DETERMINANTS OF DRY PORT PERFORMANCE IN KENYA: A CASE OF THE INTERNAL CONTAINER DEPOT, NAIROBI

BY

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A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS AND ECONOMICS IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS IN TAX AND CUSTOMS ADMINISTRATION

MOI UNIVERSITY

2020

DECLARATION

Declaration by Candidate

This thesis is my original work and has not been presented in any other University for examination. No part of this project may be reproduced without the prior written permission of the author and/or Moi University.

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DEDICATION

To God for being my enabler. To all lecturers whom I have had the privilege of being their student at the Kenya School of Revenue Administration. Lastly, to my sisters who have been challenging me throughout my journey of education, my parents, wife and son for unending support and inspiration.

ACKNOWLEDGEMENT

First, I give thanks to the Almighty God for being my enabler. My supervisors, Dr. Bruce Ogaga and Dr. Ambrose Kemboi, thank you for dedicating your knowledge and time to ensuring that I choose the right topic and follow the right process of writing a research project. Writing this research project may not have been completed without your help and guidance.

Further, I would also like to thank my lecturers whom I have had the privilege of being their student and my friends at the University for giving me much knowledge and experience when writing the proposal. Thank you so much for your patience, insightful advice, valuable support, and time.

Lastly, I would also like to express my gratitude to my family who encouraged and supported me when I was writing the research project by giving me time and resources that enhanced the success of the project. Thank you; Cherry, Armani, Grace, Phanice, Jane, Jasmine, Lucy and Milton Mokua.

ABSTRACT

In view of the global outlook, the rising number of container throughput and traffic globally has affected the functionality of seaports necessitating the emergence of dry ports. Dry ports have become an essential medium for seaports to solve the problem of rapid changes in globalization with the need to fulfill economies of scale and scope in the international market. Since the introduction of dry ports, there has been a lot of considerations with concern to Inland Container Depots targeted at improving port operations with an aim of making global trade more efficient and effective to all stakeholders. This study looked at the factors used by Embakasi dry port in optimizing its purpose as a way of providing solution to trade facilitation and ensuring there is free flow of containers at the Seaport in Mombasa. In particular, the study interrogated the determinants of dry port performance with a view of improving revenue collection. The explanatory variables used in this research project were Information Communication Technology, infrastructure, capacity of personnel and stakeholder cooperation. Hypothesis were formulated so as to describe an unknown but a tentative answer to what the research considered ought to be the possible outcome of an existing problem. Theories covered in this research project were the stakeholder theory, institutional theory and the theory of agency. The research used explanatory research design. Data collected was primary data through an ordinal scale involving close-ended structured questionnaires. The target population of the study consisted of 838 participants in international trade comprising of senior managers of Kenya Revenue Authority (KRA) customs and border control department, clearing and forwarding agents, and senior managers of Kenya Ports Authority (KPA). Sample size of 271 participants was selected using stratified random sampling technique. Data was collected at the Internal Container Depot (ICD) Nairobi and KRA headquarters, Nairobi for the financial year 2018/2019. The study employed descriptive and inferential statistical analysis to determine the relationship between variables using Statistical Package for Social Scientists (SPSS). In particular, correlation analysis and multiple regression analysis were used. The results are presented in the form of tables, and figures. The results of the multiple regression analysis revealed that Information Communication Technology ($\beta1=0.141$, $p<0.05$), infrastructure ($\beta2=0.565$, $p<0.05$), capacity of personnel ($\beta3=0.094$, $p<0.05$) and stakeholder cooperation ($\beta4= 0.22$, $p<0.05$) had a significant and positive influence on the performance of the dry port as p-values of the respective variables were less than 0.05. The model summary results revealed that there was a 77.2% variation in the performance of the dry port due to changes in Information Communication Technology, infrastructure, capacity of personnel and stakeholder cooperation. The study therefore concluded that that Information Communication Technology, infrastructure, capacity of personnel and stakeholder cooperation had a positive and significant effect on the performance of dry port. Therefore, KRA should develop a policy that enhances infrastructural development within the dry port through the construction of better facilities and foster useful collaborations and linkages with other border agencies involved in the process of customs clearance. The research suggested that future studies can evaluate the political, economic, social, technological, environmental and legal factors determining the performance of a dry port.

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OPERATIONAL DEFINITION OF TERMS

Capacity of Personnel: Refers to the level of qualification, training, attitude and ability to execute responsibilities by the individuals mandated with the stakeholders in seeing the success of their respective roles competently (Fanti et al., 2015).

Cargo Scanning: Cargo scanning or non-intrusive inspection refers to non-destructive methods of inspecting and identifying goods in transportation systems. It is often used for scanning of intermodal freight shipping containers (MRA, 2018).

Clearance Time: The time taken to clear a consignment of goods through customs, from the time of arrival until the physical release (KRA, 2018).

Customs administration: A competent authority that has a mandate under law for administration of customs laws and regulations (KRA, 2018).

