FACTORS AFFECTING EFFICIENCY OF CONTAINER TERMINALS: A CASE OF INLAND CONTAINER DEPOT, EMBAKASI, NAIROBI COUNTY, KENYA

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF ECONOMICS, ACCOUNTS AND FINANCE ADMINISTRATION IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE POSTGRADUATE DIPLOMA IN CUSTOMS ADMINISTRATION OF JOMO KENYATTA UNIVERSITY OF SCIENCE AND TECHNOLOGY.

2019

DECLARATION

I declare that this is my original work and has not been presented to any other university or research study for examination and any other purpose.

Sign: ….....

Date…….

Emmaculate Monchari Nyaribo

HDB-335-C016-7264/2016

This research project has been submitted for examination with my approval as the university supervisor

Signature----------

Date----------

Mr. John Khamila.

Kenya School of Revenue Administration

DEDICATION

I dedicate this project to God Almighty who has been my source of strength and under his wings I have soared. I also dedicate this work to my mother for her kindness and endless support. Thank you. My love for you cannot be quantified. God bless you.

ACKNOWLEDGEMENT

My deepest gratitude to God who has provided all that was needed to complete this project. He strengthened me throughout the project.

My sincere appreciation to my supervisor Mr. John Khamila whose contribution and constructive criticism pushed me to expend the kind of effort I exerted to make this work as original as it can be. Thanks to him I experienced true research and my knowledge on the subject matter has been broadened.

Finally, I thank my classmates and friends Elnorah Mwadime and Pauline Njoroge for their prayers, words of motivation and comfort that came just in time. May God bless you all.

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ABBREVIATIONS &ACRONYMS

DEA: Data Envelopment Analysis

EAC: East African Community

EDI: Electronic Data Interchange

GDP: Gross Domestic Product

ESCAP: Economic and Social Commission for Asia and the Pacific

ICD: Inland Container Depot

ICMS: Integrated Customs Management Systems

KPA: Kenya Ports Authority

RDT: Resource Dependence Theory

SGR: Standard Gauge Railway

SPSS: Statistical Package for the Social Sciences

TEU: Twenty-foot equivalent units (container)

UNCTAD: United Nations Conference on Trade and Development

DEFINITION OF TERMS

Training and Development: - is the process by which individuals and organizations obtain, improve, and retain the skills, knowledge, tools, equipment and other resources needed to do their jobs competently or to a greater capacity (Balcik, Beamon, & Smilowitz, 2008))

Handling Equipment: - is mechanical equipment used for the movement, storage, control and protection of materials, goods and products throughout the process of manufacturing, distribution, consumption and disposal and they include transport equipment, positioning equipment, unit load formation equipment, and storage equipment. (Chu, 1995)

Infrastructure: - is the fundamental facilities and systems serving a country, city, or other area, including the services and facilities necessary for its economy to function. Infrastructure is composed of public and private physical improvements such as roads, railways, bridges, tunnels, water supply, sewers, electrical grids, and telecommunications including Internet connectivity (O'Sullivan, Arthur 2003)

Container Terminal Efficiency:- means to enhance the competitiveness of a container terminal is to improve its service level, which can be realized by fully utilizing invested resources such as docks, berths, yards and equipment in efficiency improvement of the terminal (The Asian Journal of Shipping and Logistics, December 2016)

ABSTRACT

Container terminals inefficiency has emerged and is clearly evident at ICD Embakasi Nairobi with indicated long clearance period or overstays of received containers at the port for more than 10- 12 days. The delays in clearing containers at the ICD is made worse by inadequate training and development leading to unclear communication in nominating containers for clearance at the ICD, inadequate cargo handling equipment, and inadequate transport infrastructure. The objective of this study was to assess the factors influencing container terminal efficiency at the ICD Embakasi with focus on specific objectives, to establish the effects of training and development on container terminal efficiency at the ICDE, to determine the effects of handling equipment on container terminal efficiency at ICDE and to find out the effects of transport infrastructure on container terminal efficiency at ICDE. This study adopted a descriptive research with survey of a total population of 133 and applied a stratified random sampling technique to select a sample size of respondents. The study used questionnaires in order to bring out the results of the study as expected. Respondents were drawn from the departments within Kenya Ports Authority, Customs and Border Control Department and container terminal operators. The study analyzed the data using descriptive statistics. The information was codified and entered into a spreadsheet and analyzed using frequencies and percentages obtained from the Statistical Package for Social Sciences (SPSS). From the research findings, the study concluded all the independent variables studied have significant effect on container terminal efficiency at ICDN as indicated by the strong coefficient of correlation and a p-value which is less than 0.05. The overall effect of the analyzed factors was very high as indicated by the coefficient of determination. The interpretation of the correlation analysis between dependent and independent variables indicate a high degree of positive correlation which implies that any slight change on any of the independent variables indicate a high degree of positive correlation which implies that a slight change on any of the independent variables; training and development, handling equipment and transport infrastructure will proportionally influence the dependent variable, container terminal efficiency.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

New vessels are being constructed with much higher ability to attain economies of scales. To date, the biggest container vessel is capable of carrying 11,000 TEUs. However, the deployment of bigger vessels requires an enormous investment in offering higher depth alongside the port of call, as well as stronger quay cranes and lift height. For effective process, ports also require a bulky storage yard and a better road and rail infrastructure. In order to meet the growing demand for container beds, ESCAP (2005) estimates that 569 new container beds in Asia and pacific region will need USD 27 billion between 2002 to 2015 (ESCAP, 2005). With respects to the increasing global sea traffic and changing technology in the maritime transport industry, seaports are coping with mounting pressures to upgrade and provide cutting-edge technology. They are also being required to improve container terminals efficiency to deliver comparative advantages that will attract more traffic. Some of the main challenging factors terminal operators are surmounting to is to secure traffic flows and prevent diversion to nearby ports including handling containers and cargos more rapidly, providing more adequate and performing equipment, reducing berth times and delays, enabling large storage capacity and ensuring multi-model connections to hinterland (Castro, 1999).

The Harbour of Mombasa is the main in East Africa and a vital gateway for imports and exports to Kenya and its neighbouring countries. The imports and exports that pass through the Embakasi dry port are critical to Kenya's financial development, and to the financial well-being of its neighbours as well. Liquid bulk goods, mostly petroleum, oil and lubricants, are the single largest import product by weight without these tariffs, the economy of Kenya (and most other

countries of the EAC) which rely on imports for all its requirements in terms of petroleum, would grind to half. The next four major products by weight are, clinker, wheat, corn, iron and steel which are crucial in meeting the country's food requirements and in terms of supply (KPA, 2010).

Inland Container Depot Embakasi (ICD) is owned and operated by Kenya Ports Authority. It is linked by rail with port of Mombasa provides shippers with dry port facilities in the commercial heart of the country and it was established in 1984.ICD Embakasi sits on a spacious yard of 29 hectares located in Industrial Area off Mombasa Road on ICD Road can accommodate a throughput of 180,000 TEUS per annum making it ideal for shippers of both imports and exports and also empty containers. The main objective of ICD is to bring port services closer to customers in the hinterland through special railtainer service. The main services offered at ICD Embakasi include handling of both containerized and loose cargo, stripping and stuffing of containers, hire of labor and equipment, weighing of containers, cargo documentation finalized at ICD, leasing of yard slots to shipping lines and other interested parties for storage of empty containers. However, container terminals effectiveness is often related with output and performance; also extra aspects that are associated with the more organizational side of production such as how efficiently ports use inputs to produce current output levels and whether the technologies adopted by container terminal operators are most efficient, that are critical to determining container terminals efficiency (Chin and Tongzon, 1998). Efficiency is often the speed and reliability of container terminal services. In fast paced sectors where products have to be transferred to markets on time, terminal operators are key nodes in the logistics chain and, as such must be in a position to ensure very reliable rates of service for shipping lines. These contain on-time berthing of vessels, guarantee turnaround time for vessels and guaranteed

connection of containers. That is the total turnaround time it takes to wait for pilot to berth, terminal time, un-berthing and final departure from port area (Tongzon & Ganesalingam, 2009). Terminal effectiveness can be expressed in the freight prices charged by shipping firms, the turnaround time of vessels and the dwelling time of the cargo. The bigger the vessel stays at the berth, the greater the cost that the vessel will have to pay. This can be passed on to transporters in terms of higher freight charges and longer cargo dwelling time, thus reducing the attractiveness for them to hub at a port. (Tongzon & Ganesalingam 2009) recognised and classified several terminal effectiveness indices into two wide groups, namely: operational efficiency measures and customer-oriented measures. The first set of measures deals with capital and labor productivity, as well as rate of usage asset. The second set comprises direct charges, vessel's waiting time, minimization of delays in inland transport and reliability (Tongzon & Ganesalingam, 2009).

