

## Initiating Marine Spatial Planning (MSP) process: Resolving conflicts between Chittagong port and other maritime sectors in Bangladesh.

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### **Abstract**

*Bangladesh is a maritime nation and its seaborne trade is highly dependent on the country's prime port, Chittagong which handles more than 90% of the total seaborne trade of the country. In the Port area of Chittagong, there are many more maritime activities other than shipping which includes fishing, oil & gas exploration, military and naval exercises, tourism, movements of naval and coast guard ships, pushing and towing, bunkering to the anchored ships, movement of old ships to scrapping yards. Being one of the largest segments of the maritime economic sectors, Chittagong port often faces conflict with other sectors. Bangladesh initiated several tools to manage its ocean and coastal resources but failed to achieve due prosperity. In this sense, Marine Spatial Planning (MSP) can be a timely tool to minimize conflicts among all stakeholders and maximize the use of all resources through an integrated management process. The study aimed to find out conflicts of the Chittagong port with other maritime sectors and explore the role of MSP to resolve those conflicts. This study adopted a qualitative approach and synthesized data from both primary and secondary sources. To collect primary data, a total of 11 semi-structured interviews were conducted from different maritime sectors. The outcome of this study may include conflict resolution; engagement of different maritime stakeholders. The outcome of this research can benefit port sectors, maritime stakeholders, policymakers, researchers to understand the role of MSP for conflict resolution in Bangladesh.*

**Keywords:** Marine Spatial Planning, conflict resolution, stakeholders, Chittagong

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## 1. Introduction

Bangladesh is such a maritime nation where 80% of the country's trade is transported through its seaports and country's dependency factor on maritime trade is 33% (ESCAP 2020). Chittagong port, country's prime seaport, is a gateway to trade which allows all other countries for international trade. Likewise, it plays a vital role in the growth of GDP, creation of local jobs, the establishment of port sided industry, supply chain linkage and maintaining international trade. Chittagong port contributes to handling 93% of the country's trade (CPA 2021).

As a major seaport, Chittagong Port has a multitude of disputes with other maritime sectors. In the port area, there are many more maritime activities other than shipping which includes Fishing, oil & Gas exploration, Survey, military and Naval exercises and firing practices, movements of naval and coast guard ships and convoys, Pushing and towing, Bunkering to the anchored ships, lighterage operation in outer anchorages, debunking & movement of old ships to Sitakunda for scrapping. Every year, more than 3000 ships call in Chittagong port but there is no ship's routing system (no designated route, traffic separation scheme) which creates conflict mostly with the fishing sector and other vessels engaged in various maritime operations/ activities (Mannan 2019).

As Chittagong port is the backbone of the country's economy, the conflict should be identified and reconcile through an integrated management process. The study will address MSP as an efficient tool to reconcile conflict among a variety of stakeholders through an integrated management approach (Douvere and Ehler 2009). MSP has been widely used to integrate all discrete management approaches to avoid or minimize conflicts among different users (Saha and Alam 2018). Several coastal and ocean management tools such as Integrated Coastal Zone Management (ICZM), Marine Protected Area (MPA), Integrated Coastal and Ocean Management (ICOM) have been proposed and utilized in Bangladesh and they have mixed results. Either they approach a single sector or only concentrate waterfront with a land centric view. For example, ICZM in Bangladesh was mostly in the land centric ocean view and gave full emphasis on disaster management, gender equality and women empowerment rather than coastal management (Hossain et al. 2014). On the other hand, Integrated Coastal and Ocean Management (ICOM) was a popular tool worldwide to manage coastal and ocean areas such as EEZ and continental shelf before the 21st century but most of them became unsuccessful due to the lack of monitoring and evaluation process (Cicin-sain et al. 2000). In most of the coastal countries ICZM is limited to 1-2 kilometres from land to sea (Christie 2005). However, ICOM failed to give priority on ocean governance and management in Bangladesh (Islam and Shamsuddoha 2018). Recently many coastal and maritime countries have started to use a new management tool for coastal and ocean governance, managing conflict (user –user and user- environment) and the tool is Marine Spatial Planning (MSP) (Douvere 2008). About 70 countries worldwide are now implementing MSP in different stages (EU MSP Platform 2018).

One of the most shared definitions provided by the IOC-UNESCO, “Marine spatial planning 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 usually have been specified through a political process (Douvere and Ehler 2009).” So, from this definition, it is clear that MSP is a public process which engages several stakeholders to achieve multi objectives and also engages government entities for better policymaking process. Gopnik et al. argues that MSP involves stakeholder at the early stage of the decision-making process (Gopnik et al. 2012). However, MSP is a holistic approach which reduces conflict among different users (human-human, human- coastal and ocean environment) and makes the conflict and compatibilities among different users visible to solve the problem (Douvere 2008). For example, the port sector may identify their conflict with other sectors and involve those sectors to solve conflict with a multi-objective approach. MSP is similar to land spatial planning but here the background and dimension of planning are different because the land is static but the ocean environment is dynamic (Douvere 2008).

With the above background in mind, this paper aims at finding out major conflicts of Chittagong port with other maritime sectors and explores the role of MSP to reconcile conflicts.