Dry port performance: Port performance requires a set of measures related to vessels stay at port, rate of loading and unloading the cargo and quality storage and inland transport. Therefore, the term dry port performance is defined as the total traffic and or cargo handled per annum expressed in million tons per annum (MTPA), both import and export in the Inland terminals (UNESCAP, 2011).

Dry ports: Inland terminals or ports that have the same capabilities, services, and function like seaports through the provision of the transport network and connecting the movement of containers between the Seaport and Hinterland (Rodrigue et al., 2010)

Information Communication Technology: It is an extensional term for Information Technology (IT) that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals) and computers, as well as necessary enterprise software, middleware, storage and audiovisual systems that enable users to access, store, transmit and manipulate information (Christensen et al., 2017).

Infrastructure: Refers to the basic physical and organizational structures and facilities like buildings, railways, roads and power supplies needed for the operation of a society or enterprise (Rahmanto, 2016).

International Trade: The exchange of goods or services across international borders (Maranga, 2015).

Revenue Collection: Collection of income accruing from taxation to a government during a specified period (KRA, 2018).

Stakeholder: A stakeholder is an individual or group that has interest in any decision or activity of an organization. Stakeholders may include: The Government of Kenya, Terminal operators, Kenya Railway, Kenya Ports Authority and Kenya Revenue Authority, Clearing and Forwarding Agents as well as other port operators (Schaltegger et al, 2019).

Trade Facilitation: The harmonization, simplification and modernization of import and export for promotion of international trade (WCO, 2018).

ABBREVIATIONS AND ACRONYMS

BPS	Budget Policy Statement
GDP	Gross Domestic Product
ICD	Internal Container Depot
ICT	Information and Communication Technology
IPA	Importance Performance Analysis
IT	Information Technology
KCB	Kenya Commercial Bank
KRA	Kenya Revenue Authority
MTPA	Million Tons Per Annum
NACOSTI	National Commission for Science, Technology and Innovation
PCS	Port Community System
RECTS	Regional Electronic Cargo Tracking System
TBL	Through Bill of Lading
TEU	Twenty-foot Equivalent Unit
VIF	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Background

Container terminals and ports form an essential component in the growth of modern economy. Since the start of the 20th century, containerization has reduced transport cost for international trade. Before the introduction of containers, movement of goods from one country to the other was so expensive that only few items were transported across the globe. Nonetheless, in the present era, an American car can be designed in China, components produced in Germany, the car assembled in Japan, and advertisement campaign made by an American firm (Beresford et al., 2012). Due to increased demand for hinterland connections to Inland terminals, European ports have steadily experienced an increase container volume. The European hinterland transport market share on road use increased by about five percent while the share for rail decreased by four percent. Dry port has become an essential medium for seaports to solve the problem of rapid changes in globalization, prioritization of regionalization and instability of global trade with the need to fulfill economies of scale and scope in the international market like the Asian economic community.

Because of increased demand for seaport transport, dry ports are becoming prominent due to economies of scale, which have made Sea transport become an essential part of the global economic growth. For instance, in Asia, container throughput and the size of the container ships increased, thereby minimizing transportation expenses. As a result, the most significant container currently can move up to about 19,224 TEUs (ICS, 2016). Therefore, for countries to face the growing size of sea ships, their port management should pay attention to handling the capacity of ships that transport products to and from their ports. According to Clarkson's Shipping Intelligence Network Report,

“World Seaborne Container Trade also grew from 139 million TEUs in 2010 to 181 million TEUs in 2019” (Clarksons, 2019). The increased container trade has resulted in an increase in congestion ports, a condition that has been experienced in Europe and North America because of high container throughput growth. Because of lack of space in Rotterdam, one of the largest ports in Europe, the port experienced congestion that affected the movement and port operations of about 50 percent of the entire supply chain system (Wp, 2009). In response to the extension of containers, container terminal and port operators started expanding container capacity by building a new container terminal.

The study conducted by Slack (1999), offered a solution to the problem of congestion and capacity of ports through the creation of a satellite terminal known as "Dry Ports." The terminal provides an inland terminal or port that has the same capabilities, services, and function like seaports through the provision of the transport network and connecting the movement of containers between the seaport and hinterland (Rodrigue et al., 2016). The concept of dry ports is an essential solution that can help overcome the challenge of port capacity and congestion that can be implemented by countries. Dry ports enable container seaport systems transform supply chains into an adaptive business network that will help increase sea robustness and competitiveness.

Most countries have well developed dry ports that facilitate cargo and trade flows between seaports and cargo’s final destination. Dry ports play a significant role in Europe, especially in Sweden. Swedish dry ports play an essential role in the European seaport system by being the region's container buffering zones, space providers, value-added logistics service providers and intermodal transport zones to containers (Bergqvist, 2016). Nonetheless, dry ports in the Scandinavian region have faced

challenges like lack of skilled workers, limited length of rail tracks, and low capacity of rail links (Konings et al., 2009). Each dry port has distinct factor that affects its growth and development, as well, its ability to execute its mandate to its clients.

