

Role of Effective Planning Process in Boosting Dry Port Effectiveness: A Case Study of Central Pakistan

Jamshaid Alam,
Divisional Transportation Officer,
Pakistan Railways.
Jamshaid166@yahoo.com

Abstract

Inland Dry Port terminal has become a very effective tool of enhancement of seaport capacity through its vertical integration with the hinterland and it results in tremendous direct and indirect benefits as envisaged in the literature. These benefits cannot be achieved without identifying and involving the proper stakeholders in the planning process of dry ports and its operation. Multan Dry Port was established in 1995 and it is marked by inefficiency and failed to achieve the general benefits of establishment of dry port. This paper identifies the bottlenecks and the flaws in the planning process, which contributes towards the inefficiency of the dry port. Multan dry port has immense intermodal potential and present research proposes intermodal node over the existing railway network, thus facilitating the dry port operation in a cost effective way. Multan being industrial and commercial centre of Pakistan is playing vital role in uplift of national economy. In this context the establishment of Multan Dry Port is an important hallmark. This paper identifies the factors which were ignored in the planning process of the dry port and due to absence of its vital rail link with sea port which results in its inefficiency and underutilization. Due to absence of the rail link it cannot get benefit of economies of scale and the cost of bonded carrier makes the handling of consignments at Multan dry port uneconomical. The paper also devises a theoretical framework for the planning process of the dry ports in future thus identifying the actors/stakeholders and their role in boosting dry port efficiency and its greater economic benefits to the national economy.

Key words: planning process, Multan Dry Port, Intermodal node, Port Capacity

1. Introduction

In the changing dynamics of supply chain, the port management has become very vital to ensure a sustained and efficient mechanism of transportation, which is economical and beneficial to the users and non-users. The ever-increased containerization has posed many challenges of port congestion and port capacity. Door-to-door delivery needs value added services from multiple actors as an integrated approach. Many port authorities are focusing over the hinterland management and intermodal transportation through establishment of dry ports not only to relieve themselves from the challenges but also to make them competitive. To achieve the objectives of establishment of the dry port as envisaged in the literature on the subject, it is essential to identify the actors with specific roles and actions.

Multan Dry Port Trust was established to manage a dry port in Multan with the objective of customs clearance facilitation to local traders and to enhance the exports from the region without engaging the government agencies responsible for trade development and the export promotions. Multan Dry Port was neither aligned with the seaport authority nor developed any sustainable transport model. Modal shift is a prime objective of the dry ports' establishment but Multan Dry Port did not approach the railway authorities for provision of intermodal node for intermodal transportation. Even after the decades of operation, Multan Dry Port is marked with inefficiency and could not attract substantial share of actual volume of the traffic.

The objectives of this research are to identify the weaknesses of the planning process and to propose optimum setting of goals for the establishment of Multan Dry Port. It also identifies the bottlenecks which resulted in inefficiency of the Multan Dry Port. The planning process for establishment of Multan Dry Port is very limited and does not involve stakeholders who are essential for the success of a dry port; neither

there are any pre-defined objectives for the establishment of the dry port. Pakistan Customs is the sole authority which notifies the establishment of dry port for the purpose of custom clearance under section 9&10 of Customs Act 1969. This paper investigates the constraints, which are faced by the customers of Central Pakistan through open-ended interviews and surveys. It proposes the intermodality (shifting containers from road to rail) through providing intermodal node at the existing network of Pakistan Railways to remove the major bottleneck of the high cost due to bonded carriage.

The paper also explores the literature and identifies the broader objectives of the establishment of dry ports and assign these objectives to the actors/ stakeholders in the context of Pakistan's planning process so that an integrated approach is developed and followed in the future to achieve the benefits as envisaged in the literature.

2. Literature Review

To enhance the performance and efficiency of the seaport its vertical integration with the hinterland is planned and exercised. A well-planned and comprehensive linkage of the seaport with the hinterland is of utmost importance in ensuring the efficiency of the network and maintains a competitive advantage over the other port cities. Conception of intermodal dry port or inland port is an effective and economical strategy towards achievement of national economic goals. Intermodal dry port is the extension of the seaport into the mainland and it is classified on the basis of the distance [1] and it needs to be clearly defined and separated from other conventional intermodal terminal or Inland Clearance Depots as defined by the United Nations Economic Commission for Europe [2].

The dry port concept and its functions have been discussed in the literature in detail. "The dry port concept is based on a seaport directly connected by rail to inland intermodal terminals, where shippers can leave and/ or collect their goods in intermodal loading units as if directly at the seaport" [1]. Broadly speaking the dry port is linked by railway to the seaport [3]-[4]. The rail link to the dry ports is emphasized to promote intermodal transportation of the containers due to obvious environmental and cost benefits of railways. The dry port concept is part of the intermodal transportation system. The dry port itself is an inland intermodal terminal with additional services located inland [4]. The dry port can ensure the massification of inland freight flow [5] and operational efficiency due to its linkage to and from seaport through the high

capacity mode [1]. [5] Have classified three fundamental characteristics of a dry port [5].

