The Influence of Hinterland Transport Inefficiencies on the Performance of Ports-A Case Study of Kenya Ports Authority

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Abstract: This research focused into the influence of hinterland logistics and transport connectivity on the port of Mombasa with the objective of determining the northern corridor inefficiencies and how they influence performance of port of Mombasa. Mombasa port with vast hinterland in the east and central Africa provided a better platform to describe the relationship. The researcher will employ a descriptive research to describe the state of affairs as it exists and a stratified sampling method to reach at most representative respondents in the study universe of fifty-eight respondents covering port users and clearing and forwarding agents, port officials and leading transport and logistics organizations: KSC and KMA. Questionnaires and interviews will be used by the researcher as instruments to collect data and finally analyse and synthesize for presentation using Microsoft Excel data analysis software for purposes of achieving objectives. The findings of the research effectively revealed that the influence of hinterland transport inefficiencies on performance by KPA was glaring. Northern corridor inefficiencies was found to contribute to slow uptake of cargo into the hinterland leading to high truck turn round time and therefore high cargo dwell time at the port, leading to a conclusion that indeed hinterland transport connectivity plays a significant role in the success of ports. Major recommendations made is that KPA to lobby for a participatory role in policy formulation and implementation on design, maintenance and prioritization on roads infrastructure development and modern dual railway transport system with dynamic wagon loads to accommodate different cargo weights. The government agencies involved in cargo administration to invest in integrated ICT to facilitate smooth flow and management of information thereby removing unnecessary corridor administrative stations and finally KPA to revive the practice of port regionalization concept by investing in inland dry ports in major market areas so that shippers would not cover long distance on poor infrastructure to the port.

Keywords: Hinterland Transport Inefficiencies, Port Performance

1. Introduction

1.1 Background information

As trade volumes along world's trade routes increases, pressure has been experienced in transport facilities including ports. Ports being nodal point in the global logistics and supply chain have had their roles clearly defined. However, their performance can be inhibited or promoted by efficiency and effectiveness of other elements in the chain as they complement each other in service delivery. Traditionally, port performance has been measured through analysis of internal port logistics and sea side access facilities with no focus on correlation between hinterland transport connectivity and port performance, which has led to paradigm shift in trade route decisions and choices where shippers do not only choose a convenient gateway but a gateway characterized by efficient and effective logistics.

Development of ports worldwide, have been greatly influenced by trade flow routes and emergence of independent social political and economic jurisdictions. Mombasa port is not an exception .The Port can trace its history back many centuries to a time when dhows called at the Old Port on the north side of Mombasa Island during the famous spice trade between the Arabian Gulf, the east coast of Africa, the Indian subcontinent and the Far East

1.1.1 The Impact of Containerization

With the coming of the container age, Mombasa port commissioned deepwater births in 1980 which had been designed for subsequent conversion into container handling berths. The same year marked the beginning of the container trade in Mombasa, with 1,385 TEU handled in 1980 As container traffic continued to grow, berths No's 16 and 17 were converted into container handling berths and a third berth, No 18, purposely designed for container handling, was added in 1980. The rapid increase in container traffic through Mombasa prompted the port authority to extend the container handling operation upcountry and in the years that followed it set up two inland container depots at Embakasi in Nairobi (which opened in 1984) and at Kisumu (1994). It's significant to note that the year 2012 saw the construction of berth No. 19 and the beginning of building of another terminal at port Reitz.

with the collapse of the EAC in 1977, the running of Kenya's ports was taken over by the national government, which established the Kenya Ports Authority (KPA) in 1978.KPA was enlarged in 1986 when it merged with the autonomous state organization Kenya Cargo Handling Ltd to form a single body responsible for all aspects of national port development and operations.

1.1.2 Current status and functions of KPA

KPA is a state corporation with the responsibility to maintain, operate, improve and regulate all scheduled

International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Impact Factor (2012): 3.358

seaport on the Indian Ocean Coastline of Kenya, The services offered at the port include: Managing the cargo container terminal for movement of containers from ship to shore and shore to ship, Berthing of ships, providing stevedore work for conventional ships, and Permanent Railway services for movement of cargo into and out of the port among other logistics support services.

1.2 Problem statement

Ports do not exist in isolation as they depend on services of logistical elements. However attractive a site may be for harbour development, it cannot create a port unless the situation allows for development of the all important relations with the hinterland with exception to transshipment ports. The relations of a port with its hinterland is anchored in the various logistical activities in the supply chain logistics path, key among them the transport element.

Hesse and Rodrigue, (2004) as cited by Notteboom, (2008), expressed that "The supply chain focus on port competition holds clear implications on the role of hinterland connections. Port hinterlands have become key component for linking more efficiently elements of supply chain mainly to ensure the needs of consignees are closely met by suppliers in terms of cost, availability and time in freight distribution."