The East African Logistics Performance Survey shows important improvements in port and corridor effectiveness. Ongoing reforms and infrastructure improvements at the ICD Embakasi have yielded important outcomes as freight dwelling time has fallen from an average of 6.5 days in 2011 to 5 days in 2012. Despite these improvements, the efficiency of the ICD Embakasi is still below the internationally acceptable standards for maximum 3 days (East African Logistics Performance Survey, 2012). Compared to 2011, the effectiveness of the corridor has enhanced slightly as a result of concerted attepts by EAC governments to upgrade regional road infrastructure and remove non-tariff barriers. Despite these initiatives, truck turnaround times remain low as an average truck records less than 5,000KMs per month against an industry practice of 9,000 to 12,000KMs per months (East African Logistics Performance Survey, 2012). The efficiency of container terminal is still affected by the high regulatory burden of the road

transport sector with numerous checkpoints (weight bridges, customs and police checks) along the transport corridor. This situation is compounded by congestion in urban areas along the transport corridor and less than adequate investment in the rail network to effectively complement the road transport system (East African Logistics Performance Survey, 2012).

Conversely, ICD Embakasi has exceeded its design capacity, yet it is expected to handle growing imports and exports. The port already operates at maximum capacity for both general and containerized cargo, and will experience a gradual decline in operational efficiency unless both capacity and terminal efficiency problems are resolved urgently (KPA, 2010). In relations to capacity, vessel imports at the port have increased on average 10 percent each year since 2005 (KPA, 2010), in spite of relatively low GDP growth rates in 2007 to 2008. In term of effectiveness, a number of important problems need to be resolved, for both imports and exports, relating to the motion of products through the port and inefficiencies created by the handling of loading and unloading trucks, the collection of customs duties, inspection, etc. The effective capacity for container cargo is particularly acute with the growing request in containerized cargo; the Embakasi dry Port is facing serious capacity problems (KPA, 2010).

Short-term instant impact are enhanced delays in vessels, port congestion surcharges, and slower port traffic (when congested) resulting in important delays in freight and greater expenses for importers. Exporters are also experiencing enhanced expenses due to possible unscheduled delays at the port, disappointing clients who have based their own company choices on set shipping schedules. The reality continues that capability problems at the dry port of Embakasi could act as a brake on increasing trade within the area (KPA, 2010).

1.2 Statement of the Problem

Inland Port Depots are important interventions established to ease congestion in the Marine Port of Mombasa. A number of aspects have been associated with the performance of the Inland Container Depot of Embakasi. Some have positively led to change while others have greatly affected the performance negatively. Factors like the current infrastructure e.g. the road network, rail connectivity and the general communication network, the systems applied in receiving and releasing containers in depots and the machinery and expertise employed influence efficiency of customs service at the ICDs. These factors will be empirically investigated in the Inland Container Depot of Embakasi. Their relative significance in promoting customs efficiency has not yet been known. Therefore, this study will construct a regression model that will simultaneously test the factors that influence the efficiency of the customs process at the Inland Container Depot of Embakasi and the relative significance of the identified factors (Cannon, 2018).

1.3 Research Objectives

1.3.1 General Objective

To perform an investigation on the factors affecting the efficiency of the Inland Container Depot, Embakasi.

1.3.2 Specific Objectives

i. To establish the extent to which training and development affects container terminal efficiency.

ii. To determine the effect of handling equipment in container terminal efficiency.

iii. To examine the effect of infrastructure on container terminal efficiency.

1.4 Research Questions

i. To what extent does training and development affect container terminal efficiency?

ii. What role does handling equipment play on the container terminal efficiency?

iii. What is the effect of infrastructure on container terminal efficiency?

1.5 Justification of the Study

This research is indeed important because the Maritime Industry plays a key role in country's economic growth and development. The Port of Mombasa is of strategic significance far beyond the limitations of Kenya. As the largest harbour in East Africa, it is the core gateway for the import and export of merchandises not only for Kenya but also to countries of the East African Community (EAC) as well as Central Africa.

The study also seeks to benefit all stakeholders and players in the maritime sector, in particular container terminal operators and policy makers, as the research will provide an in-depth understanding of the practical consequences of variables affecting the effectiveness of container terminals. The results will also guide future research and practical consequences, particularly for those who want to do comparable research by assessing factors that influence container terminals in the maritime industry.

Finally, the research will be of great help to Kenyan Government, its neighbouring countries and other African countries who have same problems with terminal inefficiencies; because when the outcomes and recommendations from the research are well utilized and taken into consideration by the appropriate authority and stakeholders, then the issues of container terminal inefficiencies can be adequately addressed thus enhancing the capacity and productivity of their ports which onward will be boost economic growth and development.

1.6 Scope of the Study

The scope of the study focuses on factors influencing container terminals efficiency with case study of Embakasi Inland Container depot. It also looks at all persons involved in the operations of ICD Embakasi, stakeholders who make use of the facility in port operation activities as well as freight forwarders/shippers, shipping agents and Kenya Port Authority (KPA). The target population included the Kenya Port Authority, Conventional Cargo and Container Terminal Operations. The complete amount of these representatives, when placed together, was roughly 300.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, literature reviewed from different areas related to the study objectives is presented. The review focuses on the meaning of Inland Container Depots and their functions alongside presenting how infrastructural endowment and systems used in receiving and clearance of goods. Part of it will be based on the review of equipment used and their efficiency. The chapter lays a conclusion with a presentation of a conceptual framework of the research and a summary of the literature.

2.2 Theoretical Review

A theoretical framework consists of concepts relevant to existing scholarly literature used for a particular study. A theory is a formulation used to explain, predict and understand a phenomena and in many cases to challenge and extend existing knowledge within the limits of critical bounding assumptions (Labaree ,2013). This theory is informed by three theories namely; Stakeholder's Theory, Queueing Theory and Resource Dependence Theory.

2.2.1 Stakeholder Theory

This study was guided by "The Investor theory:" as initially put across by Freeman, from normative, descriptive, and instrumental perspectives (Donaldson and Preston, 1995). The Stakeholders are further defined as any group within or outside an organization that has a stake in the organization, its performance or its effects on strategic decision making within an organization (Boselie, 2010). Stakeholder theory starts with the premise that values are necessarily and explicitly component of the business process. It asks executives to articulate a mutual feeling of value generated and what brings together its key stakeholders. It also urges

executives to be clear about how to deliver on their intent. The business and stockholders (customers, suppliers, Employees, and shareholders) are named as units in stakeholder theory. Investors theory proposes bilateral relationships between the business and its investors, based on interdependent exchange of inputs from stakeholders, such as their interests, expectations/obligations, financial aid, labor, etc., and outputs of the firm, such as profits, products, social engagement, and more benefits (Donaldson and Preston, 1995). This theory has been applicable in the firms with interdependent relationship between stakeholders of maritime supply chain of container ships because the efficiency of other stakeholders such as Container terminals, customs, shipping agents, clearing and forwarding agents and employees of these companies determine the performance, thus necessitating them to work in collaboration to maintain competitiveness in performance through information visibility throughout the chain.

ICD management governs the economic-policy making process and different economic policies will lead to different economic outcomes.

2.2.2 Queueing Theory

Adedayo et al. (2009) stressed that many situations in life requires one to line up or queue before being attended to. This lines formed are referred to as waiting lines or queues. According to them queue occurs when the capacity of service provided fall short of the demand for the service. Sanish (2011) in his article on application of queuing to the traffic at New Mangalore Port refers to queuing theory as an analytical techniques accepted as valuable tool for solving congestion problems. According to him the primary inputs to the models are the arrival and service patterns. These patterns are generally described by suitable random distribution. He observed that the arrival rate of ships follows exponential distribution while the service time follows Poisson distribution. He observed that queuing theory can be used to predict some important parameters

like average waiting time of ships, average queuing length, average number of ships in the port and average time to transport cargo haulage & utilization factor closer to the actual values.

Queues are not an unfamiliar phenomenon and to define it requires specification of the characteristics which describes the system such as the arrival pattern, the service pattern, the queue discipline and the queue capacity Adedayo et al. (2013) observed that there are many queuing models that can be formulated. According to them it is essential that the appropriate queuing model is used to analyze problems under study. The arrival pattern: This may be the arrival of an entity at a service point. This process involves a degree of uncertainty concerning the exact arrival times and the number of entities arriving. And to describe this process there are some important attributes such as the sources of the arrivals, the size of each arrival, the grouping of such an arrival and the inter-arrival times. The service pattern: This may be any kind of service operation which processes the arriving entities. The major features which must be specified are the number of servers and the duration of the service. The queue discipline: This defines the rules of how the arrivals behave before service occurs.