Strategies proposed to solve problems experienced in seaports have been identified to synchronize dry port operations in the region. For instance, the introduction of the combined infrastructure of rail and road network helped increase freight volumes to seaports while, on the other hand, reducing traffic congestion in seaports. Besides, the Scandinavian dry port also introduced competitive, innovative, and creative services that attract clients to use their facilities for export and import services (Bergqvist, 2016). On the other hand, a distinct approach was also introduced and implemented in the dry port of Valencia. The port introduced a Port Community System (PCS) that integrated different stakeholders in the maritime transport and seaport operations by managing administrative procedures and information in the operations of the dry port. The system covered information of multiple stakeholders, especially rail operators, shippers, and seaports creating coordination and integration between the ports clients and the dry port (Dotoli et al., 2010).

From across the globe, it is evident that exports can drive economic development and growth in a country. The African continent, nonetheless, faces significant challenges for the development and growth of its economy since most countries have not been able to successfully connect with the world economy. African exporters face adverse geography characterized with poor economy. According to the study by Elbadawi et al., (2001), they found out that domestic transport cost is the continent's strong constraint for exports. As such, lowering the cost of domestic transport in the continent can contribute to higher exports, thereafter growth and development of the region's

economy. Through introduction of dry ports, the cost of domestic transport would be decreased since exporters and importers will be closer to inland terminals.

Vandervoort and Morgan (1999) provide an instance in which a dry port in Egypt could not offer sufficient maintenance, systematic institutional and legislative process and infrastructure that could optimize their connection to the Seaport system. As a result, the government in African countries like Tanzania, South Africa, and Nigeria have come up with strategies to upgrade their logistics infrastructure as a way of improving dry port operations. The upgrade aims to enhance connectivity between seaports and dry ports by reducing container dwelling time from 15 days to 7 days, which is an internationally recognized period (Jeevan et al., 2015). The approach has increased the connectivity between seaports and dry ports and their clients, thereby smothering cross border trade by allowing private investors to promote trade competitiveness in the African Continent. In brief, challenges that are faced by dry ports in distinct countries tend to vary. As such, strategies that are used by nations that have seaports to overcome those challenges might be different, but they all ensure that dry ports fit into the multifaceted seaport system (Vervest et al., 2004). For that reason, dry ports should improve the interaction between the port and its distinct stakeholders, who are operating with varied objectives in container transportation network as a way of contributing to the competitiveness of the seaport.

The most prevalent problems that occur because of the increase in the number of container throughput in the globe are the problem of port congestion. According to Visser et al. (2007), the problem of traffic congestion in ports does affect not only ports but also shipper and consignee. Traffic congestion at the ports has domino effects on logistics and transport cost, which usually occur when transporting cargo using land

transport like trucks and rail. Congestion on roads can make the price of commodities being moved to increase because of the lost time used in container movement, more fuel consumed in traffic, and negative environmental impacts as a result of air pollution from trucks used for transport. Therefore, for logistics companies to reduce congestion in ports, it is essential to shift modes of transport and the pick-up points for containers. The shift is expected to reduce the cost of transport by using other modes of transport like rail other than trucks, which can be used to connect and access a dry port to the hinterland.

Therefore, it is in this light that the research focuses on establishing the determinants of dry port performance in Kenya. A dry port is an essential concept that offers the solution of reducing congestion in the seaport. The Inland Container Depot does not only play a significant role in the provision of a place for loading and unloading containers but also the provision of a chain of national and regional economic activity (Kerama & Simba, 2019). The terminal provides an inland terminal or port that has the same capabilities, services, and function like Seaports through the provision of the transport network and connecting the movement of containers between the Seaport and Hinterland (Rodrigue et al., 2010). The dry port plays a significant part in the African Maritime Industry since there are many landlocked countries in the Continent. Therefore, the establishment of dry ports is important to inland regions. In regard to trade and economic growth, ICD in Embakasi is expected to offset the development of additional services.

Nairobi boasts of an Inland Container Depot, which is directly linked to the port of Mombasa through the SGR. The ICD in Embakasi was established in 1984 and operated by the Kenya Ports Authority, and it is linked to Mombasa port thereby providing

shippers with a dry port in the commercial Center of the country (Kerama & Simba, 2019). The dry port is estimated to be 29 hectares, and it is located off Mombasa road. Its size enables it to accommodate a throughput of more than 180,000 TEUS in a year making it perfect for import and export shippers. All un-nominated containers that belong to upcountry importers in Kenya are transported via SGR to Embakasi ICD before they are cleared. It is estimated that Embakasi ICD receives an average of 225 trains in a month. Since the government embarked on a move to transport Cargo via SGR a year ago, it is reported that 936 SGR trains have operated between Embakasi ICD and the port of Mombasa carrying about 95,212 TEUs, which account for about 73.7 percent of Through Bill of Lading (Kerama & Simba, 2019). The main aim of ICD in Embakasi, Nairobi, is to handle loading and to offload of cargos that are on transit to upcountry or neighboring countries like Uganda and Congo.

