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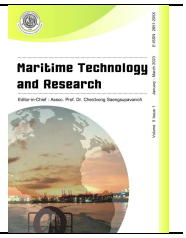

Research Article

Chattogram Port: A dedicated service institution to evolve the country boldly

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Abstract

Chattogram Port, the premier seaport of Bangladesh, has reached a remarkable position, not only in South Asia, but also in the world for its record performance in handling cargo and containers. This has happened due to continuous increase of GDP, infrastructural development, increased purchasing power, foreign exchange by manpower business, port development, and the efforts of many people. The history of Chattogram port began in the 4th century BC, when Chattogram was known as "Shetgang", or "Delta of the Ganges"; later, in the 16th century, it was known as "Porte Grande". The present location of the port was established in the year 1887 that developed by 1910. In 1960, all assets of the port were declared under the property of "Port Trust". However, port management, operations, and others are directed by Chittagong Port Authority Ordinance, 1976. As per port throughput of 2019, the port was declared as the 58th busiest container port in the world by Lloyds List in their 100 ports ranking in 2020. Furthermore, in 2021, Chattogram Port handled a record 3.2 million TEUs. This research applied a mixed-method approach, where the quantitative approach tried to explore Chattogram Port's performance data, and the qualitative approach used historical data and information to articulate port features in the internal and external environment. The originalities of this research are geopolitical debate to select Chattogram Port as a prime maritime load center of South Asia to connect the landlocked parts of India, Nepal, Bhutan, China, and Myanmar, active regional and international forums like BCIM, Bangladesh, Bhutan, India, Nepal (BBIN), SAARC, BIMSTEC, OBOR, and QUAD based on Chattogram Port, and development of Liner Shipping Connectivity Index (LSCI) internationally to improve freight transport connectivity, and use expansion of hinterland to provide maritime logistics services for regional connectivity. A recent step by the port authority to invest in constructing a deep seaport in the Bay of Bengal, attractive to the world port community and remarked by all in port expansion, investment, and efficiency, was investigated rigorously. Overall, this paper aims to explore Chattogram Port's current activity and future planning, and recall the port's history as inspiration and motivation to shape the port in a notable position in the port world.

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1. Introduction

Chattogram Port, the premier seaport of Bangladesh, has reached a remarkable position, not only in South Asia, but also in the world for its record performance in handling cargo and containers. This has happened due to continuous increase of Gross Domestic Product- GDP, infrastructural development, increased purchasing power, foreign exchange by manpower business, port development, and the efforts of many people. The history of Chattogram port began in the 4th century BC, when Chattogram was known as "Shetgang", or the "Delta of the Ganges"; later, in the 16th century, it was known as "Porte Grande". The present location of the port was established in the year 1887 and by 1910 under the property of "Port Trust" that formed in 1960. However, port management, operation, and others are directed by Chittagong Port Authority Ordinance, 1976.

As per port throughput in 2019, the port was declared the 58th busiest container port in the world by Lloyds List (2020) in their 100-port ranking in 2020. Furthermore, in 2021, Chattogram Port Authority (CPA, 2022a) handled a record 3.2 million TEUs (Twenty-foot Equivalent Unit). In terms of tonnage, CPA (2022b) updated that, in Financial Year-FY 2020-2021, Chattogram Port handled 113,729,373 MTs (Metric Tons) of cargo, with an 11.98 % annual growth. This research applied a mixed-method approach, where the quantitative approach tried to explore Chattogram port's performance data, and the qualitative approach used historical data and information for articulating the port features in the internal and external environments.

The originalities of this research are for geopolitical debate, to select Chattogram Port as a prime maritime load center of South Asia to connect the landlocked parts of India, Nepal, Bhutan, China, and Myanmar, and active regional and international forums like BCIM, Bangladesh, Bhutan, India, Nepal (BBIN), South Asian Association for Regional Cooperation (SAARC), Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC_, OBOR, and Quadrilateral Security Dialogue (QUAD). This is based on Chattogram Port, with the development of Liner Shipping Connectivity Index (LSCI) internationally to improve freight transport connectivity, and the expansion of hinterland to provide maritime logistics services for regional connectivity. A recent step taken by the port authority was to invest in constructing a deep seaport in the Bay of Bengal, becoming attractive to the world port community and being remarked by all in port expansion, investment, and efficiency, which was investigated rigorously.

The structure of this paper is to describe Chattogram Port's location in the Bay of Bengal, the berth and jetty positions in the port protected area, the port operations system, the capacity, and other details of modern port management. After that, a brief history of Chattogram Port is articulated, in order to know its base and to present scenarios in Bangladesh and connections to the world by sea. Port function, facilities, and policies are stated to know the operational excellence and role of the port in national development. In the quantitative study in Section 6, port performance is ascertained to know the record of vessels berthed in port, the average turnaround time of vessels over a year, cargo and container port throughput, and port ranking as the busiest container port in the world. In addition to Chattogram Port's container port throughput data, another port, Kolkata, has its data collected to know the productivity of rival ports in the Bay of Bengal and South Asia.

The geopolitics issue, based on Chattogram Port and the activities of the various forum members in the region, are stated in Sections 8 and 9, respectively. Then, the port expansion plan, and how the port can assist in improving inland transport connectivity, are detailed in Section 10. After that, Section 11 describes regional connectivity through the Chattogram port, before the results of qualitative research surveys are given in Section 12. Finally, the paper is concluded by giving some future directions or recommendations for Chattogram Port for making a sustainable plan to keep the growth record of port performance by increasing hinterland and improving inland connectivity. Overall, this paper aims to explore Chattogram Port's current activity and future planning, and recall the port's history as an inspiration for motivation to place the port in a notable position in the port world.

2. Chattogram Port: At a glance

The Chattogram Port (CPA, 2021) is in the estuary of the Karnaphuli river 11 km from the Bay of Bengal with a natural tide (up and down) daily. The maximum permissible draught of a vessel that is called to the port jetty is 9.50 m, starting from 8.50 m; also, the Length Overall (LOA) of a vessel must not exceed 190 m. As per port directives, pilotage is compulsory, and communicating devices operating with Very High Frequency (VHF) over channels 6, 12, and 16 are ready 24 h. The port has three outer anchorages named A, B, and C; in addition, a special anchorage area is established for awaiting vessels. Night navigation is only allowed for LOA 170 m vessels with special permission from the port authority.

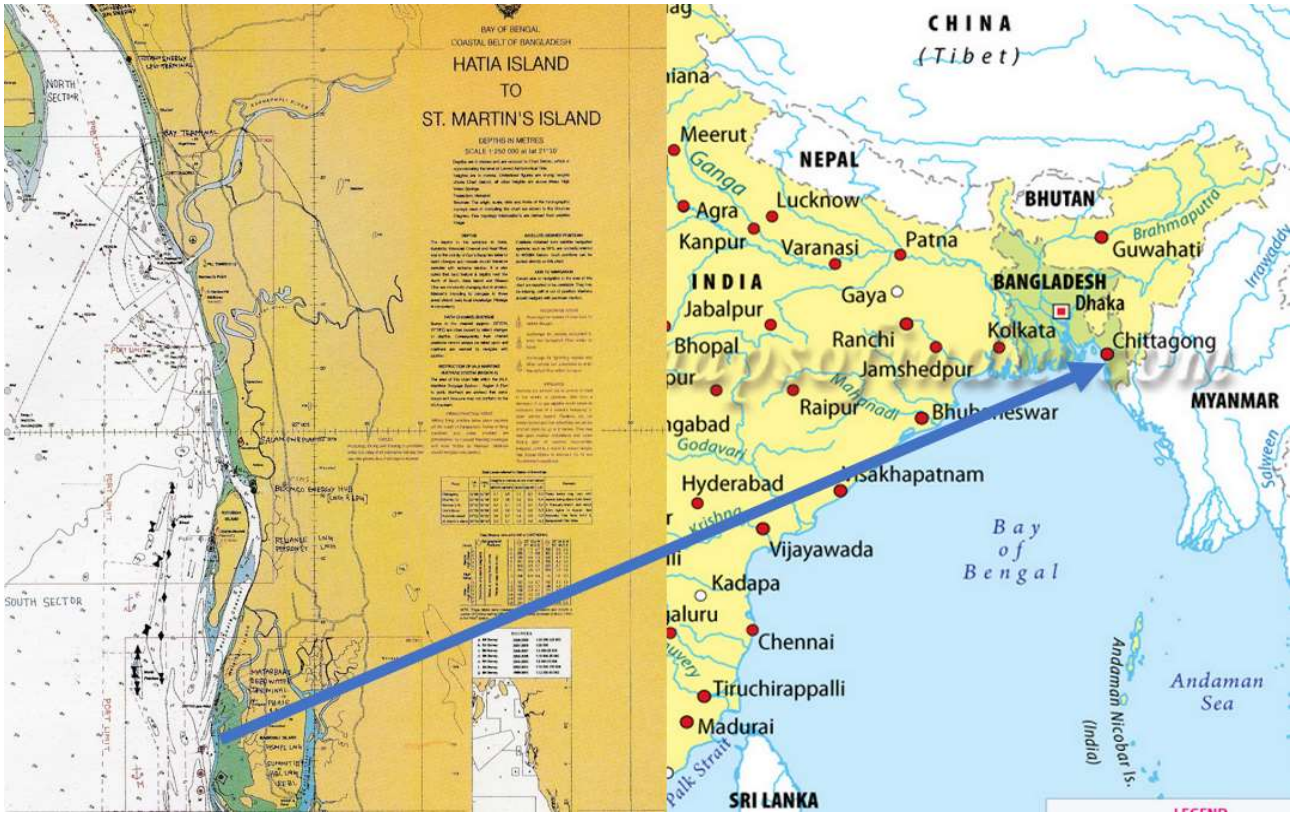

Figure 1 Map of Bay of Bengal- right (Maps of India, 2019) and Chattogram Port Area Map- left (CPA, 2021).

The Chattogram Port is a tidal port, and pilotage is compulsory because of the river's zig-zag position and current that changes the movement of vessels frequently. As stated, night navigation is possible but is limited to 170 m vessels with pilotage and tugboat. In terms of facilities, the port has 17 berths for cargo (6) and containers (11), where the cargo berth is able to accommodate container vessels easily. In addition to 33 specialized berths for bulk commodity handling, the port has 2 dry dock jetties and 5 river mooring berths. In the port-protected area, transit sheds, warehouses, car sheds, and open dump areas are available. The port is well-connected to the rail Inland Container Depot (ICD), which was constructed in 1987 at Kamalapur in Dhaka, by direct rail intermodal track; also, there is an active river connection by inland coasters and vessels. **Figure 1** shows the position of Chattogram Port in the Bay of Bengal and its strategic importance in South Asia especially in providing maritime logistics services effectively and timely.

