

## The future of the Blue Economy in Bangladesh

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### **Abstract**

*Since 2014, the Government of Bangladesh has initiated discussions with stakeholders in order to adopt the concept of a 'blue economy' across relevant policies and strategies. By definition, the blue economy fosters the idea of sustainably deriving economic value from the untapped potential of marine resources using sustainable solutions and innovations for increasing food security, improving nutrition and health, alleviating poverty, creating jobs, increasing trade and industrial profiles while protecting ecosystem health and biodiversity, and maintaining regional peace and security. This policy paper focuses on Bangladesh's transition to a blue economy through the analysis of existing and potential sectorial opportunities and constraints. It also provides a way forward in terms of actions to be carried out for the sustainable development of ocean economy sectors. It has been elaborated on the outcome of the Joint Collaboration on Blue Economy between the Government of Bangladesh and its development partners such as the European Union, the World Bank and the UK Research institutions such as the University of Portsmouth.*

**Keywords:** Shipping, Tourism, Blue Carbon, Fishery, Aquaculture

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## 1. Introduction

Between 2012 and 2014, disputes over maritime boundary with Myanmar and India were favourably settled for Bangladesh, resulting in the expansion of its territorial waters of more than 30% and the country received entitlement to 118,813 km<sup>2</sup> in the Bay of Bengal (Alam, 2014). This achievement offers a wide range of new economic opportunities for jobs & growth around sectors such as marine fisheries, marine aquaculture, tourism, exploitation of natural resources, trade and energy. Yet for these opportunities to truly contribute to the long term development of the country, the marine resources must be managed in a sustainable way. In that regards, the Government of Bangladesh (GoB) has initiated, since 2014, discussions with stakeholders in order to adopt the concept of blue economy across relevant policies and plans (Hussain et al. 2017). By definition, the blue economy fosters the idea of exploiting untapped potential of the marine environment using smart solutions and innovations for increasing food security, improving nutrition and health, alleviating poverty, creating jobs, lifting trade and industrial profiles while protecting ecosystem health and biodiversity, and improving regional security and peace (Hussain et al. 2018).

This paper addresses the blue economy development in Bangladesh through the analysis of sectorial opportunities and constraints it is facing and will face in a near future. It also provides a way forward in terms of actions to be carried for the sustainable development of the blue economy sectors. It presents, therefore, inputs for the BE strategy of the country. Their identification has been done under the context of the EU-BGD Joint Collaboration on Blue Economy, the World Bank Review of the Blue Economy in Bangladesh (Patil et al., 2018) and the more recent Blue Delta Governance Project<sup>1</sup>. For these purposes, all stakeholders have been met while all available documentation have been consulted, including the one dealing with the development issues of BE activities in other countries, particularly in Asia. Additional discussions made with representatives of administrations, researchers, academics and practitioners during a series of thematic and regional workshops have further contributed to define and analyse major opportunities and constraints that Bangladesh is facing for the implementation of its BE policy (Failler et al., 2019). In that regards, the paper brings new elements of thought for the understating of the development of BE in Bangladesh. The paper is structured in 5 sections covering a wide range of aspects

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<sup>1</sup> This project applies the blue governance approach to improve the resilience and health of delta social-ecological systems by developing governance mechanisms that account for specific land-sea processes and challenges. This is especially vital for Bangladesh, where more than 100 million live on the Ganges-Brahmaputra delta, of which 30 million live in poverty. The Blue Delta Governance project is implemented by the University of Portsmouth, UK, Ministry of Foreign Affairs, Bangabandhu Sheikh Mujibur Rahman Maritime University (Maritime University), University of Dhaka, Bangladesh Agricultural University, Khulna University as well as the Intergovernmental Oceanographic Commission, UNESCO. It is funded by Global Challenges Research Fund, UK.