## 2. Methodology

Researchers adopted qualitative methodology as it is a holistic approach which helps to know the nature of a situation, find out the problem of that situation and finally helps to establish a theory (PESHKIN 1993). To answer the research question, the researcher conducted interviews to acquire in-depth knowledge about the research problem. This research paper is completed by using both primary and secondary data.

The Secondary data were obtained from various Port Yearbooks, journals, articles, dissertation, shipping statistics and market review and relevant published materials. Also, official documents, law and amendments from the website of Chittagong port of Bangladesh were analyzed. Some International Organizations’ website (International Maritime Organization-IMO, International Oceanographic Commission-IOC) related to this topic were reviewed.

To collect primary data, a total of 11 semi-structured interviews (see **Appendix 1**) were conducted from 8 different sectors, including interviews from government officials, policymakers, researchers, businessmen, ocean users, and entrepreneurs. To find out the answer of research questions, researchers identified interviewees who possess vast knowledge on the maritime sectors such as port & shipping, maritime tourism, offshore oil & gas, military operations, nature & biodiversity etc. The sample size kept small for stronger sample criteria and effective data analysis. The interview questions varied from

interviewee to interviewees based on their knowledge, work experience but maintained the core issues.

The narrative process mainly used to analyze the data collected from the interview (Hunter 2010). After transcribing the interviews, Coding of the interview transcript was done which helped us analyzing the data. Coding is the process of identifying interesting and silent features of the text within a text that relates to the research question or research objectives (John et al. 2014). For every interview transcript, many codes were created. Then all the codes were merged and combined to form an overarching theme which was made according to the research question. Under a particular theme, all the coded data were gathered and different opinions of different respondents about that particular theme were obtained. The whole process was repeated for each theme. Finally, all the themes were combined for developing a broader concept. For secondary data analysis, the content analysis method was used helps to understand and interpret the inner meaning of the textual material, articles, and graphics (Shamsuzzaman and Islam 2018).

### **3. Interview Analysis and Discussions**

#### **3.1 Conflict of Chittagong Port with other maritime sectors:**

According to the respondents, major sectors of the blue economy are emphasized below to find out the conflict which is directly/indirectly connected with the Chittagong port: a) Fisheries b) Oil and Gas Extraction c) Maritime Tourism d) Nature and Biodiversity Conservation e) Military Exercise f) Maritime Transportation sector.

##### **a) Fisheries Sector:**

The fisheries sector plays an important role in fulfilling the demand for animal protein. About 11% of the total population (more than sixteen million) is directly or indirectly dependent on this sector (Shamsuzzaman and Islam 2018). The fisheries sector is mainly divided into three major categories: Inland capture, Inland culture and Coastal and Marine Fisheries (Industrial and Artisanal fisheries) (Islam et al. 2017). Industrial fishing is also known as Deep Sea Fishing where large trawlers' are used for catching fish within the depth of 40-100 meters whereas artisanal fishing is within the depth of 10-30 meters (Hussain et al. 2010). In the Bay of Bengal (BoB) territorial waters, there are four major fishing grounds which include: (i) South patches, (ii) South of south patches (iii) The Middle Fishing Ground (iv) Swatch of No Ground (Miah 2015).