A contributor to container terminal congestion is the time containers dwell in the storage yard after being delivered to the terminal or unloaded from the ship. Prolonged container dwell time results in high storage yard area occupancy and may create substantial adverse effects on terminal productivity and throughput capacity. With improved management of container flows, additional terminal capacity may be created without investing in costly new equipment and yard capacity improvements, Holgan et al (2010). Cargos arriving at the port terminals are temporary stored in the terminals yard before being loaded to their next mode of transport. The time period cargo stay in the yard is influenced by some factors depending on long term contractual agreements (Merck, 2009).

2.2.3 Resource Dependence Theory

The theory of resource dependence was efficiently used in the strategic operations literature to define relationships between customers and providers. According to Barney (2002), the resource-based view examines the connection between the company's inner features and performance.

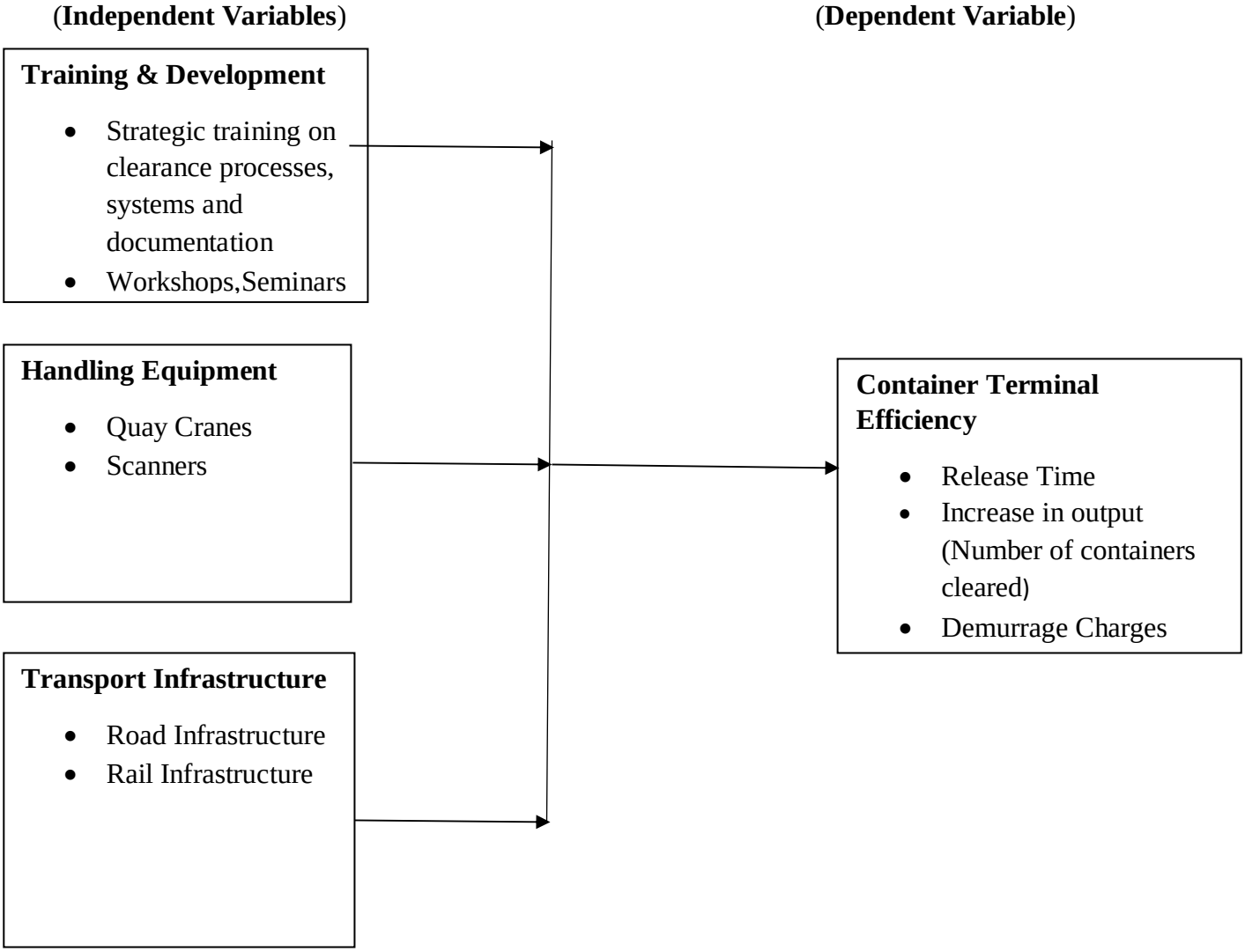
Resource dependency theory also examines the connection between the organizations and the resources they need to function. Resources can be of many sizes. This involves raw materials, employees, financing and even machinery and equipment. If one party retains the bulk of the resource, another business will become dependent on it in order to function. Too much dependency generates uncertainty, leaving organizations at danger of external control. External control may be enforced by government or other organizations and may have important activities, such as financing or staff policies.

Managers are constantly seeking advantage to improve partnerships with organizations in order to strengthen their own and strategize business plans in order to lower this risk through cooperation, acquisition and mergers across the industries. Mahoney and Pandian, (1992) claim that a firm does not have a good performance because of better resources, but rather due to the firm's competence to make better use of them, which represents a deeper focus on the basics of the resource based view as proposed in (Penrose ,1990). To put it in another way, a firm that knows how best to make use of its resources will utilize them in a way to maximize productivity.

2.3 Conceptual Framework

Conceptual framework is defined as an end result of bringing together a number of related concepts to explain or predict a given event, or give a broader understanding of the phenomenon of interest or simply, of a research problem. Conceptual Framework is a filtering tool for selecting appropriate research questions and related data collection methods. (Jabareen & Y, 2009). The research will be guided by a Conceptual Framework that is indicated by the independent and dependent variables.

Figure 2.1: Conceptual Framework



2.3.1 Training & Development and Port Efficiency

Training and development supports and shapes port operations at the container terminals. Training and development enables the container terminal operators and its management to develop competencies and skills that can make them more effective and sustainable, thus increasing the potential output and reduced delays at the terminals while at the same time improving the stakeholders' morale as there is a clear chain of command and workflow flows easily at all phases of cargo clearance. (National Council of Nonprofits,2019)

2.3.2 Handling Equipment and Port Efficiency

Port management is becoming more conscious provision of modern equipped berths with additional capital intensive cargo handling techniques involving low labour costs as a means of general competitiveness and encouraging trade through their ports (Branch, 1986, p.86). Different types of equipment are used for cargo handling depending on factors such as the nature of the cargo, handling costs, resources available including land, labour and equipment. Today, different types of cargo handling systems are in use for container handling. Container handling system starts at the quayside where containers are handled to and from the SGR and trucks by multipurpose cranes, gantry cranes and even mobile cranes. Quay transfer may be done by tractor-trailers, by straddle carriers or by heavy duty lift trucks. In the container yard at ICD, stacking and de-stuffing may be carried out by straddle carriers, yard gantry cranes or a variety of lift trucks/reach stackers. Receipt and delivery operations may also involve these equipment types as well as tractor-trailer systems.

2.3.2 Transport Infrastructure and Port Efficiency

Stakeholder's workshop, (2012) reported that Conditions of the Road at Miritini in which is mostly used in transporting cargo on transit and to ICD. Since April 2011, the road has deteriorated so much that the truck turnaround times for a journey of less than 10 km can take as long as 6 hours which means that truck efficiency and movement of nominated CFS & ICD Nairobi is severely compromised, trucks that could do five trips at the beginning of 2011 are barely able to move one container a day to day due to poor roads, this in turn leads to more delays in clearing the goods as they are not able to reach the ICD on time to be cleared. From the Meeting on the Northern corridor trade and transport logistics chain stakeholders' consultative forum (2011) the Port and KRA reserve the right to nominate various CFS&ICD for container clearance, importers have faced delays exceeding 10 days waiting for cargo to move from the Port to ICD. The Kenya National Highways Authority reports that it expects World Bank Support to fix the road. However, the country cannot wait that long. Local resources should be utilized to dedicate passage for trucks between the Port and inland haulage to increase off take of container." Kenya is faced with the dilemma of high road construction costs and increasing road maintenance due to overloaded trucks plying its trunk route network, particularly along the Northern corridor, World Bank (2007). KPA's management report 2011/2012, said that they have been building their capacity to handle increased volumes of cargo but they are let down by poor infrastructure.