<sup>2</sup> Some sectors such as Port development, deep-sea mining for instance, have not been covered due to the lack of information and availability of expertise in these sectors.

considered as important and for which information is readily available<sup>2</sup>. Section 1 gives an overview of the major stakes that BE will face in a near future: pollution, climate change effects, alongside with food production, shipping and trade, as well as new technologies have been highlighted and presented. It also provides a projection of the potential importance of the maritime activities in a few years including the highlights of challenges and constraints. The section 1 is completed by a presentation of the environmental dimension of the BE by analysing the importance of the Blue Ecological services such as carbon sequestration, costal protection and other key services provided by coastal ecosystems, especially mangroves. It also reminds the necessity to control pollution coming both from the land and the sea. The Section 2 goes deeper into the marine food production and provides an analysis of the marine fishery management requirement alongside the development of the marine aquaculture. Section 3 looks at the emerging sectors such as marine tourism and more particularly at eco-tourism in the future by highlighting the natural assets of Bangladesh but also by scrutinising the major obstacles to the development of Blue Tourism. It also gives an overview of the Blue Biotechnologies, Blue Energies and other Blue initiatives that can emerge rapidly with a sound policy and the development of public-private partnership. Section 4 provides a detailed forecast of the shipping industry in Bangladesh by emphasising the potential of ship building and maintenance of the country. It also concentrates on the other major activity around shipping: ship breaking and its future in Bangladesh. Section 5, dedicated to the institutional arrangements, starts with establishing the linkage between BE development, SDG14 and Maritime Security that is a prerequisite for any BE implementation. It also gives details on the implementation of the Maritime Spatial Planning as a key tool for avoiding negative externalities between Blue Activities and at the same time for securing the business environment. A conclusion gives some suggestions to enhance the implementation of the Blue Economy in Bangladesh.

## **2. Blue Economy in the perspective of Economic Development and Environmental protection**

### **2.1 Exploring the potentials of blue economy for enhancing economic sustainability in Bangladesh**

Proper utilization of marine resources towards achieving the sustainable economic development has got worldwide attention in recent years. Likewise, the Bangladesh government has also emphasized on the blue growth after settling the permanent maritime boundary with the neighboring countries. Coastal and marine resources i.e. living, non-living and renewable are identified as the main components of blue economy of Bangladesh. Moreover, trades and commerce related to sea and coast, and protections from the natural disasters also have economic returns for enhancing the blue growth. Conversely, sea level rise, climate-driven extreme events, pollution, human interferences and unregulated laws are identified as the major challenges for the development of the blue economy. To achieve the sustainable blue growth in

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Bangladesh, a strategic planning and management framework is required which should focus on potential sectors, research and ocean governance. Enhancing blue growth and achieving Sustainable Development Goals (SDGs) must go together to ensure that balance does not swing too far towards blue growth at the expense of environmental sustainability.

In comparison to other natural resources systems, the potential of coastal and marine ecosystem of Bangladesh, as a driver of economic growth, has long been overlooked by the policy makers. Only recent years, the Bangladesh government has provided priority on exploitation and management of marine resources. The vast potentialities of Bay of Bengal for the national economic development are still not fully realized. However, considering the overexploited and weakly governed marine fisheries, there should be a check and balanced through an appropriate policy and legal framework. Illegal fishing, piracy, climate change, and marine pollution are already at the alarming stage for the Bay of Bengal marine ecosystem. To make the blue economy concept fully functional for the Bangladesh, it is an urgent need to foster research activities to generate knowledge and skilled manpower and then formulate the national plan and policies.

## **2.2 Coming stakes in the ocean: Food production, shipping and trade, tourism, ecosystem-biodiversity, new technologies and climate change challenges**

Blue economy is an emerging concept in all over the world where Bangladesh is not in exception. The blue economy of Bangladesh is subject to multiple interlinked activities. Among the major activities, food production, shipping and trade, tourism, ecosystem-biodiversity, new technologies and climate change challenges are the most promising sectors. Bangladesh has enormous resources which have great potential to uplift the existing economy, improving livelihoods, while significantly reducing environmental risks and ecological scarcities. However, there are lot of constrains which hinder to get the ultimate fruit from these potentialities. The major constrains include lack of policy, institutional or organizational structure and coordination, data or information, knowledge in innovating and diversifying marine products and services, marketing strategies, continuous scientific research, skilled manpower with motivation and dedication, public awareness, maritime security and concern in marine and coastal environment. Initiations to overcome these constrains with long and short term strategic plans and properly implementing the strategic decisions will bring the state more productive and could be a model country with blue economy approach.