All modern cargo and container handling equipment is available for container handling operations, and the operations are facilitated to an international standard. The port has a 4,067 TEU holding capacity, and there is a 136,954 square meter yard area and other facilities for container operations at the port. It supports an inland intermodal system by rail and river modes. An inland river container terminal at Pangaon in Dhaka is owned by the port authority, which has international standard terminal facilities, including a 3,500 TEU holding capacity and a 55,000 square meter yard area, also operated with modern container handling equipment. Proudly, the port has one oily waste and one solid waste reception vessel, and some tugs that follow the pollution inside the port-protected area. The port authority has complied with the International Ship and Port Security (ISPS) code since 2004, and has a self-security system, guards, and others security features. Vessels and port anchorage areas are regularly monitored by Vessel Traffic Management Information System (VTMIS) software and Container Terminal Management System (CTMS) for all kinds of port operations.

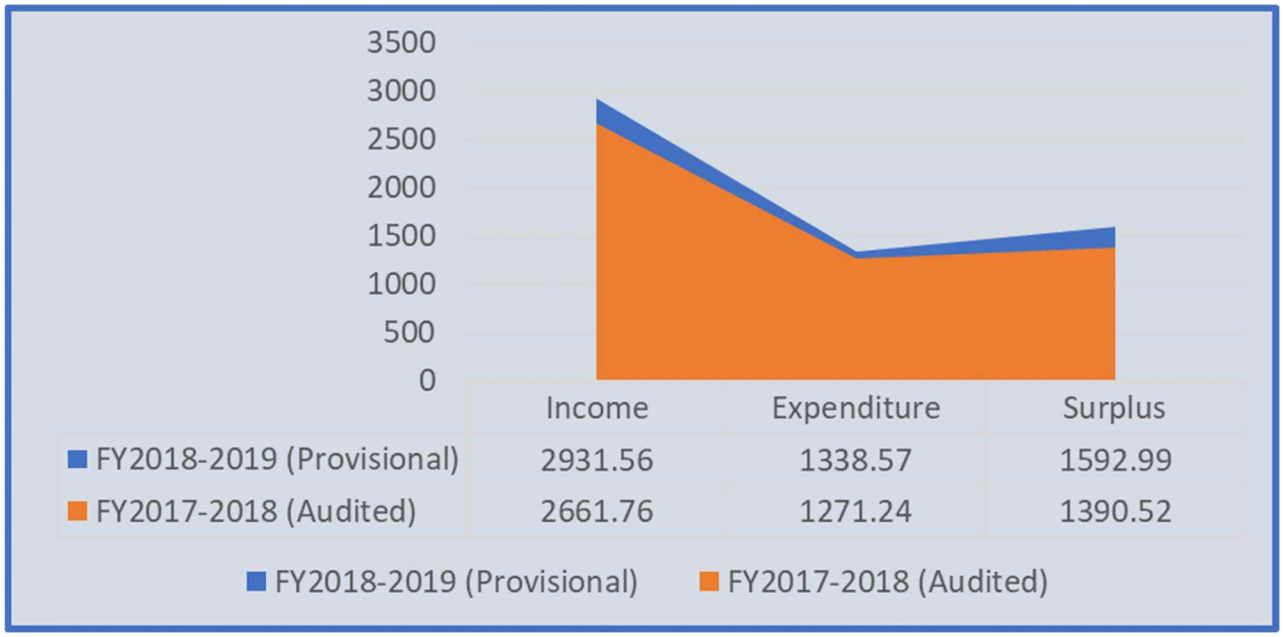

Figure 2 Disclosed revenue of Chattogram Port in Crore Taka.

Figure 2 shows the revenue status; the surplus amount is greater than the expenditure for port management. The revenue and expenditure have increased in both years; also, the surplus amount has increased significantly.

3. Research methodology

This research applied a mixed-method approach, where the quantitative approach tried to explore Chattogram port's numerical data for the vessel, cargo, container, turnaround time, and port rankings, and analyzed it accordingly to show it in a graphical way. On the other hand, the qualitative approach had two parts, to explore historical data and information in order to articulate the port features in the internal and external environments. The first part synchronized Chattogram Port's history year by year, along with port function, management style, policies, and facilities. Flint (2021) brought the geopolitical theory to review the context of place, space, scale, region, network, and territory to secure the sovereignty of a country. In this connection, Section 8 discusses the geopolitical issues of Chattogram Port in the Bay of Bengal, as well as for Asia. Within this

part, information on geopolitical issues, regional forum activities, regional connectivity problems, and other aspects, is gathered from secondary sources to understand the situation of Chattogram Port in the world port and shipping community. The second part of the qualitative approach conducts qualitative research using fixed questionnaires (See **Appendix A**) to identify the obstacles that are delaying port development, the potential factors, and the views of respondents on Chattogram Port in 2050, as a vision for the modern Chattogram Port.

Tashakkori and Creswell (2007) explored a strong factor in mixed-method research, the combination of qualitative and quantitative approaches, by which the end product of the study is summarized in the inferences and conclusions. In this research, qualitative pieces of literature are included to know the port at a glance, the port's history, function, management, policies, and other information, with quantitative data for visualizing port performance; lastly, the qualitative survey, provides a clear vision of and position for Chattogram Port at the Bay of Bengal in the Indian ocean. Qualitative data of Kolkata Port is used to develop a benchmark for Chattogram Port in terms of port efficiency, productivity, and sustainability in a crisis moment, such as the Coronavirus Disease (COVID-19) pandemic period. As a part of the qualitative method, port connectivity to foreland (sea) and hinterland (land and river) is examined by Critical Success Factors (CSF), such as History, Management, Infrastructure, Equipment, Capacity, Performance, Productivity, Efficiency, Connectivity, and Safety and Security, in recognizing the Chattogram Port globally.

4. History of Chattogram Port

Bangladesh is a proud maritime nation that has featured for a long time. van Schendel (2009) explored Bangladesh as a surprising country in the world, which was not imagined in 1930, but emerged as a bold nation through its people. He discovered one important sea route in the Bay of Bengal that went east, following the coasts of Arakan and Burma (currently Myanmar), then on to south-east and east Asia. This route was fully controlled by Samandar, or Sattigaon; after that, Chatgaon was renamed Chittagong, or today's Chattogram, also noted by Ray (2007) as doing Bengal's trade from ancient times to the British period.

Scholberg and Arasaratnam (1994) saw the merchant trade in South Asia emerging as a power, where maritime zones were divided into four, in which Bengal was led by Chattogram Port, along with Kolkata, in the seventeenth century. To state the position of Chattogram Port in the seventeenth century, Scholberg and Arasaratnam (1994) explored the name for the merchant port used by Bengali, Tamil, Telugu, Malay, Arab, and Persian traders. As viewed by Choudhury (2015), Chattogram was a cosmopolitan city, and was attractive to foreigners for trade prior to the Mughal conquest, setting a place for dominating the region in Asia.

The history of Chattogram port began in the 4th century BC, when Chattogram was known as "Shetgang", or the "Delta of the Ganges"; later, in the 16th century, it was known as "Porte Grande" (See **Figure 3**). The present location of the port was established in the year 1887 that developed by 1910. In 1960, all assets of the port were declared under the property of "Port Trust".However, port management, operations, and other aspects are directed by Chittagong Port Authority Ordinance, 1976.

In a description from the 16th century (See **Figure 3**), Deyell (2011) found that the port was geographically blessed not only with fertile soil and abundant water, but was also a location bonded by both land and sea modes of transportation, which benefitted it in doing business in Asia and in developing a dynamic monetary system. That inspired and motivated me to research international trade and pointed to Chatgaon as a seaport in the Bay of Bengal. Due to the geographical proximity, (Prothom Alo, 2022), a large part of the Bengalis were the people of Chattogram, that is, Chatgaonia. Owing to this majority, a separate chapter was added to the census report on the information of the people of Chattogram. Rice was imported from Burma to Chattogram Port.

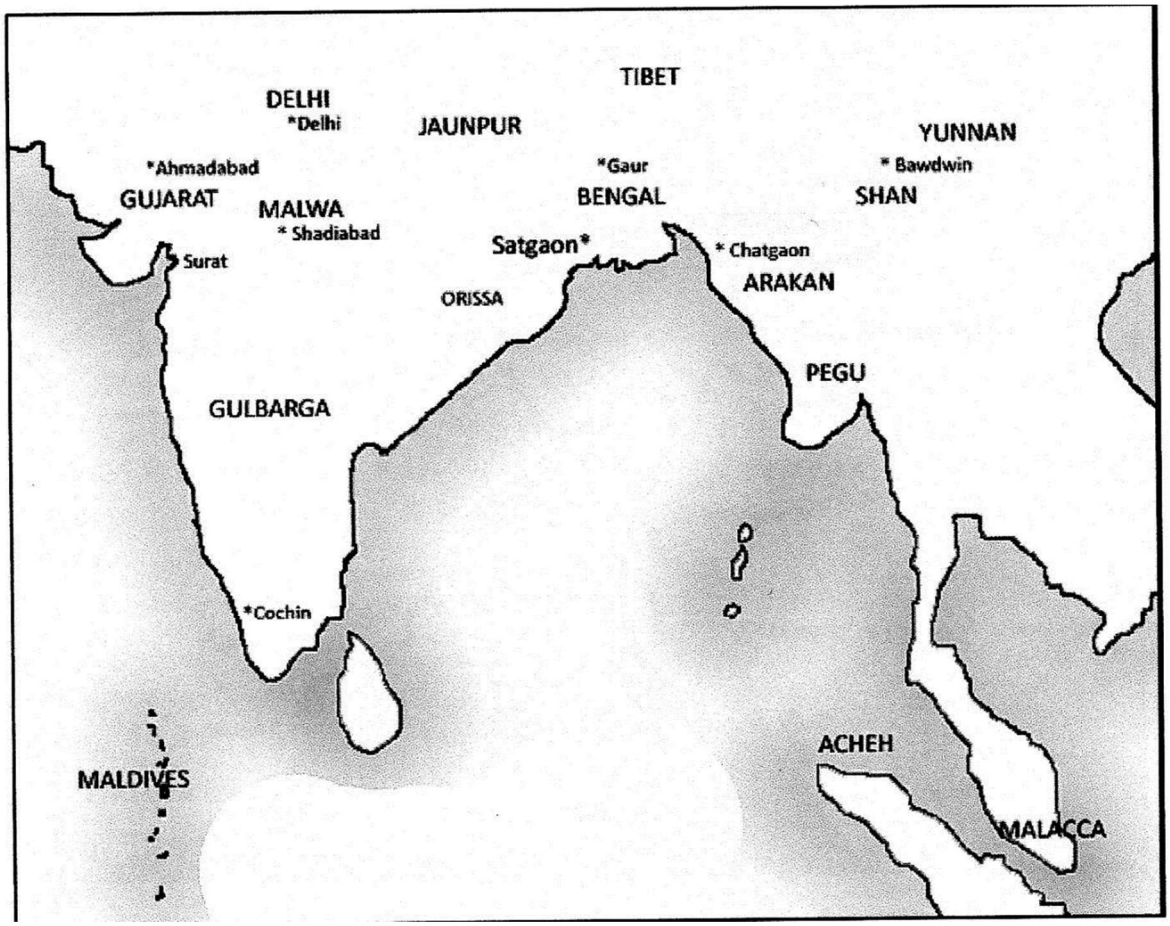

Figure 3 Chattogram Port's position in Chatgaon in the 16th century (Deyell, 2011).