Cargo throughput flowing through the supply chain logistical corridors and handled by the ports has increased overtimes, as is evidenced by doubled ship capacity over the past decades from 1st generation container ships to 4th generation and massive investment in capacity and facility upgrade by ports. This phenomenon has stretched the hinterland transport infrastructure leading to congested cargo flows through the corridors depicting hinterland transport inefficiencies and challenges which arise as a result of not planning ahead of demand or lack of coordination. Visser et al (2007), observed that increasing container throughput in the ports also leads to increasing transport volumes in their hinterlands and this has also brought the issue of capacity and quality of the hinterland transport system to the fore. From the discussion, this will have a ripple effect in the operations of a port by stifling cargo off-take rates which increases container dwell time and therefore high transit costs

Kenya ports authority which manages Mombasa port, the biggest port in East Africa is affected by inefficiencies of hinterland transport connections that have influenced its performance. Efficient evacuation of containers through to the hinterland transport facilities and destinations complements ports performance and competitiveness in the region. This is because ports performance does not only depend on internal logistics and infrastructure but also on the quality and flexibility of hinterland transport connections which serve it and its markets which is always the road networks, railway systems, inland waterways and pipeline system

Magala & Sammons, (2008), argue that "Ports can no longer expect to attract cargo simply because they are natural gateways to rich hinterlands. Major port clients are now likely to choose ports not simply on their efficiency and location advantages but rather on the quality and reliability of the entire supply chain. The successful functioning of ports is indistinguishable from the successful functioning of the entire supply chain. For shippers, port choice becomes more a function of the overall network performance and ports are chosen on the basis of faster, better and more costeffective access to the markets in which shippers compete for profit".

For ports to be successful they have to think along with the customer, and figure out what his needs are, not only in the port but throughout the supply chains and networks. This requires a supply chain focus of port authorities and an institutional and governance framework that encourages collective actions in the port community (Jacobs and Notteboom, 2009; Van Der Horst and De Langen, 2008; Notteboom, 2008; De Langen and Chouly, 2004).

Kenya ports authority plays an important role in facilitating and promoting national and international trade of East Africa's region including Kenya, Uganda Ruanda, Burundi and South Sudan. In this regard, the role and service delivery at the port of Mombasa must be analyzed through among other logistical elements, its hinterland transport efficiency as its through hinterland transport capabilities that a ports performance is enhanced.

This research seeks to establish the influence of the hinterland transport inefficiencies to the attainment of port performance, reliability and therefore the overall service delivery.

1.3 Objectives of the study

1.3.1 General objective

The general objective of the study is to evaluate the influence of hinterland transport inefficiencies on performance Ports

1.3.2 Specific objectives

- 1. To find out how poor roads links to the hinterland affects by Kenya Ports Authority performance
- 2. To find out how poor railways links to the hinterland affects kenya ports Authority performance
- 3. To investigate how administration measures along the hinterland transport corridor influence Kenya ports Authority performance
- 4. To find out how social economic and political challenges in hinterland transport affect Kenya ports Authority performance

1.4 Research Questions

- 1. How does poor road links to the hinterland affect Kenya Ports Authority performance?
- 2. How does poor railway links to the hinterland affects Kenya Ports Authority performance?
- 3. How does hinterland transport corridor administration measures influence Kenya Ports Authority performance?
- 4. How do social economic challenges in hinterland transport affect Kenya ports authority performance?

1.5 Justification of the study

The level of service delivery at the port of Mombasa is contingent upon a host of activities offered by various logistical elements in the entire East and Central Africa, a market that port of Mombasa serves. Many studies reveal that there are inefficiencies which often characterize the port as an institution thus impeding the international trade competitiveness of the region. It's important to appreciate the port as an important element in the supply chain and to understand more on the influence of hinterland transport connectivity logistical element which the port administration may not be in control in the overall service delivery.

1.6 Scope of the study

The study is limited to the description of the influence of hinterland transport inefficiencies on Kenya ports authority which manages port facility of Mombasa, located in the Mombasa City of Mombasa County. The study will be undertaken in Mombasa in the port area and premises of logistics providers who operate from the port of Mombasa to hinterland destinations. The study will be carried out in the month of February, 2014

2. Literature Review

2.1. Introduction

This chapter examines existing literature in support of the concept of ripple effect of hinterland transport inefficiencies to ports performance with a view of developing a conceptual framework on the influence of hinterland transport inefficiencies on performance by ports.