- **Containerization:** An inland port is dominantly linked with the handling of containers, both maritime and domestic, but other intermodal activities, such as swap bodies also play a role. This involves an array of added value activities such as consolidation, deconsolidation, transloading or light manufacturing.
- **Dedicated link:** An inland port must be linked with a port terminal with a high capacity corridor. Although truck shuttle services can be used, rail or barge dedicated links are the best options.
- **Massification:** An inland port must permit economies of scale in inland distribution by being able to handle larger volumes at a lower unit cost. Otherwise, direct services from the maritime terminal are a better option. A dedicated link and massification are mutually reinforcing.

The above discussion reveals that there is a consensus that a dry port is necessarily linked to the seaport with a dedicated high capacity means i.e. rail link to promote the intermodalism due to its obvious benefits and the efficient transfer of containers from seaport to the dry port and vice versa. It provides a variety of value added services to the customers like cargo consolidation and distribution, temporary storage of containers, custom clearance etc [6].

Dry port is the vertical integration of the seaport with its hinterland. A seaport can extend itself in the inland regions by establishing an efficient and effective network of dry ports to pursue its strategic goals [1]. The dry ports generates benefits in terms of reduced CO2 emissions, reduction in congestion, and increase in the seaport's terminal capacity [7]-[8]-[9] lowers the transport energy costs, reduces the congestion in the seaport city by managing modal shift from road to rail. For the entire society a dry port enables lower environmental impacts, job opportunities and regional development [4]. Dry port has the potential for modal shift in the supply chain in favor of more sustainable modes of transport if the opportunities and constraints are evaluated [9]-[1] and addressed properly. The containerization of maritime transportation and the innovations in the intermodal transport have transformed the supply chain and trade. Intermodalism is getting popular for door-to-door freight delivery involving truck and rail or barges, taking advantage of a different mode on each segment of the trip. An integrated intermodal transport can result in concentration of traffic at a specific port [10].

Intermodalism has emerged as a new technological innovation without which the goals of economic development and sustainability cannot be achieved [11].

The cost, both internal and external, of door-to-door intermodal transportation involving rail decreases with the increase in the distance due to economies of scale. [12] Has calculated the internal costs of different transport modes on door-to-door basis and concluded that the cost of the train is lower in comparison to the road. The operational cost and the full cost further decreases in case of Long Intermodal Freight Train [12]. Intermodal is a worthwhile alternative and the location of the intermodal terminal determines the economic competitiveness and success of the intermodalism [13]. The intermodal transportation is beneficial to the customers due to low cost and to the non- users due to broader economic benefits like reduced emissions, congestion and accidents [14] - [15].

There is a variety of actors involved in the planning, establishment and operation of the dry ports. The stakeholders are interested in safeguarding their interests as per the predetermined objectives of the establishment of the dry port. "Inland ports offer an opportunity for actors, such as port authorities, rail operators, logistic services providers or economic development boards, to leverage their role through a convergence of interests. The formation and role of the actors vary from country to county. [5]

'Evidence gathered in the paper underlines that the major actors in the development of inland ports in Europe tend to be port authorities and terminal operators while in North America, rail operators and real estate promoters and managers tend to be more prevalent. The positive point is that many actors, particularly in the public sector, are increasingly aware of the complexity of functions related to inland ports and are setting up corresponding governance and regulatory frameworks. The negative point is that both public and private actors have a tendency to overestimate the benefits and traffic potential and underestimate the costs and externalities of inland port projects. It appears that one important component in the commercial viability of an inland port is the relationship between operators and regulators' [5].

The performance of the dry port depends on the governance and the active participation of the actors involved in the process of management and operation of the dry port [16]. The seaport and the port authorities are of tremendous advantage of the efficient operation and management of the dry ports and the port authorities are emerging as active actors in the hinterland to attract container volumes from distant

hinterlands and improving the accessibility of the port [17]-[18]. 'Port authorities thus have a role to play in shaping efficient hinterland networks. But they have to start from the knowledge that their impact on cargo flows and on hinterland infrastructure development is limited to that of facilitator' [19]

2.1 Multan—A Manufacturing hub

Multan is situated in the South of Punjab (province of Pakistan) and there is tremendous economic activity taking place related to the agriculture, livestock, horticulture and textiles. There is further industrial potential due to the availability of the raw-material, skilled labor and demand in the national and international markets [20]-[21]. Keeping in view the availability of agricultural raw materials, the textile industry is located in this region which is predominantly engaged in export and import of their products. Other industries include pesticides, plastic which uses the imported raw material. Multan Industrial estate consists of about 300 manufacturing units, located within the metropolitan limits of the City Government of Multan.