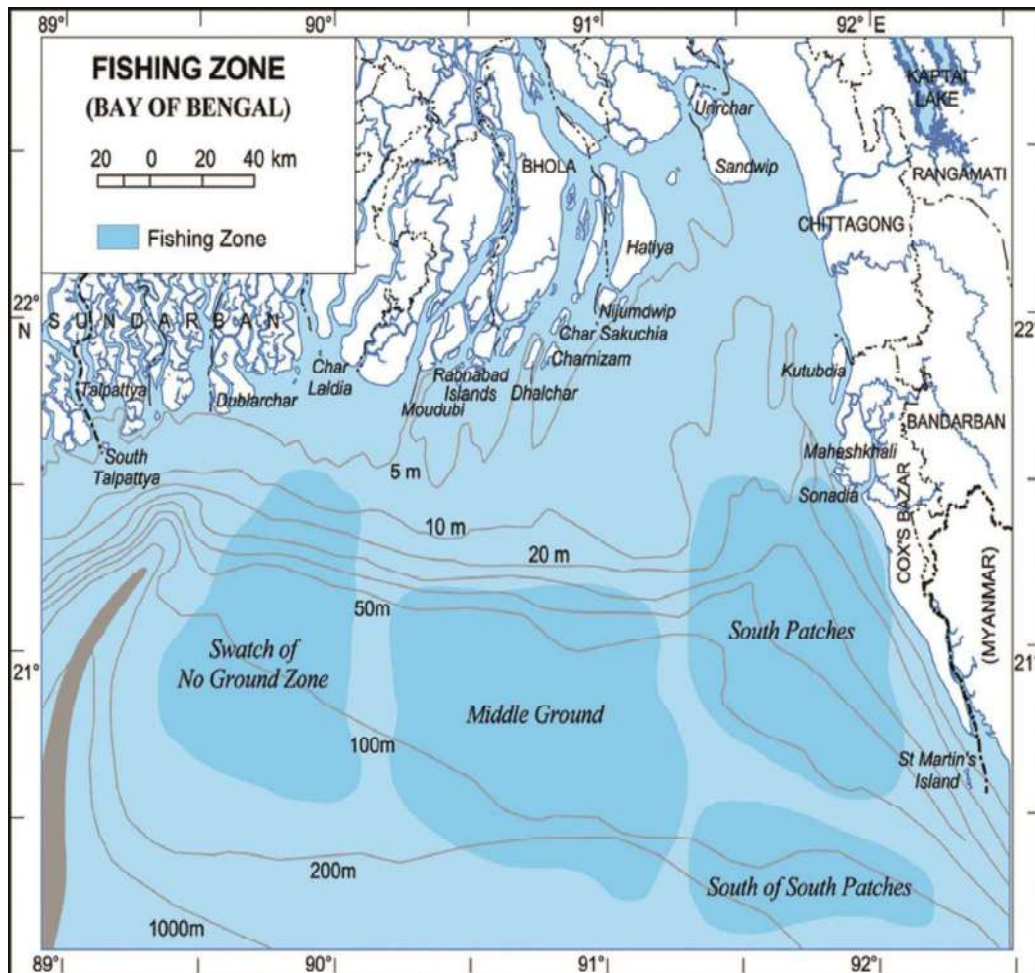


Figure 1: Four fishing grounds of Bangladesh in the BoB (Iqbal et al. 2011)

As mentioned before, Bangladesh has 4 major offshore fishing grounds among which 2 ground including South Patches and South of South Patches is near to the Chittagong Port (**Figure: 1**). There are three types of ship visits in Chittagong Port: Merchant ship, Coastal ship and Inland ship. In the year of 2019-20, 3764 foreign ships call at Chittagong port (CPA 2020). Every year the number is increasing significantly and there is a chance of increased conflict between port and fisheries sectors when they arrive in the Chittagong port because there is no designated shipping route or Traffic Separation Scheme (TSS) which will separate these two traditional sectors. Most Often, fishing vessels and their nets create navigational hazards on the merchant ship in the route of St. Martin- Coxsbazar- Maheshkhali- Kutubdia. A few years ago, there was an accident between a Fishing vessel and merchant ship near the Elephant point (St.

Martin) during night time which resulted in drowning the fishing vessel and death of fisherman (Mannan 2019).

One of the respondents from BMFA argued that there is no report of an accident between merchant vessels and Industrial boats when boats are navigating. But the problem occurs when industrial boats are engaged in fishing at that time they can't raise their speed, unable to move in a zigzag way because they have fishing gear in the aft side. During fishing time their maximum speed might be about 3.5 knots. On the other hand, the speed of merchant vessels approaching the outer anchorage of Chittagong port is around 22-24 knots. The chance of collision increases in the night time as there is no lighting or buoy. He mentioned that a fishing vessel capsized with 24 people near St. Martin Island after collision with a cargo ship during night time in 2019.

Regarding the conflict between fisheries sector and merchant vessels moving to and from Chittagong port, high Official from CPA stated that this conflict is very ancient. Fishing gear is a major concern of merchant vessels moving to/from the port. Most often the propeller of those vessels gets fouled by the unmarked fishing net, rope and other fishing apparatus which restrict the vessel's ability to manoeuvre as expected. Propeller fouling not only causes speed reduction but also sometimes causes few merchant ships to lose their speed completely and make them adrift. As Chittagong is a tidal port and the tidal stream is very strong: drifting with a fouled propeller is highly dangerous and poses the risk of collision. To avoid any collision, pollution, grounding or any other damage; masters of those ships can't but drop their anchor in the midway of the approaching/ outgoing route. Merchant shipping is all about business. But due to propeller fouling these ships suffer from unexpected delays which may cause them financial loss especially when they sail under a *time charter*. The impact of fishing gear on the safety of navigation is so subversive that it deserves priority consideration.

Respondent from CPA argued that this problem is somehow reduced recently than before as Bangladesh coast guard is playing a more active role in terms of clearing surface obstructions through patrolling but their manpower is not sufficient to tackle this. Sometimes, Artisanal boats which are not registered i.e IUU (Illegal, Unregulated and Unrecognized) do fishing in the estuary of Kanafully. These boats and their gears are the major navigational hazards. During the fish harvesting period, Chittagong port finds highest number of reports of net fouling of merchant vessels and it tarnished the image of Chittagong port to the shipping world. Patrolling crafts of Chittagong port and coast guard try to keep all sorts of boats outside the shipping channel but often fail as their number is very less compared to the number of artisanal boats. Moreover, the shipping route is not yet established and presented on the chart so merchant ships don't always follow the same route/ area for navigation.

There is no safe shelter for the fishing boats and trawlers to take berthing during bad weather (storm, cyclone) and it is very necessary to save their property & manpower. High official from BMFA argued that as we have no sheltering facility, all ships are taking shelter along with mooring buoys in the karnafully river inside the Chittagong

port; mostly near the Karnafully Bridge (Mannan 2019). As a result, it creates two problems,

1. Very often a single mooring buoy has to hold more than 15 vessels whereas the actual holding capacity is up to 10nos. There are several results of accidents (hull and equipment damage) due to breaking down of chain (Mannan 2019).
2. These anchored vessels with the mooring buoy reduce the navigable space during night time, the area becomes more hazardous.

