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Institutional Arrangements for the Blue Economy: Marine Spatial Planning a Way Forward

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1 INTRODUCTION

Blue Economy is one of the most 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 (Godfrey, 2016). In order to achieve goal 14 of sustainable development goals -2030, it is important to implement the contemporary and newly developed principles and concepts including Blue Economy and Ecosystem-based management (EBM). It requires adequate institutional arrangements including a comprehensive legal and policy framework with appropriate management tools and operational strategies. As an implementation tool 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. These include lack of legal framework, lack of incentives, incapacity, lack of integration and coordination between various departments and political unwillingness.

The objective of this article is to analyze the significance of Blue Economy in achieving sustainable ocean governance through an institutional framework. The importance of MSP in implementing newly developed management principles and concepts including EBM will be highlighted and examined. In this respect, relationship between MSP and Blue Economy will also be examined in the chapter. The chapter will be concluded with some recommendations to improve the institutional framework to achieve the objectives of Blue Economy in Bangladesh.

1.1 BLUE ECONOMY CONCEPT

1.1.1 Emergence of Blue Economy

The concept of “Oceans Economy” or “Blue Economy” is a recent phenomenon, which originated from the United Nations Conference on Sustainable Development held in Rio de Janeiro in 2012 (United Nations, 2014). The Conference focused on two themes: Framework for sustainable development; and advancement of Green Economy. However, the coastal and developing countries were at the forefront, and strongly voiced for Blue Economy from very beginning of the Conference. Consequently, the concept of Blue Economy was recognized and included in the United Nations Conference on Environment and Development process, the Johannesburg Plan of implementation, and reaffirmed in the outcome document of the Rio+20 Conference (United Nations, 2014).

Despite the widespread use of Blue Economy in global development process, there has no universally accepted definition of Blue Economy (WWF Global, 2015; Roberts, 2016). According to the World Bank report, Blue Economy refers to sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and healthy ocean ecosystem (World Bank, 2017). The concept refers to the economic activities that directly or indirectly take place in ocean, use outputs from ocean, and put goods and services into ocean’s activities and the contribution of those

activities to economic growth, social, cultural and environmental wellbeing (Roberts, 2016). Blue Economy has diverse components, including established traditional ocean industries, such as fisheries, tourism, and maritime transport; also new and emerging activities, such as offshore renewable energy, aquaculture, seabed extractive activities, and marine biotechnology and bioprospecting (World Bank, 2017; World Bank Group, 2017). The components of Blue Economy depend on each country's unique national circumstances in consideration with protecting and maintaining the diversity, productivity, resilience, core functions, and intrinsic value of marine ecosystems (United Nations, 2017).

The goal of Blue Economy is “improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities, endorsing low carbon, resource efficiency and social inclusion” (Godfrey, 2016). So, the goal of improved human wellbeing and social equity should be achieved through reducing environmental risks and ecological scarcities. Thus, Blue Economy ties up a balance between development and environmental protection. Therefore, Blue Economy seeks to promote economic growth, social inclusion, and the preservation or improvement of livelihoods while at the same time ensuring environmental sustainability of the oceans and coastal areas (World Bank Group, 2017), which is popularly known as ‘Sustainable use’.

Sustainable use of ocean resources has been recognized the key component of Blue Economy. Sustainable use of ocean resources entails economic activity is conducted in a balance with long-term capacity of ocean ecosystem to support this activity and remain resilient and healthy (Goddard, 2015). Therefore, Blue Economy is, predominantly, understood with the sustainable use of ocean resources (World Bank Group, 2017). But ongoing trends of exploitation of ocean resources and therefore the degradation of marine and coastal ecosystems show that endeavors to date to ensure sustainable use have been insufficient (Bari, 2017).

1.1.2 Blue Economy and Sustainable Development Goal Fourteen

In September 2015, the United Nations adopted the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development at the historic United Nations Summit (United Nations, 2016). While the SDGs are not legally binding, governments are expected to establish national frameworks for the achievement of the 17 Goals (United Nations, 2016). Goal 14 of SDGs, ‘Life below water’, pursues for conservation and sustainable use of the oceans, seas and marine resources (United Nations, 2015). Goal 14 requires exploring and exploiting ocean resources in a sustainable manner which confirms conservation of ocean. The global leaders have fixed 7 targets to achieve Goal 14. The targets comprise sustainable management and protection of 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 (United Nations, 2015). Goal 14 aims for overriding that pressure by sustainable use of marine resources. Goal 14 is of two folding: conservation of ocean and marine resources; and sustainable use of ocean and marine resources. The targets of Goal 14 clearly reveal that the

conservation of ocean should be achieved through the sustainable use of ocean resources. Therefore, sustainable use of ocean resources is the toolkit to achieve conservation of oceans under Goal 14, which is also the key component of Blue Economy.

Sustainable use of ocean resources is the main driving component of Blue Economy, which essentially requires use of ocean resources in a sustainable manner to confirm the long-term capacity of ocean and protection of marine ecosystem. Apparently, exploration of Blue Economy will bring more human activities in Ocean, and threat to the natural ocean ecosystem. Ocean is facing threats of marine and nutrient pollution, resource depletion and climate change, all of which are caused primarily by human actions (UN Global Compact, 2016). These threats place further pressure on sustainable use of ocean resources.

1.2 BLUE ECONOMY AND SUSTAINABLE OCEAN GOVERNANCE

Blue Economy is the concept where ocean is considered a development space, and offers hundreds of food, nutrition and livelihood. However, the ability of ocean to provide those food and nutrition over the long term is already under pressure from human activities; and it is being further threatened by fragmented, uncoordinated, and conflicted activities in ocean (WWF Global, 2015). In this backdrop, ocean needs sustainable ocean governance. Sustainable ocean governance confirms rational human activities through a coordinated, reconciled and balanced ocean management. In general, sustainable ocean governance means the coordination of various uses of the ocean and protection of the marine environment (Pyc, 2016). Sustainable ocean governance is shaped by programs and action plans promoting integrated management and the concept of sustainability (Vallega, 2000). The fundamental value of sustainable ocean governance is the maintenance of long-term sustainability of marine natural resources (Pyc, 2016).

