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The Role of Chittagong Port Authority to Develop Other National Ports in Bangladesh to Provide Maritime Logistics Support in South Asia

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ABSTRACT

Chittagong Port is the principal seaport in Bangladesh that has contributed to the national economy with the opportunity to be a world-class regional port in South Asia. Cooperation among the three national ports Chittagong, Mongla and Payra is essential to do maritime logistics business in the region after serving the nation proudly. Here, Chittagong Port Authority (CPA) has the opportunity to help others in the process of port development for increasing efficiency and productivity by providing financial and technical assistance because of its financial and technical capabilities as a pioneer seaport in the port world. This paper examines the role of CPA to bolster and develop the underutilized Mongla Port and newly established Payra Port, where qualitative research methodology is applied to explore the ways, by which CPA can assist, link and integrate with others effectively, especially in developing the port infrastructure and inland transport networks. In addition, the research found the prospectus of Mongla and Payra to supply port services to the neighbors India, Nepal, and Bhutan as well as serve the South-West part of China with the aim of increasing regional connectivity and promoting international trade in those basically landlocked areas and countries of Asia.

1. Introduction

Chittagong Port is the principal seaport in Bangladesh that has contributed to the national economy with the opportunity to be a world-class regional port in South Asia. Cooperation among the three national ports Chittagong, Mongla and Payra is essential to do maritime logistics business in the region after serving the nation proudly.

Here, Chittagong Port Authority (CPA) has the opportunity to help others in the process of port development for increasing efficiency and productivity by providing financial and technical assistance because of its financial and technical capabilities as a pioneer seaport in the port world. Maritime logistics and port connectivity are playing important roles in promoting regional economic

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development that is closely associated with the efficiency and quality of shipping and port activities ^[1]. Ominously, Bangladeshi seaports are not yet considered efficient by the global standard in terms of technical or non-technically especially operational efficiency, infrastructural bottleneck, backward transport networks, poor information technology usage, financial delay in investment and poor port management ^[2]. Mention that the strong relationship between the port and port city or city is weakening both in economic and geographical terms ^[3]. Moreover, a port is the heart of the transport system to interfaces among various transport modes to enhance connectivity to their hinterlands and forelands ^[1,4]. In essence, port development is required in Bangladesh for facilitating the domestic import-export trade and supporting the South Asian region for economic growth and trade development that will be treated as a maritime transport business.

This paper started with a special discussion on “Country moves with us” where the importance of port facilities for Bangladesh is described and then turned to the next section of research methodology where qualitative research methodology is followed to get the empirical reflection of experts on port management. After that related works of kinds of literature on port performance, competitiveness and governance stated with short literature on South Asian maritime transport system, including Bangladesh’s port facilities, intermodal freight transportation and inland transport networks for understanding gaps in the literature for developing ports of Bangladesh for increasing maritime logistics support to South Asia. Furthermore, this research attributed the statement and feelings of the respondents in the qualitative research findings section. Based on the literature review and qualitative research findings, one section was added for analyzing the role of CPA to develop all ports of Bangladesh inspired the next section for creating a regional common platform for transport connectivity. Finally, the paper concluded with the future directions that will help to extract important points for port development in Bangladesh.

Moreover, port authorities have a stake in innovation for improving operations, gaining competitive advantage, achieving and maintaining a ‘license to operate’, and finally achieving resilience against a changing environment ^[5]. This paper examines the role of CPA to bolster and develop the underutilized Mongla Port and newly established Payra Port where qualitative research methodology is applied to explore the ways by which CPA can assist, link and integrate with others effectively, especially in developing port infrastructure and inland transport networks. In addition, the research found the prospectus of Mongla and Payra to supply port services to the neighbors India, Nepal

and Bhutan as well as serve the South-West part of China with the aim of increasing regional connectivity and promoting international trade in those basically landlocked areas and countries of Asia.

2. Country Moves with Us

Chittagong port has the slogan of “Country Moves with Us” which featured its importance in the national economy and social responsibility to all citizens of Bangladesh. Driven in particular, Bangladesh is moving forward with the performance of Chittagong port inevitably. Most of the import-export trade of Bangladesh is performed by seaports where Chittagong port is managing more than 90% of trade and the country is dependent on the performance of Chittagong port. Brightly, the Chittagong port master plan researched by HPC (Hamburg Port Consultancy) projected the container traffic in 2.7, 4.4, 5.1 and 5.4 million TEUs (Twenty feet Equivalents Units of Containers) for the years 2020, 2025, 2030 and 2040 respectively that will be doubled within the next 20 years ^[6]. From the research of Kharel ^[7], it is found that Nepal and Bhutan are striving to get reasonable port access in South Asia where they are paying 42% excess cost with the penalty of a time burden for using the ports of India. Here, they are using the congested and inefficient ports of India, whereas Chittagong and Mongla ports of Bangladesh are potential alternative ports for them. Moreover, freedom of transit is appreciated by all in South Asia, especially for landlocked countries Nepal and Bhutan to access Bangladesh markets and seaports predictably. Furthermore, the opportunity remains for China, India and Myanmar to use the ports of Bangladesh to decrease the transport cost and develop their countries’ dark areas that are basically landlocked or undeveloped.

