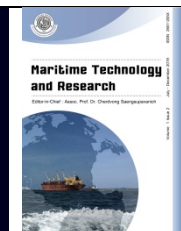




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Research Article

The role of Bangladeshi ports in developing integrated intermodal freight transportation system in South Asia

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Abstract

This paper aims to find out the role of Bangladeshi ports in South Asia for developing integrated intermodal freight transportation system to mitigate the demand of port transport in the region through container from port to inland container depot or dry port or inland container terminal even from/to shipper/consignee premises. The strategic location of Bangladeshi ports in the Bay of Bengal are lucrative for the international traders, investors and others to invest in the port industry as well as manufacturing industry to develop international trade in South Asia especially in India, Nepal, Bhutan and Bangladesh. In addition, Bangladesh has opportunity to serve Myanmar through coastal shipping and road haulage of containers. In here, port rivalry among the ports of Bangladesh, India and Sri Lanka is described to focus the importance of Bangladeshi ports also to get the real scenario of port facilities in South Asia. At the end of the paper, deep port initiative is attributed to connect with the One Belt, One Road (OBOR) initiative of China. Finally, in the view of intermodal freight transportation and port competition in the regions, future directions are stated for Bangladeshi ports to compete with others in the South Asian region.

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1. Introduction

The strategic location of Bangladeshi sea ports (known and written as “ports”) in the Bay of Bengal are lucrative for international traders, investors, and others to invest in the port industry, as well as the manufacturing industry, to develop international trade in South Asia, especially in India, Nepal, Bhutan, and Bangladesh. In addition, Bangladesh has an opportunity to serve Myanmar, through coastal shipping and road haulage of containers. In this paper, rivalry among the ports of Bangladesh, India, and Sri Lanka is described to focus on the importance of Bangladeshi ports and to describe a real scenario of port facilities in South Asia.

Service network designs are broadly described to explain the function of port authorities where intermodality extends the networks of ports from creating hinterlands, and clearing the access from ports to terminals nearby hinterlands of the further movement of cargo and containers between inland terminals and port premises.

Broadly speaking, the phase of regionalization (Rodrigue & Notteboom, 2010) provides a perspective of port development at a higher geographical scale, beyond a port’s perimeter. In addition, successful (Mathisen & Hanssen, 2014) promotion of Intermodal Freight Transportation (herein after as “IFT”) will help to achieve a sustainable transport sector, due to the low external

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costs of multiple handlings and examinations at various points. In addition, the ocean freight transport industry (Jarzemskis & Vasiliauskas, 2007) has changed its structure and operational strategy to cope with the new trends and preconditions of containerization and the rise of intermodality. In fact, globalization of the world economy and demands from manufacturing industries have created a cluster of free trade zones, and their connection to ports has changed the pattern of logistical services from port to shipper premises, or vice versa. The historic (Ghosh & De, 2001) concept of ports is of economic and physical economic infrastructures that serve in a coastal area and manage and oversee traffic. In addition, ports are subsystems of total transport networks and meeting places for all modes of transport, also supporting nearby air freight activities. Connectively, researchers (De Martino & Morvillo, 2008) viewed ports as logistical service providers who arrange necessary support services to activate the supply chain through interrogative practices that are undertaken by global players like shipping companies and terminal operators.

This paper is structured into 4 parts; 8 chapters are included to discuss IFT, and role of Bangladeshi ports in developing integrated IFT systems for connecting South Asia, with the aim of supporting maritime logistical services. Part one features the Introduction, Research Objectives, and Methodology, where the perspective of the research is attributed. Part 2 is the main portion of the research, including a Literature Review and Qualitative Research Findings. After stating the qualitative findings, one analysis paragraph is used in each section of Chapter 5 in the light of the literature review. Part 3 describes the innovation and integration of Bangladeshi ports in searching new ideas or work opportunities with other ports of South Asia; especially, the Chinese One Belt, One Road-OBOR topic is discussed in terms of the international maritime community, and deep port initiative is attributed to connect with this initiative. Lastly, in part 4, a view of IFT and port competition in the regions, and future directions for Bangladeshi ports to compete with others in the South Asian region, are given after the conclusion. Overall, this paper aims to identify the role of Bangladeshi ports in South Asia in developing an integrated intermodal freight transportation system to mitigate the demand of port transport in the region through containers from ports to inland container depots or dry ports or inland container terminals, and even from/to shipper/consignee premises.

2. Research objectives

Ports (Carbone & De Martino, 2003) play an important role in the management and coordination of materials and information flows in the transport chain, as an integral part of the entire supply chain. In the area of maritime transport, reliability and productivity are collective concepts for creating synergies to guarantee reliability, continuous services, and good productivity. This objectives of this research are threefold:

1. To identify the current situation of Bangladeshi ports and explore their opportunities in South Asia.
2. To examine integrated IFT systems and how Bangladeshi ports will develop IFT within Bangladesh and connect with neighboring countries in maritime logistics by providing intermodal services from their ports.
3. To connect with the Chinese OBOR initiative and identify the prospects of Chittagong Port as a prime maritime load center for the Bay of Bengal under the Maritime Silk Road-MSR.