Blue Economy aims for the economic development which is both inclusive and environmentally sound, and to be undertaken in a manner that does not deplete the natural resources. This balance approach to the economic, social, and environmental dimensions of ocean activities controls the over exploration of ocean resources (World Bank Group, 2017). Moreover, management of ocean resources is the prime mover factor for Blue Economy as well as sustainable ocean governance. Blue Economy and sustainable ocean governance require an integrated management of ocean resources to ensure exploring economic interest as well as protection of marine ecosystem. Sustainable ocean governance makes possible collaboration across nation-states and between the public and private sectors (World Bank Group, 2017), which is also crucial for Blue Economy. Blue Economy has a significant concern for environmental risk and ecological damage (World Bank Group, 2017), whereas sustainable ocean governance seeks protection of ocean ecosystem while exploring ocean resources. From management perspective, sustainable ocean governance is a precondition for Blue Economy.

1.2.1 Blue Economy and Ecosystem Based Management

Blue Economy restores, protects and maintains the diversity, productivity, resilience, core functions, and intrinsic value of marine ecosystems (WWF Global, 2015). The economic activity should be conducted in ocean with the long-term capacity of ocean ecosystems to support this activity and remain resilient and healthy. It is generally understood to be a long-term strategy aimed at supporting sustainable economic growth through oceans-related sectors and activities, while at the same time preserving the environment (UNCTAD, 2014). In this context, Ecosystem based management of ocean is a proven approach to maintain productivity of ocean for long time as well as confirming sustainable economic growth. The ecosystem approach focuses largely on preserving ecosystem functions, structures, and services (Kirk, 2015), which offers better economic growth and environmental protection. The goal of the ecosystem approach is to restore and sustain the functions of ecosystems, based on their health, productivity through management systems that are fully integrated with social and economic goals, for the benefit of current and future generations (UN General Assembly, 2006).

Ecosystem based management provides the process of making decision as well as the objectives to be achieved with specific guidelines for economic and environmental protection (Kirk, 2015). It can facilitate a coordinated approach to the application of different policies affecting the coastal zone and maritime activities, from traditional ocean sectors to new businesses focused on ocean health (World Bank Group, 2017). The objective of Ecosystem based management is the promotion of “conservation and sustainable use of ocean resources” (UN General Assembly, 2006). Ecosystem based management ensures not only environmental aspects of ocean but also provides the process, objective and implementation of Blue Economy concept.

1.2.2 Blue Economy and MSP

There are different tools for the implementation of Ecosystem based management including Integrated Coastal Zone Management (ICZM), Marine Spatial Planning (MSP), Marine Protected Areas (MPA), and activities supporting carbon sequestration (World Bank Group, 2017). But MSP has become an essential tool for identifying and utilizing marine spaces, and for drawing up plans for sustainable ocean governance (Hassan & Haque, 2015). MSP is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through the political process (Ehler & Douvère, 2009). The objective of MSP is to ensure ecological, economic and social benefits through the Ecosystem-based management (Ehler & Douvère, 2009). The best feature of MSP is an integrated approach that allows planners to consider various uses of oceans at the same time with consideration of environmental impacts in the ocean spaces (Davies, Watret, & Gubbins, 2014). MSP is a significant departure from the sector-by-sector or use-by-use approach to integrated approach which allows planners to consider various uses of oceans at the same time (Hassan, 2013).

Blue Economy has introduced a new dimension in ocean management. It recognizes that diverse ocean uses and marine ecosystem services are interconnected, and additional value can be gained

from managing these uses and services jointly rather than managing them separately (Burgess, Clemence, McDermott, Costello, & Gaines, 2018). The Blue Economy conceptualizes oceans as “Development Spaces” where spatial planning integrates conservation, sustainable use, oil and mineral wealth extraction, bioprospecting, sustainable energy production and marine transport (Ministry of Foreign Affairs, 2014). Rapid growth of human activities in ocean to boost Blue Economy is creating unbearable threat to the marine environment. The various ocean energy technologies will potentially have significant adverse environmental impacts on the marine environment (Hussain, Failler, Karim, & Alam, 2017a). The mounting pressure on ocean due to the expansion of existing marine activities and new uses looks for new tools and approaches to foster a more rational and wise use of ocean space (Douve, 2008). In this context, MSP is an effective implementation tool for sustainable ocean management through a rational use by balancing between economic growth and environmental protection (Domínguez-Tejo, Metternicht, Johnston, & Hedge, 2016). MSP provides a holistic ocean management for blue growth, which is analogous to the hypothesized advantages of ecosystem-based management.

Historically, economic activity in the oceans has been managed on a sectorial basis, with only limited coordination between ministries, regulatory bodies, and industry when overseeing, among other things, overlap of property rights, shipping routes, and fishing grounds (Economist Intelligence Unit, 2015). As a result, sector by sector management of ocean activities used to create innumerable conflicts among the users, and cause threat to economic development. In this case, MSP is the tool for promoting a more rational and integrated use of the oceans by mitigating inter and intra conflicts. MSP has a significant role in promoting a rationale use of ocean resource to overcome the various hurdles to the development of the blue economy (Young, 2015). Therefore, MSP can be a mean to confirm sustainable use of ocean resource, and to achieve the benefit of Blue Economy.

1.2.3 Blue Economy and Zoning

MSP is an implementation tool to achieve Ecosystem-based Management while zoning is the most important toolkit to implement MSP effectively. An effective MSP depends on effective marine space zoning as well as application of some other principles. Zoning is a mean of applying MSP to specific marine spaces, a toolkit for implementing the ecosystem approach with an aim of achieving a healthy marine ecosystem by separating potentially conflicting ocean uses; and enabling economic and social benefits from various commercial and recreational activities (Hassan, 2013). One of the significant challenges to exploit Blue Economy is to avoid conflicting uses of marine space. In this context, Zoning has long been regarded as a cornerstone of ocean resource management, separating conflicting uses through application of the various zones and determining the appropriateness of various activities (Day, 2002).