In order to handle all modes of transport, both coming from the sea or hinterland, it is crucial to develop a port in which the speed of handling is set at the highest level ^[8]. he most important value-added and investment level in port-related manufacturing and logistics support by creating space in the supply chain to show better port performance ^[9]. If there is no cooperation between the actors in the port community, the assessment of rates on performance could not be generated and may not be useful in the process of port development ^[10]. In this situation, as a leader and pioneer in port management, CPA has to show the path to other national ports to increase productivity, compete with others and enable maritime transport as a part of port governance in the modern world. To unfold, ports have to serve the nation together where port cooperation is appreciated because the fate of the nation is highly dependent on the import-export trade where the country is moving forward with the best perfor-

mance of port superciliously.

3. Research Methodology

Social research is a collection of methods and methodologies that needs to apply systematically for producing scientifically based knowledge and it's an exciting process of discovery where persistence, personal integrity, and tolerance for ambiguity are required to complete the research successfully^[11]. Preliminary, to analyze of the basic two research questions (*How CPA can play a vital role to develop underutilized Mongla Port and newly established Payra Port? How CPA can assist, link and integrate with others effectively?*), followed the qualitative research methodology of Neuman^[11], and followed the field research for taking the interview with people acting in the research area. Finally, qualitative research methodology is applied to get the real thought of the actors who are related to the performance and motion of the Bangladesh port sector. The qualitative process always strives the get new things or innovations from the respondents that will contrast with the literature review and secondary source information appropriately.

Extraordinarily, UNCTAD (United Nations Conference on Trade and Development) published its first research paper on "Port Cooperation" in 1996 where cooperation between ports within the country or region had attributed highly and to date this paper is the great direction for ports in managing their activities by providing or getting helps each other. This paper is the main document in selecting the areas where CPA can work with other national ports for bolsters own capacity and guide others on how to bring the standards like a CPA to attract port users and international traders. In this connection, three major indicators are chosen for this research which are port performance, competitiveness and governance and by increasing the international standard level of those indicators, it is possible to provide maritime logistics support nationally, regionally and internationally.

Furthermore, CPA has to play a vital role to support Mongla and Payra with the aim of developing their capacity based on the literature of UNCTAD^[12] and extracting the below types of cooperation in developing the overall port sector of Bangladesh.

1) Institutional. Arrange to support other ports by inspiring governments, international development organizations like ADB (Asian Development Bank), AIIB (Asian Infrastructure Investment Bank), World Bank and others exclusively for capital investment in the port infrastructure, equipment purchase and facilities development.

2) Industrial. Organize other ports and group with international associations like IAPH or regional port as-

sociation in getting technical assistance and emergency troubleshooting.

3) Commercial. Guide how to negotiate with the international investor for long-term investment in the Bangladesh port sector and show how they will be benefited from this investment gradually.

Overall, in addition to secondary literature review including the UNCTAD^[12] research paper, qualitative research methodology was applied to know the role of CPA in cooperating with others for serving South Asia by providing integrated maritime logistics support efficiently and economically.

4. Limitations

The related experts who are in driving positions as port users, traders and port authority representatives, all replied that research is essential to develop the port sector of Bangladesh. But nobody is interested to provide answers officially. That resulted in a small sample size in qualitative data collection (21 out of 60 which is only 35%). In addition, it was not possible to quantify the amount of investment by CPA to other national ports such as Payra and Mongla also inland terminals PICT (Pangaon Inland Container Terminal) and Dhaka rail ICD.

5. Literature Review

To follow the research methodology, the port cooperation paper of UNCTAD^[12] is reviewed to find out the gaps in port development. The basic approach of this research is to develop the port sector of Bangladesh by using the performance, productivity and strategic position of Chittagong port. The direct literature of Chittagong port is rare where related literature is attributed accordingly. Mention that port development is not increasing land and other facilities, it is crucial to attracting the port users by showing that port authority increased the land and others by creating synergies in developing connections in the port clusters^[13]. The issue of competition and cooperation among the various players is always important in the cost-profit trade-off involving risk evaluations in port management. In some geographical contexts, the researcher found the tendency toward cooperation between ports is both organic and part of a deliberate strategy to promote competition within a shared hinterland^[17]. The literature review mainly focused on the three basic indicators which are port performance, competitiveness and governance discussed one after another.

5.1 Port Performance

The requirements for seaport services are growing

day by day to cope with the increased demand for cargo and information flow ^[14]. As container traffic keeps growing and physical expansion is constrained by the limited supply of available land around most ports, port facilities will need to become more productive if they are to remain competitive where assessing how ports perform is useful not only for transport planning but also for informing port management, policy, and regulation ^[15]. In addition, Cariou et al. ^[16] addressed the challenges in cargo handling operations particularly in a container that needs of going beyond ports within their seaport activities. Mention that the port reform initiative helped some countries with their significant improvements in port performance whereas others are re-thinking or yet not started the process because of its complexity and adjustment over time ^[17,18]. Port productivity and performance are related to the effectiveness of the supply chain as a whole where ports and users can take advantage of complementary strategies and capabilities to improve the port performance technically ^[19]. In the empirical analysis, Zhao et al. ^[3] provided their concept on the port characteristics where maritime connections, hinterland connectivity and port efficiency are the major variables in port networks. Talley ^[20] concluded that technically efficient optimum throughput, cost-efficient optimum throughput and effective optimum throughput are the economic objectives of a port that will satisfy all stakeholders of a specific port.