The region is connected with the seaport with road network and the rail network. It is connected to the port city, Karachi, by Grand Trunk road (939 KMs) and Indus Highway (928 KMs). Railroad also links the city with Karachi by both the Main Line 1 (ML1) and Main Line 2 (ML2) 930 KMs and 1090 KMs respectively (Fig 1). At present ML2 is not efficient route due to speed restrictions however, the feasibility for the revival of ML2 is under way in the China-Pakistan Economic Corridor (CPEC). Motorway connecting Multan and Karachi via Sukker and Hyderabad are at different stages of construction under CPEC as shown in figure 2 [22].

Figure 1: Pakistan Railways network connecting Multan with seaports



Source: Pakistan Railway Year Book 2014-2015

Figure 2: The existing road network and the proposed Motorway in CPEC connecting Multan with seaports



Source: Planning Commission of Pakistan

2.2 Multan Dry port

Multan dry port was established in 1995 under a trust Multan Dry Port Trust, a non-profit organization, to facilitate custom clearance and to promote the exports of the country [23]. Since its creation and operation, it could not perform efficiently and could not attract the local businesses to Multan Dry Port. Multan Dry Port in the whole southern Punjab has performed less than its capacity due to its administrative weaknesses and government policies [24]. The statistics of imports and exports (TEUs) provided by the Multan Dry Port and the Custom Collectorate also verify the declining trend in the last years with an increase in the export containers handling in the last two years (Figure 3). However the statistics regarding the imports are discouraging and a source of concern in spite of the fact that the potential is very high and the imports are being handled at seaport by the customers instead of Multan Dry Port.

2.3 Assessment of the potential of the Multan

Region

This area has been marked as a high potential for exports of mango and textiles by the Trade Development Authority. Apart from the potential, the current volume of import and export containers is very high and these containers are handled elsewhere instead of Multan Dry Port. 'About 3200 TEUs of import of Multan area are cleared per month, out of which only 250 on average are handled by Multan Dry Port' [25]

Pakistan Revenue Automation Limited (PRAL) is a consultancy body providing Information Technology services to Pakistan Customs. It keeps record of the taxation and imports and exports. Data has been acquired from PRAL to make an assessment of the actual containers transported to this region. The data is filtered through address of the importer/ exporter. The data does not show the exact number of TEUs but it is calculated on the basis of number of invoices generated at the time of import/ export container clearance irrespective of its size and volume. According to the PRAL, the data is not representative because many of the manufacturing units of the Multan region are registered in Karachi as importer/ exporters. The data of actual number of containers handled at seaport instead of Multan Dry Port is shown in Figure 4.

The survey conducted for the purpose of this research shows even greater number of export containers moving towards seaport. The origination-based survey at the highway near Kotri (where Grand Trunk and Indus

Highway converge) shows that more than 200 TEUs (100 containers of 40') are originated from Multan region. In comparison with the actual traffic, the number of TEUs handled by Multan Dry is at very lower side and shows the inefficiency of the Dry Port.

2.4 Analyzing the bottlenecks

There are many bottlenecks which hamper the efficient functioning of Multan dry port. Some of these are identified and analyzed below. The container which needs to be moved from sea port to the Multan Dry Port, without being custom cleared at seaport, are called bonded containers and the carrier (Truck/ Trailer) is called 'bonded carrier'. The bonded carrier is registered with the respective dry port and managed under the terms and conditions of Pakistan Customs [26]. The bonded carrier operator charge more than those of the non-bonded carriers due to the obvious reason of fulfillment of the conditionality of Pakistan Custom at extra cost. The less availability of the bonded carrier is also a bottleneck. Ten importers and the exporters were interviewed to get their opinion. The interview was open ended and they were asked why they prefer to clear their containers at seaport and don't carry them to Multan dry port when you have the facility in your native town. All the respondents were concerned about the extra costs due to bonded carrier. Both these extra costs make their merchandise uneconomical and uncompetitive. Less availability of the bonded carrier is also an issue and delayed availability of the trailer delays the consignment.

The bonded container carried to Multan Dry Port for customs clearance has to pay double port handling charges and other port levies thus enhancing the cost of the business. All the respondents were concerned about the extra cost to be incurred in case they carry their container to Multan Dry Port.

The respondents were also concerned with the non-uniform system of customs clearance and the delays caused by Custom authorities during the scrutiny and assessment of the merchandise. They were of the opinion that there is need of a standard mechanism of custom clearance.