2.2. Theoretical Review

Most trade and investments are attracted around strategic areas with access to seaports for ease of transport of products to distant markets. However, with the development and continued investment in hinterland logistics systems, firms no longer discriminate on areas for investment as they have an option of employing the competencies of superior logistics service providers and infrastructure to support their business. Jacobs (2009) noted that international barriers to trade have effectively been lifted by the GATT/ WTOagreements since the 1980s, global manufacturers have vertically disintegrated their fordist production systems into geographically dispersed and flexibly organized supply chain systems. This aspects has increased volumes of cargo moving through ports and forced them to pay attention to the hinterland logistics

2.2.1 The theory of port competition and hinterland connections Zondag et al (2008)

Zondag et al (2008), presented a port competition model which is linked to a worldwide trade model and the transport costs data base of the European Community. The pilot version of the model was developed for the Le Havre – Hamburg port range but its set up is generic and can be applied to any region in the world facing the issue of port competition. De Langen and Chouly (2004), identified two important variables of the competitiveness of a port: port performance, in the sense of a competitive service to shipping lines, and the ability of a port to serve markets in the hinterland efficiently. UNCTAD (1992), identified components of port competitiveness to include Geographical location, hinterland networks, availability and efficiency of transportation, port tariffs, stability of port and port information system. McCalla (1994), argued that key elements of a ports competitiveness includes Port facilities, inland transportation networks, container transport routes. The dominant component between the two researchers which stands out clearly is the efficiency of inland transportation networks

The industrial re-organization of world economy as a result of globalization, Supply chain effectiveness and efficiency took center stage with the ports being the logistical nodes in the supply chain which can substitute each other. According to OECD/ITF (2008) *Discussion Paper No. 2008-19 on port competition and hinterland connections*, A port that provides services of a given quality at the lowest price does not necessarily gain market share, as other factors that are not under the port's control affect port choice, the focus shifts from port performance to supply chain performance.

Many ports of the word today no longer have traditional or secure captive hinterlands this is because with the development of mainly physical transport infrastructure across international borders have given rise to options of routing of cargo extinguishing distinct port hinterlands and creating overlapping port access areas. "It is no longer possible to talk about captive traffic in a port but rather volatile traffic which can be captured by several ports" (Cuadrado et al. 2004). According to Anming (2008), competition between ports is treated as competition between alternative intermodal transportation chains in reference to both corridor facilities and inland roads. He further argued that when ports compete in quantities, an increase in corridor capacity will increase owns port output, reduce ports rival output and increase owns port profits. Limao and Venables (2001), argue that successful and efficient gateway ports are often those that are effectively connected to their economic hinterlands by adequate and effective transport corridors. Notteboom and winklemans (2001), as cited by De Langen (2008), observes in the paper structural changes in logistics: How will Port Authorities Face the Challenge that port competition has moved between ports to competition between transport chains. A port would therefore leverage on the competencies of its transport chain corridor to enhance its effectiveness and improvement on key performance indicators.

2.2.3 The theory of Integration for port-hinterland freight transport (Notteboom 2008)

The existence of Physical hinterland transport infrastructure alone to a port is not a *prima facie* guarantee of efficient and effective connectivity it therefore calls for developing a mechanism of integrating port logistics and hinterland freight transport and its intermediaries. According to Potter and Skinner, (2000), as cited by Ducruet et.al (2009), transport integration, is the linking of disjointed and often incompatible transport systems. Rodrigue and Notteboom (2000), Observes that Maritime shippers are becoming increasingly active in the management of hinterland flows in many ports, namely through alliances and contracts with rail and road transport companies and have synchronized more efficiently inland distribution capacities with port-maritime distribution capacities while coping with congestion and the costs associated with a high throughput maritime - land interface. Jacobs and Notteboom, (2009) observers that through a vertical integration of their activities market players such as shipping lines, forwarders, transport operators and logistics groups seek to reduce costs, to improve efficiency, to generate revenue and to deliver value and a 'one-stop shop' service to the customer.

Third party logistics providers may arise from vertical integration of shipping line, terminal operator and hinterland transport provider

2.2.4 Port - Hinterland logistics regionalization theory (Notteboom and Rodrigue 2005)

Advanced by Notteboom and Rodrigue (2005), is a concept of extending ports competencies beyond its boundaries to the far hinterland market. The strategy of developing port networks with hinterland nodes and dry ports in the hinterland has become widely accepted as a viable strategic option (Langen and Chouly 2004). In the regionalization theory port authorities should promote an efficient intermodal system in order to secure cargo under conditions of high competition. The phases of regionalization bring the perspective of port development to a higher geographical scale, which is beyond the port perimeter. (Notteboom and Rodrigue 2005). This leads to development of inland terminals which will transfer part of the collection and distribution function inland away from the ports, thus preventing a further overcrowding of limited seaport areas therefore easing congestion and creating spatial dispersion of logistics sites as shown in figure 2.1 as phase 3 of strong zoning and polarization of hinterland logistics sites, as advanced by Notteboom and Rodrigue (2005)



A Spatial Model on Logistics Sites in the Port Hinterland: *Adopted from Notteboom and Rodrigue*, 2005

According to Rodrigue and Notteboom (2000), Regionalization theory represents a setting where inland distribution becomes of foremost importance in port competition, favoring the emergence of transport corridors and logistics hubs.