2.4 Empirical Review

Empirical research is research using empirical evidence. It is a way of gaining knowledge by means of direct and indirect observation or experience. Empiricism values research more than other kinds and can be measured qualitatively or quantitatively. Quantifying the evidence or

making sense of it in qualitative form, a researcher can answer empirical questions, which should be clearly defined and answerable with the evidence collected. Research design varies by field and by the question being investigated. Many researchers combine qualitative and quantitative forms of analysis to better answer questions which cannot be studied in laboratory settings, particularly in the social sciences and in education. (Goodwin, 2005)

2.4.1 Training & Development

For the container depots partners to turn information into knowledge and to manage that knowledge effectively, training of employees becomes key. Training leads to greater innovation and tacit skills. Decker &Nathan (1985), Robertson (1990) in their research found that training affects change in the worker skills through "a change in trained knowledge structure or mental model. Training may not only affect declarative or procedural knowledge but also may enhance strategic knowledge which is defined as knowing when to apply a specific knowledge or skill (Kozlowski et al., 2001, Kraiger et al., 1993). Studies made by (Morey et al 2002, Salas et al., 2001) indicate that training improves declarative knowledge, planning and task co-ordination, collaborative problem solving, and communication in novel team task environments.

A multi-skilled workforce helps to support efficient operations. On the yard, the multi-skilled members are capable of operating reach-stackers, the gantry crane and a shunt locomotive, as well as undertaking various ground staff duties. Well motivated employees are crucial to running an effective Container terminal with improved container ships performance and clients' satisfaction due to timely service delivery (Cullian et al., 2004).

2.4.2 Handling Equipment

Handling systems means the mechanism used in moving materials from one point to another with less human effort (Lyons, 2009). Material handling equipment and systems often represents

major capital outlays for organization. Like the decisions related to the number, size, and materials handling decisions can affect many aspects of logistics operations (Lambert et al, 2001).

(Stakeholders report, 2012) states that it is unfortunate that quite a number of significant interventions that would have eased the delays at the port have been known for over 30 years. All the major stakeholders agree with the assertion that "ICD port facilities are inadequate and in poor condition" and that without substantial investment in equipment, the port is unlikely to handle more traffic.

According to (Bailey et al, 2004), one of the most basic requirements of any organization is to be able to transport or move materials, equipment's and spare parts from one point to another. Material handling is of vital importance and is indicated by the range and high cost of the equipment that each organization have. Handling materials, which is a major activity in storehouse and stockyard is a costly operation and therefore the methods and equipment should be efficient. Poor handling equipment's leads to Shorty work making an organization not to handle the required load on time, causing delays, congestions and inefficiencies along the supply chains.

According to (KPA Audit report, 2012-2013) indicated that various freight stations had failed to move 6,000 containers that had been cleared, increasing the pile-up at the port yard to 18,000 Twenty Foot Equivalent Unit (Tues.) against its capacity of 14,500. If the container freight stations (CFSs) move the cargo that is ready, operations will return to normal, but the stations said that KPA had failed to put its equipment to optimal use even as some of them hold up to 2,300 Tues., two times their capacity. The delays at the port is costing importers huge storage charges with containers taking up to 14 days to move from the port to CFSs or even to ICD due

to tedious container location exercise and prolonged physical verification where hinterland customer can be reached easily without having to travel down to Mombasa for clearance exercise. Importers and clearing agents blame the delay on inefficiency in the freight handling and the tedious container location exercise by KPA, saying they should be allowed to collect part of the cargo cleared from the port whatever port of their choosing.

According to (Gerald, 2010) the Mombasa Port's facilities are overstretched and under intense pressure leading to complaints from the local clearing and forwarding firms and customers, about Container on container clearance. (Kimani, 2010) reported that KPA unveils new plan to cut red tape at Mombasa port where the commissioner general of KRA blamed the delay to a number of signatures required on the documents which he said were too many and were to be reduced plus port handling equipment breakdown.

According to (Stock et al, 2009) for an organization to operate efficiently, "its supply chain activities should flow smoothly to create value to the customers hence it should minimize delays by avoiding poor /outdated equipment's" The operational Audit report of 2011/2012 points out that the current regulatory framework governing operations of the CFSs is not sufficient to ensure quality and standards of services. The pressure to move Containers out of the port area quickly has occasionally led KPA to nominate CFSs without due consideration of their container handling capacities.

Most of them are congested not only due to lack of sufficient and reliable equipment but also because their operators do not exhibit proper planning in receiving staking and realizing. According to (Maundu,2012), reported that though the corporation has good equipment that can support its quayside operations, these machineries are largely unproductive, raising questions about the capacity of the staff. Importers and clearing agents blame the delay on inefficiency in

the freight handling, saying they should be allowed to collect part of the container cleared from the port's yard. Agents said it took them five days to clear and move containers from the port while it takes more than five days for any CFS to transfer containers in a vessel. According to (Kenya Shippers report 2011/2012), Mombasa Port's facilities are overstretched and under intense pressure.

2.4.3 Transport Infrastructure

Infrastructure is the necessary condition for effective cargo handling activities and appropriate infrastructure is required to prevent congestion, promote trade growth and ensure deep-sea container connectivity for countries strongly dependent on international trade. Vessel infrastructure, nevertheless, needs to be complemented by efficient hinterland transport connections if the port is to fully exploit its potential as growth catalyst and supply chain node (Suykens and van de Voorde 1998). Unfortunately, it is not unusual for development initiatives to concentrate solely on the enhancement of the port's infrastructural capabilities, without due regard for hinterland links.

The urgency of looking at port and terminal developments in combination with their inland connectivity is exacerbated by the pressure on container terminals to boost their effectiveness as a result of the fast rise in containerized freight traffic flows and their enhanced variability (Haralambides 2002). As port capacity cannot be created as quickly as demand rises (Haralambides 2002), any overcapacity is eventually exhausted and episodes of congestion occure even in the most effective terminals. This calls for a phased but continuous and well-coordinated effort in expanding container capacity at terminals. Terminal operations are affected not only by the larger number of vessel calls but also by the increased variability of call sizes

The predictable rise in transhipment associated with larger vessel size, is likely to impact the terminals not only forcing them to handle higher volumes in the same period of time, but also to reduce the variability of their operations (i.e. increase reliability) in order to guarantee seamless flows of cargo among transhipment ports and/or transhipment port and feeder ports (Gilman 1999). Increases productivity and reliability at terminals will involve more monitoring, higher visibility of containers and more emphasis on environmental and regulatory compliance, especially as terminals now occupy critical positions the supply chain (Notteboom 2008).

Infrastructure is generally split into physical and soft components. Physical infrastructure involves not only operational equipment such as amount of berths, number of cranes, yards and tugs and storage area, but also intermodal transport such as highways and rail (Tongzon and Heng, 2005). Whereas, the soft infrastructure relates to the workforce employed. Maximum deployment of both kinds will help reduce the turnaround of vessels, improving the terminal ability to accommodate more containers. Ships are continuously growing their carrying capacity, and container produced for big transport units in foreign container transport are being considered. This scale of enlargement needs fresh and capital-intensive transhipment equipment in gateway ports. Intermodality is particularly important for the rapid transport of freight to and from the gateway port. Without adequate linkages, the effectiveness of container terminal operation may decrease owing to congestion and delays (Tongzon and Heng, 2005).

2.4.4 Container Terminal Efficiency

Some scholars (Tongzon, 1995; de Langen, 2003) have researched factors influencing port efficiency in relation to cargo flow. These studies are interdependent since the freight flow depends on the port choice of port users. Advantages such as the location of the port and the

distance to the consumer markets play an important role in the volume of port throughput. However, more factors of ports determine the terminal throughput volumes.

Also, Tongzon (1995) also determines that flow of cargo depends on the following factors: the first factor is the geographical location of a port. If the port is located on an easily accessible location in different ways, more cargo is likely to flow to that specific port. The second factor is the frequency of calls to the ship. The higher the frequency of ship calls, the higher the port throughput. The third factor is the effectiveness of the terminal. This indicator can be evaluated by looking at the combination containers, the efficiency of the cranes, the size of the ships and the exchange of cargo (economies of scale), the average amount of containers handled per hour. Again, Tongzon says that port fees could also be included as variables in the model.

