economic growth from the oceans in a manner that is sensitive to environmental constraints. A key tool employed within this lens is economic valuation in order to identify the worth of ocean-based industries to national, regional and global economies. On the other hand, innovation is central to many interpretations of the Blue Economy. This lens focuses on research and development, investment and monitoring which is largely favoured by government and industry groups.

The Government of Bangladesh defines the Blue Economy concept as a sustainable pathway forward for growth of the ocean economy.²⁵ According to the Seventh Five Year Plan, "Blue Economy comprises activities that directly or indirectly take place in the seas, oceans and coasts using oceanic resources and eventually contributing to sustainable, inclusive economic growth, employment, well-being, while preserving the health of ocean."²⁶ Bangladesh's approach to Blue Economy also states that Blue Economy "requires a balanced approach between conservation, development and utilization of marine and coastal ecosystems, all oceanic resources and services."²⁷

Table 2: Components of Blue Economy

Harvesting Living Resources	Extraction of Non-living Resources	Other Economic Activities	Protection of the Sea
Fisheries	Mineral, gravels and sand	Maritime transportation	Marine surveillance
Aquaculture and Non-traditional species	Oil and gas	Ports and related services	Protection of marine and coastal environment
Marine biotechnology	Desalination (fresh-water generation)	Shipbuilding and ship breaking industry	Waste management
Bio-prospecting	Renewable marine (offshore) energy	Coastal and maritime tourism	Blue carbon
Seafood processing	Sea-salt generation	Marine services	Ecological/ecosystem reserve

Source: Compiled from various sources.

²⁵ P.G. Patil, J. Virdin, C.S. Colgan, M.G. Hussain, P. Failler, and T. Vegh, *Toward a Blue Economy: A Pathway for Bangladesh's Sustainable Growth*, Washington, D.C.: The World Bank Group, 2018.

²⁶ General Economics Division (GED), *Seventh Five Year Plan (FY2016 – 2020): Accelerating Growth, Empowering Citizens*, Dhaka, Bangladesh: Planning Commission, Government of the People's Republic of Bangladesh, 2015.

²⁷ P.G. Patil et al., op. cit., p. 27.

The Blue Economy is a vast topic that covers a wide range of industries and activities. A review of the existing literature shows that the components of the Blue Economy are very diverse in nature, ranging from the fisheries and aquaculture to oil and gas mining and other sea related economic activities such as transportation and Tourism. In addition to those, initiatives to protect of the ocean health have also been included as components of Blue Economy. The next section provides a brief discussion on various components of Blue Economy and current state of Bangladesh's initiatives regarding those. To make the discussion easier, the components of Blue Economy has been categorized into four major groups based on the nature of the activity. These groups are: Harvesting Living Resources, Extraction of Non-living Resources, Other Economic Activities and Protection of the Sea. Components included in each group are mentioned in Table 2.

3. Blue Economy of Bangladesh

The newly demarcated area of the Bay of Bengal has opened a new economic frontier for Bangladesh. In order to utilize its unexplored marine resources, Bangladesh is already taking initiatives to flourish its Blue Economy. Since 2015, the GoB has undertaken a number of consultations and workshops on Blue Economy. Besides, Bangladesh's Seventh Five Year Plan has called for twelve actions to be undertaken for maintaining a prosperous and sustainable Blue Economy, which include fisheries, renewable energy, human resources, transshipment, tourism and climate change among others.²⁸ In 2017, the GoB has established the "Blue Economy Cell" with the mandate to coordinate Blue Economy initiatives across sectoral ministries. According to a World Bank report, the gross value added to Bangladesh in 2014-15 from ocean economy was US\$ 6,192.98 million which was around 3.33 per cent of the Bangladesh economy.²⁹ However, Blue Economy has the prospect of contributing to Bangladesh's economy on a much higher level. The Ministry of Foreign Affairs (MoFA) has identified 26 potential Blue Economy sectors.³⁰ This paper focuses on components of Bangladesh's Blue Economy like living and non-living resources, economic activities and protection of the sea as mentioned in Table 2.

3.1 Harvesting Living Resources

Fisheries is one of the major sources of income for Bangladesh. Nonetheless, only 15.41 per cent of the total fisheries come from marine sources.³¹ Furthermore, Bangladesh's marine fishing is still heavily artisan based, vast majority of its marine

²⁸ General Economics Division (GED), op. cit.

²⁹ P.G. Patil et al., op. cit., p. 36.

³⁰ "Blue Economy National Co-ordination Workshop", Ministry of Foreign Affairs (MoFA), Bangladesh, Official Website, 2018, available at https://mofa.gov.bd/site/press_release/bb5cd232-1529-46db-aa8c-d0c8bc4c0e47, accessed on 10 January 2018.

³¹ Department of Fisheries Bangladesh, *Yearbook of Fisheries Statistics of Bangladesh 2016-17*, Dhaka: Ministry of Fisheries and Livestock, 2017, p. Xiii.

catch comes from artisanal fisheries (out of 6.37 lakh Metric Ton (MT) of marine fishery production in 2016-17, 5.29 lakh MT came from artisan fisheries).³² Compared to inland and freshwater aquaculture, the amount of marine aquaculture is also small and mostly based on tiger shrimp.³³ Thus, Bangladesh can increase its fishery production by industrializing its marine fisheries and exploring large pelagic fish harvesting, long line fishing of tuna and tuna like fishes.³⁴ Shellfish, seaweed and algae are known to be great sources of protein, iodine and other vital minerals and there is a huge demand for them in international market. The GoB is taking initiatives in this regard. In 2016, it procured a modern survey vessel named *Meen Sandhani*,³⁵ which aims to do a stocktaking of available fishing sources in the Bay of Bengal.

Marine biotechnology is a fast-growing field with the potential discovery of new chemical products, enzymes and other ingredients which is expected to bring great advancement in pharmaceutical, biomaterials health care and makeup industries.³⁶ As Bangladesh has a blooming pharmaceutical industry, investments in these areas are sure to bring benefit to the country.

3.2 Extraction of Non-living Resources

Seabed mining and acquisition of minerals are highly valuable for economic purposes. But currently, the data available for seabed minerals in Bangladesh are outdated.³⁷ In terms of sand and gravel, the coastal belt from Patenga to Teknaf has been explored with the discovery of 17 deposits of potentially valuable minerals.³⁸ These valuable minerals can contribute to various industries e.g., glass, paper, etc. Bangladesh's offshore energy exploration is still far away from reaching its optimal level. According to the MoFA website, 19 exploratory wells were drilled in the Bay of Bengal up until 2014 and it resulted in two gas discoveries, i.e., the Sangu and the Kutubdia.³⁹ Bangladesh is said to have great potential for ocean-based technology such as wind, tidal and wave energy, but no feasibility study has been conducted on the area so far.

³² Ibid., p. 14.

³³ M. Gulam Hussain, Pierre Failler, A. Al Karim and M. Khurshed Alam, "Review on Opportunities, Constraints and Challenges of Blue Economy Development in Bangladesh", *Journal of Fisheries and Life Sciences*, Vol. 2, No. 1, 2017, p. 38.

³⁴ M. Gulam Hussain, Pierre Failler, A. Al Karim and M. Khurshed Alam, "Major Opportunities of Blue Economy Development in Bangladesh", *Journal of the Indian Ocean Region*, Vol. 14, No. 1, 2018, pp. 93-94.

³⁵ Anwar Hussain, "Bay fish survey from November", *Dhaka Tribune*, 07 August 2016.