Zoning provides specific use of particular space either for single or multiple uses of ocean resources. A multiple-use zoning approach provides high levels of protection for specific areas whilst allowing a range of reasonable uses, including certain extractive activities, to continue in

other zones (Day, 2002). Zoning gives a spatial planning basis for determining where many activities can or cannot occur (Kenchington & Day, 2011). Zoning is the outcome of a conciliation among the Blue Economy Sectors to use marine space according to space and time determined at policy level. Specific use of marine space accelerates adopting strategic goal for exploring that particular resource with specific target and evaluation. Zoning brings a spatial dimension to the regulation of marine activities by helping to establish geographical patterns of sea uses within a given area (World Bank Group, 2017).

Zoning, substantially, avoids conflicts among the relevant Departments and confirm functional separation to get optimal benefit of Blue Economy. Zoning provides integration across multiple uses and sectors, to minimize conflicts, to maximize sustainable economic development, and to protect important habitat and biodiversity areas (F. Douvère & C. Ehler, 2009). If the ocean spaces are properly planned and managed under MSP within a comprehensive framework of ecosystem based management, that will certainly generate strong foundation for huge earnings and economic benefits for the country (Hussain, Failler, et al., 2017a). Zoning regulations prescribe strategic management measures which confirms collective and community engagement for sustainable ocean resources management (Kenchington & Day, 2011), which ultimately ensure sustainable use of marine resources and sparks out Blue Economy through the collective engagement of multilayer Sectors.

1.3 INSTITUTIONAL ARRANGEMENTS FOR BLUE ECONOMY

Blue Economy conceptualizes a multi-dimensional use of ocean resources by a number of Sectors and Departments. Sustainable use requires those Sectors and Departments should be controlled and managed under an integrated institutional arrangement. Therefore, institutional design is at the central in managing blue growth to promote command-and-control management (Burgess et al., 2018). Moreover, Blue Economy emphasizes on active and effective stakeholder engagement and participation (WWF Global, 2015). Thus, all of the relevant Sectors and Departments should be identified, engaged and motivated through the common goal of Blue Economy. Therefore, the institutional arrangement for Blue Economy must be participatory, accountable, transparent, equitable and inclusive, in order to be responsive to present and future uses of ocean resources (WWF Global, 2015).

Designing institutions well is important, but what makes an institution well-designed is a question of the elements identified for managing the resources (Dietz, Ostrom, & Stern, 2003). The ideal sets of institutions are diverse and layered, have some degree of redundancy, and promote both dialogue among stakeholders and opportunities for learning and change (Dietz et al., 2003). The capacity of institutional system to absorb a disturbance and still retain its basic function and structure is an essential to design resource management in an uncertain and changing world, a world experiencing environmental shocks and unprecedented environmental conditions at an increasing rate (Burnes, 2007). Institutions with resilience to both of these sources of uncertain

and changing will be needed to sustain blue growth in the long term (Burgess et al., 2018). Blue growth will require reducing or eliminating externalities found across sectors, communities, or countries, and across time, through institutional design that can be locally and departmentally supported and feasible (Burgess et al., 2018).

Designing proper institutional framework is a challenge to grasp the benefit of Blue Economy because of the multi-layer uses, complexities, allocation of activities, uncertainties and changing nature of resources, and external factors. In this context, MSP is an effective tool for multidimensional uses management by reconciling among the Sectors in setting objectives and implementation plans (Frazão Santos, Orbach, Calado, & Andrade, 2015).

1.4 INSTITUTIONAL ARRANGEMENTS FOR BLUE ECONOMY IN BANGLADESH

The Institutional arrangement is a ground-breaking condition for exploring Blue Economy in a coastal state. Identifying the appropriate Departments and engaging them in implementation and operation of Blue Economy activities is a challenge in sustainable ocean governance. Blue Economy as a new dimension of economic development which requires highly pre-planned and well-arranged institutional arrangements. Due to various reasons, the institutional arrangements for sustainable ocean governance and Blue Economy under current legal and institutional system is at a very rudimentary stage in Bangladesh. The current institutional arrangements for exploring Blue Economy in Bangladesh can be demonstrated in five points:

- (i) Institutional arrangements for Marine Living resources (Fisheries)
- (ii) Institutional arrangements for Shipping and maritime transportation
- (iii) Institutional arrangements for marine non-living resources
- (iv) Institutional arrangements for Maritime Security
- (v) Institutional arrangements for Marine Environment and sustainable tourism

1.4.1 Institutional Arrangements for Marine Living Resources (Fisheries)

Marine living resources, particularly Fisheries, is one of the major Blue Economy opportunities for Bangladesh. The Ministry of Fisheries and Livestock is the highest governmental agency which is responsible for dealing with Fisheries resources management in Bangladesh. The Ministry has two divisions: Fisheries and Livestock. The Fisheries Division deals with the functions relating to Fisheries resources in general and marine fisheries particularly. The Division is engaged in the preparation of schemes, co-ordination of national policy; utilization of fish and fish wastes; development of fisheries resources and fishing; management of fishery resources; conservation of fish; control, management and development of Fisheries (Department of Fisheries, 2018). The Ministry has five agencies which are either directly or indirectly related to the management of marine fisheries resource. The agencies are:

- Department of Fisheries
- Marine Fisheries Academy
- **Bangladesh Fisheries Research Institute**
- Bangladesh Fisheries Development Corporation
- Fisheries and Livestock Information Office

1.4.1.1 Department of Fisheries

The Department of Fisheries has been working as the key agency for fisheries resource development and management in Bangladesh. The Department has a Marine Fisheries Wing which deals with all relevant functions of marine fishing. The Marine Fishing Wing is headed by a Director; and administered with other subordinated staffs. The functions of the Marine Fisheries Wing are mainly vested by the Marine Fisheries Ordinance 1983 (Department of Fisheries, 2018). According to Article 5 of the Marine Fisheries Ordinance 1983, the Director has responsibility for the management, conservation, supervision and development of marine fisheries and the implementation of the objectives of this Ordinance. Article 8 of the Ordinance states that the Director is responsible for issuing licenses in respect of all marine fishing in the Bangladesh.