The overarching goal of this study is to support maritime logistics services to the nation and our neighbors in creating intermodal facilities with Bangladeshi ports as “Maritime Logistics Services”.

3. Research methodology

This research followed the methodology (Neuman, 2011) for qualitative studies in constructing the social reality, in order to exchange cultural meaning by focusing the interactive process with a few cases. In the process of qualitative research, the researcher was involved from

the beginning of self-assessment to explore the title of the research, and followed the steps below (Neuman, 2011) to conduct a qualitative research survey and works, as per research objectives.

Table 1 Qualitative research steps (Neuman, 2011).

Steps	Activities	Results	Limitations
Acknowledge social self	By studying the related books and journals of port affairs, the author resolved to do more research on port development and IFT.	Visited Chittagong Port and identified gaps on port development.	No funding opportunities in Bangladesh.
Adopt a perspective	Intermodality is the prospective next transport system that will help Bangladeshi ports to serve the nation more efficiently.	Identified the relation between Intermodality and port activities.	Sufficient works of literature on intermodality regarding Bangladesh are not available.
Design the study	Choose the qualitative method for obtaining information from the respondents.	A field test was successful.	Limited knowledge about intermodality at field level.
Collect the data	Physical interviews were conducted at the office of respondents. Initially, research questionnaires (R/Q) were used and, where time allowed, open-ended questions were asked.	Data collected.	Time limitations during the physical interview.
Analyze the data	Data compiled and set into literature.	Research paper developed.	
Interpret the data	Compared and contrasted with the literature review. Concluded with future directions.		
Inform others	Conference presentation and journal publication.		

When visiting the ports of Chittagong and Mongla, research themes were shared with the port authority staff and experts in the shipping sector. After that, R/Qs were designed and field tested by interviewing one shipping expert in Chittagong. Finally, 5 questions are put in the qualitative research survey R/Q, with the opportunity for open-ended questions during physical or telephonic interviews of obtaining new ideas related to the research topic. In order to explore the R/Q, 6 interviews were conducted between December 2016 and May 2017. Meanwhile, the R/Q was sent to experts in the area of shipping, transport, and logistics at home and abroad; 1 answer was received through email, and 5 telephonic interviews were performed before June 15, 2017. Research (Kumar, 2008) needs to meet the professional code of ethics for conducting a research survey in respective fields. In this connection, ethical matters were strictly followed during research interviews, and no questions were asked that were harmful to the personal life or society of the respondents. However, the research faced a sizable limitation in obtaining responses, due to low interest in the subject matter, especially in intermodal freight transportation.

4. Literature review

The port regionalization concept (Monios & Wilmsmeier, 2013) extended the opportunity of port development with a focus on institutional relationships that govern the complexity of inland connections. Indeed, it not only considered port development in itself, but also interconnection with

hinterlands by facilitating inland terminals, spatial road and high-way development, and good connections with rail tracks. Specifically, port authorities (Brooks et al., 2017) have had an integrated and holistic role within port activities at the national or regional level historically. In addition, nowadays, port authorities go outside of port premises to act as builders of inland distribution networks, by developing inland terminals, annex roads, and railway networks to facilitate intermodal facilities to attract port users. From their experience of Italy, Brooks et al. (2017) described the relationship between ports as coexisting within the same region, even crossing the national boundaries. In addition, they considered the feeder-hub relationship that exists between the port of Hong Kong and other ports in mainland China. Similarly, South Asia (Min, 2016) has the opportunity to build a relationship by exchanging cargo and containers. For instance, the eastern ports of India can send containers to the Seven Sister states/Nepal/Bhutan via the Mongla port of Bangladesh, and also collect cargo and containers by the feeder-hub system via Mongla as a part of port cooperation. Previously, ports (Berkoz & Tekba, 1999) were the primary components of the general transportation sector but, now, ports are playing a vital role in developing trading centers and expanding the world economy.

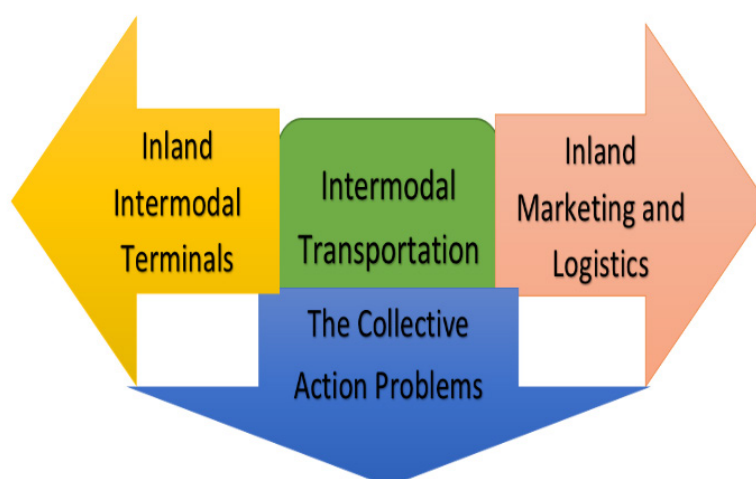


Figure 1 Role of intermodal transport in port regionalization, developed by the author (Monios & Wilmsmeier, 2013).