³⁶ Narsinh L Thakur and Archana N Thakur, "Marine Biotechnology: An Overview", *Indian Journal of Biotechnology*, Vol. 5, 2006, p. 264.

³⁷ The last report on this issue was published in 1994 by Bangladesh Atomic Energy Commission (BAEC).

³⁸ M. Khurshed Alam, *Bangladesh's Maritime Challenges in the 21st century*, Dhaka: Pathak Shamabesh Book, 2004, p. 173.

³⁹ "Ocean/Blue Economy for Bangladesh", Ministry of Foreign Affairs, Bangladesh, Official Website, 2018, available at <https://mofa.gov.bd/>, accessed on 10 January 2018.

Sea salt generation using traditional methods has been around in Bangladesh for a long time. The government patronized this industry by discouraging import of salt through the National Salt Policy in 2011.⁴⁰ However, Bangladesh's salt production predominantly comes from small scale farmers who do not use modern equipment, thus are more vulnerable to unpredictable interruptions like natural disaster.

In many countries of the world, seawater is appropriately desalinated in order to produce fresh water. A recent report says that the global water desalination market is in the path of reaching US\$26.81 billion by 2025.⁴¹ Bangladesh is heavily dependent on underground water for agriculture (which is quickly reducing in stock). Hence, exploring new avenues of freshwater generation is necessary. Additionally, possibility of exporting water to drier countries in near future cannot be ignored as extreme impacts of climate change loom over the world.

3.3 Other Economic Activities

More than 90 per cent of Bangladesh's external freight trade is seaborne,⁴² but Bangladesh scores only 12.07 out of a possible 100 in The United Nations Conference on Trade and Development (UNCTAD) Liner shipping connectivity index.⁴³ Eighty per cent of the US\$ 78 billion annual overseas trade of Bangladesh is handled by Chattogram Sea port alone.⁴⁴ To reduce the burden, the GoB has already invested in several seaport facilities, i.e., Sonadia, Matarbari (which has been reported to be converted into a deep sea port)⁴⁵ and Payra.⁴⁶ In addition to upgrading the infrastructure, improving the quality of port services is important. Most of Bangladesh's seaborne cargo is carried by foreign cargo ships.⁴⁷ Moreover, the size of the national fleet has gone down to 13.8 per cent in 2016.⁴⁸ Thus, Bangladesh can benefit greatly if local shipping companies are promoted.

⁴⁰ Mohammad Ali Zinnat, "Good days for salt farmers", *The Daily Star*, 03 February 2016.

⁴¹ "Water Desalination Market Size Worth USD 26.81 Billion By 2025", *Hexa Research*, 10 August 2017, available at <https://www.hexaresearch.com/press-release/global-water-desalination-market>, accessed on 17 January 2018.

⁴² M. Khurshed Alam, "Blue Economy", *ICE Business Times*, 01 November 2015, available at <http://ibtbd.net/blue-economy/>, accessed on 22 January 2018.

⁴³ UNCTAD Stat, "Liner Shipping Connectivity Index, Annual", available at <http://unctadstat.unctad.org/>, accessed on 28 October 2018.

⁴⁴ Sohel Parvez, "15pc VAT on all port services to hurt businesses, consumers", *The Daily Star*, 09 January 2018.

⁴⁵ Dwaipayan Barua, "Matarbari port to be turned into a deep-sea port", *The Daily Star*, 07 January, 2018.

⁴⁶ "Infrastructure spending stimulates growth", *The Daily Star*, 28 December 2018.

⁴⁷ M. Gulam Hussain, Pierre Failler, A. Al Karim and M. Khurshed Alam, 2017, op. cit.

⁴⁸ "Maritime Profile: Bangladesh", UNCTAD, available at <http://unctadstat.unctad.org/>, accessed on 22 January 2018.

Bangladesh's record in the shipbuilding industry is quite impressive. It is currently able to fulfill 100 per cent of its inland water vessels.⁴⁹ However, in the global industry, Bangladesh contributes to less than 0.01 per cent.⁵⁰ On the other hand, the ship breaking industry of Bangladesh is known worldwide. Bangladesh, India and Pakistan represent about 70 per cent of the global ship breaking industry.⁵¹ However, the industry is globally criticized for exploitation of cheap labour and environmental violations. Given that the industry plays a great role in Bangladesh's economy, measures are to be taken to ensure that the ship recycling process is done in an environment-friendly way.

Bangladesh's coastal and marine tourism is meager and mainly dependent on local tourists. But Bangladesh is home to the largest continued coastline in the world, which has great tourism potential. However, it should be kept in mind that unplanned tourism can often lead to destruction of precious natural resources. Saint Martin's, Bangladesh's only coral island is already being burdened by heavy tourist activity.⁵² Ensuring planned tourism thus is the key. The inauguration of US-based international luxury cruise line 'Silversea' in Bangladesh has signalled the beginning of a new era of sea tourism in the country.⁵³

3.4 Protection of Sea

The environmental protection of the sea is a crucial part of the Blue Economy concept. The Bay of Bengal is home to a vibrant and diverse fauna and flora. To protect the health of the sea, it is important to have a good marine waste management system. Bangladesh has undertaken a successful coastal green belt back in the 1990s.⁵⁴ Recently, the government has initiated programme for greening the new islands in the Bay of Bengal,⁵⁵ which is a positive initiative. In addition, Bangladesh needs to think about marine waste management to protect its sea. On the other hand, ensuring the security of the Bay is crucial for expansion of ocean-based industries. Therefore, Bangladesh needs to strengthen its maritime surveillance.

Blue carbon is another name for carbon sequestration, which refers to the long-term storage of carbon in plants, soils, geologic formation and the ocean.⁵⁶ In

⁴⁹ "Ocean/Blue Economy for Bangladesh", op. cit.

⁵⁰ "Maritime Profile: Bangladesh", op. cit.

⁵¹ Abdullah Bari and M. Rafiqul Islam, "Our Oceans and Blue Economy: Opportunities and Challenges", *Procedia Engineering*, Vol. 194, 2017, p. 9.

⁵² Aparup Chowdhury, "Rethinking Sustainable Coastal and Marine Tourism Development", paper presented in the *PATA Way New Tourism Frontiers Forum*, organized by Bangladesh Tourism Board, Cox's Bazar, Bangladesh on 23-25 November 2016.

⁵³ Tarek Mahmud, "New prospects in Bangladesh Blue Economy", *Dhaka Tribune*, 12 March 2017.

⁵⁴ Banglapedia, "Coastal Greenbelt", available at <http://en.banglapedia.org/>, accessed on 22 January 2018.

⁵⁵ "New coastal islands to get green", *The Daily Star*, 11 January 2018.

⁵⁶ "What is Blue Carbon?", *National Ocean Service*, available at <https://oceanservice.noaa.gov/facts/bluecar->

Bangladesh, Chowdhury et al. estimate that around 3 million tons of CO₂ is stored in the mangroves and salt marshes per year, but there is lack of data on seagrass beds, river-estuary and coastal water.⁵⁷ Even though blue carbon has not been integrated into policy discussions for climate mitigation,⁵⁸ having a measure of blue carbon may help Bangladesh in future climate negotiations.

Just as the components of the Blue Economy are diverse, so is the number of the actors involved in the process. Each of the industries and activity in the Blue Economy framework has their own set of actors involved with them, including their own line ministries, private sector investors and businessmen, and non-governmental organizations working on that specific area. In many industries, there is also involvement of small businesses and root level workers, especially in fisheries, sea-salt generation and ship breaking. On the other hand, issues such as marine surveillance and environmental protection have to be handled by the government as a whole. In addition, because of the necessity of international cooperation in development of the Blue Economy, many regional organizations and other cooperating states are also important actors of Blue Economy.