However, this is a challenging task for the Wing to manage a volume of activities through its limited resources. The Wing does not have any function to develop the capacity building for deep sea fishing. The current marine fishing is limited to territorial water. But with a view to expanding capture fisheries production, Bangladesh should adopt appropriate deep-sea fishing technologies, i.e. long line and hook fishing and the utilization of supporting (Hussain, Failler, Karim, Alam, & Todorova, 2017).

1.4.1.2 Marine Fisheries Academy

The Government established Marine Fisheries Academy to maintain proper management of sea fishes through the production of skillful resources for marine fishing. The Academy is entrusted to train cadets through modern techniques and equipment in order to meet the challenges of millennium in shipping sectors. The Academy is a national institution to train and educate personnel for Bangladesh maritime fisheries industries in Bangladesh. The Academy strives for skillful human resources for deep-sea fishing by an efficient fishing fleet. Since its inception, Academy is shouldering the responsibilities of exploring and pooling the seafaring talents of the country; and training them in well planned and well-organized manner as Navigator, Engineer and Fish Processing Technologist (Marine Fisheries Academy, 2018). However, adequacy of modern technologies and equipment in the Academy is a core barrier to produce skillful human resource for marine fishing.

1.4.1.3 Bangladesh Fisheries Development Corporation (BFDC)

Bangladesh Fisheries Development Corporation is an autonomous organization under the Ministry of Fisheries and Livestock. The Corporation is mainly involved in harvesting fisheries resources and developing marketing facilities in the country. BFDC has fish harbors, landing and distribution centers, ice plants, and processing plants in several locations of Bangladesh. In recent years, BFDC has played a vital role in supplying safe and quality fish in the domestic market (Bangladesh Fisheries Development Corporation, 2018). The Corporation may adopt effective marketing policy to boost national revenue from marine fisheries resources. But the current focus of BFDC is on fresh water fisheries; and have shown less success in marine fisheries.

1.4.1.4 Bangladesh Fisheries Research Institute (BFRI)

Bangladesh Fisheries Research Institute is also an autonomous organization under the Ministry of Fisheries and Livestock. The objectives of the Institute are: to carry out basic and adaptive research for development and optimum utilization of fisheries resources; to coordinate fisheries research activities in Bangladesh; to do experiment and standardize techniques for maximizing productions and better management of fisheries resources; to advise the Government in all matters relating to research and management of fisheries resources (Bangladesh Fisheries Research Institute, 2018). The Institute has a Marine Fisheries and Technological Station in Cox's Bazar. The Marine Fisheries Station conducts basic and applied research on marine fisheries. But the research station is going on lack of standard research due to scarcity of modern lab and strategic focus in marine fishing.

1.4.2 Institutional arrangements for Shipping and maritime transportation

The Ministry of Shipping is the apex body for formulation and administration of Shipping and maritime transportation in Bangladesh. The Ministry is responsible for formulating policies and plans to facilitate the quick implementation of various projects relating to standard shipping operation (Ministry of Shipping, 2018). The objectives of the Ministry relating to maritime shipping focus on modernization of sea ports; creation of efficient workforce in the maritime sector; safe and affordable transportation of goods; and facilitation of international trade (Ministry of Shipping, 2018). There are seven sub-ordinate Departments and Organizations those are directly related to maritime shipping and operation. The departments/agencies are: Department of Shipping, Bangladesh Shipping Corporation, Marine Academy, National Maritime Institution, Chittagong Port Authority, Mongla Port Authority and Payra Port Authority.

1.4.2.1 Department of Shipping

The Department of Shipping was established in 1976 to act as the maritime safety administration of Bangladesh and the international focal point of maritime affairs. The Department is responsible for formulation and implementation of the national policies and legislations to ensure safety of life and ships at sea; development of shipping industry; maritime education and certification;

employment and welfare of seafarers; and other shipping related matters. The department is also responsible for ensuring the compliance of international conventions relating to maritime matters (Ministry of Shipping, 2018). The Department operates its functions relating to Merchant shipping through 9 (Nine) major agencies: Mercantile Marine Department, Government Shipping Office, Seamen Welfare Directorate & Emigration Directorate, Bangladesh Shipping Corporation, Marine Academy, National Maritime Institution, Chittagong Port Authority, Mongla Port Authority, and Payra Port Authority.

Mercantile Marine Department: The Mercantile Marine Department (MMD) is responsible for controlling the shipping activities in accordance with the Merchant Shipping Ordinance 1983 for ocean going and coastal ships. The Principal Officer is the head of this Department. MMD has a branch office in Khulna for providing services to ships at Mongla Port. The main functions of the Mercantile Marine Departments are: registration, survey and inspection of ocean going and coastal vessels; issue of Safety Equipment Certificate; issue of Seaworthy Certificates to Vessels; issue of No Objection Certificate to vessels entering to and departing from the Ports; and attend to enquiries and investigations as to shipping casualties (Mercantile Marine Department, 2018). While MMD has to conduct huge operational activities, it has a limited number of staffs in comparison to the work load. Further, the management process is not up to the world standard level to compete at international playground.

Government Shipping Office: The Government Shipping Office is located in Chittagong. The main functions of the Government Shipping Office are: issue of Continuous Discharge Certificate (CDC) to seafarers; conduct sign on and sign off the seafarers; dealing matters relating to employment of Bangladeshi seamen on foreign and national flag vessels; arbitration and settlement of problems/disputes related seafarers' employment on board ships; maintenance and operation of Seaman's Funds (Government Shipping Office, 2018). Complexities in procedure and delay to resolve any issue are identified as two major drawbacks of the Office for effective functioning.

Seamen Welfare Directorate & Emigration Directorate: The Seamen Welfare & Emigration Directorate was created in 1971 by amalgamating three departments with a view to implementing the provision of the ILO Conventions for promoting the welfare of seafarers. The Directorate provides welfare services to seafarers and advises the Government on measures to be taken for promoting welfare of seamen as per requirements of Maritime Labor Convention 2006 (Department of Shipping, 2018). But the statistics and country report show that the position of Bangladesh is at the bottom of line in confirming the provisions of the ILO Convention.