Figure 4 Russian ships in mine removing operations in Chittagong Port in 1972 (Kamal, 2014).

On the other hand, the exports from Chittagong to Akiab port were mainly turmeric, onion, garlic, hemp, and jute rope. Abdul Bari was one of the importers and exporters of goods from Chittagong and Burma and was the creator of the first Bengali shipping company, the Asiatic Steam

Navigation Company. In 1905 - 1906, a total of 14 ships of the British India Steam Navigation and the Asiatic Steam Navigation Company operated on the Calcutta-Chittagong-Rangoon waterway. In 1936, a bill titled 'Bill to Control the Coastal Traffic of India' was introduced by Abdul Halim Ghaznavi and P N Sapru. The purpose of the bill was to ensure that no foreign shipping company on the coast of India could compete incompatible with an Indian shipping company on rent or any other matter. Although the bill did not come into effect immediately, it had far-reaching implications for Indian maritime trade.

In 1972, Russia, or the previous USSR (Kamal, 2014), helped to remove mines from the navigational route of Chattogram Port which had been completely devasted by Pakistan in the war of 1971. As per **Figure 4**, it was observed that Russian ships were engaged in mine removal operations in Chittagong Port in 1972. This assistance brought operational seaports to South Asia and contributed to the development of the country to date. Islam (2016) viewed Chattogram Port's role as a secondary port during the British colonial statute, the main seaport of the eastern wings of Pakistan in Pakistan-Bangladesh's 24 years, and the premier seaport for Bangladesh after its independence in 1971. The Port Ordinance 1976 redesigned the port trust format to an authority, in order to work independently and serve the nation restlessly.

To modernize port operations, CPA changed the stevedoring style, started the berth operator system, and appointed a private container terminal operator. In 2007, Saif Powertec (2022) received a contract from CPA to operate two main terminals, Chittagong Container Terminal (CCT) and New Mooring Container Terminal (NCT), and proved its worth through its dedication and earnest efforts. In 2021, it handled 1.96 million TEUs, under CPA management, out of 3.21 million TEUs, which is 61.06 %. Privatization brought increased efficiency and productivity in the port and broke the record handling year to year, except in 2020, which was hampered by the COVID-19 pandemic. Overall, CPA is moving forward to serve the country through its dynamic people, assets, technology, and maximum hinterland coverage in the South Asian region.

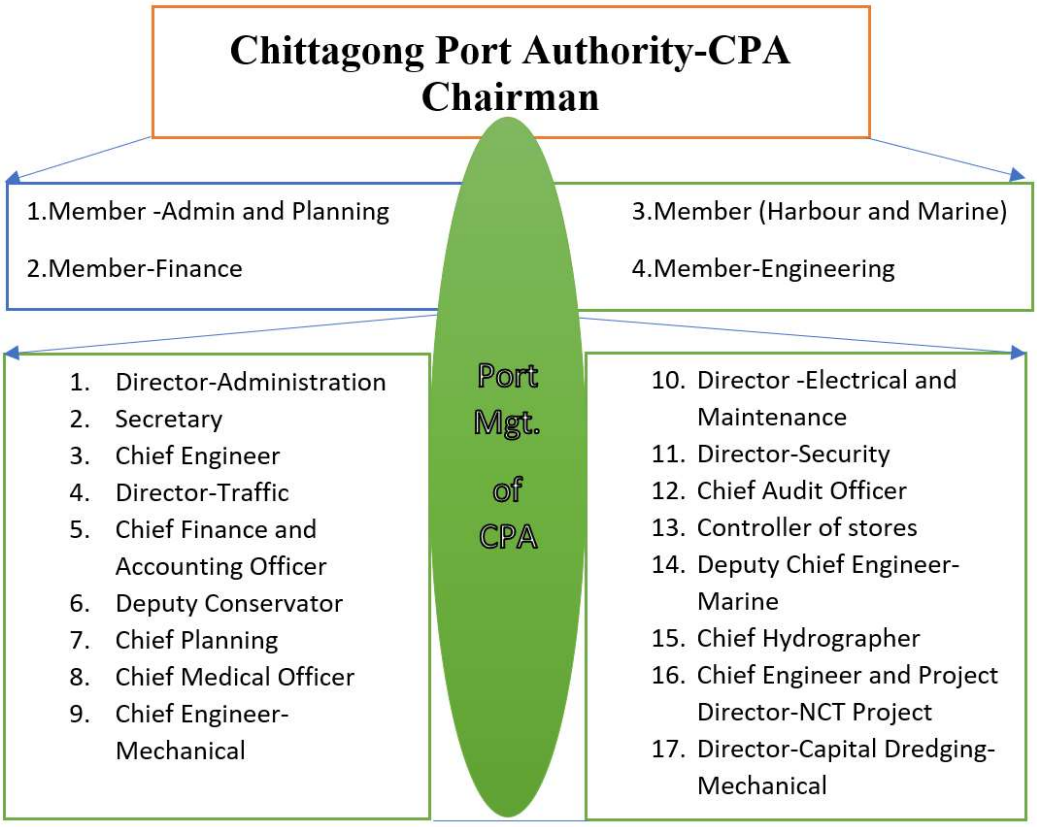

Figure 5 Port management of Chattogram Port (CPA, 2021).

5. Function, management, and policies of Chattogram Port

The functions (CPA, 2022c) of the Chattogram Port Authority are managing, maintaining, improving, and developing the port facilities to provide and maintain adequate and efficient port services at all times. CPA is responsible for regulating and controlling the berthing and movement of vessels and navigation within the Port, and to do such acts and things as may be necessary or convenient to be done in connection with, or incidental or conducive to, the performance of its functions under Port Ordinance 1976.

The board (CPA, 2021) of the port management or port authority is led by the port Chairman, which consists of four other members, who are Member-Admin and Planning, Member-Finance, Member-Harbour and Marine, and Member-Engineering.

Figure 5 is showing that there are 17 departments/sections under the Chairman and Members who are responsible for overseeing the main activities of port management, operations, and safety and security that ensure the smooth delivery of imports-exports and present the country's position to the world shipping arena. The Chattogram Port is the only port in the region that is working under the Ministry of Shipping but is able to take its own decisions as per Port Ordinance 1976. Chattogram Port policies, acts, and modules are stated below in **Table 1**, including related policies on port transportation and management:

Table 1 Port policies/acts/manuals/others of Chattogram Port, compiled by the author.

Policy/ Act/ Modules

SL#	Name
1	The Ports Act, 1908 (Act No. XV of 1908).
2	The Chittagong Port Authority Ordinance, 1976. (Ordinance NO. LII OF 1976) on July 07, 1976. Now, Chittagong Port Authority Act, 2022
3	Regulations for Working of Chittagong Port, (Cargo and Container), 2001.
4	The Protection of Ports (Special Measures) Act, 1948. (ACT NO. XVII OF 1948)
5	Container Manual for Chittagong Port and Dhaka ICD (In force from February 2003).
6	Private ICD/CFS Policy 2016 (June 2016).
7	Estate Management Rules, 1998.
8	The Service Regulations of Chittagong Port Employees - 1991.
9	Traffic Manual of Chittagong Port Authority.

Figure 6 "Country Moves with Us" slogan of Chattogram Port (CPA, 2022d).

To follow the Ports Act 1908 and Chittagong Port Authority Ordinance 1976, only one inland container terminal, named Pangaon, operates under the management of CPA.

Figure 6 views the slogan "Country Moves with Us" was developed as an inspirational sentence for developing relations between the port and the country. It helps to motivate the workers and appreciates their dedication to the country.

6. Performance of Chattogram Port

This section analyzed five important factors, which were vessel handling performance, vessel turnaround time, cargo handling performance, ranking of Chattogram port by Lloyds List, and analysis of port throughput in 2021.

6.1 Vessel handling status

The funnel graph in **Figure 7** represents the vessel status of Chattogram port from 2015 to 2021, where the port peaked at 4209, a historical record of vessel handling in 2021. It broke all previous chronicles and demonstrated the significant changes in port performance and productivity that were 1.5 times that of 2015. Due to COVID-19 and the restrictions on crew changes, the number of port calls was limited in 2020, but slightly decreased, and the port was on the right track in serving the port users. However, this recovered fully in 2021 and experienced tremendous growth in port throughput in containers, which resulted in record vessel berthing in Chattogram Port in 2021.