The most discussed factors from these studies are, besides the location, the physical and technical infrastructure, the port efficiency, the hinterland connections, the port charges and the available (logistic) services. The physical and technical infrastructure includes depot physical characteristics such as the size and holding capacity, the type of cranes in the port and the meters of quay. On the other hand, port competition has had an impact on the port choice factors. Containerization has led to standardization in the maritime industry, implying that ports cannot rely on specialization to maintain their market share and to generate revenues as much as they used to do (OECD, 2008). Moreover, port rivalry has shifted from rivalry between ports to between transport chains. Connections to the hinterland are of essential significance to the port, as container fleets are nowadays a link in a logistics chain (de Langen et al., 2010). However, this means that the quality of the inland links and the variety of the accessible modalities determine the amount of container terminal. In addition, the fees for the hinterland have become comparatively essential. However, the OECD (2008) says that the price per kilogram per km in

the hinterland is 5 to 30 times as big (depending on the mode of inland transport) as the prices of shipping by sea. Port fees also have an impact on the competitive situation of the port; they include taxes, administrative expenses and shipping fees. Port consumers prefer ports with the highest price/quality ratio. However, port fees are not the most significant decision influencer since this indicator is smaller in the list relative to other variables in a number of research. Also, Tongzon (1995) also points out that port fees represent an exceptionally small percentage of the total costs of international trade. Making a connection between port rivalry and the psychical and technical facilities: when these infrastructures are heavily congested, their quality decreases and this weakens the competitive position of ports.

2.5 Critique of Existing Literature Review

The stakeholder theory asserts that directors have responsibilities to both shareholders and non-shareholder stakeholders and run the companies for their benefits. The main arguments in favor of the stakeholder theory are that the theory is not only a single model to resolve the problem of identifying the proper objective of corporations, but also considers economics and ethics issues that make companies take social responsibilities, and to presents fairness to everyone involved in business, with the result that directors will run corporations for benefiting all stakeholders. It is easy to see that the expectation of shareholders from their companies is to get an abundant return on their investment (Donaldson and Preston, 1995).

However, the theory assigns a task to directors, that is, balancing the interests of all stakeholders when making decisions and operating companies. The reason of doing this is that there are divergent interests held by stakeholders. However, in fact this task is a never ending task of balancing and integrating multiple relationships and multiple objectives. It has been demonstrated that the balancing is an impossible task to directors. That is to say, the

consideration of many interests will probably lead directors to engage in opportunistic behaviors and shirking, because directors are likely to be accountable to nobody but a vague group. Therefore, ICD Embakasi needs to involve its key stakeholders, that is, port staff, investors, clearing and forwarding agents and even logistics companies in major decision making.

Cullinane and Wang (2006) studied the efficiency of 69 container terminals with an annual throughput over 10,000 TEUs in Europe using cross-sectional DEA. They pointed to the presence of a substantial inefficiency in most terminals. It has been shown that the average effectiveness of container terminals situated in distinct areas varies, either to a large or to a tiny extent. The inputs were the terminal length, the size of terminal region, the equipment (expressed in numerical value), and the output of the container.

RDT (Barney (2002) proposes that actors lacking in essential resources will seek to establish relationships with (i.e., be dependent upon) others in order to obtain needed resources. Also, organizations attempt to alter their dependence relationships by minimizing their own dependence or by increasing the dependence of other organizations on them. Within this perspective, organizations are viewed as coalitions alerting their structure and patterns of behaviour to acquire and maintain needed external resources. Acquiring the external resources needed by an organization comes by decreasing the organization's dependence on others and/or by increasing other's dependency on it, that is, modifying an organization's power with other organizations.

Therefore, the theory assumes that an organisation that lacks this resources will be resource dependent on another organisation thus being prone to external control. However, in the dynamic business setting, an organisation that lacks this major resources will always seek ways to improvise on its existing resources or acquisition of this resources so as to be self-dependent. A

firm that has more accurate expectations about the true value of a resource in conceiving and implementing a product market strategy can use this expectation to acquire resources in a factor market at a price that generates positive economic profits, once that resource is used to actually implement a product market strategy.

The queueing Theory asserts that Queues are not an unfamiliar phenomenon and to define it requires specification of the characteristics which describes the system such as the arrival pattern, the service pattern, the queue discipline and the queue capacity Adedayo et al. (2013) observed that there are many queuing models that can be formulated The absence of manpower with skills to handle the clearing process and the politics in container nomination has left the operation of the port terminals in crisis and difficult situation.

Therefore, the study attempting to establish these relationships is more necessary for developing applications of such relationships and efficient with a close link to ICDE. Container clearance leads to inefficiency and long dwell time for the clearance of containers. (Brinkerhoff, 2009) identifies three key competitive advantages resulting in high revenues. Advanced technology system put in place, proper transport infrastructure to facilitate fast movement of cargoes from one place to another and well advanced handling equipment that will take the shortest time possible to perform clearing of containers.

2.6 Summary of the literature

An elucidative research on literature revealed that little studies have been done on the factors associated with the inefficiency of the ICDs. It was really surprising with a consideration of the significance of the ICDs in easing the frequent congestion in the main port of Mombasa. It would be of importance if factors making ICDs effective be upheld for eventual improvement of the mother ports. However, a deeper review of the roles of the ICDs identified that the inefficiency

could be influenced by three factors; training and development, infrastructure and handling equipment used.

2.7 Research Gaps

In the light of the countless research reviewed, there are some new efforts in the literature that relate to niche issues resulting from current political, economic, technological and business development at a global stage. The first working group is the current growth in port security. The works of Bichou (2011) and Guan and Yang (2010) are among the latest works dealing with safety elements container and possible bottlenecks. The second type of problems, relate to supply chain aspects and the role of ports and container terminals in the design of modern supply chains. The works of Ribinson (2002) and Panayides (2006)) are among the first who tackled the problem at a port level. The aim of these works is to identify the current trends in modern supply chains and find ways of integrating port operations at the best level possible.

More focused on container terminals due to the increasing role of container cargo in global trade are the work of Fan, Wilson, and Tolliver (2009), In these works, the reader can find interesting aspects of containerized global supply chains with comparisons not only of different terminals but of trade routes and cargoes as well. Numerical value), while container throughput will be the output.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explained the research methodology of the study and justified the research methods and choices by presenting an objective research process. A descriptive research design was adopted and the primary sources of data were collected using a structured questionnaire. The topics discussed include the research design, population of the study, sampling procedure, data collection procedure, data analysis and research instruments.

3.2 Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari, 2006). The study employed a descriptive survey to assess factors influencing container Terminals efficiency; a case study of the ICD Embakasi. A Descriptive research design focuses on how to describe, explain and interpret conditions as they are currently. Descriptive research examines a phenomenon occurring at a specific place and time. It is concerned with conditions, practices, structures, differences or relationships that exist, opinions held and processes that are evident (Creswell, 2003). Survey research is a field of study that involves the collection of data from a sample of elements that are drawn from a clearly defined population. The data will be collected with a questionnaire about the specified real phenomena of interest (Kothari, 2004).

3.3 Target Population

Sekaran refers to population as the entire group of people or things of interest that the researcher aims to assess (2010). The research therefore engaged all those engaged in the operations of the container terminal in the port of Mombasa as well as those engaged in the use of the unit in port activities. The target population included Kenya Port Authority, Customs & Border Control Department and Container Terminal Operations. When placed together, the amount of these individuals is roughly 133. Therefore, the research was aimed at 133 people.

Table 3.1: Summary of Target Population

STRATUM	TARGET POPULATION	PERCENTAGE
Kenya Ports Authority	30	23
Customs & Border Control Department	43	32
Clearing & Forwarding	60	45
TOTAL	133	100

3.4 Sampling Frame

The sampling frame describes the list of all population units from which the sample will be selected (Cooper & Schindler, 2003). It is a physical representation of the target population and comprises of all the units that are potential members of a sample (Kothari, 2008Sampling and Sample size Keller (2009) indicates that a sample is a set drawn from the entire population. A stratified sampling technique will be employed to stratify three (3) units at the ICD Embakasi:

Kenya Port Authority (KPA) with 30; Customs & Border Control with 43 and Clearing & Forwarding with 60.

Table 3.2: Sampling Frame

STRATUM	TARGET POPULATION	SAMPLE
Kenya Ports Authority	30	20
Customs & Border Control Department	43	30
Clearing & Forwarding	60	50
TOTAL	133	100

3.5 Sample size

A sample sufficient for the study was taken considering the high population of the employees in Kenya Port Authority, Customs & Border Control Department and Clearing & Forwarding. For the managers in the customs section, all were included in the study. A simple random sampling technique was used to get the sample size. To help establish the appropriate sample size for this study, a formula by Yamane was used in computing the sample population (Tarleton, 2015).

$$n = \frac{N}{1 + (N(x^2)}$$

Where N is the target population

n is the sample size

X is the precision level given as 0.05

The final sample size was therefore calculated and given as:

$$n = \frac{133}{1+((0.05^2)} = 100$$

Therefore, the sample population was 100.

3.6 Data Collection Instruments

The main instrument employed for data collection in this research was a questionnaire. A Likert scale questionnaire was administered to the respondents.