2.3 Conceptual Framework

The concept of influence of hinterland transport inefficiencies on port performance is as described and presented in the framework below



From the conceptual framework, poor roads links that characterize the northern transit corridor has direct influence on ports performance given that over 90% of transit containers are evacuated through road transport. Its inefficiencies therefore course delay of cargo en-route resulting to poor truck turn round time. This will see the port register high container dwell time a phenomena that pulls down port performance. The railway network which ideally was designed to complement port performance has become irrelevant as far as evacuation of cargo is concerned. Currently according to port statistics, the railway handles less than 5% of the total cargo off take at the port. Similarly, Social economic and political situation that is evident in the countries that share the corridor has some degree of impediment to smooth flow of cargo along the corridor. This is because of poor social economic environment leads to poverty stricken and unemployed youth to venture in highway crimes thus interfering with supply chain security and the net effect will affect port performance. Administration measures along the corridor are bureaucratic and characterized by corrupt practises leading to traders incurring extra cost in the name of facilitation fees. In the long run this renders transport from the port of Mombasa uncompetitive by factual analysis without reference to any other corridor. These factors among others are key elements which contribute to the inefficiency of the northern transit corridor

2.3.1 Poor Road links

The main mode of transport in Kenya for high percentage of dry cargo is road. The country has a road network of 63,292 kilometers of classified roads. Of this, 8,938 is made of bitumen while 54,354 is gravel and earth. About 115,000 kilometers of the road network is not classified. Road transport if over relied upon by a port may outstretch its capacity and through ripple effect stifle port performance. Road infrastructure in and to the seaports reach their capacity limits and heavy congestion not only occurs on the roads, but also at terminals. (Visser et al., 2000).

Effective and efficient transport is predicated on good infrastructure; roads, airports and port. Kenya's transport sector scores poorly in terms of infrastructure. Most road networks are in poor condition. The port of Mombasa, which provides the entry point for sea transport and serves East Africa, the Great Lakes and Sudan, is doing quite well following the reform of the Kenya Port Authority through effective management. However, major corridor highway have not complemented in improvement. Rehabilitation of Mombasa-Nairobi-Malaba Highway, which is the main road artery in the country and a link to the landlocked countries in the neighborhood namely Uganda, Burundi, Rwanda and the Democratic Republic of Congo, has been slow.

2.3.2 Poor Railway links

Rail transport is the second most important mode of transport after road and offers the best alternative for transporting bulky produce for both local and export markets. The rail network essentially comprises a single line, overland rail track from Mombasa through Nairobi, Nakuru, Kisumu/Eldoret, Jinja, Kampala to Kasese in western totaling Uganda to 1650km. The key rail track for transit cargo runs from Mombasa to Kampala via Malaba comprising of 1330 km. Kenya Railways works closesely with the Kenya Ports Authority in transportation of bulk commodities. However, the Kenya Railways has not been operating at its full capacity It is for this reason that the government had embarked on a process of concessioning the railway so that it can be operated more effectively. The concessioning deal being done jointly with the Uganda government was signed early in 2006.

2.3.3 Corridor administration measures

The Northern corridor coverers mainly Kenya and Uganda as transit facility for Rwanda, Burundi, DRC, and S. Sudan bound cargo. Kenya and Uganda exercise administration and regulation of the corridor with the objective of economic and political protection. These administrative measures however, act as impediment to smooth cargo flow rendering the corridor inefficient. Corridor operational and transactional inefficiencies arise through documentation and long transactional procedures. Nathan Associates (2009), observed that The imposition of taxes and restrictions on goods traded based on trade agreements and protection of domestic industries, and enforcement of safety and sanitary standards increases the time and cost of moving goods across land borders or through international gateways, can be justified on political and economic grounds. Problems arise where there is lack of diligence, consistency and transparency in enforcement of these regulations or where the procedures are inefficient thus introducing unnecessary costs, delays and uncertainty. In the northern corridor, inefficient border posts, too many weigh bridges and customs points riddled with corruption have traditionally been identified as a major source of cost and delay

2.3.4 Social-Economic Challenges

The social economic and political status of Kenya notwithstanding decades of economic stagnation, is towering in East Africa because of its significant long-standing role as East Africa's main transportation hub linking the port of Mombasa such that a turmoil will impact negatively to other East African counties because of absence of supply chain security. This was evidenced by post election violence which characterized the 2007-2008 General Elections. Kenya as a transit route serves Uganda, Rwanda, Burundi DRC and south Sudan. These countries have had to do with problems leading to inefficiency of the northern corridor as a result of Kenya's political social and economic wrangles. for example attacks by armed protagonist groups, protesters, roadblocks along the main highways between Kenyan administered part of the Northern corridor and destruction of rail infrastructure created not only hinterland transport inefficiencies but also choked the Mombasa port's access to the hinterland.