In the context of port performance, Dappe and Suarez-Aleman ^[15] identified three major viewpoints which are operational, economic, and financial. Here, the operational perspective refers to the quality of the outputs provided in port services and facilities efficiently and timely. After that, the economic angle takes into account factors such as the mix of inputs used, the technology used to transform inputs into outputs along with the port's productive scale. Twofold objectives of the port are strategic productivity and growth that are related to efficiency and expansion of the port performance respectively ^[10]. Lastly, the financial perspective addresses the mix of financial resources and profitability indicators. However, ports are complex places where performance is influenced by many factors including size, location, ownership, infrastructure, facilities, and others, but people or human resources are the most vital resource to get optimum performance ^[21]. In addition, smart ports always adopted smart people to show their efficiency in port operations and management. Throughput volumes are the main indicator in measuring port performance in the port industry, but it is not the regional economic impact of the port and its attractiveness to the port-related industries in the region ^[9]. A port may reduce time-related costs by reducing the congestion and

turnaround time of the vessel that processes the quality of the port service as a part of port performance, in general ^[20].

5.2 Port Competitiveness

Port competitiveness has focused on the analysis of specific services rendered by ports or port activities where actors are involved often motivated by opposing interests and non-convergent objectives ^[22]. Historically, port authorities were created at the national or regional level for integrating the port activities and also for port development ^[17]. The port authority is a part of port community that is composed of a set of actors that are related to logistics lines and also lead and drive the port community ^[10]. Hales et al. ^[23] showed the significant effects of five variables of Volume Competitiveness (VC) and Investment Competitiveness (IC).

Identification of drivers of port competitiveness and identification of together with the measurement of the drivers in economies of scale in shipping especially being proactive in making hinterland strategies by port authorities, governance changes in framework and management level of port authority, degree of competition for attracting customers and investor, inter-firm networks in building relations between local and international stakeholders and in the aim featuring green and sustainable port planning efficiently ^[24]. The variables that are stated by Hales et al. ^[23] in Figure 1 and Parola et al. ^[24] in Figure 2 are common factors that need to consider by all for port competitiveness and taking the initiative to develop and compete in the business rivalry of the port sector in the South Asia or Bay of Bengal.

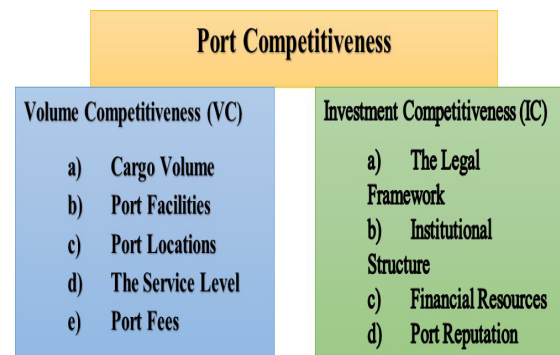


Figure 1. Port competitiveness ^[23].

5.3 Port Governance

The port policy generally and port governance more specifically reflected the changes in government and politics within a nation always ^[17]. Public port authority acts as both landlord and regulatory bodies where port operations are performed by private companies denoted as the best

model of port governance^[18]. Port governance always increased the port's effectiveness and competitiveness in the change of port management. The change in governance structures constitutes an important pillar in view of the achievement of sustainable development of ports including economic, social and environmental challenges. A port that was denoted as major engine for driving economics is a significant lever for governance to manage trade and catch economic benefits nicely^[25]. With enormous containerization of maritime cargo, the container port industry is very competitive in serving the hinterland by filling all kinds of demands where South Asian countries' port tariffs are reasonable, but associated cost or indirect costs with the port tariffs are very high where inefficiencies play a more significant role in shippers' port choices^[15]. Extension of ports often failed due to the lack of attention to the potential negative environmental impacts^[8].



Figure 2. Drivers of port competitiveness^[24].

The intermodal transport development has a great impact on further economic globalization that changed the overall transport system and supply chain where functional integration is impossible without intermodal transport chain^[26]. Nowadays, ports are facilitating intermodal transportation directly to the shipper/consignee as a part of integrated maritime logistics support and increasing the hinterland. National and regional interests, as well as those of port cities, are often at odds with each other. Most importantly, the inland transport network is an obstacle by the government on the false plea of safety, security and religious politics^[27,28]. Lastly, due to the ongoing commercialization of port authorities and the progressive pressure of stakeholders, port performance