The peaceful resolution of maritime discords has opened a golden opportunity to explore and exploit the vast valuable resources in the coastal and marine waters of Bangladesh. Sustainable management of these resources can give us the optimal benefits to uplift our existing economic condition. These resources can be properly utilized for food production, shipping and trade, tourism, ecosystem-biodiversity conservation, new technologies and climate change challenges. Considering huge potentialities of these resources and major obstacles to achieve blue economy goals, we also suggest some strategies or policies to exploit these non-renewable resources in sustainable manner. Bangladesh has a very appropriate position to take the advantage of

the blue economy, but there should be a sustainable blue economic approach in order to achieve the SDG Goals. Since the economy of Bangladesh is innately affected by natural, cultural, and other societal factors, there is the possibility of transitioning from unsustainable growth approaches to sustainable approaches through blue economy. In order to achieve such a transition, we strongly suggest adopting effective strategies for the sustainable blue economy. Therefore, more collaborative and inclusive patterns of work should be taken for the full potential of these resources. If the sustainable blue economic approach is followed properly, Bangladesh can be a successful benchmark of blue economy for the developing world. Thus, we consider blue economy not only the means of using ocean and marine resources, but also a path of providing secured life for the most vulnerable coastal people of Bangladesh.

### **2.3 Future importance of maritime activities in Bangladesh**

The current maritime key activities include extraction of living and non-living resources, land based activities, trades and transportation, shipbuilding and ship breaking, tourism and recreation, man-made structures, energy production and, research and survey. The trend data show that the total fish landing and total export income from fisheries has been showed an increasing trend. However, data on mangrove revenue suggest that in recent years, revenues from this forest are comparatively less than the revenues from the 1980s and the 1990s. For further Blue Economy development Bangladesh needs to focus on marine fisheries, non-traditional species, marine biotechnology, oil gas and mineral mining, renewable energy, marine trade and transport, marine tourism and marine spatial planning. However, lack of Implementation and enforcement, management measures, limited planning and coordination are hindering the way of further Blue Economic development in Bangladesh. Thus a strategic management process integrating multiple stakeholders is an urgent need for a sustainable Blue Economy development in the maritime territory of Bangladesh.

The lack of coordination between and among the partners is presently considered as one of the most important gaps for development of marine based economic sectors in the country. In that case public private partnership is seriously hampering the development in particularly in the sectors like trade, shipping, tourism, oil and gas field exploration, fish preservation and marketing, ecosystem services, social welfare related to coastal dwellers etc.

## **3. Blue Development of Marine Resources Uses**

### **3.1 Augmenting marine Food Production through fisheries management and mariculture**

There is new aspiration of sustainable exploitation of marine resources and to achieve sustainable development goals (SDG 14) in recent years. In this context, this document delineates new scope of venturing into the blue economy relative to marine fisheries and mariculture. Potential interventions in marine fisheries include – (i) expansion of the commercial fishing area (beyond the 80 m depth) for harvesting high value fish

species (such as tuna, lakkha), (ii) exploration for new fishing grounds and fisheries, (iii) value addition and reducing post-harvest losses, and (iv) assessment of fisheries stocks for estimation of potential yields and optimum sizes of harvest. Food production through mariculture mostly relies on – (i) domestication of new species (such as finfish: seabass, mullet, hilsa, grouper; crustaceans: mud crab; plants: seaweeds) for product diversification and risk reduction towards economic stability, (ii) production intensification (such as semi-intensive farming) and adoption of innovative fish/shellfish farming (such as marine cage culture, aqua-silviculture, integrated multi-trophic aquaculture) to create new business opportunities, and (iii) live feeds (such as rotifers, artemia biomass) production for hatchery for sustaining the mariculture industry. Nevertheless, investments, knowledge, innovations, new technologies, new breeds and newly domesticated mariculture species can promise a blue revolution in Bangladesh.