Bangladesh Shipping Corporation: Bangladesh Shipping Corporation (BSC) is a government agency to act as the national flag carrier to provide safe and efficient shipping services and carry out all forms of activities connected with or ancillary to merchant shipping. BSC engages its vessels both on time and voyage charter. At present, most of the vessels are under time charter to various local and foreign companies. BSC also started feeder service in the Bangladesh-Singapore-Bangladesh trade from 1986. BSC has been entrusted with the responsibility of carrying crude oil from Middle East and Persian Gulf region to Bangladesh. BSC also acts as the local agent of

various nationalized and private shipping companies in Bangladesh. BSC has its own marine workshop situated on the bank of the river Kharnaphully to carry out maintenance and repair of BSC vessels (Bangladesh Shipping Corporation, 2018). But very limited number of Vessels and continual loss make frustrating outcome from the Corporation.

Marine Academy: Bangladesh Marine Academy is a maritime training institution located in Chittagong. The Academy has an excellent and prestigious past of four decades to produce world class mariner for shipping operation. The Academy has achieved the requisite professional status by being a branch of world maritime University in 1990 (Bangladesh Marine Academy, 2018). The academy provides theoretical and practical training to cadet, deck officer and marine engineer for merchant shipping. Undoubtedly, the Marine academy is a unique institution in South Asia and known for its maritime excellence. The Academy is committed to efficient and skillful manpower for maritime development in shipping line. But the Academy produces a limited number of mariners which is not adequate for the large shipping industry.

National Maritime Institution: National Maritime Institute (NMI) was permanently established in 1989. The Institution is one of the most modern & IMO white listed Institutes in the South-Asian region. NMI is occupied with a large area along with modern Training Blocks. National Maritime Institute is a well-equipped for Seafarer's Training. The Institute provides both practical and theoretical knowledge for operation of merchant shipping. NMI is presently conducting Pre-Sea courses on two main academic discipline (National Maritime Institute, 2018). The Institution is committed to develop competent and qualified maritime manpower for safe and efficient manning of world fleet. However, Bangladesh needs more trained Seafarer from other disciplines, for example, oceanography, hydrography and cartography.

Chittagong Port Authority: All of the three Sea Ports (Chittagong Port, Mongla Port and Payra Port) are autonomous bodies which are regulated by respective statute. The Chittagong Port is the principal seaport of Bangladesh. The Port handles about 90% of the total maritime trade of the country (Chittagong Port, 2018). The Chittagong Port Authority is regulated by the Chittagong Port Authority Ordinance 1976 (amended 1995). Board is the highest level of authority in discharging functions guided on questions of policy by such direction as may be given to it from time to time by the government. The functions of the port authority are: to manage, maintain, improve and develop the port; to provide and maintain adequate and efficient port services and facilities in the Port or the approaches to the Port; and to regulate and control berthing and movement of vessels and navigation within the Port. But the lack of efficient management process and scarcity of skillful human resources always hampers smooth service and causes extra-costing delay in Chittagong Port.

Mongla Port Authority: Mongla Port is an eco-friendly port in Bangladesh. The Port is operated by Mongla Port Authority. There is a board consisting of chairman and three members: Member (Finance), Member (Harbor & Marine), Member (Engineering & Development) to operate the Port. The Chairman is the Chief Executive of the port authority. The Board formulates the policy of operation, administration, finance & development of the port. There are 12

Departments to carry out day to day work of the authority (Mongla Port, 2018). Mongla Port Provides facilities and services to the international shipping lines and other concerned agencies providing shore based facilities like jetties, godowns, cargo handling equipment and maintaining adequate water depth in the channel as well as making provision for safe day and night shipping. Although the Port is contributing in internal shipping significantly, it has less focus in merchant shipping in Bangladesh.

Payra Port Authority: In order to increase the economic activities in the central zone and meet the future demand, Payra Sea Port has been established as the 3rd sea port of Bangladesh. The Port is governed by the Pyra Port Authority. The objective of Payra Port focuses mainly on providing necessary services and facilities to the port users efficiently and effectively at competitive price (Payra Port, 2018). Though Payra Port Authority started its limited scale port operations by offloading bulk cargoes at inner/outer anchorage, with the passage of time it is going to handle maximum volume of container and bulk cargoes of Bangladesh using the geographical advantages, good hinterland connectivity. However, maintaining the channel and navigability is a challenge for fulfilling the goal of the Port Authority.

1.4.3 Institutional arrangements for Non-Living Marine Resources

The non-living resources, for example, Oil, Gas, Minerals and Renewable Energy, are very crucial Blue Economy sectors for Bangladesh. The Ministry of Power, Energy and Mineral Resources is the concerned Ministry to deal with these sectors. The Ministry has two divisions headed by two Secretaries: Power division; and Energy and Mineral resources division. The Energy and Mineral Resources Division has separate entities for oil and Gas (Ministry of Power, 2018a). There are six subordinate agencies under the Ministry to conduct the activities related to oil, gas, minerals and renewable energy in Bangladesh. The agencies are: Energy and Mineral Resources Division, Sustainable and Renewable Energy Development Authority (SREDA), Petrobangla, Geological Survey of Bangladesh, Bangladesh Hydrocarbon Unit, Bangladesh Hydrocarbon Unit and Bangladesh Energy Regulatory Commission (BERC).

1.4.3.1 Energy and Mineral Resources Division

Energy and Mineral Resources Division is responsible for management of all resources; planned development and control over mine and mineral classification; continuous monitoring and information collection; ensuring proper usage and supply of minerals for energy; industry and production of raw materials to maintain a flow in the national revenue; and earning revenue through lease and extraction of mineral resources (Ministry of Power, 2018b). In this context, the Division is supported by Bangladesh Mineral Development (BMD). The Division has initiated many programs for exploration, development and generation of onshore gas at offshore blocks in order to satisfy the demand in Bangladesh. The Division prepares budget to ensure energy security, necessity of casting, activities under the supervision of the department, timed planning and

increased monitoring and performance of the implementation. However, the Division has less success in planning and managing marine minerals and resources.