indicators are in new shape with the socioeconomic interest in a port^[9]. Consequently, port authorities are in charge of hardware dimensions of port development for ensuring and enabling efficient management of supply chains through policy actions that should be aimed at improving infrastructure and inland connections by keeping the criteria of environmental, social and economic sustainability to promote the hinterland and ensure^[22]. International organizations like the IMF (International Monetary Fund), and World Bank believe that South Asia presents a bright spot amid the gloomy global outlook^[29]. In Bangladesh, Chittagong and Mongla ports are managed by port authorities where major approval authority is the Ministry of Shipping under the government where CPA exercises a high-level degree of operational and financial autonomy^[15]. The South Asian port sector attracted significant interest from private investors in the late 2000s. Development of port facilities at Chittagong Port Bangladesh's largest port has been slow. Although occupancy at the CPA container berths is high and rising, there is a pressing need for more investment in a capacity where Mongla has had excess capacity for many years^[15]. Intermodal freight transportation is lagging behind in Bangladesh and there is no established intermodal network except the Chittagong-Dhaka container transportation with the general rail network. Recently added the RICT (Riverine Inland Container Terminal) that named "Pangaon" in Dhaka but it also handling in Chittagong port yard. Ports are an integral part of the supply chain for managing and coordinating the materials and information flow^[14]. Despite the predilection for promoting port privatization, full privatization has not been without its problems and critics^[17]. Due to the complexity of seaports and the large number of firms in a port, port performance indicators are useful to measure whether the development of the port is satisfactory or not and learn how to improve the performance also communicates the performance of the port to a wide range of stakeholders^[9]. To enhance the capacity of a port management, it is essential to strengthen the networks of the Hinterland exclusively. The development of the global supply chain bounded to change the traditional role of ports (Loading and discharging operations) and enhanced the capacity to a new role as efficient distribution of products across the supply chain and integrated logistics service providers as a part of the global distribution channel^[19]. Port investors always look forward to tying with the port cities to get all kinds of logistics facilities and security for supporting the maritime trade because port-city relationship exhibits substantial significance in the development of port by attracting international investor and their hinterland while

also sufficient spatial economic disassociation and environmental tension^[3]. Talley^[20] advised considering the operations, economic and port management objectives in port performance.

In summary, the above-mentioned literature demonstrated the port performance, competitiveness and governance are appreciated in that port development to build strong relationships among the stakeholders by port authorities. In addition, the intermodal network is very weak in Bangladesh and South Asia, for this reason, Bangladeshi ports are unable to expand their hinterland and go to the neighboring area's in the lack of regional cooperation and desire for transport integration among the South Asian countries apparently.

6. Qualitative Research Survey Findings

The five main basic research questions are guiding this paper as the theme of the qualitative research survey with the aim of open-ended questions. In order to explore per questionnaire, 21 interviews were conducted from June 2018 to August 2018. After field testing and setting the research questions, an invitation was sent to 60 persons who are experts in the shipping field, port management and port users. Here, questions are asked to the respondents with the aim of acquiring knowledge on port development in Bangladesh as below:

6.1 Role of CPA in Developing Other National Ports

Possibly, the existing development status of Bangladeshi ports where the role of CPA is appreciable because of their participation in establishing the third seaport Payra and full finance in constructing the inland riverine container terminal "Pangaon". However, the role of CPA in logistics and supply chain is very crucial in terms of efficiency, competitiveness and value-added productivity. The port has a congestion problem where vessel turnaround time is comparatively high. However, the technique of handling cargo and containers by expert persons of the port authority is appreciated by the port community of the world. There are lots of opportunities for CPAs to work in the port and maritime logistics parts especially in the development of Rail, Road, Inland waterways, Coastal, Airport and time-trend.

Mongla port is the underutilized port in Bangladesh where the government established a new seaport Payra to facilitate the demand for deep seaports as well as serve the neighbouring countries of South Asia especially Nepal, Bhutan and Seven sisters of India. It is argued that financial, technical assistance must be provided to other seaports for the development and as a part of corporate so-

cial responsibilities, in addition, to the exchange of human resources and deploying them in other ports for training and develop the employee of Mongla and Payra ports. All respondents advised them to CPA for taking leadership in developing the port sector and provide financial assistance to other ports from their profit and contingency fund also arrange finance from a financial institution or government to invest in the port infrastructure, purchasing equipment and other development works by which other ports can show the productivity and attract users.

In addition, CPA is technically sound in managing port operations, vessel management and port affairs where they can assist other ports by giving technical assistance for increasing efficiency. One respondent suggested that CPA must create the environment and situation by liaison with the government and private sector for developing other national ports for captivating the continuously growing volume of freight and container and need to think together.

6.2 Integration among the Seaports of Bangladesh

This is the time to integrate all seaports of Bangladesh and decrease the dependency on Chittagong Port where CPA has to play a vital role to develop all seaports. Respondents were tensed about the labour productivity, performance of equipment and wretched condition of roads and highways, poor railway connection, etc. They thought that CPA has to work on the quick development of all ports to cope with the containerization and mechanization of ports with the port hinterland freight distribution system and support the foreland by establishing a floating terminal in the Bay of Bengal. In addition, they appealed to the government to consider port planning and development as a priority activity to facilitate all trades in the country.