Venturing into the blue economy related to marine fisheries and mariculture is not straightforward and simple. Importantly, implementation of some of the identified opportunities above is time-consuming and investment intensive. For example,

- (i) it can take years of research (5–12 years) to domesticate a new species and bring it to market,
- (ii) any genetic improvement and selective breeding program, such as developing SPF stocks can take 5–10 years, and
- (iii) a comprehensive stock assessment of marine fishery resources can take 5–10 years and requires a reassessment in every 2-3 years depending on the level of depletion of stocks, and an expensive process too.

It is the scientific and technical knowledge, innovation and investment that can help raising marine food production under the blue economy initiative. The ultimate success of the activities will rely largely on the developments in research pipeline and new results, and to translate these results into viable commercial use. Effective stakeholder engagement (farmers, industry, academia, extension service, etc.), and the regional and global cooperation are also equally important for the sustainability of blue economy in Bangladesh.

### **3.2 Future importance of healthy oceans: Ecosystem functions and biodiversity, marine pollution, carbon sequestration, ecosystem goods and services**

Efforts and future interventions necessary to keep the Bay of Bengal large marine ecosystem healthy mainly linked to climate change, environmental pollution from different sources, biodiversity conservation, sediment movement. marine spatial planning and adoption of protected area concept to design marine reserve, fish sanctuary and ecological critical areas in the coastal zone were highlighted. The importance and means of monitoring of the marine and coastal ecosystem at the Bay of Bengal required local and international collaboration in order to ensure adoption and management of an objective monitoring system.

Blue economy development is crucial for this world in order to sustainably explore and utilise the largest part of the earth's surface covered by blue oceans. It is more so for the countries like Bangladesh which are heavily dependent on coastal and marine environment for food, livelihood, supporting and regulatory ecosystem services provided by the coastal and marine ecosystems. In this context, meaningful schemes of conservation of marine ecosystem and its resources has to be adopted by Bangladesh on a priority basis to maintain the future health of the Bay of Bengal if it wants to sustain and add to the GDP growth other country. The issues related to climate change and its impacts and economic development induced pollution management, aspects of water and sediment discharge, status of biodiversity and extraction of marine and coastal resources required a dedicated attention.

#### **4. Blue Emerging sectors**

##### **4.1 Coastal and marine tourism/eco-tourism in the future**

Having the world's largest unbroken sea-beach and vast coastline, Bangladesh has an immense potentiality to develop sustainable coastal and marine tourism. In Bangladesh, coastal and marine tourism is already in operation, though on a limited scale. But the growth of tourism in this country is lagging behind compared to the world as a whole. The contribution of this sector in the economy of Bangladesh is still below the mark. Therefore, the economy can be benefited by harnessing opportunities pertinent to the country's coastal and marine tourism. To attract the local and foreign tourists, the country can improve the existing tourist sites. It can also develop new tourist spots in the coastal and marine areas. Introduction of new tourism products such as cruise to Swatch of no ground from Chittagong and Khulna, exclusive tourist zones for foreigners, surfing zones, community-based ecotourism, underwater tourism, and sports tourism in the coastal and marine areas can be thought of. In the process of developing tourism, proper planning, budgetary allocation, community participation, awareness building, coordination between agencies and proper marketing strategies are among the important factors. By developing the proposed tourism in marine and coastal areas, Bangladesh can increase GDP, generate more jobs, reduce poverty, earn foreign currencies, gain socio-cultural benefits, conserve environment, and protect coastal areas. In addition, development of coastal and marine tourism can create the opportunity to promote local culture and heritage by integrating local communities into the development process. Finally, government can play a vital role in promoting coastal and marine tourism by providing some special services including on arrival visa and one stop service to the foreign tourists.

##### **4.2 Blue biotechnology, renewable energy, unconventional resources and products as emerging frontiers at sea**

Blue biotechnology, renewable energy and unconventional marine living resources are considered as emerging frontiers for enhancing ocean-based blue economy in Bangladesh. Blue biotechnology can help both fisheries and aquaculture industry by producing fish varieties that can become quicker, more beneficial, and greater with tastier flesh, by developing gene transfer technology to be used to develop the growth

of fish or by using of monoclonal antibodies and DNA probes to new diagnostic strategies for pathogens. Transformation of marine bio-resources (main, co-product and by-products) into food, medicine, animal feed and related bio-based items i.e. cosmetics, nutritional supplements, enzymes, agrichemicals could help in meet the Bangladesh future challenges for the 21st century.