Deficiency of services and agglomeration is also a bottleneck making the customers reluctant using the service at Multan Dry Port. The port city has better services infrastructure and the importers from Multan area have established their import offices at Karachi. The shipping lines also do not have their establishment in this area.

The businesses are cost conscious and there are a large number of importers who de-stuff their containers at Karachi and transport their merchandise in open lorries and return the empty container to the shipping line in Karachi. In this way they save their freight charges and the rent and transportation of empty container.

3. Intermodal Transportation for Multan Dry Port—an economical option

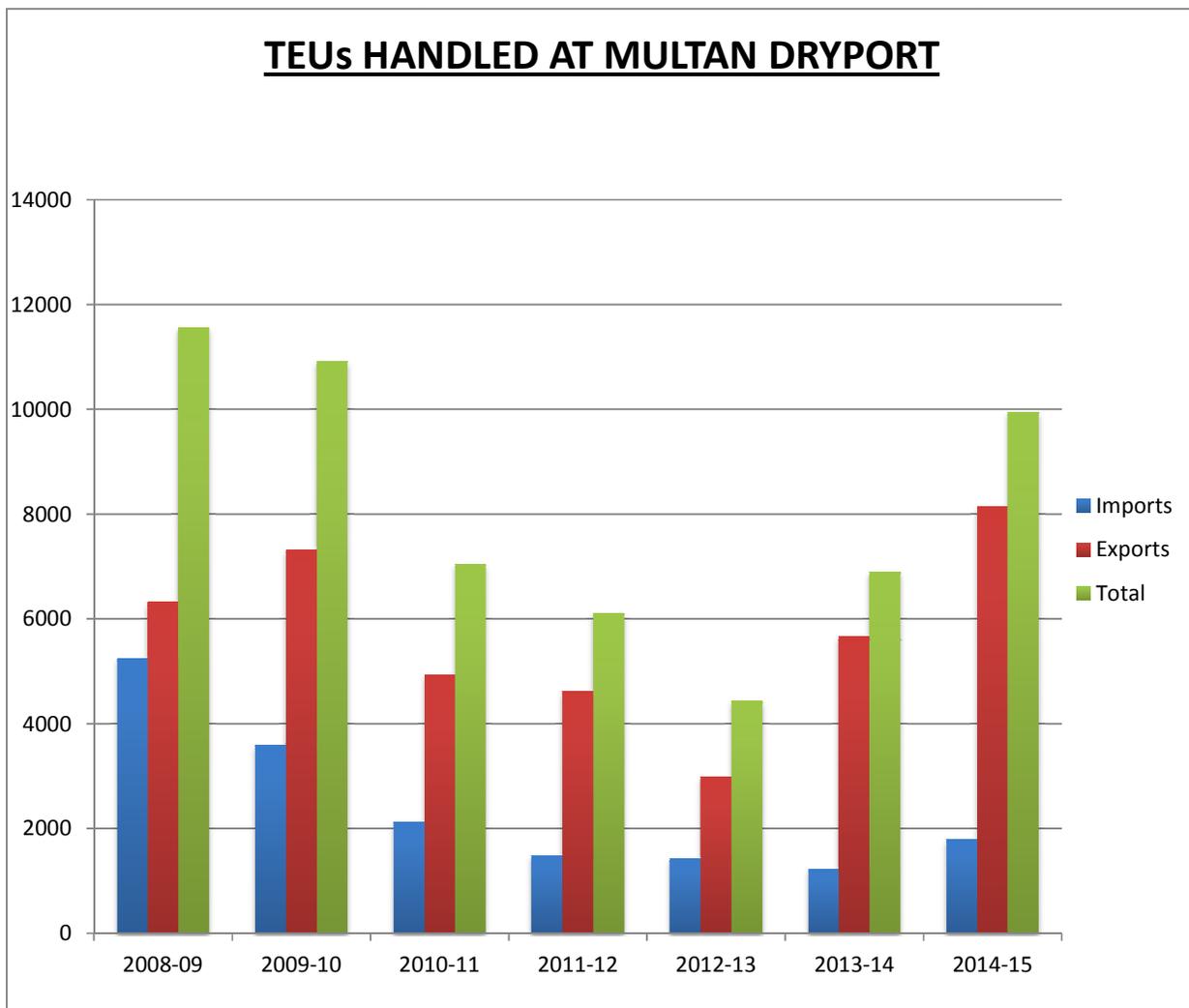
Having identified the volume of containerized traffic of the Multan region, its hinterland and distance from the seaport, non-existence of the intermodal node for the Multan Dry Port is a planning and operational flaw. As discussed in the literature review, dry ports must be connected with the high capacity mode (railways) to ensure massification of the flow. The major bottleneck stopping the customers to use the services of the Multan Dry Port is the extra cost to be

born in case of bonded carrier from seaport to Multan Dry Port.