Maslaric et al. (2016) defined IFT as the multiple transportations of containers, swap bodies, semitrailers, and specially designed containers, from origin to destination, by using 2 or more modes, without unloading the cargoes at midpoints; the role of an intermodal transport chain is the efficient transportation of goods in terms of cost, time, and reliability. They assumed that future development of the overall transport system will be based on the principle of intermodality, because intermodal transport development has an impact on further economic globalization. As a lead facilitator in a transport chain, a port authority (Notteboom & Rodrigue, 2005) has to promote an efficient intermodal system in order to secure cargo in the competitive market, and consistently maintain close liaisons with railways, road and high ways, inland terminal operators, and others. In addition, it is widely accepted (Mathisen & Hanssen, 2014) is widely that IFT is less energy intensive than other modes of transport. It is often advocated that hinterland production and logistical functions (Berkoz & Tekba, 1999) are vital elements that require an efficient transport system to add value to the economy. Subsequently, port hinterland criteria (Rodrigue & Notteboom, 2010) are changed and developed to pay substantial attention to increasing the efficiency of global freight distributions dynamically. In the light of containerization, port hinterlands mostly depend on the performance of IFT in a predictable manner. Essentially, IFT (Wang et al., 2014) is a core

economic activity, supporting a large part of national and international trade. Academics (Notteboom & Rodrigue, 2005) have explained the cause of the recent rise of port terminals acting as transshipment hubs in order to facilitate the maritime hub and spoke system and, furthermore, to connect with the inland distribution network. In particular, increased vessel size created pressure in hubs for working with spoke ports more closely, with even hub port authorities engaging with carriers for the marketing of spoke port credentials with the aim of feeding the big mother vessel as a part of international marketing or a strategy of increasing hinterland. This may be defined as an initiative of port development. Scattered and poorly connected smaller coastline ports are important in the geographical system for supporting the hub and spoke system, and they have sufficient regular containers to fill the vacant place of a mother vessel. IFT has a large role in those small ports, and proper inland terminals are able to connect with the spoke ports by rail, road, and waterways very easily.

In addition, port authorities (De Martino & Morvillo, 2008) are mainly responsible for hardware dimensions in the process of port development of communication facilities, by using the latest and updated software for vessel, cargo, and container tracking, in liaison with prime stakeholders or port users. Ports may act as Third-Party Logistics (3PL) to cover all logistical functions for a company related to maritime logistics in simplifying the export-import trade economically and in a timely manner. At the stage of the growing situation of intermodality, Silborn (2008) explored some key barriers or problems by which its share has been low to date. He identified the inability of intermodal transport to meet the requirements of customers adequately. Traditional road transport users feel it might be a flexible, transparent, and quality service; using IFT is subject to excellent remarks as a future transport system. However, the main problems are the organizational, technical, infrastructural, operational, logistical and service related, financial and economic, and political barriers. Among them, the infrastructural barrier is the main component, and it is essential to combine nodes (terminal, port), modes (rail, road, waterways, and air) and services within the IFT system with good infrastructure and handling equipment of intermodal units.

Traditionally, investment (Silborn, 2008) in transport infrastructure is the prime task of government or public authorities; Public Private Partnership (PPP) has changed the scenario, and private port and toll roads have been developed in partnership with the government. However, there has been failure (Rahman, 2005) in the transport sector, due to the leadership (and not by the general people) of Bangladesh and by encouraging the leadership to setting austerity policies for building technology capability to set up necessary infrastructure for economic take-off. Inadequate transport infrastructure (Kharel, 2009) constrained the transit/transshipment facilities in the South Asian region, especially transit services from Bangladeshi ports to neighbors, resulting in high transport costs exclusively for Nepal, Bhutan, and North-East India (the Seven Sisters). Indian ports are congested and inefficient in serving Nepal and Bhutan which, as they are landlocked, are unable to import their cargo timely and cheaply or to do export trade by using the cheapest maritime freight. Additionally, IFT (Bektas & Crainic, 2007) relies on containerization that offers cargo safety, significantly reducing loss and damage of cargo from the outwards environment. In the supply change of the IFT system, there is a speeding up of operations and interchange, in a structured system with a just-in-time approach, which decreases transport costs.