Given that majority of conventional living resources is facing over-exploitation, non-conventional marine living resources, specifically mollusk (squids, oyster, mussel), seaweeds, marine echinoderms, marine micro algae and others can be utilized as a source of new fishery products that could straightforwardly consumed as nutritionally balanced marine food. In terms of non-living resource, renewable energy comes from hydro power, solar, biogas and wind, however, tide and wave energy have good potential. Towards sustainable utilization of these sector-specific resources there are several challenges, such as little knowledge about their current status, limited focus by policy makers. To escape this situation, marine policy relatives must have to include the marine fisheries, mariculture, marine food, health, natural resources and industrial application. Research activities can create information to advise the policy and strategy, which thus stimulates future development by informing how the marine environment can be monitored and managed reasonably and realize its role in giving ecological facilities to the country as well as the world.

Despite their importance as potential fisheries very little are known about their ecological status, potential harvest technology and utilization are not sufficiently studied and reported in the literature in Bangladesh context. Allowing commercial exploitation will require detailed knowledge of the abundance of the target species. In this context, Bangladesh should actively develop a marine fisheries management plan to sustainable management marine conventional and unconventional fisheries. Development of a legal framework covering all unconventional fishery items is important before commercial exploitation these species starts. The Government should actively promote sustainable exploitation and conservation of unconventional fisheries through providing training, awareness building and market development.

## **5. Blue Prospect for ship building and ship breaking**

### **5.1 Bangladesh shipping building**

Bangladesh is traditionally a ship building nation and has a rich heritage of timber shipbuilding of many hundred years. Germanischer Lloyd has declared Bangladesh as a shipbuilding nation of international standards in September 2008. She is presently contributing to the shipbuilding industries globally through its exported workforce. These facts do not speak only of a heritage but of an inbuilt ability of shipbuilding of people of this region. For the development of shipbuilding industry, we need to generate adequate demand in the local and foreign market, elevated engineering skills, reasonable infrastructure, long term government policy support along with attractive investment climate. National and international issues and factors which apparently do not encourage shipbuilding in Bangladesh need to be addressed. Impacts of those issues should be evaluated and measures towards finding a solution incorporated.



Shipbuilding industry plays an important role in assisting national defense, promoting shipping and industrial development, increasing employment and foreign currency inflow. It is therefore an attractive industry for Bangladesh. Bangladesh shipbuilding is capable of producing international standard ship of small to medium category and at present, more than 25% shipyards are ready or to be ready with little renovation for construction of small and medium sized vessels of international standards. Productivity of Bangladeshi work force in shipbuilding is 11.4 which is the lowest in the world. It is essential to upgrade the productivity through conducting training program, incorporating process enhancement, modernizing yard facilities and employing more integrated production technology, otherwise it is difficult to sustain in this competitive industry in the long run.

## **5.2 Ship breaking**

Ship breaking is comparatively a sustainable business, particularly in the developing world, but the conditions where it is practiced is non-sustainable. Ship breaking is the process of dismantling ships and selling their parts - primarily the steel - for scrap. The main impetus for breaking a ship down is that maintenance costs go up as a ship ages. Shipping companies also have to pay port charges, crew salaries and oil fees for their ships, so when they are no longer economically viable they are sold to ship recyclers who strip the old ships down, salvaging anything of value. Bangladesh is one of the top ship recycling countries in the world. Ship breaking is becoming increasingly important economically in the country. In the developing world, ship breaking not only employs thousands of people in breaking down a ship, but the materials produced are also important to other industries, such as re-rolling steel plants. However, it is deadly too. Despite having huge employment opportunities and material supplies, it costs high in terms of environmental degradation and human health. It is reported that most of the ship recyclers avoid 'polluters pay' and other principles. Ship breaking activities are being practiced in the coastal areas of Bangladesh and have gained importance in the macro and micro-economy of poverty stricken Bangladesh. If this sector takes some eco-friendly steps in compliance with the principles of blue economy and overcome challenges it will be a big and sustainable industry in future.