According to Kenya shippers council policy paper *Supply Chain Security During Election Period* (2012), Parts of the Northern Corridor were adversely affected in 2008 by road blockades and the uprooting of parts of the main railway line to Uganda which caused unprecedented delays for cargo to the Hinterland. This happens due to poor economic planning leading social problems such as unemployment and drug abuse among youth making them susceptible to political manipulations giving rise to organized crime and militia groups along the transport corridor

2.3.5 Ports Performance Measurement

There are various ways of determining ports performance depending on what element is being measured. In relation to efficiency, Bichou and Gray (2004) expressed three broad categories : physical indicators, factor productivity indicators and economic and financial indicators they further argued that physical indicators generally refer to time measures and are mainly concerned with the ship (for example, ship turn round time, ship waiting time, berth occupancy rates and working time at berth). Factor productivity indicators focus on the maritime side of the port as it measures both labour and capital required to load and unload goods from ship. Economic and financial indicators are also related to the sea side access in relation to operating surplus or total income and expenditure in respect to Gross Registered Tonnes (GRT) or Net registered tonnes (NRT).

The traditional port measures focuses on sea access rather than land side connections and there is need for better measurement of land side connections, (Bichou and Gray (2004). Evidently, internal sea side operational parameters in relation to ships turn round times, cargo throughput per annum, and average slings of cargo handled per hour are used at the port of Mombasa. These parameters does not take into account many activities and actors external to the port environment. The port however, incorporates cargo off take rate per day and container dwell time to measure evacuation efficiency of cargo at the port according to KPA statistics the current averages of container deliveries per day is 1000 Teu's and 3 days of cargo dweltime.

2.4 Summary

The role of Ports today is clearly defined and analysed in the context of supply chain system they should be seen as part of integrated global supply chain logistics platform where management and coordination of cargo and related information flows is staged in order to achieve supply chain efficiency. Ports constitute a critical link in the overall logistics and supply chain. Thus, their level of efficiency and performance influences, to a large extent a country's Competitiveness. To achieve and maintain a competitive edge in international markets, nations need to both understand the factors underlying port competitiveness and to continually assess the performance of their own port sector in comparison with other ports in the world. Key among them is the efficiency of hinterland transport connectivity.

The general performance of a sea port in customer service delivery and its competitiveness thereof is largely influenced by capabilities of hinterland transport connectivity as it's the critical link to a ports market. A robust hinterland connectivity is not only dependent on physical infrastructure, but also various actors in logistics and transport sector which includes trucking companies, railways, freight forwarders, government agencies and their integration

3. Research Methodology

3.1. Introduction

This section gives details of the procedures that will be used in conducting the study. It includes the research design, study population, sampling technique and sample size, data collection instruments, data collection procedures and data analysis

3.2. Research design

According to Mugenda and Mugenda (2003), research design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions. This is a descriptive research and as such descriptive research design will be adopted. The choice of this design is informed by the need to ascertain and be able to describe the characteristics of the variables of interest in the study without influencing it in any way, in this case hinterland transport inefficiencies and how they influence port performance. Descriptive research describes the state of affairs as it exists. It involves observing and describing the behavior of a subject as it is.

The research design will comprise of Observation on data to be collected. This is the initial step used to familiarize the researcher with the research universe. Secondly, the Contact list of respondents to be made and this will be used as reference point in data collection. A schedule of activities that will help to guide the progress of research will be the third item for reference together with a time frame made showing the beginning of research and the expected end date and lastly Letters of introductions to be sent to the respondents and organizations involved in the study

3.3 The population of study

Population refers to aggregate of all units such as people, organizations, events or things of that will be of interest to the researcher in the study as the population possesses certain characteristics that the researcher seeks to establish. The population of interest for this study was Kenya Ports Authority, and its customers who are logistics providers in the hinterland. They included container transport companies with clearing and forwarding units. Kenfreight East Africa Ltd, one of the leading transport companies with customs agency unit and a Container freight station, was chosen by the researcher. This is because it's established in the biggest cities in East Africa and specializes in multimodal logistics and major industrial projects. It's therefore deemed to be a true representative of other port users in the industry. This being a research on hinterland transport inefficiencies, the researcher purposively targeted port logistics officials and port users who manage logistics for container movement through the Northern Corridor to the hinterland destinations The researcher was keen to target senior employees of the population particularly management staff.