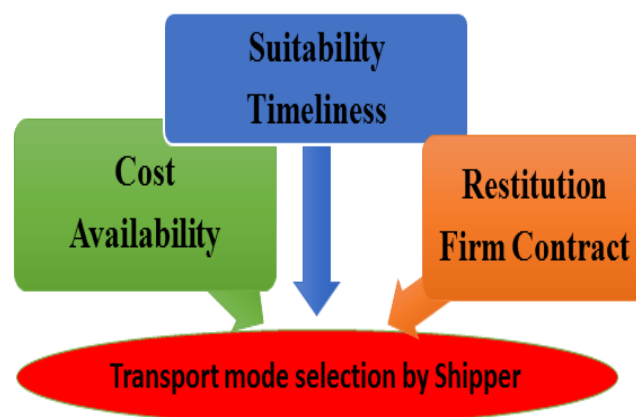


Figure 2 Shipper perspectives on transport modes (Evers et al., 1996).

In the view of transport assortment, shippers (Evers et al., 1996) are always choosy in selecting transport, where the availability of the services or facilities with an affordable cost are important as first steps. After that, the suitability of the carrier and its linkage with ports within stipulated times are the second steps. Finally, shippers consider restitution to avoid any problems with passage, with consideration of insurance, carrier involvement, brand value, and firm contract. IFT (Kharel, 2009) is broadly defined as a chain made up of several transport modes that are more or less coordinated and interacted in intermodal terminals to ensure door-to-door service. Contrary to the conventional transportation system that uses individual different modes and services, where effective coordination is used to change the mode and transfer the cargo at all modes, intermodality acts like a courier service for big volumes of parcels. Hinterland production and logistical function (Berkoz & Tekba, 1999) are vital elements for economic development that depend on the good performance of ports and multifunctional activities (dockyard, shipbuilding, ship breaking, international shipping offices, insurance companies, etc.). To date (Bektas & Crainic, 2007), many modes have been multimodal, where all arrangements require transferring the cargo, like bulk discharge at a port.

Global and regional connectivity is an issue of globalization and the catalyst of an open market economy. Bangladesh (Islam, 2016) planned to set port facilities for neighboring countries, using 2 ports, Chittagong and Mongla, roads and highways, railways, and inland waterways, as part of regional cooperation. Moreover, this will act as a maritime logistical service business with these neighbors, as well as mitigating the regional demand of South Asia. The Bay of Bengal (Karim, 2015) is important for South Asia and the Pacific because of its deep inland penetration and historical seaborne trade. It is also important for landlocked countries, such as Nepal, Bhutan, and the NE part of India, which is basically landlocked. Bangladesh has considerable geographic advantages, as it has a vast coastline, with strategic locations of ports in Chittagong, Mongla, and Payra that have close proximity to each of its international ports. Geopolitics (Karim, 2015) is one problem in implementing maritime logistical facilities in Bangladesh committed to by China, on the subject of a deep port and building partnership in the Bay of Bengal between Bangladesh and China. Moreover, Notteboom and Rodrigue (2005) defined the role of port authorities as “Facilitator” in the transport chain, but the role should be rethought broadened by creating a platform for cooperation and working together with various stakeholders. Recently, research on the Silk Road (Lain & Pantucci, 2015) explored the connection of OBOR with the Bangladesh-China-India-Myanmar-BCIM, confirming the investment of China in the report of the United Nations Conference on Trade and Development-UNCTAD (2015). The role of port management (Muntean et al., 2010) is a highly complex and dynamic environment, operating at waterways and sea and contributes to the environmental, geographic, social, technological, legal, and political affairs of a country. To design

sustainable port management, the main components are operating items and the maintenance or development of port activities with the view of achieving efficiency parameters.

Overall, with the voice of scholars (Monios & Bergqvist, 2015), intermodality ensures the standards of containers and handling apparatus are met and increasing standardization has been essential to the development of IFT. Bektas and Crainic (2007) discussed intermodal terminals, with ports having a long tradition in investing in riverine inland terminals. For example, Chittagong Port assisted in the construction of the first riverine inland container terminal at Pangaon, nearby the capital city of Bangladesh, that connected with Indian ports by small container vessels as a part of coastal shipping in South Asia. Moreover, Chittagong Port is assisting in the development of a third port, Payra, to facilitate traffic in the region. Port competitiveness (Carbone & De Martino, 2003) is becoming increasingly dependent on external coordination and full control of the specific supply chain. Therefore, port authorities have to broaden their role in monitoring the cargo flow from origin to destination to provide excellent customer service in logistical management. Ports have to follow up the movements of cargo and container within their hinterland and enable the accessing of facilities by ensuring safe inland freight transportation.