3.7 Data Collection Procedure

The process started by first requesting approval from the Principal Human Resources Development Officer of the Inland Container Depot, Embakasi to prevent any possible stops that might have arisen as a result of a lack of authorization to undertake the study. An interview with the managers was scheduled in advance to find time suitable for them to give accurate responses at their comfort, a process that took 1 month. The questionnaires were given a pretest to check on their validity and effectiveness for use a month before the actual study began. The questionnaires were distributed to the sample population and given sufficient time to respond to the questions. They were instructed not to reveal their identities except for the allocated identities not representing their names. However, the researcher made a self-introduction and requested for consent of the respondents in taking part in the exercise. Subsequently, questionnaires were them administered to the respondents. On the other side, the secondary information was collected from existing literature relating to the research topic.

3.8 Pilot Testing

It is essential that all surveys are tested before the real survey is carried out. This is done to ensure that the questionnaire is cleared to the respondents and can be completed as requested by the researcher (John Adams et al., 2007). Pilot testing is an activity that enables the study to determine whether there are mistakes, constraints, or other weaknesses in the design and enables

the investigator to make the required changes and corrections before starting the survey. A pilot research was undertaken on approximately 30 freight forwarders and clearing agents since they are directly involved with container operations to test the reliability and validity of the questionnaire.

3.9 Data Analysis

Data for this study was quantitative in nature. Quantitative analysis was done for the numerical data obtained from the field. This was done using descriptive statistics with the help of Statistical Package for Social Sciences (SPSS) and Microsoft Excel 2013. The responses in the questionnaire were coded into common themes to facilitate analysis. Data was presented in descriptive form supported by tables, frequency distributions and tables which show factors influencing container terminal efficiency.

The data obtained from the respondents was sorted and coded in SPSS analysis software in preparation for analysis. Demographic data was analyzed with the intention of describing the characteristics of those who will have participated in the research with the objective of demonstrating validity and objectivity in sampling. The data was analyzed using graphical presentations in this case frequency tables.

Data on the three variables in the study was analyzed using mean and standard deviation. This was done by calculating the mean response on every item per variable in the questionnaire. This enabled identification of outstanding issues regarding items per variable. The means were displayed in a table. For every respondent, the mean observation per variable was calculated. For all the respondents, a regression model was used to establish the relationship. The regression model took the form below:

$$Y = f(X_1, X_2, X_3)$$

Where Y is Port efficiency, X_1= Training and development, X_2= Handling Equipment andX_3= Transport Infrastructure.

The analytical model took the linear form below:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \boldsymbol{\varepsilon}$

Where$\beta_0$is the constant coefficient of regression while β_1, β_2 and β_3 are the coefficients of X_1, X_2 and X_3respectively and$\boldsymbol{\varepsilon}$= error term. The significance of β_1, β_2 $and \beta_3$ will be done using the t-statistic at 95% confidence interval.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter discusses research findings. The main objective of the study was to determine factors influencing efficiency of container terminals at ICDN. Data was analysed using descriptive techniques such as means, standard deviations and frequencies. The inferential statistics (correlation & regression analysis) were done to establish relationships between variables. Data was presented using tables for ease of analysis and interpretation of findings.

4.2 Response Rate

From the 80 questionnaires administered, 72 of them representing 90 % were returned. The data collected was analyzed for mean, standard deviation and coefficient of variation. This indicates a good response for analysis.

Table 4.1: Response Rate

Category	Frequency	Percentage
Distributed Questionnaires	80	100
Completed Questionnaires	72	90
Incomplete Questionnaires	8	10

4.2.1 Results of the pilot study

Table 4.2: Reliability and Validity Results

Variable	Cronbach's Alpha
Training & Development	0.945
Handling Equipment	0.983
Transport Infrastructure	0.940

Reliability of the questionnaire was evaluated through Cronbach's Alpha which is a measure of internal consistency, that is, how closely related a set of items are as a group. It was calculated using SPSS version 23. In this study, reliability and validity was ensured through pilot testing on a sample of 30 respondents. The findings of the pilot test showed that training & development had a Cronbach's reliability of 0.945, handling equipment had the alpha value of 0.983 and transport infrastructure an alpha value of 0. 940.From the findings, the Cronbach's reliability was higher than 0.70 threshold showing that the instrument was sufficiently reliable and valid. Cooper & Schindler (2008) indicate an alpha value of 0.7 to be an acceptable and reliability coefficient.

4.3 Demographic Characteristics

Table 4.3: Demographic Characteristics of Respondents

Departments	Frequency	Percentage
Engineering	04	5.5
Clearing and Forwarding	36	50.0
Verification Officer	14	14.0
Head of Verification Officer	02	5.5
Port Clerks	18	25.0
Total	**72**	**100**

The study reveals that majority of respondents studied were from clearing and forwarding at 50% followed by Port clerks at 25%, Verification Officer at 14 % and Engineering and Head of Verification officer each having 5.5%. This means that relevant agencies concerned with container terminal efficiency were given considerable chance in the study thereby increasing the relevance of the data collected.

Table 4.4: Respondent Position

Characteristics	Frequency	Percentage
Top Management	4	5.6
Middle Management	36	50
Supervisory Management	32	44.4
Total	**72**	**100**

A lot of middle management employees participated in the study i.e. 50%, supervisory management comprising 44.4% and top management 5.6%. This is due to the fact both middle and supervisory management have a lot of influence and information in relation to container depot efficiency at the Inland Container Depot Embakasi.

Table 4.5: Respondents Level of Education

Characteristics	Frequency	Percentage
PHD	0	0
Masters	20	28
Degree	34	47
Other	18	25
Total	**72**	**100**

Demographic characteristics of respondents indicates high level of education for management level staff with degree accounting for the highest at 47%, masters at 28% and others at 25 %. This is an indication of high knowledge within the ICDN.

Table 4.6: Respondents Work Experience

Characteristics	Frequency	Percentage
0-5 years	22	30.6
6-10 years	32	44.4
11–15 years	10	13.9
Over 15 years	08	11.1
Total	**72**	**100**

Work experiences indicates that majority 44.4% have worked for 6-10 years, followed by 0-5 years at 30.6% and 11-15 years and over 15 years accounting for 13.9% and 11.1% respectively. This indicates that majority of management employees are well conversant with container depot efficiency at ICDN.

4.4 Descriptive Characteristics

In the research analysis the study used a tool rating scale of 5 to 1; where 5 was the highest and 1 the lowest. Opinions given by the respondents were rated as follows, 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree and 1= Strongly Disagree. The analysis for mean, standard deviation and coefficient of variation were based on this rating scale.

4.4.1 Training & Development

Table 4.7: Level of agreement to customs documentation process factor that influence port efficiency at the Inland Container Depot

Training and Development			
Statements	Mean	Standard Deviation	Coefficient of Variation
B1 Port staff and stakeholders are trained constantly on documentation and system upgrades	4.1722	0.6941	0.1664
B2 Efficient leadership and management makes it easy in setting direction and sustaining port efficiency	4.5000	0.6969	0.1549
B3 Staff hired to facilitate cargo clearance are efficient and competent	4.3056	0.7077	0.1644

The first objective of the study was to establish the effects of training and development on container terminal efficiency at Inland Container Depot. Respondents were required to respond to set questions related to customs documentation process and give their opinions. The opinion in agreement that Port staff and stakeholders are trained constantly on system upgrades had a mean of 4.1722, standard deviation of 0.6941 and a low dispersion of 16.64% signifying a high level of agreement. The finding also indicates that efficient leadership and management makes it easy in setting direction and sustaining port efficiency with a mean of 4.5, standard deviation of 0.6969 and a dispersion of 15.49% signifying a high level of agreement. Opinion whether staff hired to facilitate cargo clearance are efficient and competent was positive with a mean of 4.3056, standard deviation of 0.7077 and a dispersion of 16.444% signifying a high level of agreement.

The issue of Training and development is in agreement with Decker & Nathan et al, (2001) who underscores that one of the most important facets of international logistics is training that

leads to greater innovation and tacit skills while management's ability to manage uncertainty imposed by rapid change is a necessary part.

4.4.2 Handling Equipment

Table 4.8: Handling equipment factor that influences port efficiency at the Inland Container Depot

Handling Equipment			
Statements	Mean	Standard Deviation	Coefficient of Variation
C1 We have enough machines for container clearance	3.8611	1.0731	0.2779
C2 We have enough machines for loading and unloading containers	4.2778	1.0032	0.2345
C3 We have enough scanners for container	3.6389	1.3555	0.3725

The second objective was to determine the effects of handling equipment on container cargo in facilitating port efficiency at Inland Container Depot. Respondents were required to answer questions related to handling equipment and give their opinions related to the issue. The opinion in agreement that we have enough machines for container clearance that enables clearing of container scored a mean of 3.8611, standard deviation of 1.0731 and a dispersion of 27.79% signifying neutrality of opinion.