1.4.3.2 Sustainable and Renewable Energy Development Authority (SREDA)

As per Sustainable and Renewable Energy Development Authority Act, SREDA has been established to act as a nodal organization of the Government to promote and develop renewable energy and energy efficiency activities in Bangladesh. Besides SREDA, there are some special cells/wings established in different power sector utilities to deal with renewable energy and energy efficiency issues. The Authority is working to promote and foster the renewable energy development in Bangladesh as per the Renewable Energy Policy 2008 (Division of Power, 2018). SREDA is performing the functions of: coordinating renewable energy and energy efficiency issues of the government; promoting sustainable energy; standardizing and labializing the products for renewable and efficient energy; piloting new technologies, and take initiatives for its expansion; research and development on renewable and efficient energy; capacity development; create awareness for renewable and efficient energy; and establish linkage with regional and international organizations. The initiatives and plans of SREDA to explore marine renewable energy are at very rudimentary stage which should be more focused and promoted.

1.4.3.3 Petrobangla

Bangladesh Oil and Gas Corporation (BOGC) was short-named “Petrobangla” in 1974, which deals with the exploration and development of oil, gas and mineral resources in Bangladesh. Petrobangla is also entrusted with mineral development in the country. While the exploration part of minerals activity falls under the charter of Geological Survey of Bangladesh (GSB), subsequent development of economic deposits is undertaken by Petrobangla. Petrobangla has shown significant initiatives in exploring the mineral resources from the maritime area of Bangladesh although failed due to maritime boundary dispute (PETROBANGLA, 2018). After the resolution of the Maritime boundary dispute with Myanmar and India, Petrobangla has rearranged the deep-water blocks on the eastern part. Proper planning, skillful resources and adequate modern technologies are essential for effective functioning of this leading mineral explorer corporation.

1.4.3.4 Geological Survey of Bangladesh

The Geological Survey of Bangladesh is envisaged for searching mineral resources’ structure and technological development, urban planning, environmental protection, protection from natural and man-made disasters and the geological, geo- physical, geo- chemical investigation (Geological Survey of Bangladesh, 2018). The Wing conducts excavation activities which leads to the discovery of new fields of mineral resources within the land and water territory of Bangladesh. This specialized team works under direct monitoring and supervision of the Energy and mineral resources division. However, the wing needs coordination and collaboration with Petrobangla and BAPEX for better function and smooth management of mineral activities.

1.4.3.5 Bangladesh Hydrocarbon Unit

Energy and Mineral Resources Division established Hydrocarbon Unit in 1999. Hydrocarbon Unit is a Technical arm of Energy and Mineral Resources Division. Hydrocarbon Unit provides technical recommendation to Energy and Mineral Resources Division for the development of Oil, Gas and Mineral Resources. Besides, Hydrocarbon Unit assists to provide views/comments to international and regional organizations on different issues pertaining to energy sector (Bangladesh Hydrocarbon Unit, 2018). The Unit may be predominant force in exploring and exploitation of hydrocarbon reserve in the Bay of Bengal. But the Unit needs to be more acquainted with modern equipment to deal with marine Hydrocarbon aspects.

1.4.3.6 Bangladesh Energy Regulatory Commission (BERC)

The Bangladesh Energy Regulatory Commission was established in 2003. The Commission consists of the Chairman and five members. The commission has the mandate to regulate Electricity, Gas and Petroleum products for the whole of Bangladesh (Bangladesh Energy Regulatory Commission, 2018). Additionally, The Commission provides training to the technical staff. The Commission has a training institute to produce skillful manpower for effective management and operation of energy production. The Commission controls downstream energy activity and monitors the overall activities of all relevant agencies. The Commission analyze the existing energy frameworks and suggest Government for new policy if necessary. Although the Commission is the umbrella platform for energy regulatory activities, it has less stress on marine energy to adopt appropriate legal and institutional framework for Bangladesh.

1.4.4 Institutional arrangements for Maritime Security

Ministry of Defense is the responsible body to maintain the safety and security of the land, air and water territory of Bangladesh. The Defense Ministry maintains functional integration with the Armed Force. The functions of the Ministry related to maritime security are: conducting survey on water territory and preparing map for shipping; and research and updates on meteorological aspects in Bangladesh. There are five subordinate and affiliated agencies those deal with the maritime security aspects of Bangladesh under this Ministry of Defense: Bangladesh Navy, The Coast Guard, Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh Meteorological Department and Survey of Bangladesh.

1.4.4.1 Bangladesh Navy

Bangladesh Navy (BN) has emerged as the guardian of the national maritime space in Bangladesh by playing primary roles in protecting territorial integrity, political independence, and safeguard the maritime interests. Ensuring safe and unfettered maritime commerce is an obligation of Bangladesh Navy (Bangladesh Navy, 2018). BN maintains round the clock vigilance at sea; and conducts special operations against armed robbery, illegal poaching, smuggling, gun-running and terrorism. Bangladesh Navy defends the country from threats emanating on, above and under the

sea; promote and protect our maritime interest, and assist in maritime governance. It maintains an effective posture across the full spectrum of any conflict at sea. Bangladesh Navy shall also undertake constabulary and benign tasks to ensure good order at sea for carrying out national maritime economic activities. BN has played an important role in confirming maritime security against traditional threat while non-traditional threat should be more focused to ensure the benefit of Blue Economy.

1.4.4.2 Bangladesh Coast Guard

The emergence of the Bangladesh Coast Guard as a new service was the result of an awareness to enforce national laws in the waters under national jurisdiction and ensure safety of life and property at sea. Bangladesh Coast Guard was established in 1995 following the Coast Guard Act 1994 (Bangladesh Coast Guard, 2018). Bangladesh Coast Guard is under the administration control of the Ministry of Home Affairs but has strong affiliation with the ministry of defense because of the function and origin. Bangladesh Coast Guard acts with the Motto of ‘Guardian at sea’. Bangladesh Coast Guard carries out an array of civil and military responsibilities touching almost every facet of the Bangladesh maritime environment. It has been vested for ensuring maintenance of overall law and order situation by protecting national maritime borders and coastal area from piracy, illegal fishing, exploration of oil and gas, forest preservation including protection from marine pollution and port security. But a limited number of staffs and lack of adequate modern technologies and equipment makes shackles to perform their duties properly.