Each of the group of components has their own set of challenges. While harvesting the living resources, the concern is balancing between economic gain and ecological sustainability. There is also need to explore ways to benefit from the existing bio-diversity in the Bay of Bengal. In the extraction of the non-living resources, there is need to find ways to attract private investment and develop effective regulatory framework that allows Bangladesh to efficiently use its resources. In case of other sea related economic activities, the challenge is to build large scale infrastructure necessary for port and transportation services. On the other hand, in protecting the sea the challenge lies in developing an effective monitoring and evaluation system that will be able to effectively measure the ocean health. Having a strong marine surveillance system is also included in this category, which is a requirement for all other Blue Economy activities to go unhindered. In the following section, examples from other countries are discussed in order to see how they are working on flourishing Blue Economy.

4. Blue Economy around the World

Given the economic potential of oceans and seas, a number of countries are investing enormous financial, technological and human capital to develop Blue

bon.html, accessed on 28 October 2018.

⁵⁷ Sayedur Rahman Chowdhury, M. Shahadat Hossain, S.M. Sharifuzzaman, Subrata Sarker, *Blue Carbon in the Coastal Ecosystems of Bangladesh*, Dhaka: IUCN Bangladesh Country Office, 2015.

⁵⁸ Iris Monnerreau, "Opportunities and Challenges of Developing the Blue Economy in Small Island Developing States in Africa", *Centre for Resource Management and Environmental Studies*, available at <http://www.climdev-africa.org/sites/default/files/ccda4documents/2.4%20Iris%20Monnerreau.pdf>, accessed on 22 January 2018.

Economy. This section discusses various Blue Economy policies and initiatives pursued by major powers as well as in countries where Blue Economy activities are prominent. In addition, it analyzes the country-specific Blue Economy initiatives based on the four dominant discourses (oceans as natural capital, oceans as livelihoods, oceans as good business and oceans as driver of innovations) developed by Michelle Voyer et al.

4.1 Australia

Australia is one of those countries that consider the importance of Blue Economy for addressing the major development gaps.⁵⁹ It has the third largest marine jurisdiction of 13.86 million square km which is larger than its land territory.⁶⁰ Its Blue Economy is dominated by two sectors, namely offshore oil and gas (50 per cent) and tourism (40 per cent).⁶¹ However, Blue Economy covering aquaculture, wild fisheries, marine biotechnology and other also contributes significantly to the economy. The report of the Australian Institute of Marine Science (AIMS) shows that in 2013-14, Australia's marine industries contributed US\$ 74.2 billion to the national economy which accounted for 4.8 per cent of national Gross Domestic Product and directly and indirectly provided almost 400,000 jobs.⁶² In total, Australia's marine industries contributed US\$ 42.0 billion to value-add in 2013-14, with a further indirect US\$ 32.2 billion of value added in other industries.⁶³ By 2025, Australia's marine industries are forecast to contribute about US\$ 100 billion each year to Australia's economy.⁶⁴

The intentions and policy priorities of the Australian Government with respect to Blue Economy are lucid and visionary. As earlier mentioned, it has stated, "a Blue Economy is one in which our ocean ecosystems bring economic and social benefits that are efficient, equitable and sustainable".⁶⁵ The Government of Australia has implemented several Blue Economy initiatives, e.g., promoting scientific, technological and other innovations and establishing necessary mechanisms for regional cooperation among the neighbouring countries. 'The National Framework for Marine Research and Innovation' highlights the critical areas of marine science that offer opportunities for experimentation and investments. The Framework envisages schemes for improving the quality of marine science research; creations of marine

⁵⁹ S.K. Mohanty, Priyadarshi Dash, Aastha Gupta and Pankhuri Gaur, op. cit., p. 66.

⁶⁰ Karen Evans, Nic Bax and David Smith, *Australia State of the Environment Report 2016*, Canberra: Government of Australia, 2016.

⁶¹ S.K. Mohanty, Priyadarshi Dash, Aastha Gupta and Pankhuri Gaur, op. cit., p. 67.

⁶² Australian Institute of Marine Science (AIMS), *The AIMS Index of Marine Industry*, Townsville: Government of Australia, 2016, p. 17.

⁶³ Ibid.

⁶⁴ "Australia's Blue Economy: \$100 billion in 2025", *Australian Fisheries Management Authority*, 18 August 2015, available at <http://www.afma.gov.au/australias-blue-economy-100-billion-2025/>, accessed on 23 July 2018.

⁶⁵ Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Innovation for the Blue Economy: Workshop Summary*, Canberra: CSIRO, 2015, p. iii.

infrastructure in terms of observe technologies, observe vessels, etc.; reorganization of existing institutions for marine research for better coordination and effective execution.⁶⁶ In order to build a strong Blue Economy, the 'National Marine Science Plan 2015-2025' identifies a number of policy initiatives for future investments which include (1) National Blue Economy Innovation Fund, (2) National Marine Research Infrastructure, (3) National Marine Baselines and Monitoring Program, (4) National Integrated Marine Experimental Facility, (5) National Ocean Modelling Program and (6) Marine Science Capability Development Fund.⁶⁷

In the Australian context, the 'oceans as a driver of innovation' lens is the primary lens used to interpret the Blue Economy and to a lesser extent, the 'oceans as good business' lens.⁶⁸ The 'oceans as a driver of innovation' lens in Australia is substantiated through policy documents like the 'National Marine Science Plan'. This plan, coordinated by the National Marine Science Committee, is built on the AIMS index of marine industries to project future opportunities for growth and how they might be supported by the Australian science community.⁶⁹ On the other hand, the 'oceans as good business' lens is exemplified by a focus on valuation studies that seek to quantify the worth of marine industries in Australia and project their future capacity for growth. For example, AIMS has been developing a regular valuation of existing maritime industries since 2008, known as the AIMS Index of Marine Industry.⁷⁰

4.2 China

China, the fastest growing economy in the world, is home to rich endowment of blue resources, which could help sustain its high growth spell in the future. It has a vast coastline of 32,000 km including continental shelves and EEZ which has marine oil reserves of 24 billion tons and natural gas reserves of 1.6 billion cubic meters.⁷¹ During 2011-2015, China's ocean economy grew at an annual average growth of 8.1 per cent. In 2015, the marine economy was estimated to be US\$ 989.3 billion, which was 7 per cent higher than in 2014. This corresponded to about 9.6 per cent of the national GDP for 2015. Besides, the marine industry employs an estimated 35.9 million people.⁷²

The Government of China emphasizes on marine resources and the oceans to supplement its land resources. The Chinese leadership is aware of the importance of

⁶⁶ Oceans Policy Science Advisory Group (OPSAG), op. cit.

⁶⁷ National Marine Science Committee, *National Marine Science Plan 2015-2025: Driving the Development of Australia's Blue Economy*, Canberra: Government of Australia, 2015, p. 8.

⁶⁸ Michelle Voyer et al., op. cit.

⁶⁹ National Marine Science Committee, op. cit.

⁷⁰ Australian Institute of Marine Science (AIMS), op. cit.

⁷¹ Rui Zhao, Stephen Hynes and Guang Shun He, "Blue Growth in the Middle Kingdom: An Analysis of China's Ocean Economy", *Center for the Blue Economy (CBE)*, No. 3, 2013, p. 5.

