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Discussion Paper

THE ROLE OF KARACHI HARBOR IN STRENGTHENING CPEC: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

The purpose of this study is to distinguish and assess the performance of existing, emerging, and conceptual, commercially developed technologies at Karachi Port Trust (KPT) which is related to economic development through China Pakistan Economic Corridor (CPEC). The relevant infrastructure of KPT will facilitate CPEC growth and can play a dynamic role whereas expansion and extension of private terminal operators are equally important to support the CPEC initiative. The increase in efficiency of port operation and its processing requires a rational allocation of resources, transport, and handling equipment. The study analyses the problems, challenges and opportunities of Karachi port's operation and its efficiency. The economic impacts and opportunities for Karachi Sea Port during the development process of CPEC are also included in this study.

Keywords: *Karachi Port; Operation; Development; Competition; Efficiency.*

INTRODUCTION

The seas surrounding the third world countries, particularly in the Sub-Continent, have become economically sensitive and these countries must now face the real possibility that new economic challenges do not come across land borders, but rather from sea. Likewise, these countries are coming to realize that in the situation of competition, modern ports presence is much more flexible and efficient tool than for example, maximum market capturing or attracting regional business, both likely to activate unnecessary commercial conflict. Access to the sea can mean access to the strategic marketing all over the world. The recent politico-economic and technological developments have encouraged the Sub-Continent region to establish modern shipping terminals which may not only be capable of commercial transit but also to further their countries'

broader maritime interests. All these developments have had either direct or indirect effect on Pakistan's economy.

The purpose of the study is to examine the impact of mega developments in the Karachi Port on China Pakistan Economic Corridor (CPEC) which is of an immediate concern i.e. impact of Gwadar port under Chinese administration with special emphasis on the sea port potential of Pakistan and implications of the current politico-economic and technological developments on Pakistan's sea ports. In addition, this study deals with the operational potential of Karachi port, with special emphasis on the roles and capabilities of the Karachi Port Trust. It also includes a brief discussion on some of the domestic constraints affecting vessel as well as container handling productivity, lack of high space of modernized equipment, Port health and responsibilities of people and cargo as well as vessel in the prevailing economic and technological environments in order to avail CPEC advantages.

Additionally, an evaluation of equipment-holding capacity of private stevedores as well as terminal operators in the Port of Karachi and its effects on decongestion of cargo; impact of more space availability on the operational efficiency in the bulk; break bulk handling at the Port specially at East Wharf region; and effectiveness of dwell time reduction measures in Karachi Port is also included in this study. Moreover, analysis of the optimization and expansion for containerized cargo area to handle the expected increase in container traffic in CPEC project development scenario is also included in the discussion.

LITERATURE REVIEW AND DISCUSSION

Overview

The emerging scenario around Pakistan involving rapprochement between friends and enemies is a source of critical concern but more so it serves as a last warning for our foreign relation experts and economic strategists, responsible for the prosperity of Pakistan. The fact is that Pakistan cannot and should not depend on its special relations with any country or any regional group, as such relations cannot stand the test of time when commercial conflicting interests are emerging in the world with new concepts and strategies of trade and economic cooperation. The best course for Pakistan to meet new regional economic challenges is to make itself economically strong in order to be able to compete successfully against others for its share of the world market. To achieve this capability, it must

concentrate on scientific education and on building up a broad industrial base. Domestic policies must be consistent and not changed with every change of government or else credibility will be lost. Only a strong and stable Pakistan, capable of contributing towards the economic development of the countries in the region, can face new economic challenges.

Development of Karachi Sea Port and CPEC

Impact of China Pakistan Economic Corridor (CPEC) on trade and its effect on Karachi Port especially in terms of the port facilities and transit time, Karachi port and its private terminals will play dynamic and core role in the development of CPEC. Transport and infrastructure of seaport are called strategic levers of trade as they help in reducing the shipping costs and transit time. In the modern era, organizations want to reduce the shipping costs and transit time to maximize profit and ensure timely delivery of product (Mirwais, Baloch, Usman, & Mandokhail, 2017). The focal point of this research is to study the importance of CPEC and its impact on import and export at Karachi Port and its private terminal operators in terms of port facilities and transit time.