1.2 Statement of the Problem

With the ever-increasing global trade volumes, ports are faced with various challenges. In many developed countries, the problem of liner shipping and container trade has been moved from seaports to inland (Dotoli et al., 2010). Just like many developing countries that have problems with import and export due to high transport costs of containers, Kenya requires dry ports to drive its economic development and growth. Both importers and exporters in Kenya are facing adverse geographical problems characterized with poor institutions that are mismanaging operations for the movement of cargos from the sea of Mombasa (Kerama & Simba, 2019). As a result, importers continue to incur millions in demurrage charges and the assistance of dry ports is highly foreseen by container seaport players to enable them to move with the paradigm of seaport logistics towards a consumer centered logistics facilitating trade and by extension enhancing revenue collection.

The Kenya Revenue Authority is tasked by Treasury with collection of revenue. Collection of revenue has always been used as the baseline for measuring their performance (Morini et al., 2017). Revenue collection in the financial year 2018/19 was Kshs.1.58 Trillion, compared to the target of Kshs.1.643 Trillion (KRA, 2019). Highlighting on the collection of taxes and the Budget Policy Statement 2018, the overall projected budget deficit stood at Kshs.63 Billion. This was a shortfall of 4 percent from the targeted revenue collection. In the previous year, 2017/18, KRA missed the target by Kshs.106 Billion (KRA, 2018). The deficit was also reported for the financial year 2019/20 where collections stood at Kshs.273 Billion below target.

The Customs and Border Control Department within KRA is tasked with collection of revenue on imports and exports at the points of entry and exit. However, the department has not been performing to its expectations. It was reported that revenue collection on dry imports declined by 4.9 percent while those of wet imports grew by 9.9 percent for the financial year 2018/19. In the previous years, 2015/16, 2016/17 and 2017/18, department missed the target by Kshs.12 Billion, Kshs.18 Billion and Kshs.15 Billion respectively (KRA, 2018).

The year on year fiscal deficit has led to an increase in public debt as the government is inclined to borrow funds to fill the gap. As such, there is need to cover the gaps and enhance revenue collection. To achieve this, the research intends to look at the determinants of dry port performance so as to accommodate growth of exported and imported containers brought about by changes in global logistics and international trade. Improved efficiency is expected to further development of the existing networks as well as increase government revenue collections. Few studies have been conducted

on the performance of dry port. Therefore, this research intends to analyze the determinants of dry port performance in Kenya: a case of the ICD, Nairobi.

1.3 General Objective

The overall objective of this study was to determine the determinants of dry port performance in Kenya; a case of the Internal Container Deport, Nairobi.

1.3.1 Specific Objectives

The specific objectives of this study were:

i. To determine the effect of Information Communication Technology on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi.
ii. To establish the effect of infrastructure on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi.
iii. To determine the effect of stakeholder's cooperation on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi.
iv. To establish the effect of capacity of the personnel on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi.

1.4 Research Hypotheses

A research hypothesis is a statement which describes an unknown but a tentative answer to what a researcher considers ought to be the possible outcome of an existing problem or phenomena (Kombo & Tromp, 2006). Within the scope, the study sought to test the following hypotheses:

i. **H_{01}:** Information Communication Technology has no significant effect on the performance of the dry port in Kenya.

ii. **H_{02}:** Infrastructure has no significant effect on the performance of the dry port in Kenya.

iii. **H_{03}:** Stakeholder's cooperation has no significant effect on performance of the dry port in Kenya.

iv. **H_{04}:** Capacity of personnel has no significant effect on the performance of the dry port in Kenya.

1.5 Scope of the Study

The focus of this study will be the performance of the dry port for the financial year 2018/2019. Data will be collected from senior managers of the Kenya Revenue Authority (KRA) customs and border control department, clearing and forwarding agents, and senior managers of the Kenya Ports Authority (KPA). The research will be concentrated in ICD Nairobi and Mombasa.

1.6 Significance of the study

This study is to give impetus to stakeholders on main focus areas of improvement for port operations. For the KRA, the study will give feedback on the various initiatives that have and/or are being implemented.

The results of this study will form the basis for future studies and expand knowledge of scholars for future researches. Mainly relying on any research gaps and need to improve on study variables and any uncovered discussion areas.

From the research results, it is expected that policy makers will draw valuable information that will help drive government policies. In particular policies related to revenue collection from customs and border control department.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section covers the review of concepts, theories that relate to stakeholder's cooperation, capacity of personnel, technology and infrastructure. These theories give more insight on determinants of dry port performance. Also, the chapter contains empirical studies from earlier researches, conceptual framework of the study, and lastly the summary of literature and research gaps of those studies.