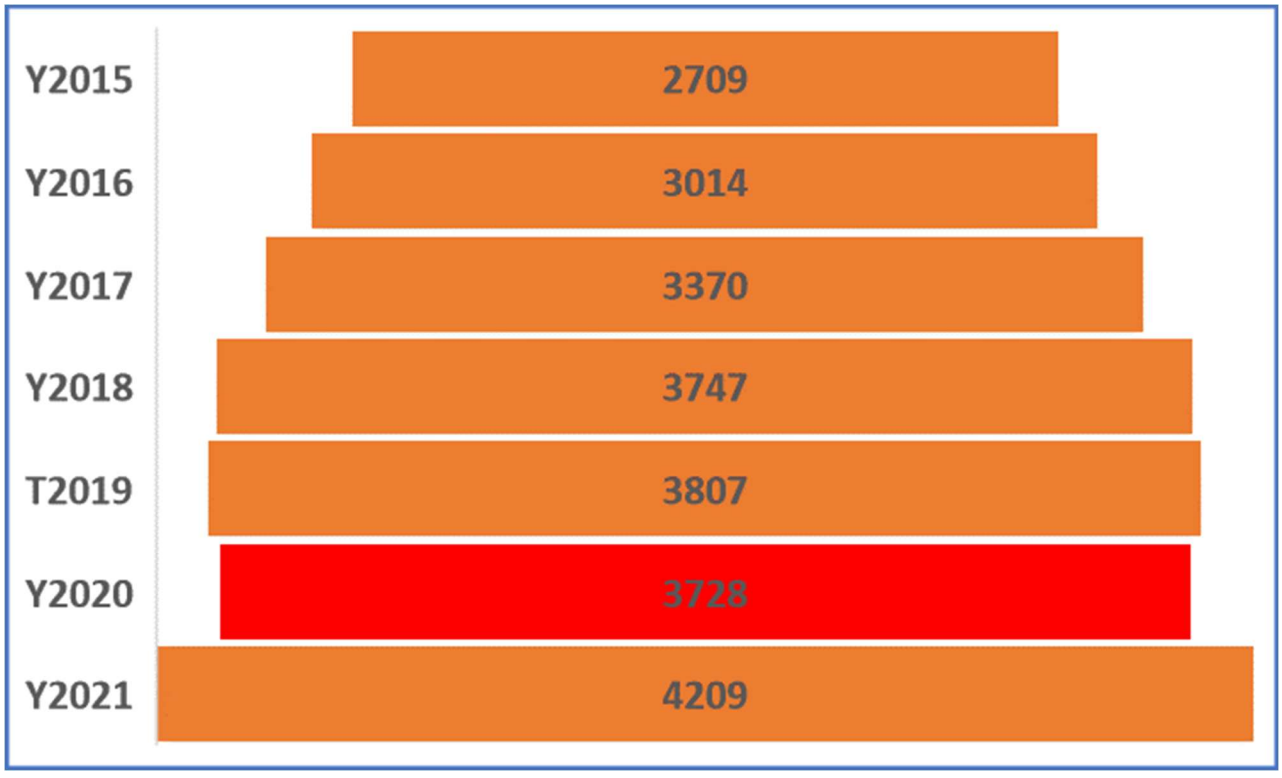

Figure 7 Vessel handling status of Chattogram Port (2015 - 2021).

6.2 Vessel turnaround time (FY2010-2011 to FY2019-2020)

The Business Standard (2022) reported a turnaround time of 2.46 days, or 59.04 h, for a container ship that stayed in Chattogram port in 2021. As per the data of the Asian Development

Bank (ADB) (2018) and **Figure 8**, it was 3.21 days in FY 2010-2011, but increased more than double in FY 2016-2017. Happily, the port's (CPA, 2020) worst situation was improved in FY 2019-2020, and upgraded to 2.86 days for all kinds of vessels, as updated by the port authority in their Annual Report of FY 2019-2020. **Figure 8** shows the great development of vessel handing that recovered and fell into momentum and increased significantly from 3.21 to 2.86.

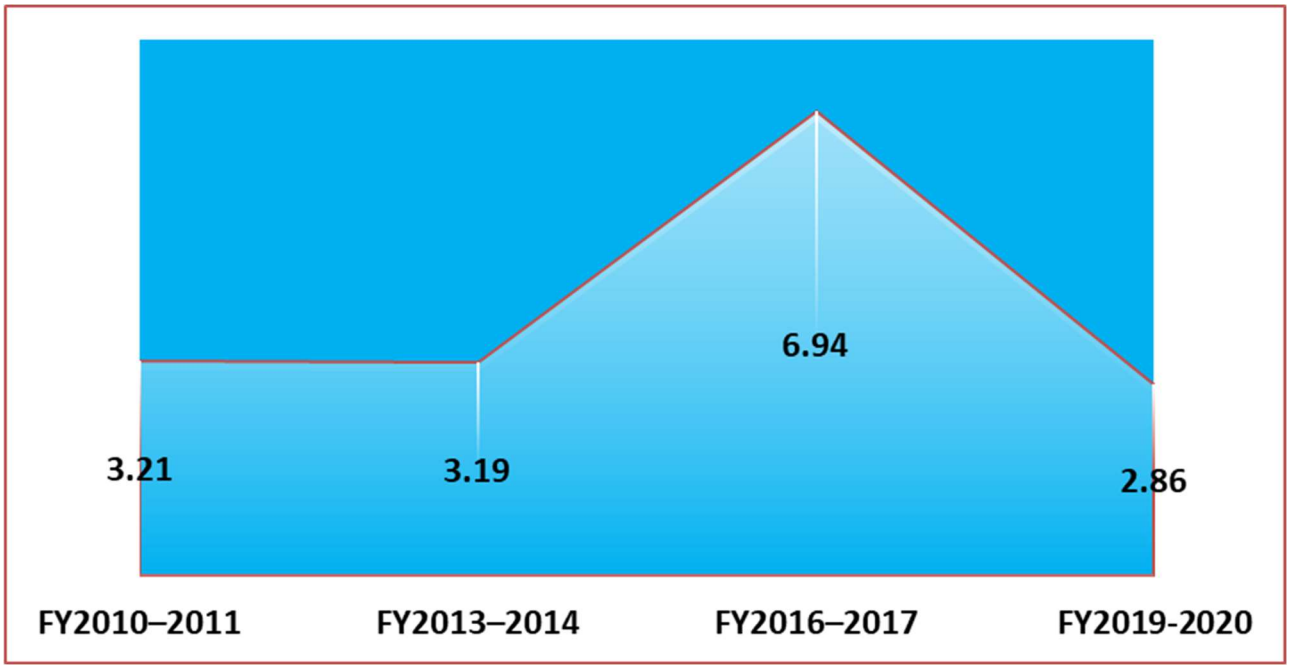

Figure 8 Chattogram Port's vessel turnaround time (FY2010-2011 to FY2019-2020).

6.3 Cargo handling status

Figure 9 shows the dominant activities of Bangladesh for importing cargo and containers through Chattogram Port, which increased by more than 100 % of imports within 8 years, that is, from FY2013-2014 to FY2020-2021. On the other hand, exports increased by over 50 % in the same period, but inland tonnage was not up to the mark and increased slightly. In total, positive growth has been observed in the last 8 years in MT. On the other hand, for inland transport, the performance of the ICD and the Inland Container Terminal (ICT) was not so remarkable, as compared to the growth of the Chattogram Port. Overall growth under the port authority was remarkable, slipping in FY2018-2019 and FY2019-2020, but increased significantly in FY2020-2021 (11.98 %). A performance table is in **Appendix B**.

6.4 Port throughput analysis

COVID-19 brought a big disruption to international shipping. Consequently, maritime logistics and supply chains were interrupted by the inland transport system in Bangladesh. Consequently, Chattogram Port was highly affected; especially, imports decreased and export orders were in a void condition, or delayed frequently. **Figure 10** shows the port performance, which changed significantly from 2013 to 2018. However, a remarkable fall of 8.04 % happened in 2020, but a pure growth of 13.19 % was recovered in 2021. A figure is observed in 2015 of maximum growth of 16.92 %. In line with such motivations, the port is increasing the supply side by constructing new container terminals and accommodating more containers on the port premises.

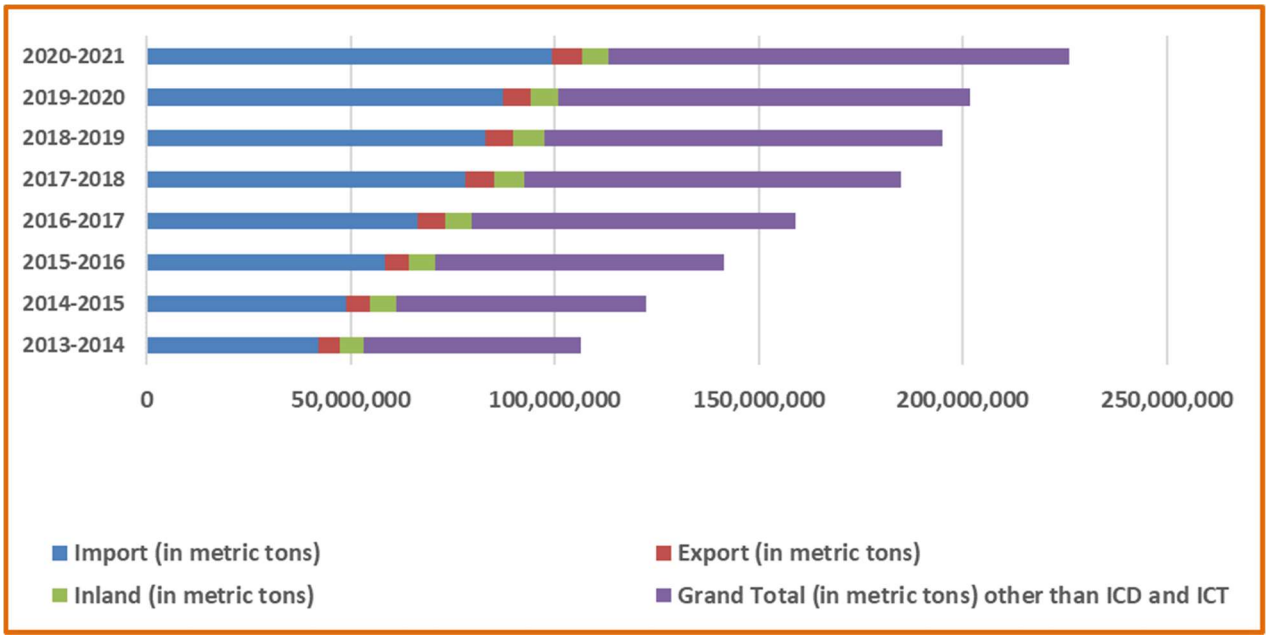

Figure 9 Cargo handling statistics of Chattogram Port (FY 2013-2014 to 2020-2021).