While with the investment and construction of energy and infrastructure projects, various social risks will appear after the initiation of the project, induced by social impacts. Social impacts assessment aims to eliminate or reduce negative social risks persuaded by investment on CPEC and to meet the social development requirements, national and local goals during the process of investment opportunity study, preparation, and implementation and operation stage are beneficial. The investment and construction of energy and infrastructure projects under CPEC will both affect Pakistan and China in social, economic, and culture, resources. Thus, the role of Karachi port to facilitate tentative heavy flow of CPEC is core issue of this study.

Gwadar port, due to political conflicts, at present, handles exceedingly small volume of cargo. However, in the long run when this port will be fully functional, it is expected that due to geo-political importance Gwadar port will tend to capture transit traffic to/from Iran, Afghanistan, and China. In addition, Gwadar port will also compete for Pakistani trade that presently goes through Karachi and Port Qasim.

The improvement in business climate through reforms will also enhance export potential. Strategy to improve external sector performance for achieving the targets includes:

- Export-oriented industries will be given priority in providing uninterrupted supply of energy,
- Remittances flow will be enhanced through reducing the cost of sending remittances, strengthening Pakistan Remittance Initiative (PRI) and skill matching according to demand in world market,
- The FDI opportunities will be encouraged in infrastructure and energy sectors through business-friendly environment, specifically under the CPEC,
- Greater involvement in regional cooperation to become part of global supply value-chain,
- The National Action Plan to resolve security related issues and encourage private sector through ease of doing business so that export industries stay competitive internationally.

Pakistan expects that CPEC and various other projects related to road connectivity will significantly reduce trade cost. Similarly, East-Asian countries are also interested in trade access with Central Asian Countries via CPEC (Dashti, Javaid, & Shahabuddin, 2017). Simultaneously, we see manufacturing sector has multiplier effect on other sectors and increase in exports is only possible if manufacturing beefs up in the country. Since government is working on this issue and developing new power plants which require LNG for electricity production, a comparatively easier source of energy. While government is also converting conventional furnace oil power plants into coal (even though we feel that existing plants should speed up conversion on coal). We expect that by timely completion of energy related projects in CPEC would definitely build market competition between Karachi port and Port Qasim Authority (Baird, 2000).

International standard of a Port to Attract Heavy Flow of Cargo

Demand for port facilities does not just arise automatically, of its own. Port development is not something whose magnitude is determined simply by economic growth and expected levels of exports and imports of different commodities. There are fundamental factors setting certain parameters for the possible development of a port's traffics, and so affecting future port facility requirements especially during implementation of (CPEC) which will effect on national and regional economic growth, the expected growth of particular industries, changes in stiffing and transport technology, and so on.

In a port context, marketing can have various purposes, depending on the relevant situation at the time and place concerned, and on the objectives of the port authority which is to avail CPEC containerized and break-bulk cargo flow towards Karachi. Port marketing techniques may, for example, be used to help maximize the utilization of a port's facilities, whether to increase port profitability, to decrease average per-ton port costs, to maintain employment, or to encourage regional economic development.

Port marketing techniques may also be used to help achieve the best possible use of port facilities, whether within a particular Terminal, or within a group of ports. There are many possible variations, but they have one thing in common: marketing is being used in some sense to change the demand for port facilities — so affecting the pattern of need for port development. This is partly a consequence of change in transport technology of the development of containerization and roll-on/roll-off operations in the general-cargo trades (Drewry Shipping Consultants, 2005). The through-transport concept has been particularly important in this context, whether simply in the sense of an interest in total through-transport costs, or in the sense of integrated through-transport operations.

It can make possible the development of economy from the use of large ships and from the development of specialized port terminal facilities in CPEC scenario. It also means that less and less trade is confined to any one port; and, equally, it means that ports may be able to attract new traffics, new users that would have been unthinkable in the past.