2.2 Review of Concepts

Seaports have existed over several years and with increased maritime trade activity, increased demand has exerted pressure on seaport utilization necessitating the development of dry ports Dry ports besides serving as inland terminals, have the same capabilities, services and function like seaports. Dry ports provide a transport network and connection that facilitate flow of containers between the seaport and the hinterland (Rodrigue et al., 2010). The dry ports serve to optimize seaport performance by decongesting the seaports, facilitating trade and promoting the supply chain performance. Dry port performance is the dependent variable in this study measured by the amount of revenue collected and volume of trade transactions. The key model independent variables for this study were technology, infrastructure, capacity of personnel and stakeholder cooperation.

Information Communication Technology is an extensional term for Information Technology (IT), Technology focuses on the impact of integration of information and communication systems such as enterprise software, telephone communication, computers, middleware and storage tools that allow users to access, store, transmit and

manipulate information and data (Christensen et al., 2017). ICT integration was evaluated by the extent that scanners and Regional Electronic Cargo Tracking Systems (RECTS) are being implemented. Therefore, the study regressed technology and observed how it impacts dry port performance in Kenya.

Infrastructure provides dry ports with optimal connectivity to facilitate speedy and timely movement of cargo from the seaport to the hinterland. Infrastructure thus is key in facilitating trade through the dry ports. Rahmanto (2016), describes infrastructure as the basic physical and organizational structures and facilities like roads, buildings, railways and power supplies essential for the operation of a society or enterprise. Thus, the benefits of infrastructure cannot be understated in supporting operational efficiency and performance of dry ports. Kenyan infrastructural development that is significant is serving the dry ports is the standard gauge railway (SGR) and the parking and inspection bays.

Stakeholder cooperation serves as the glue that supports organization workflow and operational efficiency. A stakeholder is a party that has interest in a company and can either affect or be affected by the business (UNESCAP, 2011). According to the international standard providing guidance on social responsibility, ISO 26000, defines a stakeholder as an individual or group that has interest in any decision or activity of an organization. Numerous parties are engaged in the dry ports' operation in Kenya. It is imperative that these parties pull together towards a unified goal of supporting optimal port performance to avoid conflicts and inefficiencies. This study will examine the involvement of the various stakeholders namely the Government of Kenya, Clearing and Forwarding Agents, port operators, terminal operators, Kenya Railway, Kenya

Ports Authority, and Kenya Revenues Authority in supporting dry port performance in Kenya.

Capacity of personnel is essential in handing port activities and operations. Personnel capacity refers to the qualifications, training, attitudes and ability to execute responsibilities by the individuals mandated with stakeholders in seeing the success of their respective roles competently (Fanti et al., 2015). The research is keen in examining whether the personal running the dry port operations meet the work competency criteria for optimal port operations.

2.3 Theoretical Review

The theories covered in this section are the stakeholder theory, institutional theory and the theory of agency. The stakeholder theory and institutional theory give more insight on how the explanatory variables have affected the performance of a dry port in Kenya: a case of Internal Container Depot, Nairobi. The stakeholder theory explains the effects of stakeholders' cooperation on the performance of dry port and the practices that promote strategic relationships between the stakeholders that are key in driving dry port success and corporate sustainability (Freudenreich et al., 2020). While the institutional theory as used on this research, builds on stakeholders' theory by explaining the role played by policies, procedures, laws and other internal restrictions in port performance. Lastly, the theory of agency gives more insight about an agency relationship between the Government of Kenya, treasury and KRA. A relationship in which one or more persons (the principals) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent (Kopp, 2019).

2.3.1 Stakeholder Theory

Managing stakeholder interests and identifying key company stakeholders is vital in creating value and improving organization business prospects. Stakeholder theory emphasizes that the success of a company lies in delivering value, which goes beyond financial value, to its stakeholders (Freudenreich et al., 2020). The theory notes that businesses and its employees, suppliers, customers, communities and investors are interconnected. This is because the enterprise impacts the lives of people like workers and customers who are dependent on the operations of the company.

The theory was first postulated by Mitroff (1984), in his novel "Stakeholders of the Organizational Mind." Immediately thereafter, Edward Freeman released an article the same year in the California Management Review but did not cite or attribute Mitroff as the original source of Stakeholder theory. Shortly after the article, Freeman went ahead to publish a book in 1984 on its applicability for organizational management and promoting business ethics to encourage morals and values for effective organization management. In his book, "Strategic Management: A Stakeholder Approach", methods of identifying stakeholders' groups are listed and further describes and guides on how their interests can be safeguarded. The theory views the business as a larger social body which ought to be responsible to its groups and people like workers and customers other than the firm owners. While it is widely accepted that businesses ought to consider more than making profits and needs of the shareholders, critics of the stakeholder theory have seen it as a problem to the American Corporations whereby fiduciary obligations are used (Freeman, 1994). Stakeholder theory drives more productivity and profits while still practicing ethical benefits.