⁷² "China's marine output up 7% in 2015", *Xinhua*, 03 March 2016.

the marine economy and has noted: "A developed marine economy is an important part of building maritime power."⁷³ For the first time, the Chinese government launched the China Ocean Agenda 21 in 1996 with the objective to formulate a comprehensive strategy for sustainable development of marine resources, safeguard state's marine rights and interests, and protect marine ecosystems.⁷⁴ Adoption of this agenda was the beginning of Blue Economy in China. In recent years, the Chinese government has been increasingly supportive of the development of ocean economy, implementing several national ocean-related strategies.⁷⁵ At policy level, Blue Economy assumed significance in the 12th Five-Year Plan for National and Social Development, 2011-15 which for the first time, devoted emphasis to the development of ocean economy. The major objective of the Plan was to optimize the structure of Blue Economy through the development of marine industries.⁷⁶ In March 2016, the Chinese government announced the 13th Five-Year Plan (2016-2020) which aims to achieve nearly 100 targets in the five-year period, e.g., develop smart ports, construct more ice-breaking vessels, transform the ship equipment industry and engage in deep-sea activities, etc.⁷⁷ These initiatives will help China to promote the growth of Blue Economy.

In China, Blue Economy has been guided by the development and implementation of Marine Functional Zoning, which has aimed to rationalize governance arrangements, nurture sustainable industries and secure sovereign rights.⁷⁸ Besides, China has showed a significant growth agenda in relation to its maritime jurisdiction, perhaps best demonstrated through its massive 'Maritime Silk Road' project aimed at securing trade routes and opening up new economic opportunities in the Indo-Pacific region.⁷⁹ Their ocean-based economic agenda also highlights the risks associated with geopolitical and territorial disputes.⁸⁰ The technique of economic valuation in order to identify the worth of ocean-based industries to national economies has been particularly embraced in China.⁸¹ Experts believe that this provides a metric to highlight and communicate the value of these

⁷³ Wang Qian and Zhang Yunbi, "President Xi vows to protect maritime interests", *China Daily*, 01 August 2013.

⁷⁴ Rui Zhao, Stephen Hynes and Guang Shun He, op. cit.

⁷⁵ Rui Zhao, Stephen Hynes and Guang Shun He, "Defining and Quantifying China's Ocean Economy", *Marine Policy*, Vol. 43, 2014, p. 164.

⁷⁶ S.K. Mohanty, Priyadarshi Dash, Aastha Gupta and Pankhuri Gaur, op. cit., p. 75.

⁷⁷ Federation of Indian Chambers of Commerce and Industry (FICCI), op. cit., p. 6.

⁷⁸ Wen-Hai Lu, Jie Liu, Xian-Quan Xiang, Wei-Ling Song and Alistair McIlgorm, "A Comparison of Marine Spatial Planning Approaches in China: Marine Functional Zoning and the Marine Ecological Red Line", *Marine Policy*, Vol. 62, 2015, pp. 94-101.

⁷⁹ Mohammad Aminul Karim, "China's Proposed Maritime Silk Road: Challenges and Opportunities with Special Reference to the Bay of Bengal Region", *Pacific Focus*, Vol. 30, No. 3, 2015, pp. 297-319.

⁸⁰ Clive H. Schofield, "A Landmark Decision in the South China Sea: The Scope and Implications of the Arbitral Tribunal's Award", *Contemporary Southeast Asia*, Vol. 38, No. 3, 2016, pp. 339-347.

⁸¹ Alistair McIlgorm, "Ocean Economy Valuation Studies in the Asia-Pacific Region: Lessons for the Future International Use of National Accounts in the Blue Economy", *Journal of Ocean and Coastal Economics*, Vol. 2, No. 2, 2016, p. 10.

sectors to society, governments and the business sector in order to grow investment and build social and political support.⁸²

In the Chinese context, the Blue Economy is interpreted through the 'ocean as good business' lens primarily. Michael Conathan and Scott Moore rightly point out, "China's Blue Economy policies have focused on growth of the ocean economy, through a cross-sectoral and spatial planning process for economic development. But China's emphasis is not on environmental protection"⁸³ Although the Chinese government has taken a few important steps to better protect marine ecosystems, nevertheless its main focus has been on economic development.

4.3 European Union (EU)

Europe's vast territory gives it access to a number of sea and oceans and its maritime sector employs over 5.4 million jobs generating almost US\$ 569.8 billion a year.⁸⁴ For the EU, the primary lens used to interpret the Blue Economy is the 'oceans as a driver of innovation' lens. However, compared to other countries, significant amount of emphasis is also put on 'oceans as good business' and 'oceans as natural capital' lenses. In fact, the EU is using innovation to foster jobs and protect the environment, which is aimed at meeting its needs without causing damage to ocean health.

In 2012, the European Commission formulated its "Blue Growth Strategy" to harness the possibilities of Europe's oceans, seas and coasts for growth and job. The strategy was designed "to steer the EU out of its current economic crisis" as a source of jobs, competitiveness and greater resource opportunity that can be tapped while "safeguarding" the health of European seas. It also identified five focus areas for blue growth, i.e., blue energy, aquaculture, maritime, coastal and cruise tourism, marine mineral resources and blue biotechnology.⁸⁵ A progress report of implementation of the blue growth strategy was published in 2017. It shows that research and innovation have always been a key focus of EU, with a total of US\$ 911.68 million allocated to marine and maritime research and innovation projects from 2014-2016. The report also talked about a European Maritime and Fisheries Fund to help encourage investment (though a lack of public and private risk funding for emerging industries was cited as a continuing challenge), and Coastal and Marine Spatial Planning (CMSP).⁸⁶ The

⁸² Charles S. Colgan, "Measurement of the Ocean Economy from National Income Accounts to the Sustainable Blue Economy", *Journal of Ocean and Coastal Economies*, Vol. 2, No. 2, 2016, pp. 1-42.

⁸³ Michael Conathan and Scott Moore, "Developing a Blue Economy in China and the United States", *Centre for American Progress*, 2015, p. 5.

⁸⁴ ECORYS, *Blue Growth Study - Scenarios and Drivers for Sustainable Growth from the Oceans, Seas and Coasts*, Brussels: European Commission, 2012.

⁸⁵ European Commission, *Blue Growth: Opportunities for Marine and Maritime Sustainable Growth*, Brussels: European Commission, 2012.

⁸⁶ European Commission, *Report on the Blue Growth Strategy: Towards a More Sustainable Growth and Jobs in the Blue Economy*, Brussels: European Commission, 2017.

EU also has conducted study on specific seas (such as the western Mediterranean) to see its Blue Economy potential. Besides, the EU Marine Strategy Framework Directive (MSFD) has been put in place to protect the marine ecosystem and biodiversity.⁸⁷ In 2018, the European Commission also funded an expert study on sustainable Blue Economy which suggested pathways for development of Blue Economy in Europe while conserving marine and coastal ecosystem.⁸⁸

In order to highlight the results of its research and innovation in Blue Economy, the EU published another report in 2017. The report demonstrated how EU-funded research and innovation projects were helping in meeting the main challenges in sustainable Blue Economy development. Moreover, the EU has been focusing on sustainable marine energy and blue biotechnology; both of which require high level of technological innovation.⁸⁹ In a nutshell, it can be said that the EU's efforts to flourish its Blue Economy have been focused on generating more jobs through innovation without harming the ocean's health on which marine-related economic and social activities are dependent.

4.4 India

India is the largest among South Asian countries, and endowed with 7,500 km long coastline and 2.019 million km² of EEZ, which is a repository of huge wealth of living and employment and contributes to the national economy.⁹⁰ However, there has not been any attempt to calculate how much the Blue Economy contributes to the country's GDP, which is understandable as the concept did not gain attention of the government until very recently.