For a port authority, this is no longer a safe and stable world, but an ever-changing scene. Inter-port competition is very keen in many parts of the world, for example in Europe, in North America, in parts of the Arabian Gulf, and in South East and East Asia (e.g. between Singapore and Indonesian/Malaysian ports and probably to a growing extent between Japanese and Korean ports) (Heinrich, 1999). Competition tends to be keenest in more developed parts of the world, especially where there is an excess of port capacity. However, there are obviously many countries where inter-port competition effectively does not exist. This does not detract from the potential importance of marketing, in relation to port development, because of the way it can be used to encourage the better use of port facilities. **(**Williams, Jamieson, & Rose, 1999).

In a properly fixed situation, where there are neither serious problems

of declining traffics, technological change and old or otherwise under-utilized port facilities, nor the opposite problems of trying to keep up with fast-growing traffic volumes, the main uses of port marketing may be to increase profitability and to decrease per-ton costs. In the real world, ship arrivals bunch and cargo volumes fluctuate. Marketing may have e role in helping lessen the extent of seasonal fluctuations, by analytical off-peak periods of under-utilization and attracting traffic at such times.

In practice, those responsible for ports are often faced not with a fixed situation in which port facilities more or less match demand, but with traffic and technological changes giving rise to problems of excess or under-capacity. In simple excess capacity situations, the objective is normally to attract additional traffic to make more full use of facilities, so helping to reduce per-ton costs, increase profitability, and preserve employment (UNCTAD,1998).

Sometimes where port facilities become antiquated, whether because of changes in technology (e.g., increasing ship size) or in trade, it may be possible to adapt and redevelop the facilities for quite new purposes. This is very much a marketing matter of correctly assessing the future of existing trades, of pinpointing where there is scope to adapt facilities to new purposes, of actually marketing the proposed development to new users.

Ports not only generate their own employment but also generate outside employment. For this reason, for instance, in various Continental European ports, marketing is seen as part of a wider operation to encourage the industrial development of a city or region. Similarly, in the Gulf States, there is a widespread awareness of the employment and income generation impact of ports (Saundry & Turnbull, 1997).

However, marketing may have a more direct role in relation to port-related public – private partnership and commercial development. There is in any case a need for a marketing appreciation of the scope for port-related (and especially heavy) industrial development, this for port planning; reasons to protect potentially available areas within ports for such uses, and if possible to help protect (preserve) appropriate land outside port authority areas for such development (Kaselimi & Reeven, 2008).

Apart from this, port-related industrial and commercial development may also be stimulated in another way by the establishment of free ports, free trade zones and export promotion areas. Depending, of course, on

location and other factors, such facilities may considerably enhance the scope for the development and utilization of ports and may generate significant volumes of employment.

The constantly changing framework within which ports work has already been noted, and because of this, the first need from a marketing standpoint is for ports continually to monitor the factors affecting demand for their facilities. The demand for port facilities may be affected by 'competitive' factors by changes in the economic and technological environment in which the port exists; by 'institutional' factors (policies of bodies such as shipping conferences and commodity marketing boards, and by the structure of port employment); and by governmental factors. (Zhang, 2008).

STUDY RESULTS AND RECOMMENDATIONS

Operational Hindrance at Karachi Port

CPEC related economic growth require relevant infrastructure to facilitate CPEC containerized cargo's flow and Karachi Port Trust is to play vital role in this. Modernization at Karachi Port and expansion of private terminals are equally important to support CPEC growth, following measures are recommended for the overall required improvement at of Karachi Port.

i. ***Strengthening More Space at Karachi Port*:** Pakistan's market capacity is definitely going to increase enormously in the upcoming years as projects like CPEC and modernization of private container terminals. In the next 5 to 10 years, the total market capacity and volume projection of Pakistan is going to hike tremendously after the operations of CPEC. In order to cope with the progress of containerization, container terminal operation by the private sector using their own handling equipment has been progressing by leasing the existing facilities. However, the cargo-handling capacity of these terminals at Karachi Port is insufficient to handle the above volume of containers. Therefore, an additional space for vessel berthing and cargo handling will be required by the year 2024/25 at East Wharf of Karachi Port.

ii. ***Trade will be able to receive more efficient services level at all the terminal:*** After the expansion of private container terminals at Karachi Port and the completion of other projects, trade will be able to receive better and more efficient services at all the terminals as well as Karachi Port. In this way, terminals will also provide time

efficient services to all the trade being handled. As the expansion completes, congestion issues will automatically be streamlined.