Moreover, integration is highly required to fulfill the standard demand of OBOR (One Belt and One Road) and competition may be raised among the seaports of Bangladesh, India and Myanmar enthusiastically, therefore, integration among the ports of Bangladesh is appreciated to help each other in the process of development. However, the need to comply with the basic goals of various forums like *BBIN (Bangladesh-Bhutan-India-Nepal forum for transport connectivity)*, *BCIM (Bangladesh-China-India-Myanmar forum for Regional Cooperation)*, *BIMSTEC (The Bay of Bengal Initiative for Multi-Sectorial Technical and Economic Cooperation)*, *SAARC (South Asian Association for Regional Cooperation)* and *ASEAN (Association of Southeast Asian Nations)* etc. Lastly, all claimed to set the deep seaport in Chittagong and initiative must be taken by the management of CPA.

Overall, all respondents discussed that the integration of all seaports leading by Chittagong Port will make a chance to provide transit facilities to the neighbours by rail, road and river. In addition, CPA will finance the inland connectivity infrastructure cost where a good port transport network will be developed and respondents were optimistic about the process of port development. Mention that this transit issue is forecasted as derived demand of using Bangladeshi seaports, especially by India, Nepal and Bhutan^[30,35] as per Figure 3.



Figure 3. Inland transport connectivity and the role of Chittagong Port as a development partner of other national port Mongla and Payra^[30].

6.3 Challenges in Developing the Port Sector of Bangladesh by CPA

It is not easy to develop the port sector by CPA as Bangladesh is facing huge obstacles in developing the port sector. Latest experience in setting deep seaport in the Sonadia. Most of the respondents argued that CPA is facing huge challenges in developing the port sector of Bangladesh. Recent participation in building the inland container terminal “Pangaon” nearby the capital city Dhaka is appreciated by all, in addition, to direct involvement in establishing the 3rd seaport “Payra” in 2013. However, CPA is facing challenges in developing its own capacity

and striving to increase the container jetty, terminal and handling equipment. Furthermore, the below challenges are discussed arguably.

Respondents found too many challenges in developing the port sector of Bangladesh and stated as below:

- Geopolitical and foreign policies are affecting to take strategic decisions in the port development of Bangladesh especially negative approaches of neighbouring countries by which deep seaport construction is delayed and not sure of its finance in the Bay of Bengal.

- Poor quality of roads and highways along with old models of trucks and trailers that consume passage time also environmental degradation by CO₂ emissions highly.

- Shortage of liaison among the port authority, City Corporation and city development authority to make common development of Chittagong port.

- An inefficient transit regime with a lag behind transport infrastructure and not having the future trade forecast for the region and country that is not facilitating or increasing the cargo and container handling capacity of Bangladeshi ports individually.

- Research on port development regarding Bangladesh and South Asia is fully absent and undermined for a long time and not considered by all where ADB is trying to forecast some data and related research is conducted by the World Bank on a minimum scale.

- To create synergies in the port sector by making common standards for all ports and rendering guaranteed reliability to port users.

- There is no benchmarking statistical data for the port authority to take a decision on how much development is required in terms of infrastructure and others and the port has to follow the full government process of procurement that time bounded.

- Continuous pressure on CPA for managing all cargo and containers where other ports are under-utilized. In this connection, cooperation from the government, port users and others is limited to divert the vessel or container in an alternative way.

- The political will of the government in the port development and consideration of development projects and finance over there as the government has to perform in all cases.

- For environmental sustainability, priority may be given to the intermodal instead of multimodal that pollutes the environment and need to use various modes of transport at different points or nodes. In addition, internalization is a great challenge to face congestion, local pollution, accidents, GHG & CO₂ emission, energy efficiency, etc.

➤ The desire of neighbours and world port investors for capital investment and making a regional port in Bangladesh where Chittagong is viable in all aspects.

➤ Development of a rail transport network with spatial transportation and introduction of a Double Decker container transport line between the major cities of the country.

➤ Full privatization of port sector or develop the port under the banner of PPP (Public Private Partnerships) to reduce the pressure of capital investment by port authority.

The most important statement received was “every challenge is achievable subject to the dedication of all port authorities and positive approach of the government by putting the port sector in their political circle”. Forecasting the increase in port throughput, due to infrastructural enhancement, is a major challenge for many different reasons.

6.4 Sustainability of Port Sectors in Bangladesh

The experience of CPA will help to take national approaches to sustainability in the volatile port sector and the role of government is highly appreciated. “Port Cooperation” is the main theme of port sustainability that may exceed from the national boundary to abroad by making liaison with neighbours ports or international forums of the port authority or associations. The turnaround time of an incoming vessel in Chittagong port is very high in South Asia but the average performance in managing container vessels is good. But there are some records of collapsing the total supply chain of the port that is harming the brand name of Chittagong Port as well as the country. Due to the breakdown in managing container flow, ocean freight is increased by the international carrier unjustifiably. On the other hand, CPAs are used to manage such a crisis from their vast experience in the port sector. Critically, the bad performance brought negative opinions in the mind of respondents where they argued for good port management by experienced people in Chittagong port and suggested making contingency or backup plans for avoiding such situations that bound to pay extra for the port users unexpectedly.