The Indian government stands committed to promoting the Blue Economy. Prime Minister Narendra Modi has spoken about it on several occasions at national and international levels. He observed: "To me the Blue chakra or wheel in India's national flag represents the potential of Blue Revolution or the Ocean Economy. That is how central the ocean economy is to us."⁹¹ He endorsed Blue Economy as a new pillar of economic activity in coastal areas and linked hinterlands through sustainable tapping of oceanic resources and announced his vision for the seas through Security

⁸⁷ European Commission, "Environment", 18 May 2017, available at http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm, accessed on 15 October 2018.

⁸⁸ M. Pantzar and M. Kettunen, *A Sustainable Blue Economy: Adopting the Concept of Ecosystem Services in EU Marine Protected Area Management– A Study of Experts' Views*, Brussels: European Commission, 2018, pp. 11-22.

⁸⁹ European Commission, *Investing in the Blue Economy: Unlocking the Potential of the Ocean to Create Jobs and Boost the Economy*, Brussels: EU, 2017.

⁹⁰ Vijay Sakhuja, op. cit.

⁹¹ Narendra Modi, Prime Minister's Statement Made at the Commissioning of Offshore Patrol Vessel (OPV) in Barracuda, Mauritius, on 12 March 2015.

and Growth for All in the Region (SAGAR). The centerpiece of India's push for the Blue Economy is the Sagarmala project that includes constructing ports, augmenting coastal infrastructure, developing inland waterways, intensifying fishing, and creating special economic zones and tourism promotion.⁹² The project envisages doubling the current share of coastal shipping in India's overall modal mix from 6 per cent to 12 per cent by 2025.⁹³

In addition, India has been actively pursuing oceanic outreach in the near neighbourhood as well as the wider Indian Ocean Region (IOR), couched in terms of the Blue Economy.⁹⁴ It has launched Blue Economy initiatives with Seychelles, Mauritius, Sri Lanka and Bangladesh among other countries of the IOR. Following Prime Minister Modi's visit to Mauritius, an India-Mauritius Dialogue on the Blue Economy has been set up and as a follow-up, on 12 April 2016 the Mauritius Minister of Ocean Economy, Marine Resources, Fisheries, Shipping and Outer Islands met with India's Minister of Science and Technology and Earth Sciences to explore areas of cooperation.⁹⁵ The most recent visit in 2017 resulted into the signing of Memorandum of Understanding (MoU) on research and education in marine sciences and technology.⁹⁶ Furthermore, MoUs have been signed with Seychelles, Sri Lanka and Bangladesh on the Blue and Ocean Economy. For instance, an agreement was signed between India and Bangladesh on 15 November 2015 to commence coastal shipping between Bangladesh and the eastern ports of India through River Sea Vessels.⁹⁷

Therefore, it is apparent that India's Blue Economy endeavours are focused on port led economic development which can be explained by 'oceans as good business' lens. Some argue that there is absence of an overarching strategic vision which incorporates the elements such as maritime security, environmental sustainability and new and innovative forms of cooperation.⁹⁸ Besides, there has been limited discussion on the financial viability and social costs of pushing it.

⁹² Pankaj Sekhsaria, "Many shades of a Blue Economy: Sagarmala project", *The Hindu*, 11 November 2017, available at <https://www.thehindu.com/sci-tech/energy-and-environment/many-shades-of-a-blue-economy-sagarmala-project/article20104312.ece>, accessed on 20 November 2018.

⁹³ "India's Blue Economy Booming", *The Maritime Executive*, 16 November 2017, available at <https://www.maritime-executive.com/article/indias-blue-economy-booming#gs>, accessed on 17 June 2018.

⁹⁴ Jivanta Schottli, "India's Maritime Turn: A Blue Economy Strategy in the Making?", *ISAS*, No. 332, May 2016, p. 5.

⁹⁵ "India-Mauritius Maritime Dialogue on Blue Economy", Ministry of Earth Sciences, Government of India, 13 April 2016, available at <http://www.moes.gov.in/content/india-mauritius>, accessed on 17 June 2018.

⁹⁶ "India and Mauritius sign deal on maritime security", *Indian Express*, 28 May 2017, available at <https://indianexpress.com/article/india/india-and-mauritius-sign-deal-on-maritime-security-4677206/>, accessed on 20 November 2018.

⁹⁷ "Deal signed to start coastal shipping soon", *The Daily Star*, 16 November 2015.

⁹⁸ Sonali Mittra, "Blue Economy: Beyond an Economic Proposition", *ORF Issue Brief*, No. 173, March 2017, p. 2.

4.5 The United States (US)

The US has thirty coastal states bordering the Atlantic, Pacific, Gulf of Mexico and the Great Lakes.⁹⁹ It is needless to say that ocean economy contributes to its economy to a great extent. In 2015, the Ocean and Great Lakes economy contributed US\$ 320 billion to GDP and supported 3.2 million jobs.¹⁰⁰ The growth of the US Ocean and Great Lakes economy continues to outpace overall US economic growth, rising by 5.7 per cent in 2014-15 compared with the 2.7 per cent of overall economy.¹⁰¹ Instead of Blue Economy, the National Ocean Service of the US terms the concept as the “Ocean and Great Lakes economy” and states that it is comprised of six job sectors dependent on natural resources: marine construction, marine transportation, offshore mineral extraction, ship and boat building, and tourism and recreation.¹⁰² In the academic world, the Middlebury Institute of International Studies, at the Middlebury college, Vermont, US, has a center for the Blue Economy. The center conducts research on how ocean and coastal resources can support economic development and enhance healthy oceans and well-managed coastlines.¹⁰³

The ‘oceans as good business’ lens has been the US’s centre of attention, as the country focuses on job creation and economic activity in the sector. In 2010, the then President Barack Obama issued a “National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes” which included some elements of environmental protection. Obama’s 2010 Executive Order also directed federal agencies to implement the recommendations of the Interagency Ocean Policy Task Force (IOPTF) under the guidance of a new National Ocean Council (NOC)¹⁰⁴, but since then not much progress has been made. In June 2018, President Donald Trump signed a new executive order detailing a revised oceans policy. This has completely changed the theme from preservation to resource use and extraction,¹⁰⁵ further emphasizing the US’s oceans as good business’ lens.

⁹⁹ Judith T. Kildow, Charles S. Colgan and Pat Johnston, *State of the U.S. Ocean and Coastal Economies*, California: MIIIS, 2016, p. 7.

¹⁰⁰ The White House, “President Donald J. Trump is Promoting America’s Ocean Economy”, 19 June 2018, available at <https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-promoting-americas-ocean-economy/>, accessed on 29 July 2018.

¹⁰¹ National Oceanic and Atmospheric Association, *NOAA Report on U.S. Ocean and Great Lakes Economy*, Charleston, SC: NOAA Office for Coastal Management, 2018.

¹⁰² Judith T. Kildow, Charles S. Colgan and Pat Johnston, op. cit.

¹⁰³ “Center for the Blue Economy”, available at <https://www.middlebury.edu/institute/academics/centers-initiatives/center-blue-economy>, accessed 16 October 2018.

¹⁰⁴ “United States”, National Marine Spatial Planning Programme, available at <http://msp.ioc-unesco.org/world-applications/americas/us/national/>, accessed on 16 October 2018.

¹⁰⁵ Trump Just Remade Ocean Policy—Here’s What That Means”, *National Geographic*, 13 July, 2018, available at <https://www.nationalgeographic.com/environment/2018/07/news-ocean-policy-indigenous-sustainability-fisheries-industry-economy-marine/>, accessed on 16 October 2018.