#### **b) Offshore Oil and Gas Extraction:**

World energy consumption has been increased due to increased economic activities, nearly 62% energy source is supplied from oil and gas, with one-third of this is shared by offshore production (Hossain et al. 2014). Bangladesh is the nineteenth largest producer of natural gas in Asia (Alam et al. 2019). Till now, Bangladesh has discovered a total of 27 gas fields among which 2 are offshore gas fields including Sangu and Kutubdia gas field. Bangladesh has a total of 26 offshore blocks among which 11 are in shallow water blocks and 15 in deep water blocks (Bari 2017). Among those Sangu reserves having 0.8 trillion cubic feet (Tcf) depleted and Kutubdia reserves having 0.04 Tcf are yet to be developed (MoFA 2019). Since 1998, offshore block no 16 has been used for the production of natural gas, primary tender and negotiation of more six blocks respectively block no 4, 9, 11, 12, 16, 21 have been also done (Hussain et al. 2018). Production of Sangu gas field is suspended since 1 October 2013 and waiting for decommissioned (Petrobangla 2020).

To meet the current rising demand, the government of Bangladesh has taken initiative for FSRU (Floating, Storage and Regasification Unit) and LNG terminal as long term and short term options respectively. According to the respondent from CPA, Sangu gas field is far away from the Chittagong Port which doesn't make any problem to the port operation. Almost all the respondents agreed that there is no conflict of interest between Chittagong Port and 2 offshore gas fields among which Sangu field will be decommissioned soon and Kutubdia gas field is not developed yet for production.

#### **c) Military Exercise:**

Almost all respondents acknowledged that there is no conflict between Chittagong port with the Army and Air Force activities but they provided few valuable conflictual examples with Naval exercise. Among other roles, Bangladesh Navy provides safeguard to the Chittagong port. Chittagong port is also the locality of Chittagong Base of Bangladesh Navy and Bangladesh naval academy; it is the home base of the



Bangladesh Navy Fleet including two submarines in the jetty no. NB-1 to 6 beside the container terminal of Chittagong port (see fig. 2).

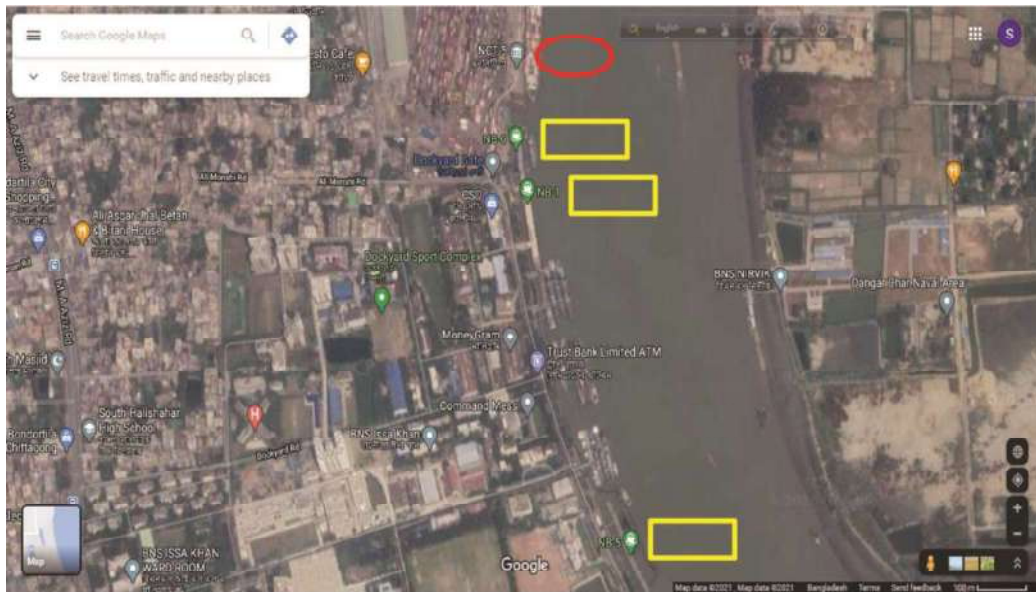


Figure 2: Naval Base in the Chittagong Port (Google Map)

The position of Naval Base and jetty of the port is a concerning issue because naval base is inside the Chittagong Port and it is just beside the New Container Terminal. In other countries like In India (Vijack Port), South Korea they have Naval base just at the end part of the port where normally no commercial activities or shipping movements take place.

Respondent from CPA highlighted that once upon a time there were approximately 15-20 total number of ships in the entire naval fleet but now their activity and number of vessels have been increased simultaneously. There are almost 14-15 vessels in Chittagong base along with 2 submarines in the Naval Berth 1-6 at all times. This port is a natural port and expansion of the River karnafully is not practically possible even though the activity has been increased hugely.

He also added that that during sea exercise by navy/coast guard, the coastal area becomes denser as more traffic movements take place. Moreover when their two submarines move it needs more clearance than other surface crafts or warships; which creates a serious problem for commercial traffic movement in Chittagong Port. Thus Chittagong port activity and vessel movements are seriously hampered when these two submarines move. Submarines are national pride but if commercial ship movement is hampered by one day it loses thousands crore taka.