Respondents agreed on we have enough machines for loading and unloading containers by a mean of 4.2778, standard deviation of 1.0032 and a dispersion of 23.45%. The opinion on we have enough scanners to facilitate cargo clearance appeared neutral to the respondents with a mean of 3.6389. This supports Gerald assertion (2010) that the port facilities are overstretched and under intense pressure leading to complaints from the local clearing and forwarding firms and customers.

4.4.3 Transport Infrastructure

Table 4.9: Transport infrastructure and how it affects port efficiency at the Inland Container Depot

Transport Infrastructure			
Statements	Mean	Standard Deviation	Coefficient of Variation
D1We have good road network to ICD to facilitate port efficiency	4.2444	0.7149	0.1812
D2The construction of standard gauge railways has improved port efficiency	4.3722	0.5829	0.1333
D3Transport traffic and delays at the ICDN affect port efficiency	4.5278	0.5623	0.1241

The third objective was to find out the effects of transport infrastructure on port efficiency at Inland Container Depot Embakasi. Respondents were required to give their opinions in relation to some set questions related to infrastructure and container cargo clearance at the ICDN. Respondents were in agreement that we have good road network to ICD to facilitate port efficiency as indicated by a mean of 4.2444. There was further agreement that the construction of standard gauge railways has improved container delivery & clearance positively reducing congestion of trailers at on the roads as indicated by means greater than 4. Transport traffic and delay at ICDN was also noted as a big factor affecting container cargo clearance as indicated by a mean of 4.5278 signifying agreement. This is in agreement with Star newspaper (2012) report which saw freight forwarders and clearing agents urging the government to improve the railway system to help eradicate delays at the port of Mombasa. They add that, better roads to ICDN will end port delays.

4.4.4 Container Terminal Efficiency

Table 4.10: Container Terminal Efficiency at Inland Container Depot

Containerized Cargo Clearance efficiency at the Inland Container Depot			
Statements	Mean	Standard Deviation	Coefficient of Variation
F1 Container Cargo clearance is normally delayed	4.0833	1.0790	0.2642
F2 We have enough number of containers cleared	3.7500	1.0522	0.2806
F3 We pay high demurrage/detention costs on container	4.6444	0.7412	0.1559

On container terminal efficiency at the Inland container depot respondents were required to respond to some items related to the same. Respondent's opinions indicate container cargo clearance is normally delayed at the ICDN. We have less number of containers cleared at the port coupled with high demurrage/detention of container charges.

4.5 Inferential Statistics

4.5.1 Correlation Analysis

The correlation analysis Table below shows the relationship between the independent variables, Training and development, handling equipment and transport infrastructure and the dependent variable container terminal efficiency at the Inland Container Depot. The analysis indicates the coefficient of correlation, r equal to 0.713, 0.801 and 0.646 for training and development, handling equipment and transport infrastructure respectively. This indicates a very strong positive relationship between the independent variables, training and development, handling equipment and transport infrastructure and the dependent variable container terminal efficiency at ICDN.

Table 4.11: Correlation Analysis

Variable		Container Terminal Efficiency	Training & development	Handling Equipment	Transport Infrastructure
Container Terminal Efficiency	Pearson Correlation	1			
	Sig. (2-tailed)				
Training & Development	Pearson Correlation	0.713	1		
	Sig. (2-tailed)	0.000			
Handling Equipment	Pearson Correlation	0.801	0.714	1	
	Sig. (2-tailed)	0.000	0.000		
Transport Infrastructure	Pearson Correlation	0.646	0.706	0.613	1
	Sig. (2-tailed)	0.000	0.000	0.000	

Correlation is significant at the 0.05 level (2-tailed).

From table 4.11 above 0.713,0.714 and 0.613 represents training and development, handling equipment and transport infrastructure respectively. Interpretation of the correlation figures above clearly indicate a high degree of positive correlation between each independent and dependent variable since they all fall above 0.5. This implies that the independent variables have a significant impact on the dependent variable. For instance, improved training and development would have a positive effect on the efficiency of the container terminal at ICDN.

4.5.2 Multiple Linear Regression Analysis

Table 4.12: Regression Model of Fitness

Model	R	R^2	Adjusted R^2	Standard Error
1	0.967	0.935	0.932	0.205

The model of fitness determined suitability of the regression model for estimation of the data given. The R value represents the simple Pearson's correlation of 0.967 which indicated a good linear relationship between training and development, handling equipment and transport infrastructure.

The R^2 value also referred to as the coefficient of determination indicates how much total variation in the dependent variable container terminal efficiency could be explained by the independent variables. In this case the R^2 value of 0.935 meant that training and development, handling equipment and transport infrastructure explain 93.5% of the factors influencing container terminal efficiency at ICDN while the other 6.5% is explained by other factors not included in the model.

Table 4.13: Analysis of Variance ANOVA

The Anova analysis involved analysing the total mean scores for each variable using SPSS as shown below.

ANOVA[a]					
Indicator	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Regression	22.462	3	7.487	165.176	0.000
Residual	1.541	34	0.045		

From the table above the results of the analysis show that the regression model made on both variables was significant as supported by the F statistic of 165.176 and a p value of 0.00 i.e.

($p=0.00$) which is below 0.05 ($p<0.05$) and therefore means that the independent variables are predictors of the container terminal efficiency at ICDN

Table 4.14: Regression of Coefficients

Variable	B	Std. Error	Standard coefficients(β)	t	Sig.
(Constant)	0.496	0.204		2.426	0.021
Training & Development	0.362	0.082	0.185	4.43	0.000
Handling Equipment	0.401	0.112	0.241	3.576	0.001
Transport Infrastructure	0.736	0.100	0.189	7.348	0.000

The regression model used to predict efficiency of container terminal took the model

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \boldsymbol{\varepsilon}$

Where $Y\ is$ container terminal efficiency, $\beta_1 - \beta_3$ are the regression coefficients and X_1 is training and development, X_2 is handling equipment and X_3 transport infrastructure and ε is the error term obtained from the f significance from ANOVA.

Therefore, Efficiency of container terminal= 0.496+ (0.362*training and development) + (0.401*handling equipment) + (0.736*transport infrastructure)

Results on the regression of coefficients in table 4.12 above indicate that there exists a significant and positive relationship between training and development, handling equipment, Transport infrastructure and efficiency of container terminals at ICDN as supported by beta coefficients of 0.362, 0.401 and 0.736 respectively. On the first independent variable, the results imply that an improvement in training and development at ICDN would impact the integration by 0.362 units. On the second variable, the results suggest that developments with handling equipment would impact container terminal efficiency by 0.401 units. Also, similar results indicate that better transport infrastructure at ICDN would impact the integration process by 0.736 units.

CHAPTER FIVE

SUMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter deals with the summary of the findings of the study and provides conclusions of the findings in relation to the study. It also highlights recommendations and suggestions for further research study.

5.2 Summary

From the 80 questionnaires administered, 72 of them representing 90 % were returned and analyzed for mean, standard deviation and coefficient of variation. The study revealed that majority of respondents studied were from clearing and forwarding and port clerks. Middle and supervisory management employees were studied since they have a lot of influence and information in relation to container terminal efficiency at the Inland Container depot. The study also indicated that majority of management employees are well conversant with factors that determine port efficiency at the ICDN. Training and development, handling equipment and transport infrastructure is seen critical in container terminal efficiency.

The correlation analysis indicates high degree of positive correlation since the numbers fall above 0.5. This indicates a very strong positive relationship between the independent variables, training and development, handling equipment, transport infrastructure and the dependent variable container terminal efficiency at ICDN.

The regression analysis also revealed that training and development, handling equipment, transport infrastructure were good predictors of container terminal efficiency as supported by an r squared of 0.936. The results also revealed that there is a positive and significant relationship between training and development, handling equipment and transport infrastructure and

container terminal efficiency at ICDN as supported by beta coefficients of 0.362, 0.401 and 0.736 respectively. These results show that training and development, better handling equipment and improved transport infrastructure will positively impact on container cargo terminal efficiency.

5.2.1 Training & Development

The study established that training and development of the relevant human resource improved compliance especially from clearing and forwarding agents and thus improved container terminal efficiency. The study revealed that constant training on the dynamic systems and processes resulted to container terminal efficiency. The study established that skill, expertise and knowledge influenced container terminal efficiency.

5.2.2 Handling Equipment

From the findings handling equipment at the ICDN enhanced container terminal efficiency since this is the equipment used to transport, position, load and store cargo at the ICDN. Adequate handling equipment allows port clerks and the Customs & Border Control Departments to scan and analyse lodged manifests online once the cargo arrives at the port. The clearance process is therefore fastened and therefore improves the efficiency of the container terminal since more containers are released on time.