Respondents described the worst situation of Mangle port and its authority (MPA). They found an idle and unskilled person who is managing the port only by name without adding any value-added service to the port users. Several times, the government had taken necessary initiatives to bring efficiency and attract the business community to use the port at a minimal tariff, but due to poor category service, interest in Mongla port is uncertain. Most of the respondents were advised to take over the

MPA by CPA and manage accordingly. To sustain the current trends of port activities, respondents suggested taking a long-term development plan and may lease the Mongla port to the international terminal operator who will handle the operations as well as manage the customer by fixing the hinterland. Environmental sustainability is a growing concern of the port industry and needs to promote inter-modal transportation, which is environmentally friendly and make long-term sustainable development of the port in developing energy and operational efficiency plan at the port yard and inland transportation. All appreciated the steps by CPA for taking Carbon Tax from vessels under the port-protected areas of CPA.

6.5 Inland Transport Networks Development

Two important issues are key factors in port development, one is inland transport network development and another one is specific IFT (Intermodal Freight Transportation) system development for facilitating the inbound and outbound freight by applying just in time approach. Greatly, 21 respondents argued for road modes for developing inland transport networks in Bangladesh urgently where CPA may play a vital role in assisting the government and other port authorities by providing financial assistance or arranging finance for inland transport network development by using the surface or spatial transportation rather than choosing rail and waterways modes exceptionally as the road is speedy transport mode in Bangladesh till date.

All respondents favored the urgent development of roads and highways because congestion and passage time are very high which resulted in high freight for sending cargo to the port and vice versa. In addition, the intermodal freight transportation system will not be implemented without the good condition of roads and highways. After that freight rail network development is a priority area where CPA is able to invest in starting the Double Decker container line from Chittagong port to Dhaka and inspire rail authority in constructing a dedicated rail track for freight transportation as rail is cheap and safe transportation system and suitable for intermodal transportation. Lastly, they argued for inland waterway transportation and are happy to know that the container is transported by waterways from Chittagong to nearby Dhaka.

For better utilization of existing trucks and trailers, it is of utmost requirement to renovate all roads and highways with bridges and culverts. Emphasize given on the access roads to ports and major cities and industrial areas. Most of the respondents deliberated their opinion on transit facilities to the government and stated that the present condition of road and highways are not suitable to provide

such facilities to anyone. Even so, it is hard to mitigate the domestic's demand for port transportation facilities to cover all import-export trade timely. One respondent stated that only for bad road communication, Mongla port is underutilized. Therefore, need to invest in the infrastructural development of roads and highways where CPA may invest to create better facilities to/from the access port easily.

CPA has its own ICD (Inland Container Depot) in Dhaka and the container is in operation from Chittagong port to Dhaka and respondents are worried about the time that is taken by the rail hugely and not appropriate in container transportation. For any container transportation, it is taking 5 to 6 days whereas road haulage time is a maximum of 2 days. Overall, current rail transportation is not feasible for all and needs to improve the freight rail networks. Furthermore, we have the best connection to inland waterways. The recent development of RICT nearby Dhaka and the opening of the door to private investors for constructing private RICT may improve inland waterway transportation. Some respondents argued for common transport networks in three seaports to exchange the equipment and preserve special funds for emergency response in a breakdown in any ports and quick renovation of inland transport networks. In addition, for smooth operations of break-bulk cargo in the Bay of Bengal, a quality coaster or inland vessel is required to decrease the turnaround time and it is essential to establish a floating terminal for avoiding multiple handling of cargo & containers in the port jetty. It will attract coastal shipping among Asian countries and direct entry to the inland terminal. Some of the respondents attended in the open-ended questions where they suggested CPA take full responsibility to build an integrated intermodal freight transportation network of road, rail and inland waterways for domestic container transportation and establish a dry port nearby cross-border to provide maritime logistics support to the neighbours for doing "Transport Business" and arrange same for other national ports.

7. Compare and Contrast

With the aim of developing seaports, many governments created port authorities especially to progress the port development commercially^[13]. Based on the literature and qualitative research survey, the below points are considered to bring the standard of maritime logistics of Bangladeshi seaports with the aim of serving nationally, regionally and internationally: The shipping industry is showing the potential to improve the energy efficiency that started from ocean passage to shipyard (terminal, jetty and other places) and it's a part of port performance in

the present world^[31]. Another factor that is influencing the port authorities to inspire the shipping companies to use natural gas (LPG-Liquefied Petroleum Gas, LNG- Liquefied Natural Gas and others) instead of fossil fuel. To cope with the challenges and opportunities of the 21st century Maritime Silk Road for better connectivity and economic cooperation, it is essential to develop the country itself to stay in the Bay of Bengal meaningfully and had the opportunity to serve the landlocked region, India's northeast, China's southern, Nepal and Bhutan that would be the value added to the regional development and economic growth^[32].

In Figure 4, Bangladeshi seaports are well connected with the regional hub port Colombo, Sri Lanka, Klang and Tanjung Pelepas of Malaysia and Singapore. This research found the opportunity to stay within the region which means tagging with Chennai and Visakhapatnam of India, in addition to Colombo, Sri Lanka. Strategically, it will increase the regional bonding in South Asia and open the opportunity for Indian ports for using Bangladeshi seaports as a maritime load center for Seven Sisters of India, Nepal and Bhutan. As India is a good development partner of Bangladesh and is interested to use Chittagong and Mongla Port for their basically landlocked parts, it will be a great opportunity for Bangladeshi ports for developing port facilities through the leadership of Chittagong Port actively.