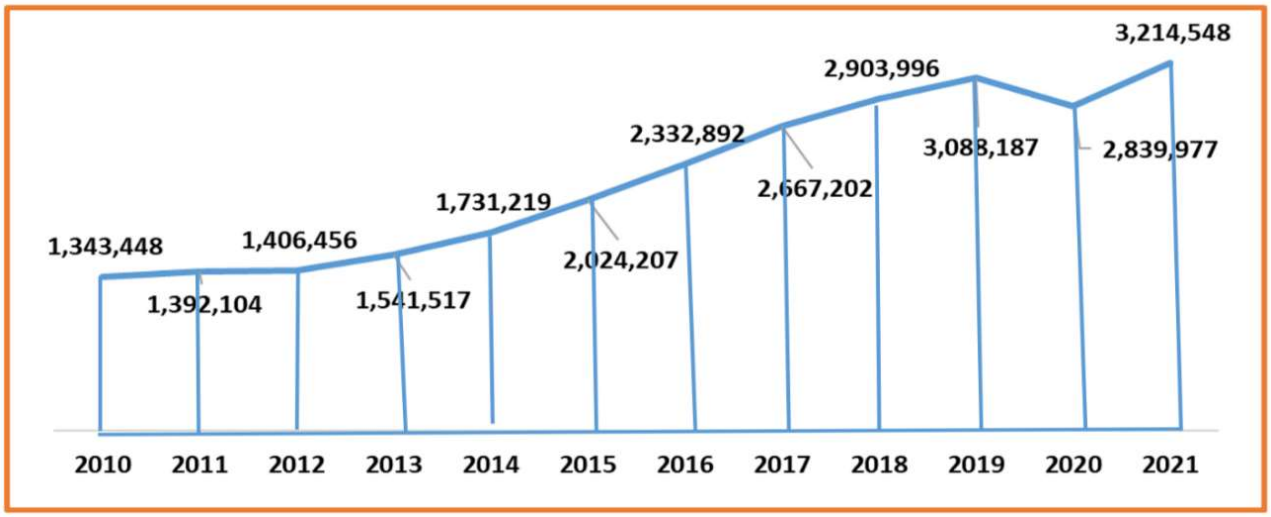

Figure 10 Port throughput of Chattogram Port in TEUs (CPA, 2022a).

6.5 Port ranking by Lloyds List

The premier port of Chittagong entered the 100 ports ranking by Lloyds List (2021) in 2011 (See **Figure 11**), with the rank of 89th busiest container port in the world. The rank slipped in 2012, 2014, and 2020. In the pandemic of COVID-19, major import items were stopped, and port throughput decreased, resulting in a significant fall to 67th from the position of 58th in 2019. Remarkable changes were observed in 2018 and 2019, where 12 steps ahead from 2017 and the port reached the milestone of 3 million TEUs in 2019 (See **Figure 10**).

Just after 7 years, the performance of Chittagong Port fell slightly in 2020, which happened due to COVID-19. However, growth was enhanced in 2021, and port throughput increased 13.6 % compared to 2020, and also 2 % as per general growth. The positive trends of the premier seaport show development of the domestic port throughput through only domestic imports and exports, without any transit or transshipment to neighboring countries.

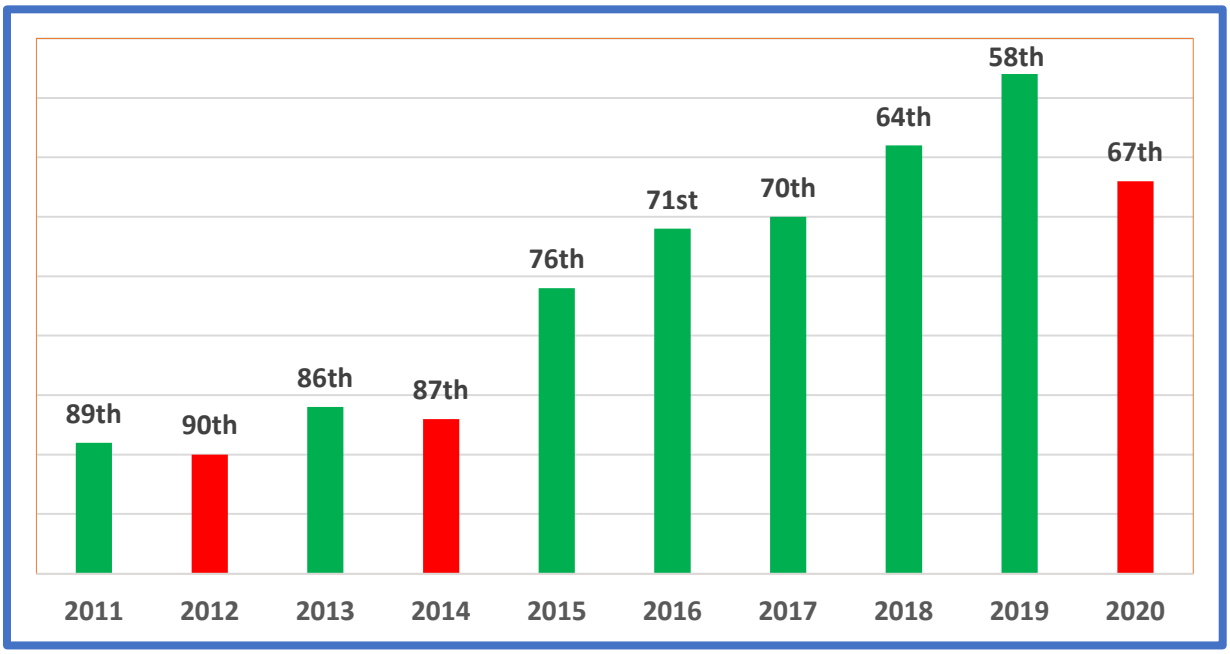

Figure 11 Container port ranking of Chattogram Port (Lloyds List, 2021).

Figure 12 extracted the positional strength of the Chattogram Port but explored poor hinterland connectivity. However, the port is the potential to act as a regional hub port in South Asia subject to avoid port rivalry with Indian and Myanmar's seaports in the Bay of Bengal. Earlier, Sections 2, 4, and 5, and this Section 6, encompassed information that can be used in a simple SWOT (Strength, Weakness, Opportunity, and Threat) analysis, which will attribute port performance and efficiency in the world port sector, below:

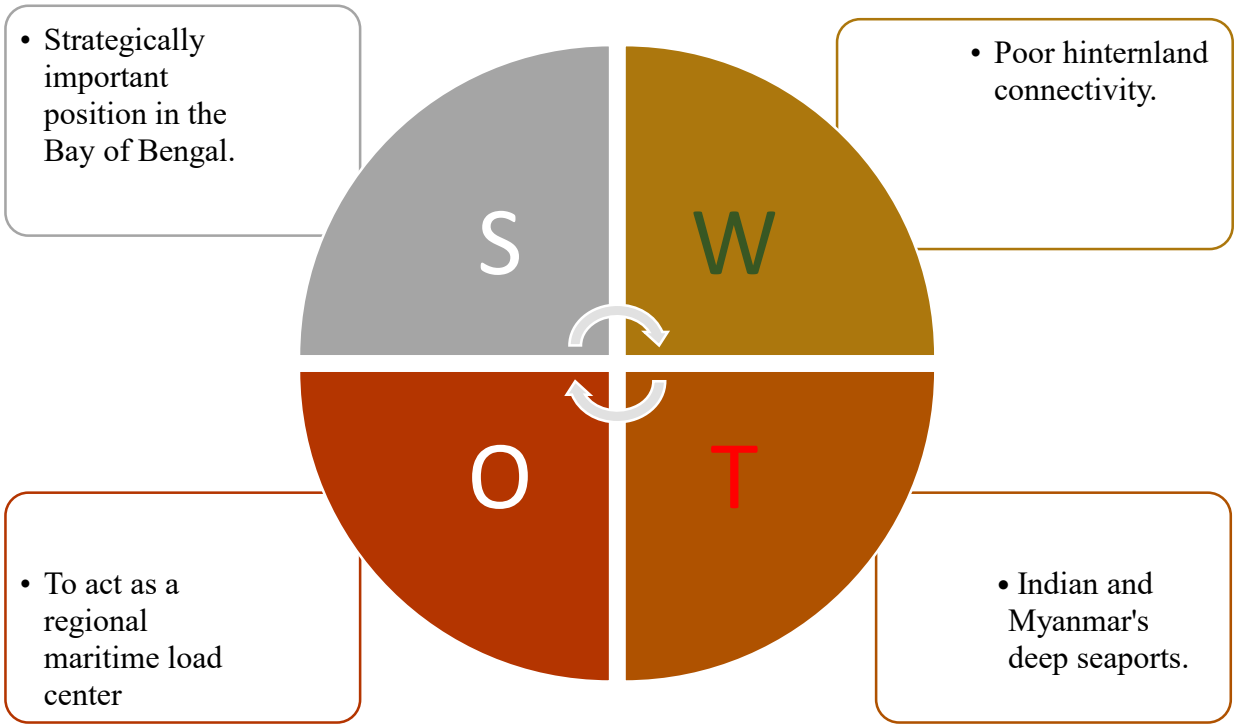

Figure 12 SWOT analysis of Chattogram Port.

7. Port rivalry in the Bay of Bengal

Basically, there is no practical rivalry among the seaports seen in the Bay of Bengal, as ports are formed for their own countries only. Congestion at Chattogram Port, and draught or navigational issues of Kolkata Port, feature port rivalry when using alternative ports from both countries, India and Bangladesh. Nepal and Bhutan have argued several times when using Bangladeshi seaports, but there have not yet been occurrences in any regular transport or business activities or international shipping from others or third ports from any countries in South Asia.