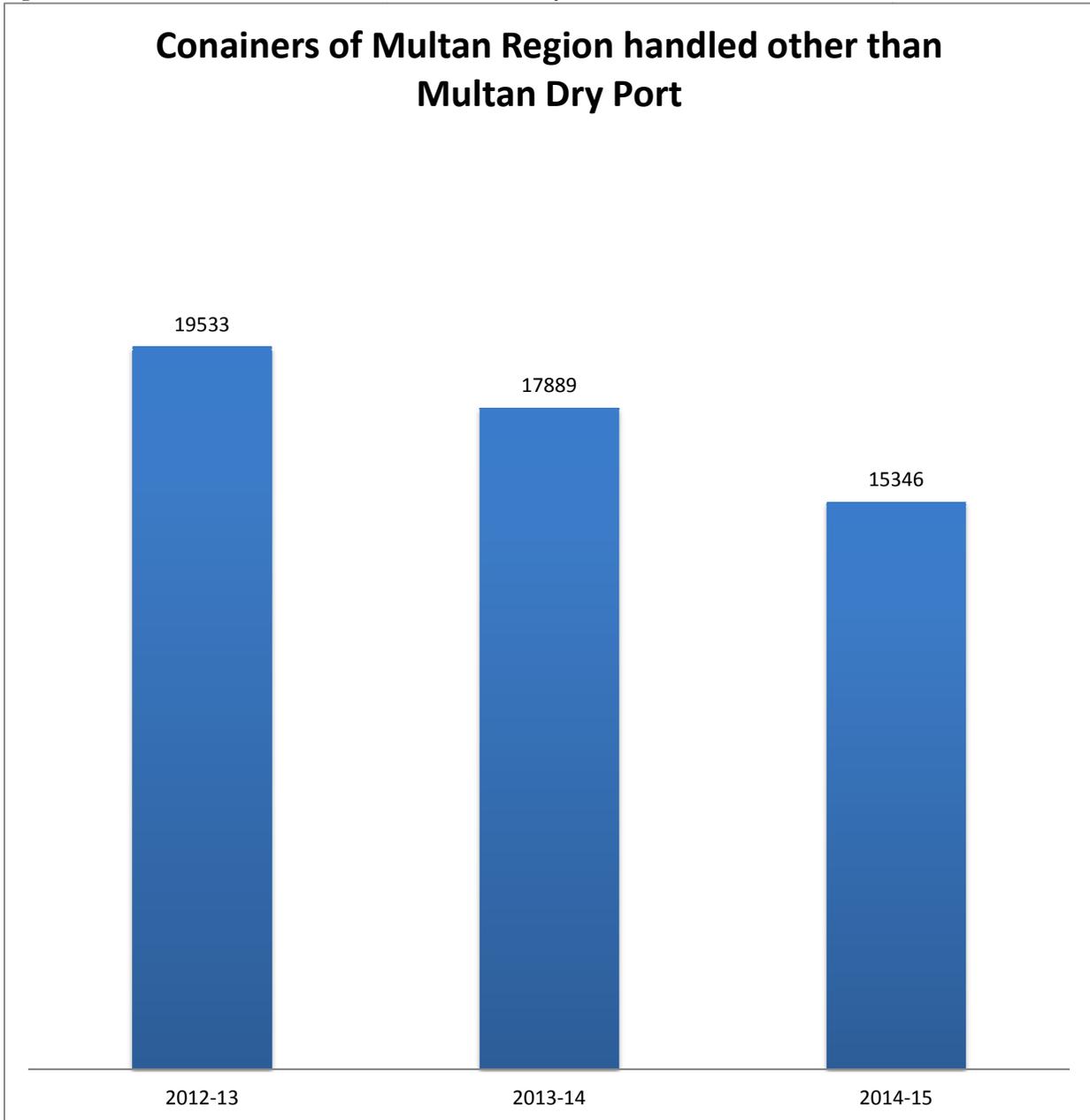
From the analysis of the classification of the dry Ports [1] and intermodal modeling in the literature, there is empirical evidence that intermodality for the distance of more than 900 KMs (Karachi-Multan) is economical and involve lesser costs—internal and external—and can result in direct benefit to the customers in terms of less cost and greater economic benefits to the society.

The industry is clustered in three areas. Figure 5 shows these industrial clusters in red shapes and also show the initial hinterland of the proposed intermodal dry port at SherShah Railway station, indicated by arrow. The industrial clusters can be classified as under according to their location.