4.6 *Small Island Developing States (SIDS)*

Blue Economy concept is at the forefront of the development of the SIDS. Target 14.7 of the UN Sustainable Development Goals (SDGs) also focuses on enhancing the economic benefits to SIDS and LDCs from sustainable use of marine resources, including through the sustainable management of fisheries, aquaculture, and tourism.¹⁰⁶ There have been a number of reports by the World Bank and the UN which focus on the prospects of the SIDS in developing Blue Economy, and a number of countries are already taking initiatives to forward the agenda. Some of the SIDS have come forth with innovative initiatives to get a head start in the area. For example, Fiji has shown large marine tourism potential by combining tourist resort development with traditional coastal fishing villages.¹⁰⁷

Many SIDS have already formulated national policies on Blue Economy and have designated special government units for it. The Government of Grenada, for example, has developed a Coastal Blue Growth Master Plan and launched its own Blue Innovation Institute. Furthermore, it has partnered with the Government of Netherlands to establish a blue growth partnership named “the Blue Network”.¹⁰⁸ Cape Verde, on the other hand, has formulated a government wide agenda called “Blue Growth Charter”, which focuses governance and innovation and sustainable use of its ocean resources. It also has a ‘Blue Growth Intelligence Unit’ that supports the Charter and provides policy advice.¹⁰⁹

In Seychelles, the government has designated the Ministry of Finance, Trade and the Blue Economy to lead the efforts.¹¹⁰ In 2015, the University of Seychelles established a Blue Economy research institute.¹¹¹ On 31 January 2018, Government of Seychelles approved a Blue Economy Strategic Framework and Roadmap, which has been described as an integrated approach for ocean-based sustainable development.¹¹² It has also shown innovation in investment ideas, by introducing ‘blue bond’¹¹³. The first blue bond was approved by the World

¹⁰⁶ World Bank and United Nations Department of Economic and Social Affairs, *The Potential of the Blue Economy: Increasing Long-term Benefits of the Sustainable Use of Marine Resources for Small Island*, Washington D.C.: The World Bank, 2017.

¹⁰⁷ Food and Agricultural Organization (FAO), *Global Blue Growth Initiative and Small Island Developing States (SIDS)*, Rome: FAO, 2014.

¹⁰⁸ “Adopting the Blue Economy: A Viable Path to Sustainable Development in Small Island Developing States”, UN Ocean Conference, 2017.

¹⁰⁹ Ibid.

¹¹⁰ “Blue Economy Movement Gaining Traction in Africa”, *Financial Tribune*, 17 July 2018.

¹¹¹ P.G. Patil et al., op. cit., p. 93.

¹¹² “Seychelles Blue Economy Strategic Roadmap and Implementation”, *The Commonwealth*, available at <http://thecommonwealth.org/project/seychelles-blue-economy-strategic-roadmap-and-implementation>, accessed on 17 October 2018.

¹¹³ The blue bond is a debt instrument issued by governments, development banks or others to raise capital from impact investors to finance marine and ocean-based projects that have positive environmental,

Bank in September 2017, which will be used for fisheries and marine resources management.¹¹⁴

Mauritius launched a national dialogue on the ocean economy in 2013 for developing a new growth strategy based on its ocean space and resources which was later named “The Ocean Economy: A Roadmap for Mauritius”. In 2015, the government established the “Ministry of Ocean Economy, Fisheries, Marine Resources and Outer Islands” to consolidate various organizations working in the area. The government has also appointed the National Ocean Council as an advisory body.¹¹⁵ On the other hand, Belize’s “national integrated coastal zone management plan” has been noted to be a model for the Central America and Caribbean regions. The plan is very cross-sectoral in nature and serves as the overall framework for sustainable use and development of resources within the coastal zone.¹¹⁶

Despite the diversity in the SIDS geographical location and socio-economic scenarios, the use of “oceans as livelihoods” lens is overarching in developing Blue Economy. Since the SIDS are also among the most vulnerable entities to climate change, ‘oceans as natural capital’ lens receives considerable importance as well. Analysis of the national documents of the SIDS countries shows that, the focus has been on conserving the marine resources and protecting livelihood of their people. Rather than venturing on large scale industrialization, the countries are aiming to use their blue space sustainably.

5. Lessons for Bangladesh

From earlier discussions, it is evident that the Blue Economy priorities vary from country to country, nevertheless, there are some common practices that Bangladesh can follow in order to explore its Blue Economy potentials. Besides, Bangladesh may take note of the innovative ideas initiated by other countries and apply them in viable context. These are discussed subsequently.

Bangladesh needs a national plan to develop the Blue Economy. Countries considered at the forefront of Blue economy implementation, i.e., Ireland, Seychelles,

economic and climate benefits. For details, see, The World Bank, “Sovereign Blue Bond Issuance: Frequently Asked Questions”, available at <https://www.worldbank.org/en/news/feature/2018/10/29/sovereign-blue-bond-issuance-frequently-asked-questions>, accessed on 10 January 2018.

¹¹⁴ Catherine Benson Wahlen, “First World Bank ‘Blue Bond’ Approved for Seychelles”, *IISD*, 29 September 2017, available at <http://sdg.iisd.org/news/first-world-bank-blue-bond-approved-for-seychelles/>, accessed on 11 October 2018.

¹¹⁵ Raffaello Cervigni and Pasquale Lucio Scandizzo, *The Ocean Economy in Mauritius: Making It Happen, Making It Last*, Washington, D.C.: World Bank, 2017.

¹¹⁶ “The Blue Economy and Climate Change in the Context of Sustainable Development: Reflections from the Perspective of Belize, CARICOM and SIDS”, available at <https://europa.eu/capacity4dev/file/32263/download>, accessed on 17 October 2018.

South Africa and EU have devised their own Blue Economy plan. For example, “The 2012 Harnessing Our Ocean Wealth (HOOW)” policy document of the Republic of Ireland, “the Blue Economy Strategy Roadmap Implementation (BESRI)” of the Republic of Seychelles, the Operation Phakisa policy document of the Republic of South Africa and “Blue Growth Strategy” of the EU were initiated preparatory to the establishment of Blue Economy regimes in the respective countries. Notably, purpose of the Blue Economy plan should be to establish a framework that can guide the planning and development of maritime activities in a rational and sustainable manner for social and economic development of Bangladesh. Thus, for developing the Blue Economy plan in Bangladesh, stakeholders in all potential Blue Economy sectors and coastal communities need to be consulted. However, experts point out that Bangladesh first needs to focus on human resource development and capacity building before developing a well-articulated national maritime policy which will take time.¹¹⁷

It is necessary to formulate and strengthen legal frameworks to better integrate Blue Economy considerations. For Example, to give an effect to her Blue Economy policy, South Africa established the Ocean Act and the Integrated Ocean Governance regime which was necessary to give Operation Phakisa the force of law as a Blue Economy component of South Africa’s national development plan 2030.¹¹⁸ Similarly, the US Magnuson-Stevens Fisheries Conservation and Management Act (MSA) of 1976 was amended in 2007 to enable her achieve long term sustainability in fisheries. For Bangladesh, the starting point could be the ongoing efforts to design the Integrated Coastal and Ocean Management Policy¹¹⁹, as well as the various Blue Economy sectoral policies under review or design.¹²⁰

Developing Blue Economy institutional framework which covers the gamut of administrative and operational maritime entities is required to actualize Blue Economy. However, at present, maritime affairs in Bangladesh are managed without any central coordination. There are many agencies involved, e.g., the Navy, the Coast Guard, Ministry of Fisheries and Livestock, Department of Energy and Mineral Resources, Ministry of Shipping and so on. Therefore, institutions operating independently are yet to have for proper coordination and accountability of the Blue Economy activities. For greater coordination, a central coordinating body is necessary given the increased level of activities in maritime areas. Bangladesh can follow the path of Mauritius and

¹¹⁷ Authors’ interview with Rear Admiral M. Khurshed Alam, Secretary, Maritime Affairs Unit, Ministry of Foreign Affairs, on 24 October 2018.