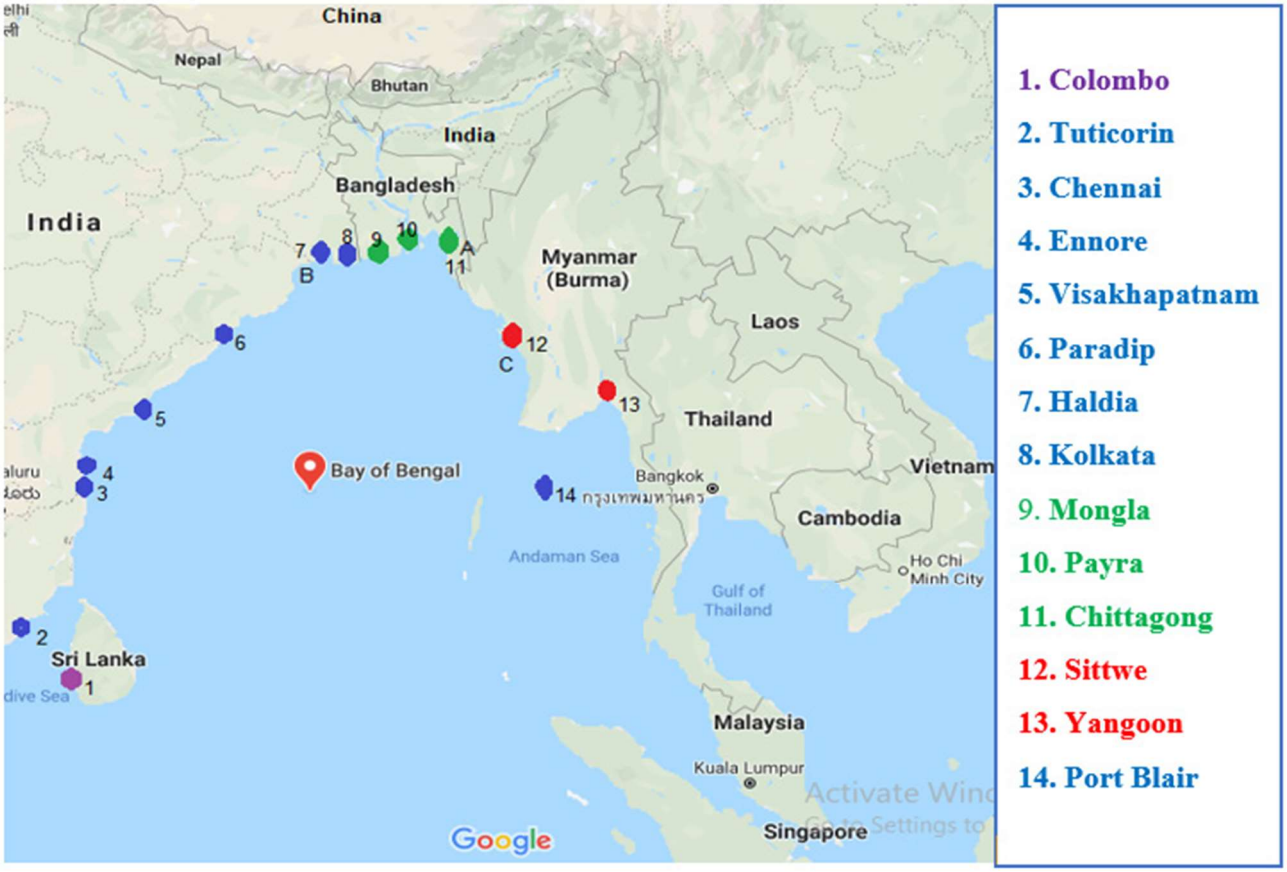

Figure 13 Major seaports in the Bay of Bengal (Saha, 2021).

Figure 13 shows the major seaports in the Bay of Bengal. Among the 12 major ports of India, Kolkata and Haldia are the main competitors of Chattogram Port. Myanmar's seaports are at a standard to compete with Chattogram, Kolkata, or Haldia. However, Sittwe (Livemint, 2022) in Myanmar, which is constructed and financed by India, has a chance to join in the port rivalry in the Bay of Bengal, but it will not affect the port performance of Chattogram, as the Seven Sister States' (SSSs') cargo and containers are not handled by any Bangladeshi seaports currently. Bangladesh is able to provide transit or transshipment facilities to SSS via land ports between India and Bangladesh's cross-border. In this situation, Saha (2019) argued for setting up a container hub port on the eastern coast of India to start feeder connectivity, instead of Singapore and others, which will improve regional connectivity in South Asia, and also support SSS for industrial development.

Statistically, **Figure 14** represents the port throughput of Kolkata Port (The Hindu, 2018) and Chattogram Port of India and Bangladesh from FY2019-2020 to FY2020-2021, respectively. Due to the COVID-19 pandemic, both ports declined, but Kolkata Port had a remarkable negative growth of -18.63 %, whereas Chittagong Port had a slight decline of -0.82 %. The Hindu Business

Line (2018) reported that Nepal Transit moved from Kolkata Port to Visag in 2018 by 1,400 km, where Kolkata port is within the perimeter of 750 km from the Birganj terminal of Nepal. The Chattogram Port was not closed during the pandemic, and workers attended to continue port efficiency and sustain the port's productivity.

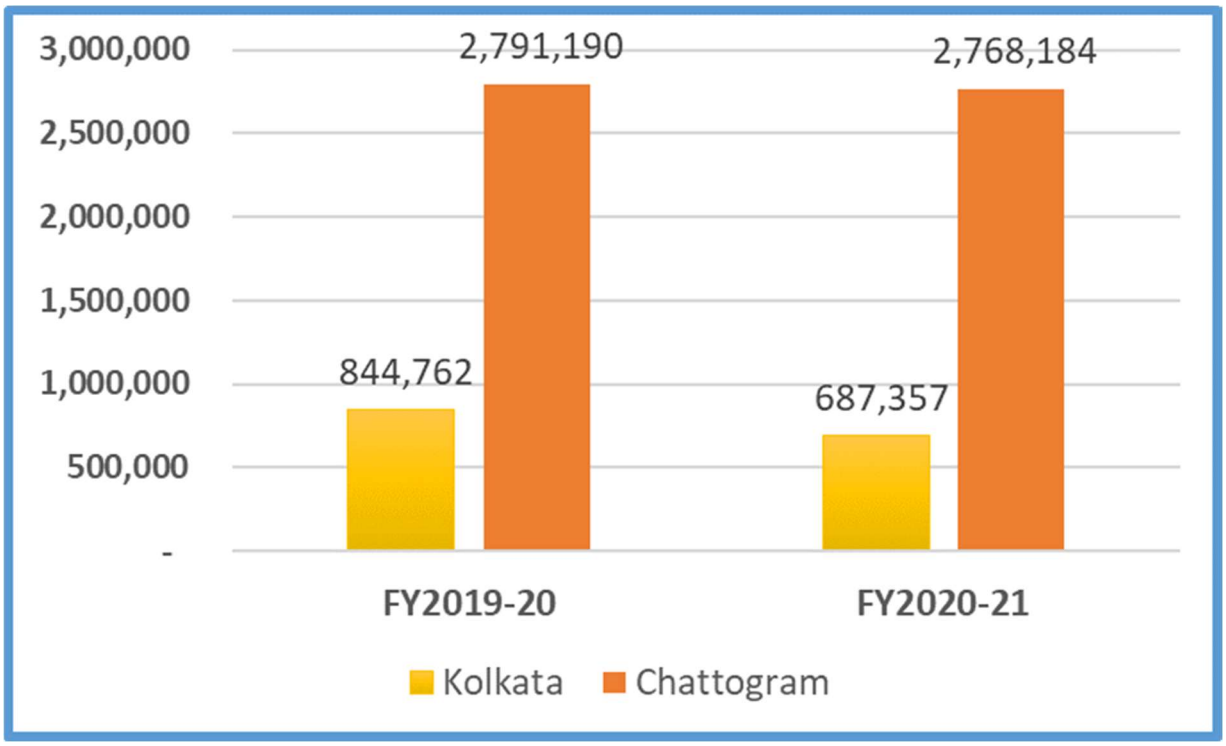

Figure 14 Port performance of Chattogram and Kolkata in TEUs.

Just after China declared the Belt and Road Initiative (BRI) or One Belt, One Road (OBOR) strategy in 2013, Bangladesh's Chittagong Port fell into trouble and faced huge challenges, as the Maritime Silk Road was mapped by centering Kolkata Port as a prime Maritime Load Centre to enter South Asia via the Bay of Bengal. BRI brought the port rivalry to the Bay of Bengal and between Bangladesh and India. The position of Chittagong Port was lucrative, as Kolkata Port faced a draught problem seriously, also serving Nepal via Haldia. China tried to please India, but India opted out from the BRI approach. After this, Chittagong became an integral part of the Maritime Silk Road (MSR), but further visible activities have not been performed by China. QUAD caused a new issue in the Bay of Bengal, and featured new maritime power like MSR, but led by many countries of the world.

PT Pemeringkat Efek Indonesia (PEFINDO) (2014) identified two types of risks as key success factors; they are business and financial, concerning international business in a seaport. In terms of business risk assessment, Economy of Service Area, Diversification, Quality of Service, and Operations Management are included in doing international business. Regarding financial risks, Financial Policy, Capital Structure, Cash Flow Projection, Liquidity, and Financial Flexibility are incorporated to set the sound financial stability of the port. To respond against business risks and further port expansion plans, the national service area is good, but supporting neighboring countries by giving seaport access is not defined, as India has a different plan to support landlocked countries. Secondly, the port sector needs big capital investment, and return is a long-term factor. So, an expansion plan for others is challenging and risky.

8. Geopolitics in South Asia: the context of Chattogram Port

India is dominating the maritime affairs in South Asia and is the leading factor for the Bay of Bengal. Chittagong port is denoted as the most accessible place in the Bay of Bengal and South Asia that is forwarded to the Southwest part of China and adjacent part of Myanmar geographically. In a study, Islam (2016) stated that the open mentality of Bangladesh allows India to use Chattogram and Mongla Port through roads and highways, rail systems, and inland waterways.

China (Islam, 2021) continues investment in South Asian countries, including Bangladesh, in multifaceted ways that are concerned with India. Among them is the modernization of Chattogram Port as Chinese economic cooperation in port development, but a deep seaport project could not make any headway. Alam (2014) observed that the South Asian region has not been integrated economically over the years because of the absence of transit agreements among the countries, or has not been lively due to multilateral agreements and the disagreement of anyone in the forum.

Batra (2009) realized that two emerging powers, China and India, have a shadow on the global growth process. This also hampers regional development, as well as that of small countries like Nepal, Bhutan, Bangladesh, and Sri Lanka, which will suffer because of their Chinese connection. China has a long-term investment and financial involvement in supporting these countries for infrastructural and business development. Xue (2016) believes that BRI will increase China's influence in the world strategically. It will transform a millennia-long governance style, casting multiple waves of aftermath via peaceful means to invest globally and capture a business, place, and power, as per their strategy.

Hossain and Islam (2019) expected constructive activities by India and Bangladesh to expand maritime cooperation in the Bay of Bengal that will secure maritime connectivity in South Asia. The relationship between India and Bangladesh is vital, irrespective of the connection to BRI or QUAD. It will go beyond geopolitics, and not be influenced by any third countries of the world.