5.2.3 Transport Infrastructure

Transport infrastructure has really been improved by the commissioning of the SGR since more container units arrive at the ICD meaning that more units od transit goods can be cleared from the ICD instead of the mother sea port of Mombasa. This has resulted to improved container terminal efficiency since it facilitates trade through faster clearance of goods. A good road network also improves container cargo efficiency as goods arrive at the ICD on time.

5.2.4 Container Terminal Efficiency

Container terminal efficiency is considered critical in improving trade facilitation. One of the key reasons for an efficient container terminal is to reduce the costs of doing business as well as increasing trade. From the study this has been influenced by training and development, handling equipment and transport infrastructure. The findings established that improved training and development at KPA, Customs & Border Control and Clearing & Forwarding departments improved port efficiency to a large extent at the ICD.

5.3 Conclusion

From the research findings, the study concluded all the independent variables studied have significant effect on container terminal efficiency at ICDN as indicated by the strong coefficient of correlation and a p-value which is less than 0.05. The general impact of the variables analyzed was very big, as stated by the coefficient of determination. The total P-value of 0.00 which is less than 0.05 (5 percent) is an indication of relevance of the factors studied, which is important at the 95 percent point of importance calculated. This indicates that the studied independent variables namely training and development, handling equipment and transport infrastructure have significant effect on container terminal efficiency at ICDN.

On training and development, the study concluded that increased improvement in skills, knowledge and expertise of the ICD human resource improved efficiency of the container terminal. While there is no universally acceptable model for training and development for improving container terminal efficiency, the international customs community believes in training and development in respect to each key principle outlined in the Kyoto Convention. Efficient and effective national customs administration ensure that governments meet their

policy objectives in respect to revenue collection, trade facilitation, trade statistics and protection of the society from a range of threats to national security.

On Handling equipment, the study concluded that equipment used in loading, transportation, storage and positioning of cargo should be constantly upgraded in line with latest technology in order to improve efficiency of the container terminal. Reduction in costs associated with constant breakdowns of the handling equipment will enhance container terminal efficiency and it does not only reduce the cost of business for traders who have to pay demurrage charges but also improve on trade facilitation as more revenue is collected through release of cargo to be supplied in the economy.

On Transport and Infrastructure, a good road and rail network results to improved container terminal efficiency. The study concluded that the good railtainer service between the sea port of Mombasa and the ICDN has improved port efficiency as more units can be cleared and released from the terminal for uses such as home consumption, warehousing, exportation or transshipment to other partner states thus improving trade facilitation and improved relations with the regional economic blocks. Better road networks also ensure cargo is promptly delivered to the designated destinations.

5.4 Recommendations

The three factors affecting container terminal efficiency at ICDN are training and development, handling equipment, and transport infrastructure among others. The study therefore recommends more improvements and use of ICT supported clearance systems and improved handling equipment.

On training and development which is the process by which individuals and organizations obtain, improve, and retain the skills, knowledge, tools, equipment and other resources needed to do their jobs competently or to a greater capacity should constantly be reviewed. This can be done through training workshops and seminars and also online learning. The various stakeholders that enhance container terminal efficiency should constantly be trained on any improvements on the technology upgrades and systems used to clear documents such as the current ICMS system used in cargo clearance which has incorporated extra modules to enhance efficiency. This will reduce delay times associated with cancellation of lodged documents such as entries and manifests.

On handling equipment which includes the mechanical equipment used for the movement, storage, control and protection of cargo, throughout the clearance process from when the goods arrive at the container terminal until disposal such as transport equipment, positioning equipment, unit load formation equipment, and storage equipment should undergo constant maintenance to avoid breakdowns that lead to delays at the port when they are not in use. Port Scanners for instance should be constantly maintained by the service providers and any system downtimes be communicated to the relevant stakeholders. The need to add more port handling equipment such as scanning terminals will significantly improve the efficiency of container terminals.

On Infrastructure which refers to the fundamental facilities and systems serving the container terminal including the services and facilities necessary for its operations. Infrastructure is composed of physical improvements such as roads, railways and telecommunications including connectivity. Better road network along the designated transit routes especially along the

northern corridor will significantly improve the efficiency of the container terminal since there will be less delays experienced from the trucks ferrying the cargo in and out of the container terminals. Additional units of the SGR trains that operate between the port of Mombasa and ICDN will also results to improved terminal efficiency since more container units can be cleared and released for the various uses i.e. home consumption, warehousing and exportation.

5.5 Areas for Further Study

This research was limited to the factors influencing the ICDN Container Terminal only. However, additional studies can be carried out on ICD Eldoret and ICD Kisumu and also the most recently commissioned ICD Naivasha since it makes Kampala destination a long-term plan, tied to Kenya's capacity to finance. The prime business objective of ICD Naivasha is to leverage Naivasha to maximize utilization of Mombasa port and the Mombasa/Naivasha SGR by increasing transit cargo for Uganda, eastern Democratic Republic of Congo (DRC) and South Sudan. This will impact container terminal efficiency which opens up an area for further research study.

In the wake of previous demonstrations by Mombasa traders accusing KPA and KRA decision to order for 100 per cent of transportation of containers from the port of Mombasa to Inland Container Depot in Nairobi. Research can also be done on the effects of the SGR in efficiency of Container terminals and on the other stakeholders.

Further research can also be done on the port charter agreement between the port players aiming at improving efficiency in cargo clearance at the port of Mombasa.

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APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

Emmaculate M. Nyaribo

P.O Box 21210-00100

Nairobi, Kenya

Dear Respondent,

RE:DATA COLLECTION

I am a student at Kenya School of Revenue Administration pursuing a Post Graduate Diploma in Customs Administration. I am currently conducting a research study on 'Factors Influencing Efficiency of Container Terminals at the ICDN'. The attached questionnaire is for gathering data which will be useful in the mentioned research.

You have been selected as a respondent in this study. I therefore request you to respond to all questions as completely, correctly and honest as possible. Please note that the information sought is purely for academic research and will be treated with utmost confidentiality.

Thankyou in advance for your cooperation.

Yours faithfully,

Emmaculate M. Nyaribo

APPENDIX 11: QUESTIONNAIRE

This research questionnaire was specifically prepared to assist in data collection relating to factors affecting container terminal efficiency at the ICDE. As a respondent in relation to the study you are kindly requested to fill in appropriate responses at the best of your knowledge. This research will be purely for academic reason and assure you that all responses will be treated with confidentiality.

1. Section A: Background Information.

A job title/Designation (optional)……

A2. What Organization do you work for?.....

A3. what is your highest level of education attained?

High school { } Bachelor's Degree { }

Certificate level { } Masters { }

Diploma { } PHD { }

A4. How long have you been working at the Inland Container Depot Embakasi?

0 – 5 years { }

6 – 10 years { }

11 – 15 years { }

16 – 20 years { }

Over 20 years { }

A5. What is your current position in Kenya Revenue Authority/Kenya Port Authority or the clearing firm you're working from?

Top Management { }

Middle Management { }

Supervising Management { }

A6. For how long have you worked in your current position?

0 -5 years { } 16 – 20 years { }

6 – 10 years { } over 20 years { }

11 – 15 years { }

2. Section B: Training and Development

How does customs training and development influence container cargo clearance at the Inland Container Depot in Embakasi?

5= Strongly Agree, 4 = Agree, 3= Neutral, 2= Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
B1	Port staff and stakeholders are trained constantly on documentation and system upgrades.					
B2	Efficient leadership and management makes it easy in setting direction and sustaining port efficiency					
B3	Staff hired to facilitate cargo clearance are efficient and competent					

3. Section c: Handling Equipment

How does handling equipment influence container terminal efficiency at ICD Embakasi?

5= Strongly Agree, 4 = Agree, 3= Neutral, 2= Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
C1	We have enough machines for container clearance					
C2	We have enough machines for loading and unloading containers					
C3	We have enough scanners for container clearance					

4**. Section D: Transport Infrastructure**

D1: How does Transport Infrastructure Influence Container terminal efficiency at the ICD Embakasi?

5= Strongly Agree, 4 = Agree, 3= Neutral, 2= Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
D1	Do we have good road network to ICD to facilitate container terminal efficiency					
D2	Has the construction of standard gauge railways improved container delivery & clearance					
D3	Transport traffic and delays at the ICDN affect container clearance					

5. Section F: Container Terminal Efficiency

5= Strongly Agree, 4 = Agree, 3= Neutral, 2= Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
F1	Container Cargo clearance is normally delayed					
F2	We have enough number of containers cleared					
F3	We pay high demurrage/detention costs on container					

END OF QUESTIONNAIRE

Thank you for your time.