5. Qualitative research findings and analysis

Qualitative research findings are actual works of the researcher and are recorded to compare and contrast with the literature review. Preliminarily, a survey request was sent to 120 prospective participants/experts in the transport sector, who were policy researchers, university researchers, PhD researchers, shipping business people, port users, shipping experts, and others. Overall, the research used 12 participants in the qualitative research survey (details of R/Q in Appendix A). This chapter tries to extract the important issues/responses/answers from the respondents to IFT systems reviewed earlier in the literature (Chapter 4). Ports (Berkoz & Tekba, 1999) are the primary components of economic activity, linked with the global economy as well as integrated into the global economic system from overseas to the hinterland within the country or abroad. In research, the model of one scholar (Janic, 2007) identified that intermodal transport decreased the cost of transport, as well as having positive qualities in avoiding multiple handling and fewer carbon emissions compared with truck transportation. Finally, Ghosh and De (2001) suggested paying serious attention to the collection and distribution of cargo from origin to destination and to fully-pledged policy initiatives for future investment in port development.

Role of IFT in transport management

All respondents were agreed that an integrated IFT system is the only way to solve the freight transport crisis or problem in Bangladesh. In order to remove the pressure of freight/congestion at road and highways, it is essential to follow the IFT system, especially container transportation via intermodal rail networks or inland waterways. They also referred to the unavoidable traffic jams between Dhaka and Chittagong that highly restrict the economic development of Bangladesh. Moreover, traditional truck transportation systems and multiple cargo handlings at various points take a lot of time to send the finished goods to port and to receive import at the consignee premises. In order to secure certain freight, all respondents are happy to see the prospectus of IFT in Bangladesh. Undoubtedly, IFT will be positive for Bangladesh, all emphasized the waterway transport of intermodal containers from Chittagong/Mongla port to Dhaka by IFT.

To sum up, the economic and operational efficiency of IFT (Wang et al., 2014) aims to optimize the operations, service, and resource utilization of carriers, owners of ports, and inland terminals and port users. The most important element of the IFT system (Janic, 2007) is the intermodal network that starts from a port and finishes at the final destination, or vice versa. The intermodal network reduces air pollution from trucks, reduces congestion at roads and terminals, and minimizes noise and traffic accidents. Overall, intermodal freight transport (Janic, 2007) is well

known in Europe, is and frequently seen as a potential transport system that is environmentally friendly.

Barriers to the IFT system in Bangladesh

The IFT system has not been developed in the South Asian region to offer dedicated transport services to all member countries, and is not in a position to reach a common understanding to access natural ports. This means Bangladesh and India find it difficult to survive with the demand for use of the ports and for smoothly-run maritime logistics services by port users and world traders. Research has identified some barriers in developing the IFT system, presented below graphically.

Barriers of IFT in South Asia

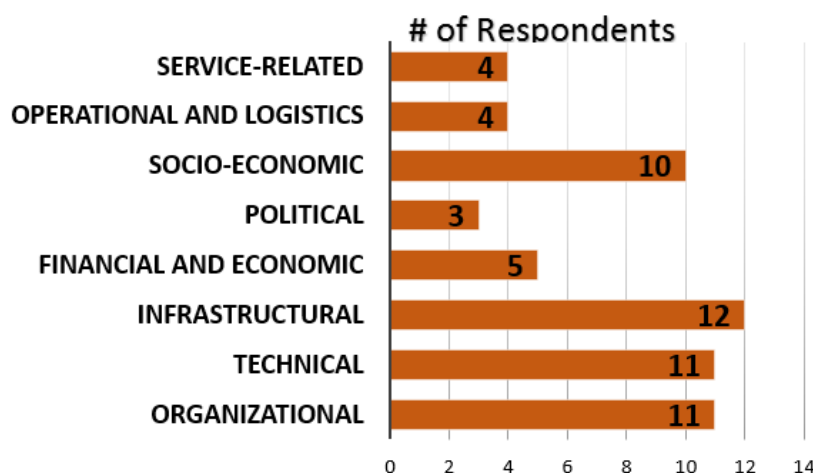


Figure 3 Barriers of IFT in South Asia, developed by the author from the qualitative research survey.

All respondents reflected that infrastructure is the main barrier to the IFT system, because of the poor connectivity of road, rail, and waterways to the port protected area. Fortunately, Bangladesh has good rail track from the period of British rule, but is a single track mainly used for passenger trains. There is a possibility of developing special tracks for cargo and container trains. Respondents argued for inland spatial road and rail infrastructure development to connect intermodal terminals and ports through mega projects by PPP or through financial assistance from international financing companies or donors. After that, they identified the organizational and technical barriers, where the role of port authorities and their activities are not up to the mark and where there is insufficient knowledge available to solve the technical difficulties in the supply chain of intermodal containers or swap bodies. In line with the previous barriers, the socio-economic barrier also plays a great role in developing the IFT system, where the attitude of developing other's infrastructure, assisting in setting industry, free access to ports, and offering maritime logistics are problems that create socio-economic complications in the region. Positively, some respondents feel that investment is a problem, because the IFT system is a complex and high investment, but others have the confidence to build the system by government or PPP, and have the capacity to do the same. There were less difficulties seen in operational, logistical, and service-related barriers, and it is possible to reduce these by conducting professional training of operating employees; most of these services will be rendered by using Electronic Data Interchange (EDI) or using computer software programs to monitor the whole IFT system. Few respondents discussed political barriers, but it is possible that developing opportunity for all will bring positive benefits, such as financial solvency, sources of employment through industrialization, etc.