Ehsan (2020) saw BRI or China's proposal as a window of opportunity and would require a chunk of sustainable funding and materialization to implement the development goals of the country, including the Sustainable Development Goals (SDGs) target set for Bangladesh. Basically, BRI or OBOR funds are treated as a blessing for improving poor infrastructure and connectivity and will attract foreign investors to establish an industry by which import-export trade will increase optimistically. Ehasan (2020) identified that the growing economy of Bangladesh attracted China to export its industrial overcapacity and products, making a maritime link to Chattogram Port through MSR under BRI.

Lastly, as per Notteboom and Rodrigue (2005), port regionalization is essential for a geographical system to evolve from an initial pattern to reach the main transport network. The history and performance of Chattogram Port were described earlier and explored its capacity, efficiency, and productivity. It is high time to expand its hinterland and serve the region and develop port-centric logistics while avoiding geopolitics, as development is a process that will give happiness to society.

9. Activities of national and international forums

SAARC (Islam, 2016) provides the opportunity to interact with each other in South Asia, but it has not reached this goal because of the mental, political, and geographical rights approaches of India and Pakistan. This is hampering harmonious relations and land sovereignty among these countries, where half of the areas of SAARC, especially landlocked countries (Nepal, Bhutan, Afghanistan, SSS of India) are not getting easy seaport access for industrial development. BBIN (Islam, 2016) framework gives the opportunity to do cross-border trade, also providing seaport access from four nations; Nepal and Bhutan are completely landlocked naturally, and SSS in the same situation. However, it was observed that there were various technical and diplomatic delays in

implementing BBIN MVA (Motor Vehicle Agreement) and in opening the door for all, as per forum objectives.

The Quadrilateral Security Dialogue, or QUAD, is a new dimension in the Bay of Bengal, initiated by the USA, Japan, India, and Australia in 2007. The Belt and Road Initiative, or BRI, also called One Belt, One Road, made a huge effort to link India, and even drafted Kolkata as the prime maritime load centre to enter South Asia in their map of Maritime Silk Road-MSR, but India opted out. Disagreement between India and China on BRI brought the QUAD issue to Chattogram or Bangladesh overtly and featured good approaches to the maritime affairs of Asia for doing international trade. Chaudhury and Chatterji (2019) informed that the new QUAD 2.0 has gained momentum since November 2017, and focused on Indo-Pacific's command by a new forum. QUAD is the repositioning of activities of MSR powered by BRI in covering maritime activities in the Indian Ocean.

Against this backdrop, BRI also made more effort to provide financial support to Bangladesh and Nepal, and contributed accordingly. In this connection, Chaudhury and Chatterji (2019) see the QUAD approach as maritime coverage in the Bay that has been transformed into a geo-strategic and geo-economic maritime space strategy for doing international shipping business.

Islam (2021) gained knowledge from an interview of German scholars, who stated that maritime connectivity is embedded in the context of SAARC or BIMSTEC as a matter of sub-regional cooperation, but the opportunity remains to intensify international trade, as many South Asian countries have coastal/maritime economies. In line with such motivation, Xue (2016) argued to increase China’s relation to the Association of South-East Asian Nations(ASEAN) and South Asia and to develop some forums to reflect the openness and inclusiveness of the Chinese way in global governance. This will help to active OBOR or BCIM in the South Asian region, and Chattogram Port will benefit by providing maritime access directly to China and Myanmar; regional transport connectivity will be increased significantly.

Alam (2014) viewed the success of ASEAN to portray the cross-border infrastructure that promoted fruitful cross-border business. Importantly, transport costs geared the business profit, or were a causal factor for loss. So, transport infrastructure and free movement within a region will help to make a regional center for international trade. In this situation, Chattogram Port is a trigger point for forums (SAARC, BIMSTEC, BBIN, BCIM, and other bilateral contracts or groups) to gain business in this region and to develop a sustainable freight transportation system.

10. Port expansion and inland transport connectivity

Globalization and localization, together as “Glocalization”, brought a new dimension to the port logistics sector, where international shipping companies and terminal operators work in the local seaports by bringing international terminal facilities, equipment, and technology to introduce a global product to a local environment. Moreover, this new joint venture strategy of the world economy has opened up new business opportunities and ways of development in the port logistics sector at different levels of facilities, like forward and backward linkage.

To state the forward linkage, the foreland connectivity of Chattogram Port is limited, with feeder vessel and container support to the mainline operator that needs to open direct shipping routes to the final destination. This will help to improve the LSCI of Bangladesh. Remarkable destination ports in the USA, Europe, the Middle East, China, and others are connected via Singapore, Sri Lanka, and Malaysia, but direct port calling is possible, which will save money and time. In line with backward linkage, inland freight transport connectivity is not up to the mark, which created local off-dock connections under Chattogram Port but is not the ultimate goal of container transportation. It is essential to develop port access roads and set inland transport nodes for quick transfer of containers and avoid using trucks and covered vans. By using the inland intermodal system, containers will reduce the cost and time, and multiple handling of cargos also reduces the congestion on Dhaka-Chattogram highways significantly.

Two massive programs are ongoing by CPA to meet national, regional, and global demand, as a part of port expansion and improving inland transport connectivity by all modes of transport. Port expansion is the derived demand of the port users, also indicating domestic and regional development. As a part of the port expansion and development plan, CPA (2021) is planning to construct a second overflow yard at the new mooring colony, CPA Tower building, Laldia Multipurpose Terminal, Bay Terminal, and Karnafully Container Terminal, which will help to supply the port facilities against the continuous growth or demand of the country. The two most important support projects are taken by CPA to assist in financial and technical support for constructing Payra Port and Matarbari Deep Seaport. Both projects will help to reduce the excessive pressure on Chittagong Port for handling cargo and containers.

Dhaka rail ICD under CPA is overutilized, as it handled 96,000 TEUs in 2021, against its capacity of handling 90,000 TEUs annually. Rail intermodal is becoming popular, but a new rail ICD at Dhirasram near Dhaka is delayed and not helping to take the scope of using environmentally friendly transport modes, which would also be cheap compared to road transportation of containerized cargo from Chattogram to Dhaka. The government has a plan to set 100 Special Economic Zones (SEZs) and new Export Processing Zones (EPZs) all over the country, Therefore, dry ports and more ICD and ICT establishment are utmost requirements for providing port transportation facilities, and connection to Chattogram Port is appreciated by road and river modes.

11. Regional connectivity through Chattogram Port

From the position of Chattogram Port in the Bay, and considering landlocked parts of South Asia, China, and Myanmar, it is essential to make the maritime load center upgrade for regional connectivity. Rahmatulla (2009) and Islam (2016) dreamed to see Chattogram Port as a regional port. Multilateral (Islam) agreements under any forums are difficult to implement in BCIM or BBIN, even for SAARC and BIMSTEC, as India is positioned in a location to support bilateral contracts with Bangladesh to others. In this context, Islam (2016) examined that freight transport support to Nepal, Bhutan, or any other country in the region is not possible without joining India and designing multilateral contracts.

To disclose, Islam (2021) believed that maritime connectivity focuses on power, security, and national interest, whereas state-centric analysis is appreciated in liberalizing and incorporating the dimensions of the domestic requirements and supply connection to others. He argued that concerned groups or business communities have the right to play major roles as the main drivers for maritime connectivity in a specific region. As a matter of fact, China (Xue, 2016) must have an extensive standpoint to support neighbors, particularly to design long-term grand strategies for small and medium-sized countries. To develop a good relationship with all neighboring countries, such as Nepal and Bhutan, China needs to coordinate with India for reaching to Bangladesh and be flexible in understanding different concerns, expectations, and opinions for making smooth maritime transport connectivity among the states. It will help to offer common goals to get maritime access to the South-Western part of China via Chattogram Port, as well as for Nepal and Bhutan. From the example of European countries, one port serves many countries, and port regionalization is established confidently with due respect to the individual countries' sovereignty. Although BCIM and BBIN had been introduced, they were not fully active due to the shortage of mutual confidence and trust.

The evolution (Alam, 2014) of multilateral institutions changed the style of global economic cooperation and introduced free trade agreements, as the South Asian Free Trade Area (SAFTA) made by SAARC, allowed one step ahead for regional development. However, he expressed that transport development is the way to commodity transfer for basic needs or business is not a part of development, it is an inclusive style for regional development. Port (Notteboom & Rodrigue, 2005) regionalization concept is developed by the recent rise of a seaport's terminal role in acting as a transit or transshipment hub in a place irrespective of country. This concept inspired Chattogram

Port to offer seaport and terminal access to all, as the port authority is able to accommodate more tonnage for the region.

Bangladesh (Hossain & Islam, 2019) is a strong developer of regional forums that are in the form of regional, sub-regional, even bilateral, and involved in BIMSTEC, Indian Ocean Rim Association (IORA), SAARC, BCIM-EC (Economic Corridor), BBIN-MVA, and many others that have led to maritime cooperation in the Bay of Bengal to promote international trade. The prime goal of this connectivity belongs to maritime activities, as well as to improve regional connectivity. Overall, regional connectivity will help to start spatial transportation routes, such as the Chattogram-South-Western part of China, and also transport support to landlocked parts of India SSS, Nepal, and Bhutan. It will increase inland shipping with India and coastal shipping with Myanmar.

12. Moving forward: obstacles, potentialities, and vision for development

This section attributes the result of a qualitative research survey that was collected to identify the port's obstacles that are delaying the development and explores the potentiality that will cater to the development of the port, subject to the taking of necessary steps for port development. After this, long visions are articulated to provide the views of the stakeholders, port users, and others.