In the last decade, at least 7 collisions between Navy ships and cargo ships took place in the port area due to the coexistence of the naval base and port (People's Daily Online 2005). CPA personnel mentioned that in the year of 2003, there was a serious collision between a Panamian flagship "Eagle Strength" and Bangladeshi flagship "Banga Biraj" damaged 18 navy ships and jetty installations. The unintentional hitting of the Panamian flagship caused the injury of 16 naval staff. After that, another collision took place between MV CEC Copenhagen and 3 navy warships in 2005 (People's Daily Online 2005). Respondent felt concerned that if any further accident occurred, there is a huge chance to damage the valuable Navy submarine though it is a not suitable place for berthing of a submarine in any commercial port.

#### **d) Maritime Tourism:**

Maritime tourism is one of the most influential sources of income in South Asian countries (Bangladesh, India, Maldives, Pakistan and Sri Lanka) and these countries are blessed with 2 percent of the world's total coastline (Hussain et al. 2018). Bangladesh is a coastal country, having a huge potential of flourishing maritime tourism because it has the world's largest sea beach- Cox's Bazar, Coral island - St. Martin and mangrove forest – Sundarbans (Mannasn, 2019). Multimodal transportation could be a good option to nurture the tourism sector but Bangladesh could not develop any waterway transportation to enjoy these sites (Hasan et. al 2014). The river cruise through the small boat, the steamer has already been introduced in the country but till date, there are only two cruise ships (MV Krnafully Express and M.V Bay One by Karnafully shipbuilders limited, Chittagong) which have a capacity of carrying 600 and 3000 passengers respectively from Cox's Bazar to St. Martin route (The Business Standard 2018). Currently, there is no Chittagong port-based cruising in Bangladesh.

Respondent from BSMRMU argued that these two cruise ships don't use Chittagong port because they started their journey to the Cox's Bazar - St. Martin route. Inside the Chittagong port limit, there are two tourist spots: Patenga Sea beach and Parki beach. Though these sites are very much popular to the local tourists, they are not developed so much. Here, few speed boats are used for a short tour. Respondents suggested introducing water sailing, resting and surfing to attract more tourists to these sites.

According to the respondent's interview, there is no possible conflict between Chittagong Port and maritime tourism because tourism industry outside or inside the port limit is not developed and limited activities like speed boat tours have been introduced near the beach area only.

**e) Nature and Biodiversity Conservation:**

According to the respondent's opinion, Chittagong port has two types of conflict: one is user-user conflict (port with other maritime sectors) and another is port with the coastal and ocean environment. Chittagong port is a tidal port situated near the estuary of Karnafully River and its port limit includes both riverine and coastal space. There is important biodiversity just near the port limit such as fishing grounds (South Patches), Marine Protected Area (MPA) such as St. Martin Island.

Merchant ship movement to and from the Chittagong Port through the fishing ground seriously hampers the biodiversity of the ground (especially South Patches). The Department of Environment has already declared this site as a marine reserve. According to the respondents, marine pollution especially from the ship is a serious threat to the coastal and ocean environment. The inland lighter ship doesn't follow and maintain the international standard and they discharge their garbage, bilge anywhere in the ocean even inside the Chittagong port limit during night time.

When respondents were asked about marine pollution by the merchant vessels, CPA interviewee mentioned that merchant vessels discharge their bilge inside the port limit during night time. As CPA solely depends on manual patrolling to catch such breaches of environmental regulations (MARPOL- International Convention for the Prevention of Pollution from Ships) therefore it is tough for them to detect and take due actions especially during the hour of darkness. He also added that CPA has logistics and technical drawbacks for implementing environmental regulations in its water.

**f) Maritime Transportation**

In Bangladesh, three types of maritime transportations move; Merchant vessel, Coastal vessel and Inland vessel. Bangladeshi Inland vessels normally travel through both coastal (up to 12 nm) and the inland waterway. There are different types of inland vessel such as cargo vessel, tanker, gas carrier, container vessel, passenger ship, small boat etc. According to the respondent opinion, small inland vessels mostly create navigational hazards in Karnafully channel.

Karnafully is a tidal river and here, the inland vessel needs *Karnafully endorsement* so that pilot can be exempted in that vessel. But many inland companies don't follow the safe manning rule and recruit crews who have no certification, just know how to operate a ship and cross the channel without endorsement.

During high tide, only merchant vessels will move through the port Channel and other vessels (inland, fishing, navy ship etc) are not permitted (port act) (CPA Ordinance 1976).

Respondent from CPA mentioned that Inland vessels (small barge such as sand trawler whose length is approximately 20-20m) which have no Karnafully endorsement, any

certification, don't have enough knowledge regarding high tide/ low tide and they suddenly enter into the channel.

According to the respondent, "We found several reports regarding one merchant vessel leaving the port and another vessel entering that time suddenly a sand barge or small bunker barge crosses the river. So, pilot from those two-vessels tries to save the barge and a collision happened."

Over centuries, Sampan (mechanized local boat) has been used in both loading/unloading cargoes and passengers in Chittagong. In Chittagong port area, they anchored at the 15, 18 no. Ghat/Berth to transfer people from one side to another side of the Karnafully River.