¹¹⁸ Timothy Walker, *Securing a Sustainable Oceans Economy: South Africa’s Approach*, Pretoria: ISS, 2018.

¹¹⁹ Bangladesh’s Integrated Coastal and Ocean Management Policy (ICOMP) is currently under preparation. It organizes amended laws, policies and institutions connected to twenty-seven “blue economic functions” covering six broad areas: (i) maritime trade and shipping; (ii) food and livelihood; (iii) energy; (iv) tourism; (v) coastal protection/artificial islands/greening coastal belts; and (vi) human resource development, maritime surveillance and marine spatial planning.

¹²⁰ Annex 1 shows the policies currently under review or development, related to the Blue Economy in Bangladesh.

Seychelles by establishing a designated Ministry of Blue Economy. Experts believe that a separate department for ocean affairs should not be placed in any particular Ministry rather representatives from all other ministries relevant to ocean management should constitute such bodies.¹²¹ Nevertheless, the Maritime Affairs Unit at the Ministry of Foreign Affairs and the launching of a 'Blue Economy Cell' at the Ministry of Power, Energy and Mineral Resources have been a good start.

Bangladesh needs to develop its resource exploration and extraction capacities. It needs to expand comprehensive technological and technical know-how required for effectively exploring, drilling and extracting marine resources.¹²² Bangladesh needs to carry out a comprehensive and pragmatic survey of marine resources. It will unveil the vastness of marine resources. The importance of having a satellite for maritime survey and research is of utmost requirement.¹²³ Bangladesh now has its own satellite which can be used for maritime survey along with other expedition in future. Besides, with the help of the satellite, ships and vessels navigating through the country's rivers and sea will be able to maintain communication with each other and prevent accidents.

Prioritizing higher education and better research facilities is essential in order to utilize sea resources for the economic development of the country. Bangladesh needs to have a strategic plan to prepare skillful human resources for maritime sectors. An economy can never be successfully established unless and until it is cultivated and shaped from the root level. Therefore, the government's initiative to establish a Maritime University was a significant decision. Besides, Bangladesh should try to build a sea-based scientist community following the examples of Australia and EU which have emphasized on the significance of research and innovation in developing Blue Economy. So, the establishments of the Bangladesh Oceanographic Research Institute (BORI) and Bangladesh Institute of Maritime Research and Development (BIMRAD) by the government are welcoming steps to the creation of marine scientific community.

It is also important to ensure that the new initiatives do not damage the ability of the natural world around us to thrive and continue to provide its critical services. The World Bank says that the changing status of ocean ecosystems may pose a significant threat to the future growth of ocean economy of Bangladesh. The three drivers of change, viz., increasing fishing capacity, coastal development and pollution may have considerable impact on these ecosystems.¹²⁴ According to Charles S. Clogon, two policy frameworks are particularly important for resource and environmental management relevant to the

¹²¹ Abul Kalam Azad, "Delimitation of Maritime Boundaries and the Prospect of Blue Economy for Bangladesh: A Critical Overview", *Journal of International Relations*, Vol. VI, No. 6, 2015, p. 90.

¹²² Md. Jahan Shoieb and Md. Muhibbur Rahman, "Emerging Strategic Landscape in the Bay of Bengal and Maritime Capability Building of Bangladesh", *BISS Journal*, Vol. 35, No. 1, January 2014, p. 41.

¹²³ Md Shahidul Hasan, op. cit., p. 240.

¹²⁴ P.G. Patil et al., op. cit.

Blue Economy.¹²⁵ One is integrated coastal zone management (ICZM) and the other, more recent framework is MSP. These policies are all based on the setting of limits on human activity and spatial arrangements of ecosystems. MSP is developing rapidly in many areas, i.e., the EU and Australia. Small island states like Belize also have their own integrated MSP, which prioritizes marine conservation. Unfortunately, Bangladesh is yet to establish ocean governance at the centre of policymaking which is necessary to adopt MSP for sustainable ocean governance in the Bay of Bengal. Therefore, Bangladesh is required to push policies in cooperation with other countries to protect the ocean from the effects of climate change, pollution and overfishing. Thus, development of environmental policies and regulations geared towards conserving, managing, protecting and sustainable use of aquatic and marine ecosystems is necessary. It is worth mentioning that Bangladesh has some environmental laws covering seas (see Annex 1), which experts deem to be inadequate.¹²⁶

P.G. Patil et al. identified seven key elements of a Blue Economy policy direction for Bangladesh.¹²⁷ First, developing/strengthening national policies to better integrate Blue Economy considerations, sub-national policy and governance frameworks. Second, implementing policies for a healthy, resilient and productive ocean spaces. Third, raising awareness to better educate stakeholders on what the Blue Economy is and why it matters. Fourth, ensuring ocean wealth is kept national and local. Fifth, constructing infrastructure to support a transition to a Blue Economy. Sixth, transforming research and development and national knowledge or technical centres via institutional links with emerging global experience and platforms to better serve Bangladesh. Seventh, maximizing finance for development approach which can unlock private capital. The study provides a comprehensive listing of recommendations for developing Blue Economy.

Based on a range of international experiences, academics and policymakers suggest four steps to implement Blue Economy, i.e., Measure, Manage, Invest and Monitor,¹²⁸ which are relevant for Bangladesh as well. First, measure the status of the ocean economy and ecosystems at the national level, as well as external driving forces such as climate change. In this regard, it is necessary to develop an ocean account to maintain a snapshot of the output from the country's ocean economy. For instance, China has launched an accounting system to measure the ocean economy.

¹²⁵ Charles S. Clogon, "The Blue Economy: Theory and Strategy", in Vishva Nath Attri and Narnia Bohler-Muller (eds.), *The Blue Economy Handbook of the Indian Ocean Region*, Pretoria: Africa Institute of South Africa, 2018, p. 47.

¹²⁶ Authors' interview with Syeda Rizwana Hasan, Executive Director, Bangladesh Environmental Lawyers Association (BELA), on 17 September 2018.

¹²⁷ P.G. Patil et al., 2018, op. cit., p. 69.

¹²⁸ Charles S. Clogon, op. cit.; P.G. Patil, John Virdin, Sylvia Michele Diez, Julian Roberts and Asha Singh, *Towards a Blue Economy: A Promise for Sustainable Growth in the Caribbean*, Washington, D.C.: The World Bank, 2016; J.S. Golden, John Virdin, Douglas Nowacek, Patrick Halpin, Lori Benneer and Pawan G. Patil, "Making Sure the Blue Economy is Green", *Nature Ecology and Evolution*, 2017.

Second, manage the interaction between the ocean economy and ecosystems, and among sectors. The ultimate success of a country in achieving Blue Economy policy objectives for sustainable development of the ocean space and resources under its jurisdiction will depend upon the management decisions of public agencies charged with regulating ocean use. The essential task of these public agencies is to set and enforce rules for the ocean economy that limit resource extraction and pollution levels. Third, invest in the transition to the Blue Economy through clear principles and processes that encourage sustainable growth in private investment. Fourth, monitor the progress towards agreed targets for the country's Blue Economy policy objective is important.