From the literature review and qualitative research survey, the socio-economic barrier is where national attitude and mentality influenced investing in the IFT system. In this connection, economic growth (Silborn, 2008) will increase the traffic flows or movement of cargo and containers, and will look to efficient and sustainable transport where intermodal transport will play a greater role, by using railways, inland waterways, less utilization of road and highways by containers, and minimum placements of cargo and containers at port yards systematically. Therefore, we need to change the socio-economic concepts of others' development and needs in order to invest in the process of good transport systems in the South Asian region.

Infrastructural development for IFT

As all the of the ports of Bangladesh lie on the coastline of the Bay of Bengal, all port authorities have to work together by building the IFT system up to the upper stream of the country and exchange experience with each other. All believe that the Padma bridge (a new river bridge which is under construction and will connect the Mongla port with Dhaka) will open a new door of freight transportation and integrate with all ports by railway networks. Emerging opportunities from rail links will help to connect ports and their hinterlands and improve inland transport networks for the easy transportation of intermodal containers easily. The respondents advised the individual port authorities to source funding from the government or to build environments for PPP to develop ports and intermodal transport infrastructure to increase hinterland within or out of the country. On the contrary, some respondents thought differently, thinking only about port business and not about out of port premises and depended on government initiatives.

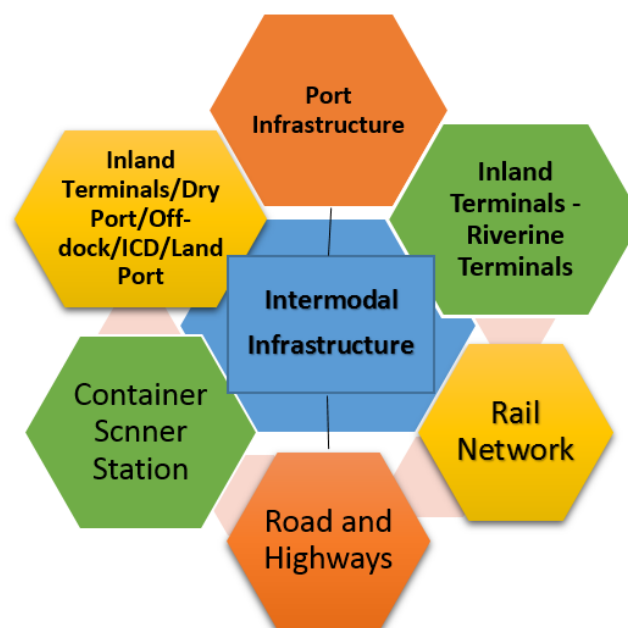


Figure 4 Infrastructural development for IFT as per opinions of the respondents.

All respondents argued for infrastructural development in 6 stages for the IFT system in Bangladesh, as well as for South Asia. Firstly, it is essential to increase the capacity of the ports. Moreover, the assessment or standardization of port infrastructure to comply with port capacity ranking indicators, equipment, and services is required. Secondly, spatial infrastructure should be increased by improving road access to inland and port terminals and, thirdly, the establishment of a new terminal, with consideration of the terminal layout to connect with all modes, should be considered. Importantly, transport infrastructures (Janic, 2007) provide the facilities for moving freight towards vessels for final destinations or to consignee premises, and quality services always depend on the volume of demand, the efficiency and effectiveness of the services, and the physical

scale of the hardware. However, attention must be paid (Monios & Bergqvist, 2015) to inland terminal developments, to ensure seamless connection between intermodal terminal and port.

Role of Chittagong port authority in developing IFT system

Chittagong Port is the principal port of Bangladesh, with vast experience in cargo and container handling, also financing port-related activities all over the country. Recent efforts of Chittagong Port and its authority (Chittagong Port Authority-CPA) in developing a new port, Payra, and an inland container terminal, Pangaon, nearby Dhaka, was appreciated by all, and attracted world traders and terminal operators to work jointly with the CPA. The respondents were confident about the capabilities of the CPA and their developmental approach to the inland transport network's infrastructure, which will help to develop the IFT system all over the country. They suggested that the CPA has to play a leading role in developing the IFT system and assisting other ports to do the same in their respective areas, exchanging experience and human resources. Some respondents argued for changing the role of land ports and the need to convert to dry ports by CPA to serve IFT to the neighbors in India, Nepal, and Bhutan regionally, and SW China and Myanmar internationally. One respondent emphasized working with China in selecting Chittagong as prime maritime loading center in the Bay of Bengal.