Figure 3: 15 No Ferry Berth (Google Map)

Normally, these boats are smaller in size, carry 15-20 people. Respondent from CPA mentioned that the pilot navigating the foreign vessel coming in the port feels irritated by their activities. As they are local boats they are outside port rules and regulations. Very often, they come just in front of a foreign vessel with 15-20 people on their boat, at the same time another vessel leaving the port in the opposite direction. That time the pilot tries to give space and save the life of the boat people but the problem is that there is a chance of hitting another vessel. It gives mental pressure to the pilot.

### Conflict of interest between Chittagong port and other maritime sectors



#### 3.2 MSP for conflict resolution

According to the interview result, Chittagong port has a multitude of conflicts with 4 major maritime sectors including *Fisheries*, *Nature and biodiversity*, *Military exercise (Naval exercise)* and *Maritime transportation* (especially inland vessels, sampan). The maximum number of sea uses took place in the Chittagong port area and there is a potential of conflict with developing sectors such as offshore oil and gas, maritime tourism, sand extraction etc. especially when developments of these sectors achieve greater momentum.

Like Bangladesh, most of the coastal countries allocate the coastal and ocean space among different users based on a single sector approach without consideration of conflict or compatibilities with other users or environment (Ehler and Douvère 2009). This sector by sector approach is widely managed by different laws and regulations, implemented by different agencies which cause conflict among different ocean users which can be dealt with an integrated management approach (Hossain et al. 2014). MSP has been widely used to integrate all discrete management approaches to avoid or minimize conflicts among different users (Saha and Alam 2018). It is a useful tool to reconcile conflict among a variety of users by identifying compatible and incompatible uses so that potentially compatible activities coexist and incompatible activities take place separately (Alam n.d.). There are four steps in the MSP process for conflict resolution: 1) pre-planning; 2) defining and analyzing present conflicts; 3) defining and analyzing future conditions, and 4) developing alternative allocation plans (Ehler and

Douvere 2009). These steps involve stakeholder engagement throughout the process. Stakeholder engagement is a challenging part of MSP but they should be involved in the early stage of the MSP process. Early engagement of stakeholders in the MSP process can be done by regular meetings, dialogues and symposium etc. (Gopnik et al. 2012). In the interview analysis, it is found that all of the sectorial activities are entangled with each other for ocean space thus resulting in conflict. These overlapping activities can be resolved by marine zoning. People sometimes refer MSP as ocean zoning but actually, it's a toolkit of MSP which reconcile among different users by separating suitable and unsuitable uses in the ocean space and keeps them side by side for sustainable ocean uses (Fletcher et al. 2013).

According to the respondents, there is no shipping route or TSS outside the pilot boarding ground/anchorage, so it can't cover the whole port limit which most often creates problems with the fisheries sector. Respondents believe that this conflict can be reduced by separating both shipping and fishing zones and areas should be divided into various purposes: such as designated zone for artisanal fisheries where industrial fishing is forbidden, another zone for artisanal fishing and a separate zone for shipping where fishers can only navigate but fishing is prohibited. MSP is increasingly being applied to develop marine zoning and allocation plans that address multiple use conflicts (Douvere et al. 2007).

In German Spatial Planning, they designated marine areas into priority areas (for defined use), Reservation areas and suitable areas and if we consider Dutch government's marine spatial planning they designated marine areas into use zones (only necessary like shipping route, military exercise etc.) (Douvere 2008). In Bangladesh, the government may divide maritime areas into priority areas (shipping lane, ship anchorage, sand extraction), reserved areas (which require a special permitting system), Prohibited areas (MPA, ECA, different valuable endangered fishing grounds like Hilsha) (Saha and Alam 2018). The prohibited zone will help to protect the marine environment from other activities like fishing, port activity, shipping, tourism, oil and gas exploration, sand extraction etc. In the zoning process of MSP, stakeholder engagement is a crucial part of the successful implementation of MSP. Regarding this, respondents suggested to do feasibility study and involve relevant stakeholders to avoid future conflict before planning and establishing a shipping route. A feasibility study should not be done by single-sector approach.

In Bangladesh, safe shelter or fish harbour is unavailable for the fisheries sector which creates two major problems: decrease sufficient sea room in the port area and increase the chance of maritime accidents in the river channel. To reduce conflict between Chittagong Port and fisheries sector regarding this matter, high official from BMFA suggested to build fish harbours for both industrial and artisanal fisheries in the bank of Karnafully river especially outside the port limit by engaging appropriate stakeholders such as fisheries department, Port authority etc.

The location of Naval base in the Chittagong Port is a concerning issue for both sectors. Previously, a recorded number of the accident took place in the Naval base by different types of ship. Respondents from CPA official mentioned that port and naval base is traditionally built up, it is not possible to displace the base. Their activity is increasing rapidly so for the benefit of both parties if they add new ships to their fleet there should be an alternative place to allocate those ships.

Respondent from BMA opined that *Careful Coordination* is required to avoid the conflicting situation arising from Navy vessel movement, sea exercise etc.