Figure 3: The container handling at Multan Dry Port 2008-2009 to 2014-2015

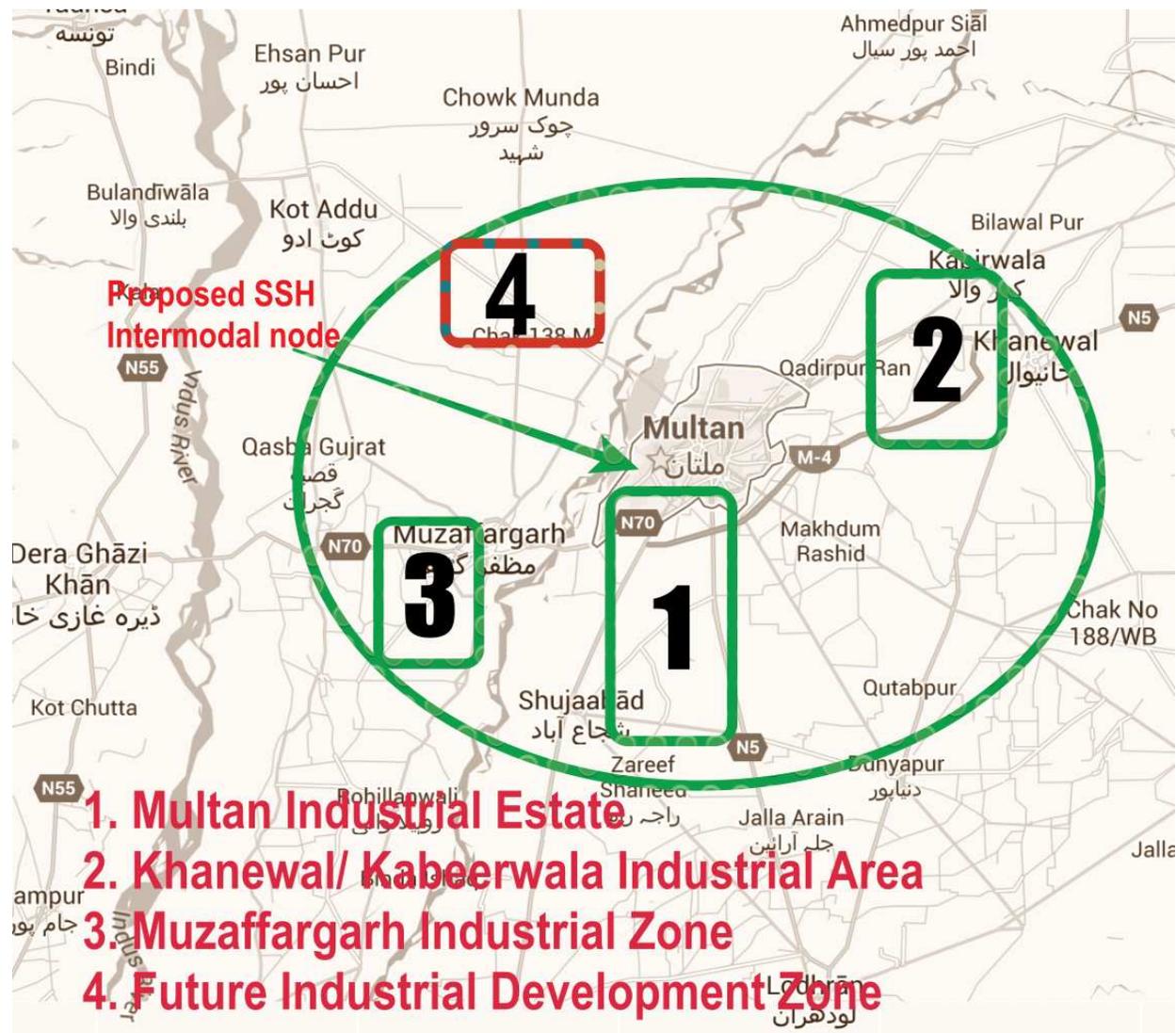


Source: Multan Dry Port Trust & Customs Collectorate Multan

Figure 4: Containers of Multan area not handled at Multan Dry Port

Pakistan Revenue Automation Limited (PRAL)

Figure 5: Proposed intermodal node at SSH and proposed hinterland of Multan Dry Port based on industrial clusters