Research (Lain & Pantucci, 2015) found the benefits of the OBOR (One Belt, One Road) initiative, not only for China, but also for participating countries, and emphasized the connectivity and greater financial integration of the world. So far, the OBOR map has not yet been finalized, and representation of a maritime loading center needs to consider Chittagong as a key gateway to South Asia. By starting coastal shipping and road haulage, Myanmar has the opportunity to connect with Chittagong Port. The BCIM economic corridor (Karim, 2015) can work with the initiative of OBOR, where it will be effective in managing transport trade in the region profitably. Raising foreland and hinterland connections (Ghosh & De, 2001) with ports always helps to sustain ports in competitive environments or in the changing management of the global shipping market. The openness of a country to international trade features in economic activity, where it becomes necessary to strengthen port systems to sustain overseas trade.

Specific ideas from the respondents

In the qualitative research survey, respondents suggested some specific ideas for innovation, and others that will help to conduct future research for IFT, as below:

1. Remove high-emission trucks and trailers from the transport pool. Silborn (2008) recognized the best practice of Japan, where IFT had a significant impact in reducing cargo movement by truck.

2. Port pricing needs to be adjustable and not be a burden for port users. In such a context, it is advised (Muntean et al., 2010) that the government acts as a responsive authority regarding port affairs, where unsatisfactory and expensive port services may reduce profits and also remove the country from the international market.

3. Dynamic port management for the whole country, and the merging of all port authorities under the Ministry of Shipping.

4. Special commission for IFT system and mapping the service map of the whole country and convert the land port to dry port with the all facilities of container handling.

5. Innovation in container handling from outer anchorage to the inland riverine container depots in Dhaka without entry to the Chittagong Port.

Overall, the performance of a port (Ghosh & De, 2001) depends on internal and external factors, where external factors compose the trade orientation of the region that is interconnected with the nearby ports, and all of those factors are beyond the direct control of port authorities, and internal factors include geonavigational draught problems and labor problems that affect the productivity of the port.

6. Innovation and integration

Innovation involves new ideas that will benefit organizations by increasing competencies or doing existing tasks more strategically and easily. Integration helps to reduce the number of activities and shares knowledge. Brooks et al. (2017), noted the attempts to achieve greater cooperation between ports by merging and consolidating port authorities within certain geographical contexts to make a common platform. The best example came from the Copenhagen-Malmö port, where Denmark and Sweden agreed to merge and develop a single port authority. To follow this, Bangladesh and India may agree to operate Haldia (India) and Payra (Bangladesh) jointly to provide maritime logistical support in the process of IFT to Nepal and Bhutan. To explain, integration is highly appreciated in the single port authority in Bangladesh, by merging the 3 authorities of Chittagong, Mongla, and Payra. The technical capabilities of Chittagong Port may be shared with the underutilized Mongla Port and the newly established Payra port. Remarkably (Islam, 2016) the issue of integrating the road, rail, and waterways and their infrastructure is under discussion because of political will and mutual trust among the countries of South Asia. Unfortunately, there is no container transportation via railway networks between Bangladesh and India, but it is easily possible to start this under the banner of Bangladesh-Bhutan-India-Nepal-BBIN because of available rail track in the geographical area of BBIN. Moreover, researchers (Wang & Notteboom, 2015) found that port authorities are playing an important role in introducing Regional Innovation System (RIS) to establish social collaboration, knowledge creation, and the promotion of innovation. Here, innovation will help port authorities to facilitate and coordinate their own roles and typically seek meaningful extensions of their functions beyond their traditional roles under changing management.

The concept of integration (De Martino & Morvillo, 2008) in the context of ports has been essentially concerned with IFT and organizational ties with global carriers for responding to the changing requirements of industrial and commercial enterprises, also improving their own internal efficiency. In addition, the One Belt One Road (OBOR's) MSR (Lain & Pantucci, 2015) is attributed for supplying the transport demand of SW region of China as a connector of the Silk Road Economic Belt and the 21st century Maritime Silk Road. China's proposed OBOR is an innovation for the current world, where integration is escalated to support the initiative to develop transport connections all over the world, as well as sharing responsibilities, destiny, political trust, economic integration, and cultural transactions. As a part of OBOR, MSR is a downwards maritime streamline to facilitate seaborne trade and, will pass the Bay of Bengal where the Chittagong Port of Bangladesh will be a regional hub and be the best location and be able to act as an MSR maritime loading center, connecting by inland intermodal connection to the surface Silk Road Economic Belt. This will cover the economic and industrial areas of Nepal, Bhutan, NE India, SW China, Bangladesh, and Myanmar. However, related infrastructure development is required to fulfill the dream of OBOR in the South Asian region, especially in Bangladesh, because of inland transport bottlenecks and poor port facilitation.