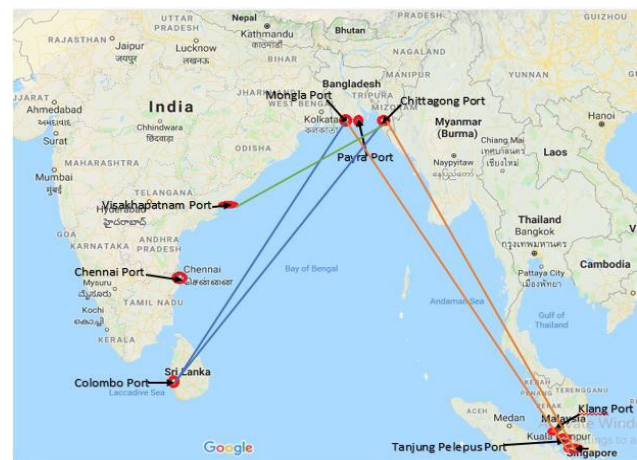


Figure 4. Foreland connectivity of Bangladeshi seaports developed by the author. Map was taken from Google^[33].

Alam^[28] stated that Bangladeshi ports are able to serve as the gateway to reach the landlock Nepal & Bhutan, India's seven sisters for facilitating global trade. Moreover, he added that subject to port development, it is possible to connect ports with Southern China and it will be the great one in between the overland surface road and maritime Silk Road. Environmental sustainability in any seaports that need innovation where research is required to make it

successful. Safety and security are great concerns for hinterland operations by ports where the port has to clear all the obstacles for attracting the port users or traders within the established hinterland^[34]. However, to overcome the challenges and problem areas will need the political will to facilitate the changes because the government is continuing to fight financial fires and ports are perhaps not a key priority in many cases^[17]. Overall, structural, operational and organizational changes are required for strengthening the capacity of CPA to build the port sector from the viewpoint of port performance, competitiveness and governance.

Finally, Chittagong port has the first mover key advantages in the Bay of Bengal or South Asia to provide maritime logistics support and offer free access to all where port development is essential. Developed ports added some new indicators like emissions of greenhouse gases, investment flow and economic impact of a port but remember that depending on the port structure, different performance indicators are relevant for different ports^[9]. The concept of integration in the port sector is highly concerned with the intermodal activities that focused on the conditions of efficiency and effectiveness of intermodal container transportation, and organizational integration that is undertaken by foreland & hinterland connections^[22]. Lastly, activities, resources and inter-organizational relationships between the players in the network are critical and essential to the port's value created by port development. A successful growth strategy for South Asia would need to rely on a balanced, multifaceted approach in a dynamic global environment^[29]. This is due to negative outlook for ports and existing operating environment is really competitive, risky and mired in slower growth. This is true that port infrastructure is still relatively backward and not in a standing position with the internationally developed port standard comparatively. Greater uncertainty in the operating environment, governing policy, and sufficient infrastructure development to make a model port in South Asia, still Chittagong port is lagging behind accordingly. In this connection, it is a good way to develop other national ports and divert the cargo and container to reduce the pressure towards CPA. Overall, port development is essential and it may be done by CPA or the Bangladesh government urgently. Here, trade forecast, regional development and recent institutional cooperation are the national and international pressure to develop Bangladeshi seaports inevitable and urgent.

8. Regional Common Platform for Transport Connectivity

South Asia is an important place for moving business

trends to Asia where the location of Bangladeshi seaports is important strategically and a key factor for all to do foreign business as well as export and import trade profitably. Port infrastructure development is highly important to regional economic development^[13]. For a common platform in providing seaport access to all in a specific region, it is important to cooperate with each other irrespective of profit or port rivalry where it may be treated as social responsibility. Goals are too general to provide sufficient directions for the authority and reform as and where required and increase the ability to safeguard the public interests of the country and region proudly. The absence of transit agreements for a long time among South Asian countries fractured the regional integration process^[28]. In addition, underpinning all trends of greater devolution, privatization and communication and approaches the desire to govern ports in a way that makes them more profitable and efficient, and, increasingly, a way that makes them more sustainable and greener^[17].

Bhatta^[36] examined that regional economic integration depends on the commonality of the political purposes of the member countries where India has to favor and sacrifice to all for emerging as a regional entity in the international political system. However, a recent initiative of India and Bangladesh in developing transport connections in the region is moving ahead toward increased regional participation in trade and commerce^[28]. In relation to improving the global transport system, the availability of transport operations contributes to the value creation for accomplishing the qualitative attributes of demand such as reliability, punctuality, frequency, availability of infrastructure and security^[14]. To assess the disruption risk of Asian ports, Lam and Su^[37] identified that climate change, oil spills, security and social and political instability are increasing the concern to all. As trade volumes are growing significantly, port disruptions are comprehensive studies for putting operational performance. A reliable freight transport system is essential for the modern world economy where marginal supply chains are involved with seaport activities greatly^[37].