Ship breaking industry has gained one of the top places in the national economy. The benefits of ship breaking are enormous in sectors like steel company, ship building company etc. Despite having so much benefits, the ship breaking industries have some problems i.e. environment pollution, workers' safety. Environment pollution can be kept to minimum by following international regulations for dumping leftover ship materials. Safety issues and health factors of the workers can be ensured by following some strict rules. Safety gears like goggles, helmets, hand gloves, face masks aprons should be provided to minimize the casualties. To hold the position in world ship breaking Bangladesh needs upgrade the infrastructure for waste management, health issues of workers. Ship breaking is global in scope. The Bangladesh ship breaking industry has proven to be internationally competitive and made valuable contributions to the domestic economy.

## 6. Blue Institutional requirements

### 6.1 Bangladesh national plan for the implementation of SDGs for a Sustainable Maritime Security

Within the BE development process the enhancement of the Maritime Security is fundamental in the context of the SDG. Some of the SDG14 targets don't have yet an equivalent in the 7<sup>th</sup> FYP. In the opposite, some of the 7<sup>th</sup> FYP targets regarding Blue Economy, Coast Guard and overall sustainable maritime security don't fit within the SDG frame (see table 1 below). There is therefore a need to develop a consistent national plan for the implementation of the SDGs for ensuring a sustainable maritime security.

**Table 1: SD Goal 14 targets and 7 FYP targets regarding Sustainable Maritime Security**

SDG Target	7 <sup>th</sup> FYP targets
14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	B15 Pollution control and preservation of environment
14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	B10. maintain the inland river systems and ecosystems for fishery, sediment transport, and inland shipping,
14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	B9. give special priority to anticipated Climate Change impacts on all relevant matters, and adjust policies and plans
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	B1. protecting and managing the fisheries for the present and the future generations B4. extending fishing areas using new technologies and methods even beyond EEZ in the international waters B14. Protection against illegal fishing, human trafficking, gun running, smuggling, narcotics trafficking and piracy

SDG Target	7 <sup>th</sup> FYP targets
14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	-
14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation[c]	B1. protecting and managing the fisheries for the present and the future generations
14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism	B6. substantially increasing fisheries production and export earnings through improved aquaculture and introduction of Mariculture B7. creating a competitive tourism industry, including ecotourism and marine cruises
14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries	B11. building a solid science, research and education base and B12. along with other coastal areas, establishment of marine academy in Khulna may be considered. Above all, for maintaining seamless and coordinated planning and actions, an integrated Coastal and Ocean Management Policy would be put in place
14.b Provide access for small-scale artisanal fishers to marine resources and markets	-

SDG Target	7 <sup>th</sup> FYP targets
14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of “The future we want”	-

Some of the SDG targets don't have yet an equivalent in the 7<sup>th</sup> FYP (14.5; 14.b; 14.c). In the opposite, some of the 7<sup>th</sup> FYP targets regarding Blue Economy, Coast Guard and overall sustainable maritime security don't fit within the SDG frame. Namely:

- B2. developing a strong renewable energy sector using ocean and atmospheric forces,
- B3. maintaining existing (*e.g.*, ship building) and developing new maritime industries;
- B5. developing a strong human resource base for domestic utilization, and export to foreign job markets,
- B8. further increasing revenue from shipping and commerce by the expansion of domestic fleet and destinations, transshipment and transit provisions, linking neighbouring states to the sea-ports, etc.
- B13. To ensure safety and security of the ports, harbours, seafarers including water craft and offshore installations within areas of jurisdiction.
- B16. To ensure capability to assist the government in times of various needs like disaster management and relief operation.

In that regards, there a need to develop a national plan of actions for the Goal 14 (in line with current and further developed targets) as well as a set of indicators for the monitoring of the implementation of the 7<sup>th</sup> FYP targets.