12.1 Obstacles that are delaying the development of Chattogram Port

The observations of interactions with 20 experimental individuals asked for their opinions on three different objectives are described. These observations led to the development of a basic process model that shows how opinions in a group of interacting people might converge or diverge over time. Here are a few significant opinion attractors in obstacles. Firstly, seaports are not integrated with the ICDs in Chittagong and all over the country. Meanwhile, there is no realistic vision of port authorities for bringing development between rail ICDs and seaports. Secondly, there is no proper controlling authority or the skilled manpower to operate port-related activities with a full smooth hand. In addition, intermodal handling equipment is in shortage at the port or terminals, with no Rubber-Tired Gantry (RTG) system in the ICD yard or inland container terminals. Some emphasize their thoughts that entrance and inland road conditions are poor, and have no maintenance, which might be one of the viral obstacles for CPA (Chittagong Port Authority). Less application of the rail sector for transporting intermodal containers brings a great influence on the road sector. This greatly disadvantages roads and highway sections. As there are various container sizes, and inadequate road capacity to accommodate them, the traditional loading and unloading system at port/ICD, rail, and others still belongs to the port sector. There are no best uses of port perimeter compared to modern port technology; for example, experienced hand shortage in operations and management. In terms of operations and management, as there is a scarcity, manual paperwork takes more time in cargo clearing, data management system, and records for the future, etc., and takes a long time. Besides, any decision depends on the Ministry of Shipping, so there is a prolonged period of time for the development of Chattogram Port from taking a proposal for a development project to implementation of the project. A few individuals strongly emphasized the idea that river draught is not sufficient for standard port operation. The role of port management varies from port to port. The future of Bay terminal operations can be uncertain for Chittagong Port Authority (CPA). This can be seen in the low capacity of rail and its smooth connection to seaport and inland terminals. Last but not least, there might be invisible geopolitical pressure. The authority should act more actively against the competitive economy and political models.

12.2 Potential factors for Chattogram Port's development

In this term, observers discussed the potentiality. Potentiality refers to any possibility that a thing can be considered to have. Actuality, as opposed to potentiality, is the action, change, or activity that indicates the exercise or fulfillment of a possibility, when that possibility becomes fully

realized. There is easy connectivity- both Foreland and Hinterland. Also, there is a derived demand by India, Nepal, Bhutan, and China. It has a transport network with all land ports. There is significant rail and river connectivity to all parts of the country, as well as easy road connections to the capital city of Dhaka, which may bring possible future growth. As import-export trade is continuously increasing, human resource management of the port authority is also building. Regional demand for Chittagong Port's access is shooting up; meanwhile, the connection with South Asia Sub-regional Economic Cooperation (SASEC) Roads and Highways is also in full swing. Chittagong Port Authority has vast assets for development, like building connectivity between the current jetty and the deep Sea for smooth operation, and extension to the port for the advancement of countries' future growth. As the world is running with the 4th industrial revolution this port can introduce box bay technology for standing more containers in a limited space of the port, with smart Port Apps, like CTMS, Blockchain Technology, and AI system for vacant place auto alarm and detection. There is a very high prospect of reducing the draft problem by dredging the inland rivers, which may bring a deep link with the Bay of Bengal. When investing in a company or authority, people look for the golden key, and CPA has this- Financial Strength and Liquidity. Finally, it has a strategic location in the Bay of Bengal. So, If India, Pakistan, and Nepal get Chittagong port for transit purposes, it will bring tremendous growth to the port. To summarize, the port of Chittagong has excellent possibilities in the near future due to its potential.

12.3 Vision 2050 for Chattogram Port: User's perspective

People are willing to share their opinions on what they want to see at Chittagong port in 2050. Their vision can be a roadmap for the future development of the port. It will be fully automated and well-connected to the deep seaport. Exporters and importers will get a self-auto contract auction, and removing the customs barrier in the auction. As an acceleration towards the 4th industrial revolution, there should be the use of renewable energy in the port management sector. In 2050, experimental individuals want to have an automated port with a ranking of under 25th in the world and 10th in the Asian region. It will be a hub port for this region and for SSS and Nepal and be well-connected as a hub port. All Asian port connections will be served and there will be improved LSCI ratings in the world, as it has the best South Asian route connection. It will be well-connected to the metro in Chattogram and provide expeditious track container trains from/to all over the country. Also, there will be priority transfer by rail and river modes to preserve the environment.

One of the major findings in port areas is low female worker involvement. Without a doubt, equal participation of the female workforce, both in operations and management, may be seen in 2050. It can be a certified green port in Bangladesh, with a limited human being workforce and more emphasis on robot workers. While Vision 2050 represents the Port's most up-to-date initiative, there will be one maritime authority for Bangladesh under the management of Chattogram Port; also, there will be a limited licensed transport operator for Chattogram port. There is a high chance that dollar use will be reduced, and currency transactions will be done in Non-Fungible Tokens (NFT coins). Extracted barriers and potentialities are indicated to be overcome and utilized for port development simultaneously, in order to gain momentum for port throughput in terms of cargo and containers and derived demand from port users.

13. Future directions

Based on the research activities, and opinions of the stakeholders, the below recommendations are stated as future directions for the development of Chattogram Port:

1. There are three seaports in Bangladesh, operated by different managements, under one Ministry. To exchange views, experience, human resources, and other related port affairs, it is essential to run the port under a single port authority. The government may develop a maritime commission to supervise all seaports, manage stakeholders and port users, and prepare a development plan for maritime logistics for the country and region.

2. Infrastructural development must be expedited, assisting with constructing a deep seaport and Bay terminal, and implementing other planned activities of the port to increase supply-side and cope with the digitalization and automation of the port, especially for container terminal management.

3. Current vessel turnaround time is not good enough to attract vessel owners and reduce international freight to Chattogram Port. Cargo and container loading-unloading time must be decreased by appointing skilled workers, installing modern handling equipment, having smooth navigation of vessels, proper vessel tracking, documentation, customs clearance, and reporting.

4. Chattogram Port's geography requires the expanding hinterland and not to make a limitation within Bangladesh; the port has the opportunity to go far and serve as a regional port. The port authority needs to draft a port expansion plan and increase hinterland. As Nepal and Bhutan are seeking port access, Chattogram Port must create a business environment with them, and develop the facilities as per their requirements.

5. Chattogram Port is operating rail ICD, Riverine Inland Container Terminal-RICT, and assisting with the project of Matarbari deep seaport and Payra port development. Similarly, the port authority has to develop more ICD, RICT, and Dry Ports all over the country to support EPZ, SEZs, manufacturing, and other industries in catching international business in a timely and costly manner.

6. BBIN, BCIM, and other forums are remarkable for developing freight transportation systems among the member countries in Asia. It is essential to activate all of those regional forums and tag Chattogram port for development as a prime maritime load center in Asia.

7. COVID-19 has impacted port operations, management, and development. This is a case for future learning, and the port authority needs to document all of those disruptions and prepare a backup plan to face any upcoming global and local pandemic actively, and to continue port operations at all times.

8. Women empowerment is important for port operations and management. Chattogram port has to appoint more female workers and officials in their workforce to reduce the barriers of gender inequality. It is possible to train casual female workers in the port's training institute and develop them for specific tasks of port operations and management.

14. Conclusions

In the management of the seaport, Chattogram Port is standing in a special position today. The port of Chattogram is the main center of import and export trade. Before the British or the independence of Bangladesh, prior to these, Chattogram Port had been working with efficiency and reputation proudly. The time has come to develop the port of Chattogram as a more modern regional port in response to the growing domestic demand, and also to that of neighboring countries. The study found that, despite the port's efficiency, strong internal infrastructure and equipment are costly for international maritime trade, due to changing communications systems and the need to apply automation and digital technology fully. This high cost is affecting our daily life, as Bangladesh is heavily dependent on imports.

It was observed that there are experienced and efficient people in port management who are relentlessly serving the country using modern infrastructure and equipment through established laws. To address the port rivalry in the Bay of Bengal, in focusing on competitive port management, Chattogram Port is far ahead of Kolkata port. In the last fiscal year, 2020-2021, Chattogram Port handled approximately 5 times more containers than Kolkata Port. The port of Chattogram has not been able to reach the world due to geopolitical reasons, which is a unique example for the region but, if used properly, it can become a valuable asset for South Asia, or the whole of Asia. For this, it is necessary to keep the port of Chattogram in a safe position and feed it cargo to upgrade it as a regional port, irrespective of the country boundaries.

The friendly country of India, the business friend of China, the cooperative nation of Japan, and others need to help each other and cooperate at all times for the improvement of Chattogram Port, to increase efficiency and productivity and introduce modern technology and terminal systems, including inland freight transport connectivity with neighbors. In order to improve the communication and transport system, there are many two-dimensional and multidimensional agreements that have been developed in various forums in the region, many of which have not been noticed or activated properly. Regional forums like BBIN MVA and BCIM EC are crucial for port development, especially in utilizing Chattogram Port's planned capacity for the region and in improving regional connectivity in Asia. If the goals of the forums SAARC and BIMSTEC, for which they were formed, are implemented, it is possible to improve the quality of regional communication, business, and lifestyle of the people in this region by centering on Chattogram Port.

To improve Chattogram Port and follow the short SWOT analysis in this paper, it is essential to enhance capacity, efficiency, and productivity by deploying modern communication technology and intermodal freight transportation systems, by establishing inland ports like rail ICD, dry port, RIC, and inland transport infrastructures, by increasing annual budget allocation for port development, and through the use of modern computer technology. To finish, port (Saha, 2015) development is essential, and it needs to apply in Bangladesh, where Chattogram Port is vibrant in leading this, because of its financial strength and long-time experience in port management.

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Appendix A: Qualitative research questionnaire

Q1. State one obstacle that is delaying the development of Chattogram Port. Please explain briefly.

Q2. State one potential factor of Chattogram port that will help for port development. Please explain briefly.

Q3. What do you want to see in Chattogram Port in 2050?

Appendix B: Cargo handling status of Chattogram Port

Cargo Handling Statistics of Chattogram Port (FY 2013 - 2014 to 2020 - 2021)

Financial Year	Import (in metric tons)	Export (in metric tons)	Inland (in metric tons)	Grand Total (in metric tons) other than ICD and ICT	ICD (in metric tons)	ICT (in metric tons)	Grand Total (in metric tons)	Growth (%)
2013-2014	41,960,170	5,338,377	5,833,786	53,132,333	445,218	--	53,577,551	7.33
2014-2015	48,941,406	5,839,986	6,469,673	61,251,065	474,800	--	61,725,865	15.21
2015-2016	58,324,786	5,971,634	6,366,607	70,663,027	493,360	--	71,156,387	15.28
2016-2017	66,464,285	6,709,759	6,330,639	79,504,683	477,836	--	79,982,519	12.40
2017-2018	78,050,447	6,997,465	7,429,082	92,476,994	446,234	--	92,923,228	16.18
2018-2019	82,939,731	6,846,406	7,761,749	97,547,886	515,245	177,524	98,240,655	5.72
2019-2020	87,275,248	6,645,145	6,965,977	100,886,370	489,124	189,777	101,565,272	3.38
2020-2021	**99,240,759**	**7,368,064**	**6,410,181**	**113,019,004**	**504,175**	**206,194**	**113,729,373**	**11.98**