7. Conclusions

Port development is essential in Bangladesh, as per the requirements of Logistics Performance Index of the World Bank, and the IFT system is a new feature in Bangladesh for developing freight transport management to manage the increased volume of cargo and containers. In addition, Bangladesh has the potential to serve neighbors, and will be treated as a maritime logistics business through IFT. Port governance (Monios & Bergqvist, 2015) has been treated comprehensively in literature, however, as a major engine for driving economies; port governance is essential in the control of activities for managing trade that result in economic benefits for the country. In addition, an integrated IFT system (Jarzemskis & Vasiliauskas, 2007) is required to develop rail and inland intermodal terminals or dry ports that would allow proper strategic decisions in the changing environment of maritime transport chains.

Increasingly, the transportation sector (Berköz & Tekba, 1999) is a strong factor in economic and regional balanced development, therefore, having great influence on national integration in the world economic market. In the views of shipper perspectives on IFT, Bektas and Crainic (2007) added that, as a single integrated service, intermodality has to behave similarly to unimodality, especially in terms of speed, reliability, and availability. Activities, resources, and the level of interorganizational relationship between the players in transport networks are critical and essential in the port value creation process.

To summarize the objectives of the research, it is clear that the 2 principal ports of Chittagong and Mongla in Bangladesh are feasible to profitably serve South Asia, especially to Nepal and Bhutan, as well as India, through the intermodal freight transportation banner. Remarkably, Lloyd's List (2018) reported that Chittagong Port handled 2.347m TEUs (Twenty-foot Equivalent Units) in 2016, and was positioned as the 71st busiest container port of the world, featuring 15.9 % growth in 2015. As India has opted out from the OBOR, Chittagong will optimistically be the prime maritime loading center in the Bay of Bengal, under the Maritime Silk Road.

From the literature review and the extracts from the opinions of the respondents, it is realistic that Bangladesh has to work more strategically to set her ports to increase productivity and enhance the capacity of handling cargo and containers. In addition, inland transport networks are very poor, and not up to the mark to operate as per the standard requirements of IFT. In this connection, necessary infrastructural development is required and needs to emphasize railway network development among the urban cities/industrial areas from/to port. As port and IFT development is a big investment, privatization is the preferable way to manage the capital, with the direction of government. Overall, Bangladesh has the possibility of connecting with South Asian transport networks by their ports, where port authorities need to act vibrantly for their own development, and advanced port facilities and inland intermodal distribution networks are needed for increasing hinterland to compete with other regional ports.

8. Future directions

This research extracted some points from the literature review, qualitative research dialogues with the respondents, respondents' recommendations, and others. In this connection, some future directions have been identified that will help the government, academics, and others for future research. These directions are as below:

1. Wang et al. (2014) suggested to use performance indicators for transportation systems for validating and evaluating models, solution methods, corresponding results, and strategies. This will help to analyze new problems particularly, and in tactical planning of transport management. All ports of Bangladesh should be aware of performance indicators and benchmarks with the Logistics Performance Index of the World Bank.

2. Port regionalization (Notteboom & Rodrigue, 2005) permits the development of a distribution network that corresponds more closely to fragmented production and consumption systems. Regional cooperation in port development is essential and needs to contribute to the infrastructural development of inland transport networks by all port authorities of Bangladesh.

3. In the process of regional port cooperation and connectivity, all port authorities in South Asia must work together by sharing and exchanging technical experience and human resource, also arranging regional training for port employees.

4. The existing unutilized port facilities of Mongla need to be used, where Chittagong Port may push vessels towards Mongla; also, international marketing and government initiatives offering the port facilities of Mongla to neighbors are required.

5. A deep seaport initiative must be directed by the Government of Bangladesh to facilitate future trade and negotiate with international donors or terminal operators to invest in this sector.

6. Integration with OBOR, BBIN, and BCIM economic corridors, to connect Bangladeshi ports is needed, emphasizing the infrastructural development of intermodal rail, road, and waterways.

7. Railways face the biggest challenges in the network of inland transportation. From research (Bektas & Crainic, 2007), there is competition between rail and other modes to provide quality services to users within a given timeframe. Chittagong Port may finance the development of an intermodal rail network and connect with Nepal, Bhutan, and India directly from the port.

8. De Martino and Morvillo (2008) recommended the development of port policies that are viable for global players. Port authorities are requested to make common port policies within Bangladesh by following the role model of other regional country port policies.

9. Developing the proper infrastructure (Islam, 2016) that is suitable for handling the vastly increased volume of freight via road, rail, and waterways and effective communication and data exchange is required. The profits of a port authority may be reinvested in port development.

10. Privatization methods in port investment (Ghosh & De, 2001) help to facilitate an advanced port system while minimizing state expenditure with regulatory control of the public sector. The privatization of Bangladeshi ports is appreciated and needs to invite international terminal operators to invest in Bangladesh, as well as work together to develop ports as per international standards.

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