Finally, there is no alternative to pursuing Blue Diplomacy vigorously as tangible international cooperation is essential for securing meaningful progress in Bangladesh's Blue Economy. The present government has been making concerted efforts to reach out to the international community using conferences and conclave on Blue Economy. Bangladesh should actively engage with the Indian Ocean Rim Association (IORA), Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), Indian Ocean Naval Symposium (IONS), etc. in the development of a regional Blue Economy shared vision and strategic priorities to guide future investment and a means to secure the development interests. More foreign investment should be forthcoming in this respect. If needed, the country can go for foreign assistance in the form of loans and grants. For instance, as mentioned earlier, Seychelles has issued one of the world's first blue bonds for fisheries management investment based on guarantees from the World Bank and Global Environment Facility. However, experts argue that Bangladesh needs to be cautious with respect to over-reliance on foreign funds and donation.¹²⁹ While dialogue and cooperation at various multilateral fora will continue, the country's diplomacy will need to focus, in particular, on the region close to Bangladesh. Therefore, the country should take concrete steps through bilateral or multilateral engagements for information sharing, joint management, joint surveillance and joint disaster management programmes with its littoral neighbours.

6. Concluding Remarks

It is now well recognized that oceans hold an incredible potential for meeting the world's ever-growing economic demand. The concept of Blue Economy is becoming popular with policy makers globally, and countries are taking various initiatives to adopt it. There is no universally accepted definition of Blue Economy, but it can be said that the Blue Economy is a way to maximize the economic value of marine resources in a manner that preserves sea's overall health. The components of Blue Economy include different ocean related industries, economic activities as well as measures to protect the marine life and environment.

¹²⁹ Abul Kalam Azad, op. cit., p. 83.

Bangladesh is also interested in advancing its Blue Economy and looking at ways to utilize its vast sea territory. So far, the country has explored only a small number of Blue Economy sectors such as fisheries and aquaculture, shipbuilding, ship breaking, salt generation and port facilities. Nevertheless, most of these sectors are still operating in traditional methods and there are opportunities for introducing innovation and technology for further expansion. Moreover, there are a number of Blue Economy sectors with great economic potential, e.g., seafood processing, marine biotechnology, exploration of oil, gas and other minerals, desalination and blue carbon, where Bangladesh's exposure is limited or absent. Therefore, exploring these sectors will be beneficial for the country.

The Blue Economy experiences around the world are diverse and context specific, but among them natural capital, livelihood, good business and driver of innovation are major lenses. Blue Economy is regarded as a source of economic growth by the EU, China, India and the US. The terms 'Blue Economy' and 'ocean economy' are often used interchangeably by these countries. Mostly, their efforts to develop Blue Economy are focused on growing ocean-based industries. Emerging Blue Economy sectors, e.g., aquaculture, ocean-based renewables, deep sea mining and marine biotechnology are given special attention. Ocean economy valuation, governance, sector specific investments and growth strategies are prioritized. Besides, innovation is central to developing Blue Economy in some cases, e.g., Australia and the EU. By contrast, SIDS focus on human welfare and the protection of marine environment as the central part in defining Blue Economy. The traditional sectors, e.g., fisheries, aquaculture, tourism, etc. are emphasized in developing Blue Economy. In addition, efforts to establish Blue Economy have included a policy framework incorporating MSP, expansion of research institutes, development mechanism focusing diversification, creating jobs and ensuring food security.

The Blue Economy experiences of other countries could be the guiding lessons for Bangladesh. For Bangladesh, a national plan is required that will outline the roadmap for Blue Economy initiatives across sectors. The formulation process of such policy has to be participatory and inclusive. Besides, the government needs to formulate laws that will facilitate the Blue Economy industries. Given the broad nature of Blue economy, coordination within and among the various government organs is also crucial. Since the idea of Blue Economy is new in Bangladesh, capacity building across the sectors is essential. In this regard, focusing on education, research and innovation needs to get priority. Lacking indigenous expertise and funds, Bangladesh has to seek partnership with foreign countries to develop its marine sector. It can continue pursuing blue diplomacy and take lead in Blue Economy initiatives in the Bay of Bengal. In addition, it needs to make sure that economic activities do not harm marine environment and ecosystems. Achieving these goals and priorities is difficult and requires time. Nevertheless, the goodwill of the government exhibits that Bangladesh is on the right track.

Annex 1: Key Reforms Related to Blue Economy in Bangladesh

Sectors	Policies	Laws and Acts	Responsible Institutions
Coastal Protection	Bangladesh Climate Change Strategy and Action Plan (BCCSAP) National Action Plan for Adaptation (NAPA)	Climate Change Trust Act 2010	Ministry of Environment and Forests Disaster Management Information Centre (DMIC) of Ministry of Food and Disaster Management
Existence of Biodiversity	Coastal and Wetland Biodiversity Management Plan	Wetland Protection Act, 2000; Environment Conservation Act, 1995, 2000, 2002; Environmental Conservation Rules, 1997, 2000, 2001; National Conservation Strategy, 2005; National River Protection Commission Act, 2013; Forest Act 1927; Wildlife Protection and Security Act, 2012	Ministry of Environment and Forests The Bangladesh National Herbarium
Waste Disposal	Bangladesh Water Act	Integrated Water Resources Management (IWRM), 2005	Ministry of Water Resources
Energy	Renewable Energy Policy, 2008; National Energy Policy, 2004	Bangladesh Petroleum Act, 1974	Ministry of Power, Energy and Mineral Resources (MoPEMR); Sustainable and Renewable Energy Development Authority (SREDA); Bangladesh Power Development Board (BPDB) Blue Economy Cell

Living Resources	National Marine Fisheries Policy; National Aquaculture Development Strategy and Action Plan (2013-2020) National Shrimp Policy, 2014	Fish Hatchery Act 2010 Fish Hatchery Rules 2011 Fish Feed and Animal Feed Act 2010 Fish Feed Rules 2011 Fisheries Research Institute Ordinance 1984	Ministry of Fisheries and Live-stock (MoFL) Department of Fisheries Bangladesh Fisheries Development Corporations (BFDC)
Tourism	National Tourism Policy, 2009	Tourism Board Act, 2010; Bangladesh Tourism Protected Areas and Special Tourism Zone Act, 2010; Bangladesh Tourism Protected Areas and Special Tourism Zone Rules, 2011	Ministry of Civil Aviation and Tourism Bangladesh Parjatan Corporation
Shipping and Transport	Maritime and Shipping Strategy of Bangladesh	Clean Air Act; Import Policy Orders, 2012-2015; Payra Port Authority Act, 2013; Chittagong Port Authority Act, 1995; Mongla Port Authority Act, 1995 Navy Ordinance, 1961 Coast Guard Act, 1994	Ministry of Power, Energy and Mineral Resources (MoPEMR); Infrastructure Financing Facility (BIFF); Inland Water Transport Authority
Ocean Based Industry	Comprehensive Credit Policy for SMEs	Inclusive Digital Financial Systems, 2015	Ministry of Industries (Mol); Bangladesh Standards and Testing Institution (BSTI); Bangladesh Small and Cottage Industries Corporation (BSCIC); Bangladesh Chemical Industries Corporation (BCIC); Central Bank

Source: Adapted from P.G. Patil, et al., *Toward a Blue Economy: A Pathway for Bangladesh's Sustainable Growth*. Washington, D.C., The World Bank Group, 2018.