Stakeholder's theory ensures that the company does not put its needs ahead of its key stakeholders and partners. Corporate social responsibility stems from stakeholder's theory and it promotes corporate sustainability in a dynamic business environment (Schaltegger et al., 2019). Thus, the firm needs to identify and satisfy the distinct needs of both internal and external stakeholders. Interactions between the organization and external stakeholders occurs at both organizational and project level. Consequently, strategic decisions designed at the organizational level influence the approach towards external stakeholders during their implementation at the project level (Schaltegger et al., 2019). Dry ports operations can be taken as an interconnection of projects from the seaport up to the hinterland. Various stakeholders are engaged in dry port activities to ensure transportation, cargo inspection and clearance, packaging and warehousing are seamless and well-coordinated. Therefore, all stakeholders must have shared values and objectives for the dry ports to effectively meet their goals.

Stakeholder theory helps identify key stakeholders that add value to the dry port supply chain. Customers and the workforce are key stakeholders that support dry port activities in Kenya. Lack of alignment of the dry port policies with the interests of customers and employee can be detrimental to the port operations. Customers can only enjoy port services only when the port operations are being conducted by a competent, motivated, efficient and robust workforce. Practices that promote strategic relationships between the stakeholders are key in driving dry port success and corporate sustainability (Freudenreich et al., 2020). Optimizing the personnel capacity is critical in ensuring that delays, conflicts and losses are eliminated from the port's operations. Therefore, this research aligns with the stakeholder's theory since dry port operations need an ethical, competent, and result driven team of stakeholders with a shared vision and interests of supporting optimal port performance.

The theory supports the independent variables used and will help model and interpret the research output. Previous studies have indicated that port operations in Kenya have been negatively impacted by mismanagement, corruption and political interference. The stakeholder theory provides a framework for ethical management and advocates for ethical business practices that can effectively curb these vices by aligning stakeholder interests to the business interests. Adoption of stakeholder theory in business management can increase job satisfaction, customer experience, and employee productivity (Freudenreich et al., 2020). Therefore, the theory will support dry port performance in Nairobi by promoting stakeholder cooperation especially in policy implementation and building healthy strategic relationships between the various institutions like KRA, Kenya Railways, clearing and forwarding agents, Kenya Bureau of Standards, KPA and the Kenya government whose coexistence is vital for the dry port performance.

2.3.2 Institutional Theory

Institutional theory identifies the role of social, political and economic structures and systems in supporting a firm's operations. The earliest proponent of the institutional theory is Richard Scott (1995) who recognizes institutions as social structures with resilience. According to Scott, the resilience is anchored on the three pillars upon which societies are built, that is, cognitive, normative and regulative foundations. These foundations coupled with firm activities and resources drive stability and social purpose. Recent definition of Institutional theory from Kraft and Furlong (2007) explains that Institutional Theory entails policy-making that is centered on creating government structures that are effective and legal. Therefore, the theory supports the creation of formal organization structures that influence technical efficiency and legitimacy.

The complexity of reporting structure affects the way information relevant for trade facilitation hence negatively affecting the speed at which goods and transactions are carried out hence causing congestion (Scott, 2001). The set of formal rules in terms of policies and procedures developed in an organization determines how the information flows and the actions to be undertaken by staff in case of an incident of a particular nature occurring (Jepperson, 1991). The structures in an organization usually leads to expectations and outcomes among different stakeholders like importers, exporters, shippers and governments institution in trade facilitation hence this determines how actions are undertaken thereby in ICD operations influencing final idea of facilitating trade (Kraft and Furlong, 2007).

Based on the Institutional Theory, the Kenya dry port in Nairobi can support effective and legitimate institutional change by implementing legitimate social, political and economic structures. These structures include personnel management, organization management, fleet operations management, information processing management, communication and administration (Scott, 2001). Also, the institutional theory encourages stakeholder cooperation within the institution through supporting by decisions that foster consensus. Therefore, this theory supports the study research model by providing insights on how effective institutions for optimal performance can be created.

Dry ports in Kenya have aroused significant social and political interests. Aligning the interests of these interested parties to support institutional change that promotes port activities is vital. The focal point of institutional theory is to drive strategic management (Zhao et al., 2017). International trade has created a dynamic environment for global competition thus increasing seaport and dry port activities. Dry ports must be structured

in a manner that they promote seamless and cost-effective movement of cargo from the seaports to the hinterland. Inefficiencies can result in importers and exporters re-routing their trade activities using neighboring countries seaports. Organizational conflicts that have been witnessed between the ports and partner institutions such as KRA, Kenya Railways, clearing and forwarding agents, Kenya Bureau of Standards and KPA can be eliminated by having policy frameworks that are aligned with acceptable professional and legal practices.