The scholarly article also suggests that negotiations, integration, regular meeting and changing mindset can be used to resolve conflict among a variety of stakeholders (Mannan et al. 2020). Maritime transportation particularly small inland barges mostly create conflict with port activity. Here, respondents suggested that this problem can be reduced by arranging proper training and ensuring competencies of the people involved. Bangladesh government should integrate its inland waterway, coastal and ocean area to its MSP process to achieve sustainable development of its maritime sector and engage its stakeholder early in the planning process to avoid or mitigate conflict.

#### 4. Recommendations

1. Bangladesh government should take necessary initiatives to register the artisanal fishing boats so that it will be easier to monitor their movement and keep them free from Chittagong port area and merchant ship approaching area.
2. CPA/Bangladesh Coast Guard can use modern and updated monitoring system i.e Vessel Traffic Monitoring and Information System (VTMIS) like Singapore or satellite based target detection system to easily detect illegal fishing activity and take prompt actions accordingly.
3. Bangladesh government should build at least two fish harbours (One for industrial fishers and another for artisanal fishers) in the Chittagong coastal area with international standard to reduce crowd in the Chittagong port area. Fish harbor can be built in the Sandwip Island and Sitakunda outside the port limit where no merchant ship movement is involved.
4. Chittagong port should increase its manpower (pilot, mooring man, boatcrews & tug masters etc) and logistics support (tug boat, dredger, cleaner vessel etc.). Furthermore, the Port should arrange proper training for the personnel who are at the operational level.
5. Bangladesh government should take necessary steps to update and enforce safe manning rule so that all types of Vessel (ships, boats, tugs etc) are manned by competent crews.

6. Mercantile Marine Department (MMD) should be more aware to check the compliance of the safe manning rule.
7. Regarding sea dumping (bilge, ballast, sewage, garbage) by all types of maritime transportation inside or outside the port limit, different monitoring bodies (Coast Guard, Bangladesh Navy, Chittagong Port's Environment team) should be more vigilant and increase its patrolling system. Oil detecting high-power cameras can be used to identify such malpractices instantly. It can be integrated with VTMS and port's ECDIS with fast alerting system.
8. To monitor the inland vessel into the coastal area, they should be fitted with necessary equipment such as AIS so that port authority can monitor them through VTMS to reduce conflict and major accidents. Department of shipping & BIWTA should take necessary steps regarding this.
9. CPA can mark and enforce mandatory reporting points to control all traffics centrally and ensure safe navigation within its limit.

## 5. Conclusions

The study aimed to find out major conflicts of the Chittagong port with other maritime sectors and explore the role of MSP to resolve those conflicts. To find out the conflicts, several maritime sectors which are directly or indirectly connected with the port have been described. According to the interview analysis, Chittagong port has a multitude of conflicts with the fisheries, military exercise, Nature and biodiversity conservation and Maritime transportation, especially small inland vessels. As Chittagong port is the backbone of the country's economy, the conflict should be identified and reconcile through an integrated management process. The study addressed MSP as an efficient tool to reconcile conflict among a variety of stakeholders through an integrated management approach (Douvere and Ehler 2009). The outcome of the study may include conflict resolution, port environment sustainability as well as ocean environment. The study also provides some recommendations.

## Appendix 1 Details of the interviewees

No.	Interview	Date of Interview	Duration (minutes)	Organization	Sector	Position
1.	R1	06 December	40	BMFA	Fisheries	Researcher
2.	R2	06 December	51	BMFA	Fisheries	Researcher
3.	R3	10 December	35	CPA	Port	Policy Maker



4.	R4	13 December	30	CPA	Port	Environmental Assessor
5.	R5	14 December	15	CPA	Port	Ocean Planner
6.	R6	15 December	20	CPA	Port	Policy Maker
7.	R7	15 December	12	CPA	Port	Policy Maker
8.	R8	20 December	30	Summit Power Limited	Offshore Oil & Gas	Engineer
9.	R9	24 December	25	BMA	Environ ment	Researcher
10.	R10	29 December	17	BSMRMU	Tourism	Researcher
11.	R11	03 January	45	BIWTA	Shipping	Seafarer

### References:

- Alam F, Saleque K, Alam K, Mustary I, Chowdhury H (2019) Indigenous and imported natural gas and the economic growth of Bangladesh: the challenges ahead." *Energy Procedia* 160:18–25. doi: 10.1016/j.egypro.2019.02.113.
- Bari A (2017) Our oceans and the Blue Economy: opportunities and challenges." *Procedia Engineering* 194:5–11. doi: 10.1016/j.proeng.2017.08.109.
- CPA (2021) Accessed January 23, 2021. <http://www.cpa.gov.bd/>.
- CPA Ordinance (1976) The Chittagong Port Authority Ordinance, 1976 Accessed January 23, 2021. <http://bdlaws.minlaw.gov.bd/act-details-527.html>.
- Christie P (2005) Is Integrated Coastal Management Sustainable?" *Ocean & Coastal Management* 48(3):208–32. doi: 10.1016/j.ocecoaman.2005.04.002.
- Cicin-sain B, Robert W. K, Adalberto V, Ampai H (2000) *Background: global interest in Integrated Coastal Management*.
- Douvere F, Maes F, Vanhulle A, Schrijvers J (2007) The role of Marine Spatial Planning in sea use management: the Belgian case." *Marine Policy* 31(2):182–91. doi: 10.1016/j.marpol.2006.07.003.
- Douvere F (2008) The importance of Marine Spatial Planning in advancing ecosystem-based sea use management." *Marine Policy* 32(5):762–71. doi: 10.1016/j.marpol.2008.03.021.