iii. ***Need Modernized Bulk / Break Bulk handling at Karachi Port:*** The volume of wheat to be handled at Qasim port in 2024/25 is estimated as 17.1 million tons. At present, Marginal Wharf Berth Nos. 2-4 are handling wheat and the handling productivity is rather high at about 120 tons per hour, which seems to be a result of good management/ operation (De Borger, Proost, & Van Dender, 2008). However, the present cargo-handling capacity is insufficient to meet the forecast demand. Therefore, it is necessary to provide specialized dry bulk handling facilities. At Karachi port, various kinds of dry bulk cargoes are being handled at conventional berths, such as fertilizer, rice, phosphate, scrap etc. Therefore, it is necessary to provide specialized dry bulk handling facilities. The bulk cargo operations at of Karachi Port are disturbed by container stacking and this leaves less space for bulk cargo. The bulk cargo operations handling should be separated from the routine cargo operations otherwise this creates management and handling issues and also wastes time and resources by limiting the current efficiency of Karachi Port. So, in order to maximize the handling capacity and efficiency of Karachi Port, Karachi Port needs modification and modernization according to the current and future requirements of its market share and growth. By modernizing Karachi Port, we can not only increase the handling capacity and revenue but also prepare Karachi Port for the future market share and growth as a sizable chunk of CPEC workload is expected to be handed over to Karachi Port.

iv. ***Increase in Volume of Karachi Port Market Share by Increasing Both Container and Bulk Handling:*** The market share of Karachi Port increased from 877,488 TEUs in 2006 to 1,987,12 TEUs in 2016 and is expected to grow with a much higher pace so Karachi Port will definitely be in a position to increase its container and bulk cargo handling by making some right arrangements like installation of mobile gantry crane (RTG) stackers and increasing the average quay length (Saeed & Larsen, 2010a).

The bulk cargo operations at Karachi Port are disturbed by container stacking and this leaves less space for bulk cargo. Giving expansion to Karachi Port will make it possible for Karachi Port to make more revenue from less space and it will also give them the opportunity to handle more

bulk cargo in the additional space vacated from Karachi Port and for this, the bulk cargo operations handling should be separated from the routine cargo operations otherwise this creates management and handling issues and also wastes time and resources by limiting the current efficiency of Karachi Port. This will maximize the handling capacity and efficiency of Karachi Port; Karachi Port also needs modification and modernization according to the current and future requirements of its market share and growth.

CPEC Related Economic Growth and relevant Infrastructure to Facilitate CPEC Growth

Gwadar port will finalize in 2030 according to the governmental plans, so CPEC workload will be shifted to other ports of Karachi port and Karachi Port is also going to have its big chunk of CPEC workload but CPEC related market growth require relevant infrastructure to facilitate CPEC growth and KPT is going to play a vital role, Karachi Port expansion it equally important to support CPEC related market growth. (Raza, 2016).

i. ***A large-sized vessel influences on the port operations in several technical, economical, ecological, and organizational aspects.*** Firstly, the port should have an adequate canal with a considerable amount of piers for bigger tonnages, sufficient storage capacity for a bigger number of cargoes to be accumulated and employ advanced specialized technologies that demand significant investment in both port infrastructure and superstructure.

   The use of large-sized vessels will likely reduce the traffic within the Karachi Port. Subsequently, the probability of port accidents is reduced, and ecologic factors are enhanced, as the fuel consumption per cargo unit of larger ships is lower. Large-sized ships enable to produce cost-efficient and time-saving cargo operations, along with the optimum use of the pier - a greater ratio between the actual loading operation term and additional operations, like mooring, arrangement of ship and cargo formalities and these factors are very important for the liner ships, which work in shipping lines. Advanced terminal operation scheduling for big tonnages will lead to less technological and mobilization pauses, however general inconsistency of terminal operations may occur due to the increased demand of service facilities and personnel for servicing several ships at a time, or idle operation when there are no ships (Saeed & Larsen, 2010b)

ii. ***Negative impacts on trade while Port is operating virtually on 100% of its capacity.*** International standards work on 70% utilization of container terminals as working on more than that creates handlings and management issues as well as safety hazards. It also slows down the handling capacity. Inefficient utilization of Karachi Port Trust (KPT) east wharf space due to reach stacker operations, occupy more space to handle less volume, therefore KPT making losing the opportunity to make most revenue of the space. Karachi Port area is inefficiently used by KPT due to the operations of Reach stacker operations and therefore is not making most of its share.