2.3.3 The Theory of Agency

The theory of agency was established in the 1970s. The first scholars to propose, explicitly, that a theory of agency be created, and to actually begin its creation, were Stephen Ross and Barry Mitnick, independently and roughly concurrently. Ross is responsible for the origin of the economic theory of agency and Mitnick for the institutional theory of agency, though the basic concepts underlying these approaches are similar. Indeed, the approaches can be seen as complementary in their uses of similar concepts under different assumptions (Mitnick, 2011). According to Kopp (2019), the theory defines the agent-principle relationship as a formal contract in which the principal hires the agents and later lookout for the principal's returns. For example, when investors invest money in businesses, they expect that the management will provide good output. According to Sherman (2020), agency theory assists in the description of the member of business management that serves as the shareholders in a firm. Based on the theory, the agents increase the value of the owners' investments and in return the owners always reward the managers. It, therefore, means that the agents and the owners of the business do not work in align (Sherman, 2020).

Consequently, agency theory can be a source of conflicts between the agents and the business owner because; the sole aim is to maximize the principal's interest without considering the self-interest to the agents. There are chances of miscommunication and disagreement that may occur which can result in various discords and problems in the company (Kopp, 2019). Moreover, incompatible desires may arise between the stakeholders and this may lead to financial losses and inefficiencies in job performance. In the end, the implementation of agency theory results in the principal-agent problem.

Sherman (2020) argues that agency theory assumes that the agents and the principal act in their self-interest and thus, work for mutual benefits. For example, top management in a company is motivated by fair remuneration and availability of corporate perks. For the top managers to keep their standard, they must maximize the shareholders' returns. In the end, the owners are motivated to reward capable executives since they generate profit for the company (Sherman, 2020). Both Sherman and Kopp have a similar opinion regarding the impacts of agency theory in a firm. The authors note that risk is an agency problem and principals assess risks differently. There are chances that the shareholders will manage to tolerate greater risks than the managers due to the predicted higher returns or rewards. Managers that implement agency theory and do not predict gains from the risky moves take more precautions.

Corporate governance in business is used to change the rules and regulations under which the agents operate and restore the principal (Kopp, 2019). The organization must have incentives to encourage the agents to act in unison with the principal's interest (Sherman, 2020). The agency theory is used to design the incentives appropriately and consider the interest motives from the agents' act. Corporate governance should remove all the incentives that encourage wrong behaviors among the agents. Moreover, rules

and policies discouraging moral hazards should be implemented (Sherman, 2020). In agency theory, agency loss is used as a common metric to determine the best principal interest. The agency loss is usually zero when the agent routinely performs with the principal's best interest. It should be noted that there is a chance of making losses when the agents diverge further from the principal's interest.

2.4 Empirical Review

Nations globally are moving to establish dry ports in their jurisdictions to ease flow of good and promote trade. Globalization and internationalization have increased cross border trade, with countries enjoying maritime access finding improved ways to ease port congestions and increase trade activities both locally and internationally (Parente et al., 2018). These developments have necessitated the investigations into importance and viability of establishing dry ports. Various researchers and policy makers have examined the significance of dry ports with a keen focus on easing seaport congestion.

Kenya has intensified efforts to grow its maritime trade and activities by investing in expanding port activities at the port of Mombasa. Therefore, need for space and optimization of terminal capacity especially in developing nations has resulted in the development of inland container deports to serve as dry ports (Nguyen et al., 2020). Despite the dry port concept witnessing increased interest in the last decade, there exists few empirical studies that exhaustively investigate the impact and performance of the dry ports in Kenya. Economic and political considerations and efforts towards the expansion of inland terminals continue to increase the number of dry ports. Global studies also seek to empirically investigate the increasing demand for dry ports for optimal maritime trade and economic prosperity.

In Indonesia, the strain on container yard availability in Lamong Bay Terminal was a result of increasing container traffic (Rahmanto, 2016). Yard capacity is vital for container handling. Rahmanto (2016) using a 7-point Linkert scale investigated the impact of government support, stakeholder support, location and transportation cost on reducing port congestion in Kandangan dry port performance. The research established that performance of Kandangan port was largely affected by government policies. However, other factors like stakeholder participation and personnel capacity vital in implementation of government policies in dry port performance need further investigation.

Crainic et al. (2015) examined how to optimize dry port freight scheduling and distribution planning using a mixed integer programming model. Optimal design and management of dry ports was seen to be an important aspect in the optimization of intermodal transportation. The study observed that overcoming shuttles schedule optimization problems between dry ports and seaports is key. The study established that an intermodal system and technology for freight tactical planning was essential for route and schedule optimization. Maritime logistics encompass various activities that support optimal freight planning and scheduling from the seaport to the inland terminals. Therefore, this research further investigates the factors in addition to technology that support optimal freight planning and scheduling for optimal port performance.