3.4 Sampling Technique and Sample Size

For sample design method, stratified sampling method was applied. The study population was stratified purposively into two categories of port officials and port user company's officials from Kenfreight East Africa Ltd with each strata being represented by sample size as a result of their numbers.

KPA had its Operations and logistics officials totaling 70 many of which work in shifts and Port Client Company, Kenfreight East Africa Ltd staff was estimated to be over 260 truck drivers inclusive. Since the population study was extremely large, it was segmented as shown in the table of research universe as follows;

 Table 3.1: Table of respondents depicting the research

universe								
No.	Population strata	class	Estimate	Sample	Sample			
				ratio	size			
1	Kenfreight E.A Ltd	Mgt	20	0.08	8			
		C&F	40	0.15	14			
		Drivers	130	0.5	48			
2	KPA Operations Officers	Mgt	70	0.27	26			
Tot	al Sample Size	260	1	96				
2 Tot	KPA Operations Officers al Sample Size	Mgt	260	0.27	26 96			

Source: Researcher 2014

The researcher choose to select 30% of estimated population size of 260 for the exercise. Through Proportionate allocation, using a sampling fraction in each of the stratum determined ratios for each stratum proportional to that of the sample size

3.5 Data Types

Data used was both primary and secondary, primary data having been collected from respondents and Secondary data obtained from both published and unpublished materials. Published materials included; written literature, articles, documents and extracts from the internet as well as journals.

3.6 Data collection method and instrument

(i) Questionnaires

The purpose of using this method is because it is faster and can save time. It's also confidential and allows for individual opinion. Primary data was obtained through the use of structured questionnaires. These questionnaires were researcher-administered to the respondents. The questionnaires had both open ended and closed ended questions to answer.

3.7 Data analysis and presentation

Descriptive statistics was used to describe and summarize the data to enable meaningful description of the distribution of the scores or measurements. Data was analyzed and synthesized for presentation using Microsoft *Excel data analysis software* which offers statistical packages making it ideal for data analysis and statistics. The process was as follows: Data tabulation where data gathered was tabulated in a table for further investigation secondly, data correlation in order to get a sequence of information. This made it possible to relate data of the same nature so as to arrive at an understanding. Thirdly, data synthesis to enable interpretation and finally the data was interpreted to give the findings and presented.

For ease of understanding and to allow comparative look at variables, the researcher has presented data collected in form of Tables; Narrative, Graphs and charts. The presentation tools allowed presentation of cumbersome data in condensed concise and meaningful forms for proper interpretation and analysis of the existing situation as per the objectives of the study

4. Research Findings and Discussion

4.1 Introduction

This chapter carries the findings based on respondents' information and observations carried out during the research. The data was collected and analyzed in line with objectives of the study

4.2 Presentations of findings

The data presentation and findings were presented qualitatively and quantitatively using bar graphs, tables and pie graphs

4.3 Response rate

The researcher deployed questionnaires to the target respondents with help of one assistant in each of the population stratum. The instrument recorded high response as indicated in the graph below.

No	Respondents	Questionnai	Questionnaires received					
	sent			Duration of service				Frequency
	Kenfreight E A Ltd			<10 yrs	%	>10 yrs	%	
1.		Mgt	8	2		5		7
		C&F	14	3		9		12
		Drivers	48	10		29		39
2.	KPA operations Officers		26	7		14		21
Totals			96	22	27	57	72	79
	82%							

 Table 4.1: Instrument Response Rate

Fom the table The topic was of high interest to the respondents in the industry this is evidenced by the high rate of response at 82%. Most of the workers in the industry are people of vast experience as most (72%) respondents indicated their years of service to be over 10 years and therefore knowledgeable as far as transport and logistics is concerned. One of the respondents was an executive officer in the policy formulation and direction position.

4.4 Road links

After analysis of collected data in relation to the influence of road links on port performance, respondents gave the following results.



Figure 4.1

From the general inefficiencies identified by the respondents, 67 % rated road links and rod transport performance in relation to complementing cargo off- take at

the port as poor .33 % rated good. The 33% rated good particularly because it's not the first choice mode of transport to evacuate Cargo and the current port performance

International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Impact Factor (2012): 3.358

indicators stand as a result of the existing capacity handled by road transport which was at 95.5 % Teu's in 2013. However, further analysis indicated that most respondents (98%) strongly agreed that road transport inefficiencies affect port performance

Poor road links was found to contribute to slow uptake of cargo into the hinterland leading to high truck turn round time and therefore high cargo dwell time at the port. This is because the roads links are in poor state and does not fully complement the improved cargo traffic through the port. The roads links as it is today however is still the major evacuation mode as most of the cargo traffic goes through the roads.