iii. ***Container stacking at Karachi Port Trust also making it difficult for bulk cargo.*** The bulk cargo operations at Karachi Port are disturbed by container stacking and this leaves less space for bulk cargo. The bulk cargo operations handling should be separated from the routine cargo operations otherwise this creates management and handling issues and also wastes time and resources by limiting the current efficiency of East Wharf of Karachi Port. The average vessel size has increased dramatically in the past years, ranging from 9,400 TEUs to 12,000 TEUs. Other ports around the world are easily able to handle bigger vessels which facilitate trade and deliver more goods at a shorter time. East Wharf Karachi Port has 600 meters quay length berthing two vessels of 270 meters or above (Kaselimi, Notteboom, & Saeed, 2011). This creates operational hazards and unsafe working conditions not only for vessel and port but also for the labor staff.

Opportunities for Karachi Port Operations

The bulk cargo operations at Karachi Port are disturbed by container stacking and this leaves less space for bulk cargo. The bulk cargo operations handling should be separated from the routine cargo operations otherwise this creates management and handling issues and also wastes time and resources by limiting the current efficiency of Karachi Port. Consequently, in order to maximize the handling capacity and efficiency of Karachi Port, Karachi Port needs modification and modernization according to the current and future requirements of its market share and growth. By modernizing Karachi Port, we can not only increase the handling capacity and revenue but also prepare Karachi Port for the future market share and growth as a substantial chunk of CPEC workload is expected to be handed over to Karachi Port. However, the present cargo-handling capacity is insufficient to meet the forecast demand. Therefore,

it is necessary to provide specialized dry bulk handling facilities. At Karachi port, various kinds of dry bulk cargoes are being handled at conventional berths, such as fertilizer, rice, phosphate, scrap, etc.

A large-sized vessel influences on the port operations in several aspects: technical, economical, ecological, and organizational. Firstly, the port should have an adequate canal with a considerable number of piers for bigger tonnages, sufficient storage capacity for a bigger number of cargoes to be accumulated and employ advanced specialized technologies that demand significant investment in both port infrastructure and superstructure. The use of large-sized vessels will likely reduce the traffic within the port. Subsequently, the probability of port accidents is reduced, and ecologic factors are enhanced, as the fuel consumption per cargo unit of larger ships is lower. Large-sized ships enable to produce cost-efficient and time-saving cargo operations, along with the optimum use of the pier - a greater ratio between the actual loading operation term and additional operations, like mooring, arrangement of ship and cargo formalities and these factors are very important for the liner ships, which work in shipping lines.

Karachi Port's existing customers face several issues and limitations because East Wharf Karachi Port has 600 metre quay length berthing two vessels of 270 metre or above. This creates operational hazards and unsafe working conditions not only for vessel and port but also for the labor staff. Now the growth of large and ultra large vessels in the container industry is also affecting the routine port operations and handling capacity of the ports as the average vessel size has increased dramatically in the past years, ranging from 276 meters to 290 meters. Therefore, the average area and length of quay need to be increased to create safe working environment, eliminate operational hazards, increase handling capacity, and modernize the ports according to the requirements.

According to the international standards, there should be at least 25 metre gap between the two vessels berthing at the same time and in the current situation, we have 600 metre quay length berthing two vessels of 270 metre or above. This creates operational hazards and unsafe working conditions not only for vessel and port but also for the labor staff. Now the growth of large and ultra large vessels in the container industry is also affecting the routine port operations and handling capacity of the ports as the average vessel size has increased dramatically in the past years, ranging from 9,400 TEUs to 18,000 TEUs. Therefore, the average area

and length of quay need to be increased to create safe working environment, eliminate operational hazards, increase handling capacity, and modernize the ports according to the requirements (Saeed, 2009).