## 6.2 Institutional arrangements for blue economy: Marine Spatial Planning a way-forward

Blue Economy is one of the important aspects of Sustainable Ocean Governance as it refers to sustainable use of ocean resources for economic growth and improved livelihood by maintaining healthy marine ecosystem. In order to achieve sustainable ocean governance, it is important to implement the contemporary and newly developed principles and concepts including Blue Economy and Ecosystem based management (EBM). As an implementation toll for sustainable ocean governance, Marine Spatial Planning (MSP) can play an important role to achieve the objectives of Blue Economy.

Due to various reasons, the current institutional arrangements for sustainable ocean govern as well as exploring the concept of Blue Economy is at a very rudimentary stage in Bangladesh.

Blue Economy protects and maintains the production of ocean in a long-time capacity of ocean ecosystem. The Ecosystem approach confirms preservation of functions, structures and services of ocean ecosystem. Ecosystem-based management provides not only an environmental protection but also the implementation of Blue Economy through sustainable use of ocean resources. In that context, MSP has become an essential tool for implementing Ecosystem-based Management which accelerates multidimensional uses of ocean space without any conflict among the users. Zoning also plays a crucial role in managing conflicting ocean activities through the application of MSP.

Multidimensional uses of ocean require identifying and engaging a number of departments for integrated institutional arrangements for coordinated management of Blue Economy activities. The current institutional arrangements in Bangladesh is based on sector by sector management approach, which is insufficient for sustainable ocean governance and effective management of Blue Economy activities. The current institutional arrangements are not integrated and coordinated, which will create a number of challenges in operation of economic activities in ocean. MSP is an ideal tool to adopt integrated institutional arrangements through uniform legal framework in Bangladesh. A uniform and codified legislation will accelerate to build up a comprehensive, integrated and coordinated management system to use ocean resources in the Bay of Bengal. The uniform legislation should focus on the institutional arrangements for Blue Economy activities. Moreover, Bangladesh needs a comprehensive ocean policy based on sustainable ocean management system. A considerable attention needs to be given to introduce MSP to make the ocean policy comprehensive as well as to achieve the benefit of Blue Economy.

## **7. Conclusion**

From the policy point of view, former EU and World Bank projects as well the current Blue Delta Governance Project are significantly contributed to the improvement of the Blue Economy development in Bangladesh. They enhance the windows of opportunities as well as the awareness of constraints alongside with the crucial need of a strong national coordination and planning mechanisms. From the academic and research perspective, these BE initiatives contribute to develop the collaboration between research centres and universities within the countries and outside, mainly in Europe. Collaborations will be further developed with join research and staff exchanges projects under preparation.

From a policy point of view, the main recommendations are:

- To continue the informative activities and institutional linkages actions done within these projects in order to enhance the awareness of decision makers and improve the effectiveness of policy implementation.

- To develop in concertation with all stakeholders a long-term vision for the BE development that includes the protection of the marine and coastal ecosystems, the climate change and the reduction of pollution (both inland and marine).
- To encourage exchanges and visits of high level civil servants as it is a key way to improve the understanding of the situation in Bangladesh (in comparison with other countries) and develop proper collaboration. To invite key specialists in area of BE development will contribute to better define the pathway, the planning of activities, the likelihood impacts and the coordination needs. This can be part of a program of capacity building. Embassies of EU countries can play a major role in this area.
- To further develop the MSP and ICZM plans and commence their implementation in conjunction with the institutions at the various scales.
- To pursue efforts on the development of a BE Private Public Partnership in the areas of mariculture and biotechnologies.

The major academic and research recommendations are:

- To develop EU and UK/Bangladesh research actions. Such research actions will contribute to the creation of new knowledge, but also to the capacity building of young researchers. For instance, specific support can be provided to organise proposal preparation and writing.
- To support of the Maritime University both for teaching and capacity building. Actions under the MoU University of Portsmouth/ Maritime University can be envisaged in that regards.
- To emulate collaboration between Research Institutes such as BFRI, BORI and Universities as well as with the private sector to set-up some innovation clusters. Support from the Brest-Technopole can be sought for this.

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