1.4.4.3 Bangladesh Space Research and Remote Sensing Organization (SPARRSO)

Bangladesh Space Research and Remote Sensing Organization (SPARRSO) was established in 1980 and re-organized in 1991. This organization deals with space and remote sensing, forestry and environment, agriculture, fisheries, geology, cartography, water resource, land use, weather, geography and oceanography. Geology and oceanography are two focal aspects of the Organization (Bangladesh Space Research Organization, 2018). It provides necessary information and disseminates research results to the Government and different relevant user agencies to take necessary action to prevent any natural calamity either on land or in water. SPARRSO conducts training, technical research, survey and monitor on space and remote sensing technology and cooperates national or international organization or institutes in the relevant matter. However, the Organization needs to be equipped with more modern technologies to ensure standard and effective service.

1.4.4.4 Bangladesh Meteorological Department

Bangladesh Meteorological Department is a scientific and technical institution of the Ministry of Defense. The Department provides information relating to weather and climate to other countries through its high modern Global Telecommunication System (GTS). The Department has five radar stations which accelerates weather and marine forecast. It provides marine warning based on

composite and analysis process. The Department is connected with Wide Area Network (WAN). The Department is also affiliated with the Regional Tsunami Service Providers, which will accelerate to take emergency protection against natural calamity (Bangladesh Meteorological Department, 2018). The Department applies Storm Surge Model (IIT-D and MRI model) and Wave Model. Furthermore, the Department is implementing Coastal Inundation Forecasting Demonstration Project for Bangladesh (CIFDP-B) (B. M. Department, 2018). The Department has a substantial focus on Marine Warning for fishing trawler in the coastal area of the Bay of Bengal; marine warning for sea going ships and fishing boat; marine warning for merchant shipping.

1.4.4.5 Survey of Bangladesh

Survey of Bangladesh (SOB) is the national mapping organization of Bangladesh. It has established Digital Mapping Center, modern printing press and Geodetic Detachment. In order to determine Mean Sea Level (MSL) for the country, it has established a Tidal Station at Rangadia, Chittagong. SOB maintains triangulation stations; and preparation of trigonometrical pamphlets as permanent record of Geodetic Control points for future use and references. Demarcation of International boundary lying in different Hilly areas is the responsibility of Survey of Bangladesh. It prepares special Maps for different Departments like Geological Survey and soil Survey, which reconcile functional coordination among those departments. Although SOB has limited manpower and old equipment, it has acquired a remarkable progress in surveying and mapping activities in Bangladesh (Survey of Bangladesh, 2018). SOB may be a crucial entity to conduct and maintain marine survey in Bangladesh.

1.4.5 Institutional arrangements for Marine Environment and sustainable tourism

The Ministry of Environment and Forest is the responsible body for protecting and conserving environment in Bangladesh. The Ministry works to ensure sustainable environment and forest through conservation of ecosystem and biodiversity; controlling environmental pollution; addressing climate change; research, floristic survey; and development of environment. The organizational structure of the ministry includes a number of divisions, directorate, board, subordinate offices, autonomous institutions and public-sector undertakings (Ministry of Forest and Environment, 2018).

On the other hand, the Ministry of Civil Aviation and Tourism is the concerned and apex entity for dealing with all aspects of sustainable tourism. The Ministry was created in 1975 with two divisions, namely, Civil Aviation and Tourism. Tourism division has functional coordination with Bangladesh Tourism Board and Bangladesh Porjoton Corporation.

1.4.5.1 Department of Environment

The Department of Environment (DoE) was established in 1977 under the Environment Pollution Control Ordinance, 1977 (Department of Environment, 2018). The DoE has been placed under the Ministry of Forest and Environment as its technical wing which is statutorily responsible for the

implementation of the Environment Conservation Act, 1995. The Department is the nodal agency in the administrative structure for the planning, promotion, co-ordination and overseeing the implementation programs. The Department discharges its responsibilities through a head office and six Divisional offices. Moreover, the Government has been set up new offices at district level. However, the Department does not any specific wing for protecting marine environment. Absence of any specific legislative framework is considered the main reason behind the institutional gap for protection of marine environment in Bangladesh.

1.4.5.2 Bangladesh Climate Change Trust

Bangladesh Climate Change Trust (BCCT) is a statutory body formed under Climate Change Trust Act, 2010 to administer Climate Change Trust Fund (CCTF). BCCT is entrusted with the overall management of Climate Change Trust Fund (CCTF) including the release of funds for the projects approved by the Trustee Board. It coordinates with the Climate Change Focal Points of different ministries/divisions, communicates with concerned stakeholders including civil society, NGO, private sector and international agencies (Bangladesh Climate Change Trust, 2018). But BCCT has little concern about the climate change aspect in ocean, for example, ocean acidification. The ocean acidification is a major threat for climate change all over the world which should be a major agenda for BCCT.

1.4.5.3 Bangladesh Tourism Board

Since its inception in 2010, the Bangladesh Tourism Board has been resolutely promoting a positive image of Bangladesh to the world by its promotion & marketing for tourism. The Functions of the Tourism Board are: adoption of national policy and recommend for implementing government plan related to tourism; suggesting on development of tourism; making attractive tourism area and creating public awareness; coordinating among government, private and local agencies; cooperate and maintain liaisons with foreign tourism industry and agencies; establishing and providing training for improving and development of tourism sector; and preparing database for tourism in Bangladesh (Bangladesh Tourism Board, 2018). The Board is conducting research work through its enlisted agency MEL-CEMS Joint Venture. But the Board has minimum concern about the marine environment. A joint collaboration of the Board with the Department of Environment is essential to confirm sustainable marine tourism.