4.5 Railway links

The data that was collected regarding railway links and transport, gave the following results

Railway Links rating



Figure 4.2

From the chart 97% of respondents rated rail links as poor. they all however, (100%) agree that Rail links and transport performance has direct effect on port performance as it's ideally the primary mode of cargo evacuation from the port but currently it's seriously ineffective. KPA Statistics indicate that, in 2013 rail transport handled 19,915 Teu's representing 4.6 % percent of full containers being evacuated into the hinterland which was an improvement of 0.5% from 4.1% in 2012 as shown below

Comparative look at rail and transport links cargo uptake from the port



From the figure above 2012 saw railway link handle 19690 teus compared to 358307 teus for the road link, 2012 it handled 17889 compared to 418341 or the road links an in 2013 the rail links handled 19915 compared to 426937 or the roads. Most of them described the Rail track as old one meter gauge, unreliable and dilapidated condition. Asked their opinion on cost of rail transport, 60 % agreed that it's higher than it should be. They also gave problems contributing to inefficient Railway links as low wagon capacity, old locomotives and dilapidated rail track.

The results reflected the status of railway links in the northern corridor which for long has been in a dilapidated state and some of the extensions severed and are no longer in use. The aspect of low capacity in terms of few wagons keeps containers detained at the port for long waiting for wagons and this contributes to the high container dwell time a key port performance measure which the port aspires to bring it down as much as possible.

4.6 Corridor administration measures

In relation to Transit corridor administration measures, respondents were asked to identify them and if they agreed whether they influence port performance. thereafter they were asked to rank them from the least delaying to most delaying using the scale of 1 to 4 with1 being the least delaying and 4 being the most delaying and inefficient. The results are as represented in the chart below



From the chart, 47% of the respondents indicated that weighbridges are the most delaying followed by border posts clearance at 28%. Customs was ranked 3rd at 17% and Police roadblocks 4th at 8%. Respondents identified corridor administrative measures and most (99%) agreed that its inefficiencies has direct link to port performance and the cost of transport.

Corridor administrative measures though necessary have been cited as being impediment to smooth flow of cargo traffic. These measures however do not affect railway transport system as they have customs integrated control measures where cargo are transported under custom and operator seals.

4.7 Social economic challenges

In this objective, respondents were asked to name Socialeconomic challenges in the corridor and whether they agree that they have impact on port performance and the result was as follows. **Rating of social-economic challenges**



Figure 4.6

From the chart 91% of Respondents agreed that Socialeconomic challenges impact on port performance. They cited the challenges as insecurity, risk of diversion of transit goods into local markets and political instability. Social behaviour of drivers was also cited by Managers and KPA officers as a challenge. This is because truck drivers do stopovers for recreation and entertainments for long hours.

Social–economic challenges is common in all corridor sectors managed by each East African country since each country has social challenges which prvent optimal performance of facilities in the corridor. The impact of social challengs to the port performance is great given that transport operators, apart from delays would invest on mitigating masures thus adding up the transport cost . This will increase overall cost of oving cargo throug the port.

4.8 Dwell time analyssis

Container dwell time at Mombasa port dropped in 2008 but marginally increased from 2010 as per the figure below.

Cargo Dwell time analysis at KPA



Source: KPA Wajipika Project Statistics 2013

The phenomenon was experienced as a result of increased volumes of cargo in which the hinterland transport

connectivity cannot cope up with at the rate at which it's received at the port





Source: KPA Wajipika project Statistics 2013



From the figure, the storage charges component in revenue increased marginally from 2007 up to 2010 it however, increased in 2010-2011 from 7% to 14% in 2011-2012 financial years. From this secondary data, it was evident that the effect of cargo dwell time at the port, contributed to increased storage charges component which is normally transferred to the shippers and therefore increased cost of logistics in the corridor.

4.9 Contestable hinterland market perspective

Mombasa port enjoyed a wider market in East Africa. It however, emerged that it was progressively losing the Burundi and Rwanda markets. This is not to say that services at the port of Mombasa were inferior to that Dar es Salaam had to offer but among other factors, the inefficiencies inherent in the hinterland connectivity linking port of Mombasa and the markets. According to KPA Wajipika transformational project (2013) noted that KPAs market share in transit cargo had significantly dropped, within a span of five years and lost over 90% of its Burundi market to Dar es Salaam as shown below.