The bulk cargo operations at Karachi Port are disturbed by container stacking and this leaves less space for bulk cargo. Giving expansion to Karachi Port will make it possible for KPT to make more revenue from less space and it will also give them the opportunity to handle more bulk cargo in the additional space vacated from of Karachi Port and for this, the bulk cargo operations handling should be separated from the routine cargo operations otherwise this creates management and handling issues and also wastes time and resources by limiting the current efficiency of Karachi Port. This will maximize the handling capacity and efficiency of Karachi Port; Karachi Port also needs modification and modernization according to the current and future requirements of its market share and growth.

The increase in the growth of international trade more space is required for the vessel accommodation and berth operation. General cargo will need to be separated from bulk cargo for the allocation of space and proper management and handling. Increment of Vessel size will influence port operations in several aspects including technical, economic, environmental, and ecological aspects. Allocation of more space will make it possible for KPT to generate more cash flow in less time. However, if proper space is not allocated soon, market share of KPT will decrease and workload will be shifted to other ports resulting in the loss of potential business. Thus, vessel size increment has been a continuous trend since the initiation of containerization and to match up with the fast-changing trends of the trade industry allocation of greater area is a promising option.

Handling of two vessels at a time creates (berthing scenario of two vessels) operational hazards for Karachi Port; this includes unsafe working conditions for the labor staff and damage threads to the containers as discussed earlier. Handling of containers will become easy with the RTGs. This is an effective method to store containers and will provide additional area that can be utilized as traffic lanes and active port terminals. This advance technological solution will enable Karachi Port to increase transshipment capability as higher storage capacity will be achieved by gantry cranes. Thus, RTGCs will increase the effective utilization of Karachi Port Space for storage, handling and traffic port operations.

Karachi Port has a number of expansion and extension projects in its

pipeline and installation of RTG stacks is one of them as RTG stacks are much more efficient than Reach stackers and can overwhelmingly increase the handling capacity of the yard by 45%. RTG stackers are also the need of time as the Karachi Port is expected to receive a sizable chunk of CPEC workload and for that it definitely needs to enhance its working capacity as soon as possible. Due to increase and quality service at Karachi Port after the installation of RTG stackers, vessel berthing and sailing charges will automatically increase for KPT and therefore will revenue of KPT. The competitors of KPT will expose it to numerous challenges along with the advantages. The solution of the basic thread lies in the advancement of technologies and allocation of more space.

CONCLUSION

With the above detailed discussion and review of the relevant literature this study postulated the certain conclusions which summarize the whole study. It is suggested that after the expansion operational space and the completion of other projects of Karachi Port, trade will be able to receive better and more efficient services at all the private container terminals. In this way, terminals will also provide time efficient services to all the trade being handled. Allocation of time efficient services will be easier for the terminals after enlargement of the area. As the expansion completes, congestion issues will automatically be streamlined. Expansion will provide private container terminals as well as Karachi Port with enough space to allocate a proper area as per requirement to all sectors represented in the figure earlier. This will create a proper flow of traffic and will make management and handling of cargo easier. Both general/routine and break-bulk cargos will be easily handled. This will also help resolving the security issues of the port.

Furthermore, CPEC Related Economic Growth require Relevant Infrastructure to Facilitate CPEC Growth and KPT is to Play Vital role, Karachi Port modernization it Equally Important to Support CPEC Growth high tech equipment and infrastructure are important for all the ports and terminals to function properly. However, investors feel pressurized and unsafe when investing in the infrastructure of the port. Ports account for transport of international trade and trade chains. Growth of trade volume demands efficient port management and investment in container terminals. On the other hand, increased vessel size has resulted in a move of power in favor of shipping companies. They exert pressure on Karachi port and its private container terminals to improve productivity and to develop new

facilities. However, investment costs for port infrastructure and facilities are extremely high. Ports and terminals were therefore privatized in order to finance the investment in ports, and to boost economic growth. Gwadar port will not be finalized in 2030 according to the governmental plans, so CPEC workload will be shifted to other private container terminals Karachi Port. Karachi port is also going to have its substantial chunk of CPEC workload but CPEC related market growth require relevant infrastructure to facilitate CPEC growth to meet market expectations.

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