1.4.5.4 Bangladesh Porjoton Corporation

Bangladesh Porjoton Corporation is a national tourism agency in Bangladesh. The Corporation was established in 1972 and started its activities from 1973. The Corporation is an autonomous body working under the administrative control of the Ministry of Civil Aviation and Tourism. National Hotel and Tourism Training Institute (NHTTI) works under the supervision of the Corporation. The main function of the Corporation is to facilitate and develop tourism sector in

Bangladesh (Bangladesh Porjoton Corporation, 2018). However, the Corporation is far away to explore marine tourism and providing world standard facility for tourist.

The current institutional arrangements in Bangladesh are significantly lack of integration, coordination and efficiency for effective management of Blue Economy activities. Moreover, some specialized institutions are essential to coup with the special aspects of Blue Economy. Nowhere it is reflected that the institutional arrangements under existing legislations and policies can confirm sustainable ocean governance to achieve the benefit of Blue Economy. Introduction of MSP can play an important role as a way forward to achieve the benefit.

1.5 MARINE SPATIAL PLANNING AS A WAY FORWARD

As reflected in this chapter, the central challenge remains for Blue Economy is the integration of various departments and sectors in a comprehensive and cohesive plan, with ecosystems as the central framework (World Bank Group, 2017). MSP helps to achieve ecological benefits through the Ecosystem-based management (Hassan, 2013). MSP accelerates this integration among the relevant departments and brings on a common platform. MSP provides the strategy and framework to bring all relevant Sectors on a platform and to engage the Stakeholders in the ocean management process. MSP promises a forward-looking, strategic and integrated approach for allocating ocean space to different activities within the bounds of ecological limits and on an equitable basis (Young, 2015). MSP brings integrated and multi-objective, strategic and future oriented, and continuous and adaptive policy to use all marine resources for sustainable blue growth (Hussain, Failler, Karim, Alam, et al., 2017). MSP helps to identify and bring the relevant stakeholders; categorizes the potential means of addressing the concerns surrounding regulatory complexity on a more systemic level.

A long range and strategic policy is a sine qua-non- to explore Blue Economy. Strategic policy (master plan) controls the process, monitoring, evaluation, capacity building and outcome. Non-operative and theoretical action plan without analyzing the practical aspects is another barrier towards sustainable Blue Economy(Alam,2016). MSP accelerates the preparation of a comprehensive plan or policy document, often referred to as the master plan, which describes the vision for the future spatial development of the marine area (Douvere & Ehler, 2009). MSP has become an essential tool for identifying and utilizing marine spaces, and for drawing up plans for sustainable ocean governance (Hassan & Haque, 2015).

Blue economy needs a strong legislative framework to formulate appropriate body and rules to achieve the benefit of Blue Economy. Any confusion and uncertainty under multiple laws are not coordinated, and may possess conflict with each other, and thus creates the regulatory complexity and time spent trying to navigate the labyrinth of potentiality (Douvere & Ehler, 2009). MSP necessitates an umbrella legislation to avoid multiplicity of regulatory mechanism, for example, the Great Barrier Reef Marine Park Act 1975. The Great Barrier Reef Marine Park Act 1975 coupled with other subsequent supportive regulations fulfils its promise of delivering a more

rational system for the use of the ocean resources (Douvere & Ehler, 2009). MSP, through this long-term vision and consistent mechanism, provides legal certainty, predictability, transparency and direction for the future development of an ocean area (Douvere & Ehler, 2009).

Collective and coordinated engagement of relevant stakeholders is a pre-requisition for smooth visualization of Blue Economy. Inter and intra coordination between academia-industry, public-private, resource-responsibility, and time-space are essential to bring forward the relevant departments related to blue economy development (Hussain, Failler, Karim, & Alam, 2017b). MSP is a proven tool to override this challenge of coordination among the relevant departments and sectors. Engaging stakeholders is essential to understanding their objectives, and it increases information and capacity for economic development (Burgess et al., 2018). Inter-ministerial coordination is very much vital to bring forward all the relevant developmental issues related to blue economy (Hussain, Failler, Karim, Alam, et al., 2017).

Overlapping and conflicting activity is the main stream barrier towards development of Blue Economy. Conflicting human activities is significantly serious in case of dealing with ocean resources, which can explore irreversible loss to the marine environment and ecosystem. MSP designates ocean spaces for specific uses (Hussain, Failler, et al., 2017a), which avoid conflicting activities. MSP is the quinine for mediating conflicts and overlapping function in ocean management. Moreover, the primary appeal of MSP is to harmonize and coordinate the currently fragmented management regimes (Backer, 2011). MSP works from the assumption that planning can help alleviate stakeholder conflicts, thus turning an otherwise zero-sum game into one that can mutually benefit all groups (Smith & Jentoft, 2017). MSP makes a reconciliation among the conflicting users by a balance between economic and environmental interest. MSP prescribes an improved planning and management system for protecting marine ecosystem health and services, which emphasizes a balance between economic development and marine environmental conservation (Hassan, 2013).

MSP organizes the uses of the sea's resources in ways that will protect ecosystem for now and the future (Hassan & Haque, 2015). The realization that the sustainable management of ocean resources requires collaboration across nation-states and across the public-private sectors, and on a scale, that has not been previously achieved (World Bank Group, 2017). Transboundary MSP is an ideal approach to address the sustainable use of transnational marine resources. Transboundary MSP provides for a holistic approach to sustainable sea use management (Hassan & Haque, 2015). Negotiation for transboundary MSP is likely to emerge only after the development of MSP at national level to make it more effective (Backer, 2011).

1.6 Conclusion

Sustainable use of ocean resources is the core content of Blue Economy, which makes a balance between economic growth and environmental protection. Ocean is considered as a very useful space under Blue Economy concept where sustainable development goal 14 requires conservation

of ocean through sustainable use of ocean resources. Sustainability of ocean to maintain long-term capacity of ocean to produce natural resource is also the key aspect of sustainable ocean governance. Both Sustainable ocean governance and Blue Economy require rational human activities in a coordinated and integrated management approach. From management perspective, Sustainable ocean governance is a pre-condition for Blue Economy.

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.

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