KPA transit market share analysis (Burundi Market)



Source: KPA Wajipika project Statistics 2013

Similarly, in the same period Rwanda market showed signs of decline and preference to port of Dar es salaam following the trends of Burundi. As shown below

KPA transit share analysis (Rwandan Market)



Source: KPA Wajipika project Statistics, 2013

The choice of Dar es Salaam port by importers and exporters in Burundi and Rwanda markets which are markets Mombasa and Dar es salaam ports are competing for, is largely due to inefficiencies inherent in the northern corridor which servers Mombasa port compared to the central corridor serving the Tanzanian port

5. Summary, Conclusions and Recommendations

5.1 Introduction

This chapter represents summary of discussions, conclusion of the research study. It Draws conclusion of the major findings of the study in relation to the objectives provided in chapter one. It discusses recommendations and suggestions for further study

5.2 Summary

The research focused on the influence of hinterland logistics and transport connectivity on performance of KPA with the objective of determining the northern corridor inefficiencies and how they influence performance of KPA. Mombasa port which is managed and run by KPA serves a vast hinterland in the east and central Africa which provided a better platform to describe the relationship of the variables. The researcher employed a descriptive research to describe the state of affairs as they exist and a stratified sampling method to reach at most representative respondents in the study universe of seventy-two respondents covering port users, clearing and forwarding agents and port officials. Questionnaires and interviews were used by the researcher as instruments to collect data and finally analyzed and synthesized for presentation using Microsoft Excel data analysis software for purposes of achieving the following objectives:- Determination of how poor roads links and poor railways links to the hinterland affects Kenya ports Authority performance and to find out how administration measures along the hinterland transport corridor influence Kenya ports Authority performance together with how social-economic challenges in hinterland transport affect Kenya ports Authority performance.

The research established that road transport service in the corridor was poor as a result of various aspects indentified by the respondents as impediments to efficient road transport. They cited major inefficiency of road transport as delays caused by poor infrastructure, which includes design, maintenance and quality of roads therefore negatively affecting port performance by causing delays leading to increased cargo dwell time at the port.

The research established that railway transport has a great impact on KPA performance. The railway is the first choice mode of transport to evacuate cargo to the hinterland. However, the research established that railway transport is seriously ineffective given the meager volumes it handles compared to the road transport. Factors contributing to this low capacity were identified as few wagons, old locomotives and dilapidated rail track. This aspect of low capacity saw containers detained at the port up to ten days waiting for wagons.

From the research, Administration measures along the hinterland transport corridor were found to influence Kenya ports Authority performance that they cause a lot of unnecessary delays in the corridor leading to high truck turn round time and therefore high cargo dwell time at the port. It's established that too many weighbridges, police roadblocks, customs stations and delay in the border crossing are factors which contribute to corridor inefficiencies thus affecting KPA performance. From the research, it was established that social, economic and political challenges in hinterland transport does affect port performance. This is because the challenges such as insecurity and rivers social behaviour contributed to long transit times which meant high truck turn round times and therefore, delays

5.3 Conclusions

Based on the objectives and findings of the research, the results of the research effectively revealed that the influence of hinterland transport inefficiencies on performance by KPA was glaring leading to the conclusion that indeed hinterland transport inefficiencies do affect port performance

5.4 Recommendations

The researcher recommends the following measures that can be adopted to mitigate against adverse influence of Hinterland transport inefficiencies on KPA performance:

- 1. KPA should lobby to have a participatory role in policy formulation and implementation on design, maintenance and prioritization on roads infrastructure development particularly in Kenya so that investment in roads will help to enhance port performance
- 2. KPA should lobby for investment in modern dual railway transport system with dynamic wagon loads to accommodate different cargo weights. This will increase the capacity and efficiency of the railway transport system which will complement port performance through increased cargo off- take.
- 3. KPA and government agencies to invest in integrated ICT to facilitate smooth flow and management of information thereby removing unnecessary corridor administrative stations
- 4. KPA to revive the practice of port regionalization concept by investing in inland dry ports in major market areas so that shippers would not cover long distance on poor infrastructure to the port.
- 5. All cargo interveners throughout the transport corridor should be put under one coordination authority or agency so as to be able to monitor bottlenecks in smooth flow of traffic and take corrective measures.
- 6. Transport companies should invest in communication and car track devices so as to be able to monitor and supervise their drivers and introduce incentives for safe and time conscious drivers. This will motivate drivers to appreciate the importance of save and faster delivery of cargo.

5.4 Limitations of the study

In carrying out this study, the following limitations were encountered: there was lack of cooperation in availing information by staff members of institutions for fear of management view on their opinions, allocation of time respond to instruments of data collection was challenging for researcher as respondents were busy and finally the researcher found it challenging to get data from management team as they viewed the study with high suspicion.

5.5 Recommendation for Further Research

Any future research should concentrated on perspective of Challenges arising from Government inconsistence on development plan on transport modernization and other factors which can create better business environment for local or international investors in the transport sector.

International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Impact Factor (2012): 3.358

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