Douvere F, Charles N. E (2009) New perspectives on sea use management: Initial findings from European experience with Marine Spatial Planning.” *Journal of Environmental Management* 90(1):77–88. doi: 10.1016/j.jenvman.2008.07.004.

Ehler C, Douvere F (2009) *Marine Spatial Planning: A step-by-step approach toward ecosystem-based management*.

ESCAP (2020) Sustainable Port Development and Improving Port Productivity in ESCAP Member Countries | United Nations ESCAP. Accessed November 19, 2020, <https://www.unescap.org/resources/sustainable-port-development-and-improving-port-productivity-escap-member-countries>.

EU MSP Platform (2018) Accessed November 19, 2020. [http://msp.ioc-unesco.org/world-applications/status\\_of\\_msp/](http://msp.ioc-unesco.org/world-applications/status_of_msp/).

Fletcher S, Emma M, Kenneth C. B, Ness S, Karen M (2013) Effective practice in Marine Spatial Planning: a participatory evaluation of experience in Southern England.” *Marine Policy* 39:341–48. doi: 10.1016/j.marpol.2012.09.003.

Gopnik M, Clare F, Laura C, Kate M, Linwood P, Larry C (2012) Coming to the Table: Early Stakeholder Engagement in Marine Spatial Planning.” *Marine Policy* 36(5):1139–49. doi: 10.1016/j.marpol.2012.02.012.

Hossain M. S, Chowdhury S. R., Navera U. K., Hossain M. A. R., Imam B., Sharifuzzaman S. M. (2014) Opportunities and strategies for ocean and river resources management. *Dhaka: background paper for preparation of the 7th Five Year Plan. Planning Commission, Ministry of Planning, Bangladesh*.

Hunter SV (2010) Analysing and representing narrative data: the long and winding road.

Hussain, M. G, Failler P, Karim A. A, Alam M. K (2018) Major opportunities of blue economy development in Bangladesh. *Journal of the Indian Ocean Region* 14(1):88–99. doi: 10.1080/19480881.2017.1368250.

Islam M., Shamsuddoha M (2018) Coastal and marine conservation strategy for Bangladesh in the context of achieving blue growth and Sustainable Development Goals (SDGs).” *Environmental Science & Policy* 87. doi: 10.1016/j.envsci.2018.05.014.

Islam MM, Shamsuzzaman MM, Mozumder MMH, Xiangmin X, Ming Y, Jewel MAS. 2017. “Exploitation and Conservation of Coastal and Marine Fisheries in Bangladesh: Do the Fishery Laws Matter?” *Marine Policy* 76:143–51. doi: 10.1016/j.marpol.2016.11.026.

John, Freya A. V. St, Aidan M. Keane, Julia P. G. Jones, and E. J. Milner-Gulland. 2014. “FORUM: Robust Study Design Is as Important on the Social as It Is on the Ecological Side of Applied Ecological Research.” *Journal of Applied Ecology* 51(6):1479–85. doi: <https://doi.org/10.1111/1365-2664.12352>.

Mannan MS (2019) Stakeholder engagement in marine spatial planning of Bangladesh World Maritime University Dissertations Dissertations. *The maritime commons: Digital repository of the world maritime university*. [https://commons.wmu.se/all\\_dissertations/1172](https://commons.wmu.se/all_dissertations/1172).

Mannan S, Nilsson H, Johansson T, Schofield C (2020) Enabling stakeholder participation in Marine Spatial Planning: the Bangladesh experience.” *Journal of the Indian Ocean Region* 0(0):1–24. doi: 10.1080/19480881.2020.1825200.

MoFA (2019) Accessed January 23, 2021. <http://www.mofa.gov.bd/>.

People’s Daily Online (2005) Bangladesh to Build Second Naval Base in Chittagong. [http://en.people.cn/200508/09/eng20050809\\_201204.html#](http://en.people.cn/200508/09/eng20050809_201204.html#)

PESHKIN A. (1993) The goodness of qualitative research.” *Educational Researcher* 22(2):23–29. doi: 10.3102/0013189X022002023.

Saha K, Alam A (2018) Planning for blue economy: prospects of Maritime Spatial Planning in Bangladesh. *AIUB Journal of Science and Engineering (AJSE)*, 17(2), 59-66. Retrieved from <http://45.64.132.67/index.php/ajse/article/view/10>

Shamsuzzaman MM, Islam MM (2018) Analysing the legal framework of marine living resources management in Bangladesh: towards achieving Sustainable Development Goal 14.” *Marine Policy* 87:255–62. doi: 10.1016/j.marpol.2017.10.026.1

The Business Standard (2018) Karnafuly Trying to Launch 3,000-Seat Luxury Ship on Cox’s Bazar-St Martin’s Route,” <http://tbsnews.net/bangladesh/transport/karnafuly-trying-launch-3000-seat-luxury-ship-coxs-bazar-st-martins-route>.