Source: Industrial location survey

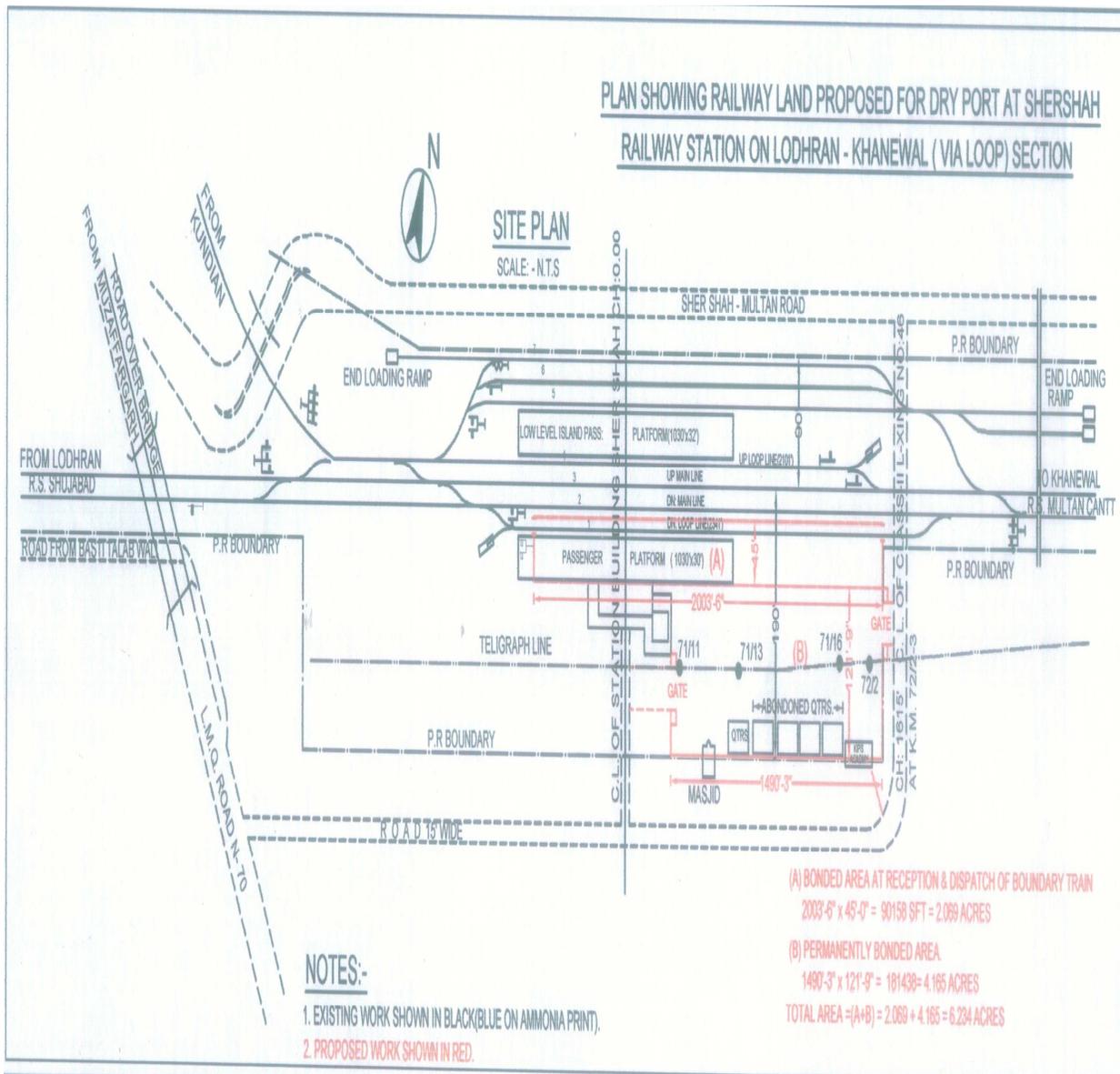
1. Industrial estate Multan at GT road
2. Muzaffargarh, Jia Bagga Road
3. Khanewal and Kabeerwala roads
4. Future industrial Development Zone

To define the hinterland, initially it is decided to keep the last leg of the journey up to 50 KMs to keep the time and cost in control. For the purpose to serve the dry port with intermodal node over the existing network of Pakistan Railways, following two railway stations with ample terminal facilities to handle the container train were identified.

1. SherShah Railway Station (SSH)
2. Muzaffargarh Railway Station (MZG)

SSH is proposed to be used as an intermodal node for dry port for the Multan region to promote the intermodal transport being more sustainable and economical. The station also fulfills all the operational requirements and the customs requirement of bonded area etc. The station is accessible from two sides from the GT road for the trailers.