Overall, the regional common platform for transport connectivity highly depends on two factors: The openness of India to open the so-called "Chicken necks" land connection among India, Nepal, Bhutan and Bangladesh that will allow getting free access by all including China and Myanmar; another one is the free access opportunity in Bangladeshi seaports subject to the development of inland transport networks by Bangladesh.

9. Conclusions

Chittagong port is the principal seaport of Bangladesh

managed by the CPA and is able to serve all modern seaport facilities to the port users for driving above 90% import-export trade of Bangladesh^[38]. Port authority in leading leadership roles sets the larger role for terminal operators who bear the market's considerable risk and face the demands of an increasingly stringent environment regime^[5]. Bangladesh acutely needs the deep seaport in the Bay of Bengal to increase the supply side against the increased demand for port facilities, in addition, to supporting the neighbours or region for doing port transport business as a part of economic sustainability^[32,35]. Historically, the port is the entry point of international trade for a country that helps to attract the international trader to do business and it's a key logistics performance indicator. A recent development in port sector is containerization and mechanization, and the port has to set as per new dimensions that are required by international shipping company and terminal operators. In this context, De Langen and van der Lugt^[13] argued from the operational perspective of public sector port authority for promoting general interests the port operations handled by third parties are a part of port development. Nowadays, port authority is an increasingly commercial role to bring the developer or work as a port Development Company due to the containerization and mechanization of port activities also developing inland connections with the urban cities and major industrial areas.

Remarkably, the continuous changes in the international maritime transportation and further movement of cargo and container towards the hinterland, structured the total transportation solutions to the port users, traders and stakeholders accordingly. Due to poor connection between the Bangladeshi seaports and hinterland as well as inadequate standard port facilities of Mongla port, Chittagong port has to manage the excess pressure of freight and face challenges in providing maritime logistics support to mitigate the demand of domestic port facilities where opportunity remains to serve South Asia by using the geographical advantages or positional standing in the Bay of Bengal greatly. This paper aimed to explore how CPA assists other national ports and port infrastructure that will be developed with the port efficiency and productivity and all ports will serve the nation equally against the domestic demand of maritime logistics or port services. In line with such motivation, Mongla and Payra will develop accordingly to supply port services to the neighbours India, Nepal and Bhutan as well as serving the South-West part of China with the aim of increasing regional connectivity and promoting international trade in those basically landlocked areas and countries of Asia. Overall, future directions will help to CPA for playing a vital role in port

development and related infrastructure development in Bangladesh for doing "transport business" in South Asia.

10. Future Directions

On the basis of the literature review, qualitative research survey and innovations for the seaport, research attributed the below future directions for port sectors of Bangladesh as well as for CPA that will help them in the process of port development in Bangladesh:

1) Bangladesh is the only country in the Indian subcontinent in which the private sector does not play a meaningful role in the container port sector^[15]. Therefore, port privatization scope needs to inspire or utilize and make joint ventures with local and international investors in the port sector as a cheap way to develop the port economically.

2) PPPs model has advantages in funding where ports are able to build and updates the assets such as handling equipment, container storage facilities, channel dredging and others including infrastructural development^[23]. To attract international investors in the port sector, it is good to appoint international terminal operators. Nowadays, terminal operators are managing not only the terminal but also managing the customers of the hinterland and increasing the hinterland by offering various port services at an affordable price.

3) Port users are always thinking about the port facilities, but it is also a factor in selecting port that has good inland transport connections with the shipper/consignee premises. Thus, emphasis should be given to the inland transport network development.

4) Most of the containerized cargo is managed at the dry port and must have a rail network to connect between the port and dry port, in addition to a road connection. Bangladesh has to build dry ports with smooth inland connections with ports in major cities for domestic cargo and in cross-border areas to serve the neighbours.

5) Having the opportunities to provide maritime logistics support, Bangladesh has to open the door of ports and promote regional connectivity in the transport sector.

6) Government has to follow up the Logistics Performance Indicator (LPI) of the World Bank and must take necessary reform initiatives to increase the value of LPI for attracting the world trader to do business with Bangladesh and use the Bangladeshi seaports in the competitive port tariff.

7) Geopolitics is a problem for investment in the port sector where India and China is a key factors to build a deep seaport in the Bay of Bengal^[32]. Government has to take a deep seaport initiative in Chittagong and share with the development partner countries for investing in the deep seaport projects.

8) With much talk, the floating crane is an innovation for ports that increased productivity and promote the modal shift for handling a large volume of containers^[5]. CPA has to take the initiative to set up a floating container terminal for handling feeder vessels towards Mongla, Payra and RICT Pangaon to save time and decrease the number of handling at the port area.

9) Maritime governance is playing a key role in developing the prestigious standing in the world^[39]. To integrate all seaports of Bangladesh, it is essential to create a maritime commission for monitoring the port productivity, governance and facilities.

10) Research is a developmental feature to focus on the gaps and necessary guidelines and directions to take initiative for future development. Research on port development is essential as this chapter is far lagging behind in Bangladesh including South Asia.

Conflict of Interest

The opinions are solely from the researcher and there is no conflict of interest with the employer **Saif Powertec Limited**. Mention that **Saif Powertec Limited** is not involved in any part of this research and is not responsible for any comments from anywhere.

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