Figure 6: Proposed intermodal node at SherShah (SSH) station over the existing network of Pakistan Railways



Source: Pakistan Railways, Multan Division

4. Fixing the objectives of the establishment of dry port and identifying the actors

1. **Port capacity enhancement:** A well thought out establishment of dry port extends the port to the mainland and it becomes a tool of hinterland management. The port can handle more ships and enhances its productivity. Seaport, in this case, is the major actor and gets the benefit of efficient management of the dry ports and its hinterland.
2. **Decrease in congestion:** Dry ports are connected with the seaport through a high capacity mode and the bulk loads are shifted from sea port to the distant locations. This results in the decrease in congestion levels at roads with other benefits of less accident, less emissions and less deterioration of road infrastructure. Seaport city administration is beneficiary of the establishment of the dry ports.
3. **Modal Shift:** The concept of dry port is associated with the better configuration of different modes of transport and promote the more sustainable and economical mode of transport. Intermodalism is associated with the planning process of the dry ports. All dry ports must be connected with the rail link to ensure efficient transfer of containers. No dry port may be established without the rail link. Both seaport and dry port must promote intermodalism towards more sustainable modes.
4. **Decrease in CO₂ and emissions:** intermodal transport which is the hallmark of the dry port concept is associated with the direct and indirect benefits. Railways are least emitting modes. An effective network of dry ports can work towards broader economic gains.

5. Theoretical Framework for Dry Port Planning

Keeping in view the objectives and the scope of the dry ports, it is essential to have a comprehensive planning process for establishment and operations of dry port involving the multiple actors with specific roles. Multan Dry Port was conceived in isolation without taking the broader objective into consideration which resulted inefficient utilization of the potential of the region.

In Pakistan's context an inter-ministerial committee can play a role in the policy framework for the dry ports. It involves Ministry of Shipping and Ports, Ministry of Commerce and Trade, Ministry of Communication and Motorways, Ministry of Railways, Federal Board of Revenue, Ministry of Environment and Climate Change, respective provincial governments, representative bodies of industry and the trade. The demand and planning process needs to be initiated from the Planning Commission of Pakistan after consultation with other stakeholders as a centralized activity to ensure the uniformity in establishment and operation.

Objective	Actor	Action/ Strategy
Port Capacity enhancement	I. Ministry of Ports and shipping	Macro scans to determine O-D of a container (imports and exports) and determine the hinterland of a particular dry port. Operational innovations to keep the costs uniform.
	II. Ministry of Commerce and Trade	Clustering the industry and assessment of the location of the dry port through GIS survey to keep the truck miles to minimum.
Modal shift	I. Ministry of Communication and Motorways	Policy formulation for intermodal priority over road only.
	II. Ministry of Railways	Capacity building to serve the specific dry port in terms of paths and rolling stock, involving the private freight operators, if required.
	III. Planning Commission of Pakistan	Give priority to public sector investment in Railways over highways and motorways to make Railways efficient and competitive.
	IV. Federal Board of Revenue	Customs Clearance facility may not be extended until the premises is served with intermodal
Reduced congestion & accidents	I. Ministry of Communication and Motorways.	Cross sector benefits may be calculated and monetized and shared with the other actors to keep the intermodal operation cost effective.
	II. Port City Government	
	III. Provincial Governments	
Reduced emissions	I. Ministry of environment and Climate Change	Launch a mass campaign involving the trade and industry bodies to shift towards more sustainable and environment friendly mode of transport for environmental and broader economic benefits.
	II. Provincial Governments	
	III. Trade and industry bodies	

6. Conclusion

In the changing dynamics of supply chain, the port management has become very vital to ensure a sustained and efficient mechanism of transportation which is economical and beneficial to the users and non-users. The scope of dry ports, with intermodal priority, in the developing countries like Pakistan is even broader where the trucking industry is deteriorated and operates in informal way [27]-[28] and can bring broader economic benefits to the country. The concept of dry port is at very primitive stage and the broader objectives have not been explored so far. Multan Dry Port was conceived in isolation and is more like a custom clearance depot and failed to attract the trade in spite of high volumes of the traffic. It needs immediate attention for establishing rail-road interface for modal shift towards a more sustainable

mode. The paper has identified the broader objectives of the establishment of dry ports which are widely acknowledged in the literature on subject and these objectives are assigned to the particular actors/stakeholders in the context of Pakistan's planning process so that an integrated approach is reached and to be followed in the future to achieve these pre-defined goals of the establishment of dry ports. This is high time for Pakistan to adopt a standard planning process for dry ports establishment and operation, engaging all technological advances in the supply chain management, as China-Pakistan Economic Corridor (CPEC) is already in planning phase. On the basis of this research an intermodal node over the existing railways network facilitating Multan Dry Port operations has been proposed which would boost the efficiency of centrally located dry port of Pakistan and bring tremendous benefits to the users

and the non-users. Moreover, Ministry of Shipping and Ports, Ministry of Commerce and Trade, Ministry of Communication and Motorways, Ministry of Railways, Federal Board of Revenue, Ministry of Environment and Climate Change, respective provincial governments, representative bodies of industry and the trade are identified as crucially important agents which can play role in policy framework of Dry Ports and can boost the efficiency of Dry Ports.

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