Malaysia has intensified its efforts to support optimal port performance. Jeevan et al. (2017) examined the key factors that influence operational performance of the Malaysian dry port using a web-based survey of its major stakeholders. Using multiple regression, the study revealed that customs clearance efficiency, value added services,

adequate transport systems like roads, highways and rails, ample operational equipment's, ample space for container storage, movement and seaport policies, cabotage policy, strategic port location and road connectivity to be the key factors impacting operations at the Malaysian dry port. Therefore, infrastructure developments fall in tandem with our investigation for the Kenyan dry port performance.

Seaport performance heavily relies on hinterland connectivity for effective and efficient connectivity of inland terminals and seaports. Mirzabeiki et al. (2016) investigated the impact of hinterland transportation, between the seaport and the inland terminals, and institutional policy together with effective information and communication systems. The research established that up to date technological and communication systems improved operational speed efficiency, optimal resource utilization, reliability and data quality. Similar studies conducted by Fanti et al. (2015) observed that effective technology can optimize lead times and result in optimal workflow patterns for optimization of human resources.

Research studies on select port in Africa has gained popularity with the increased regional and international trade. Abdoulkarim et al. (2019) evaluated dry port competitiveness over a four-year period focusing on five select African countries including Kenya using data envelopment analysis. The research ranked the port of Mombasa as the most efficient of the five ports. The research recognized that the dry port concept was a key milestone for African countries and heavy investment was being undertaken in supporting dry ports operations. With modernization efforts being undertaken across major dry ports, the research recommended investigation into dry port efficiency by observing a wider array of variables.

Bentaleb (2015) developed a multi-criteria hierarchical model for dry port seaport system in Morocco. The system was found to increase global performance for the dry ports and bridging gaps in the multimodal transportation. Also, port congestion in Ghana has been a major issue affecting the port performance. Kwateng et al. (2017) investigated the feasibility and impact of Boankra inland port in reducing congestion and transportation costs in Ghana's major seaports. Using the gravitational model, the study observed that dry port location has a huge impact on port performance. There is no agreement for the minimum distance or criteria for determining the location of a dry port, which can make transportation cost-efficient. However, the issue of distance is determined by a country's case based on its operational performance. The research concluded Boankra inland port location has yielded successful results in increasing cost efficiency by reducing transportation costs.

The most prevalent problems that occur because of the increase in the number of container throughput in the globe is the problem of port congestion. According to Visser et al. (2007), the problem of traffic congestion in ports does affect not only affect ports, but also shipper and consignee. Traffic congestion at the ports has domino effects on logistics and transport cost which usually occur when transporting cargo using land transport like trucks and rail. Congestion on roads can make the price of commodities being moved to increase because of the lost time used in container movement, more fuel consumed in traffic, and negative environmental impacts as a result of air pollution from trucks used for transport. Therefore, for logistics companies to reduce congestion in ports, it is essential to shift modes of transport and the pick-up points for containers. The shift is expected to reduce the cost of transport by using other modes of transport like rail other than trucks, which can be used to connect and access a dry port to the hinterland.

Fewer studies have investigated the operational performance and efficiency of dry ports in Kenya. Lamarque (2019) investigated the factors ailing the operational efficiency of the port of Mombasa. The study established that profitable inefficiency exacerbated by the private dry ports controlled by the political elite class in Kenya was a key deterrent to the port efficiency. The port infrastructure in Mombasa has been under fierce political and other stakeholder interference as individuals seek to profit from unfair trade practices. Therefore, it's imperative that stakeholder's participation and cooperation be investigated in promoting the efficiency in the dry ports in Kenya. Stakeholders within the Kenya dry ports network include public organization within the port, logistics participants, private trading associations, workers, central government authorities and the county government authorities. The advantages of good collaborations or partnership between a private firm and the government are that it enables parties to share risks, obligations, as well as, obligations that are applied to each dry port based on rules and regulations of the State (UNESCAP, 2011).

Ruto and Datche (2015) examined how logistical factors influence the operational performance of Mombasa port using qualitative and quantitate data. The study findings indicate that poor performance at the port of Mombasa is attributed to poor infrastructure, lack of funding, lack of government support, incompetent personnel, poor management and poor systems of service. The study recommended for the strengthening of multi sectorial linkages to support convergence in policy and reporting for optimal stakeholder participation. Institutions such as the Kenya Ports Authority and the shipping lines have been blamed for numerous inefficiencies at the ports. Also, the study advocated for the need to expand the terminal yard capacity, terminal facility rehabilitation, ICT infrastructure improvements and undertaking legal and policy reforms. This study investigated deeper the linkages of Ruto and Datche (2015) findings

on stakeholders' role on port performance by incorporating additional explanatory variables for better model results.

Kenya has made significant strides in streamlining dry port operations and efficiency. Huge infrastructure developments such as the standard gauge railway and road network have been undertaken to improve hinterland access. With the recent investment to improve dry ports network in Kenya, it is imperative that factors that influence dry performance be investigated to gain deeper insights on the dry ports' role in the economy. Neighboring countries like Uganda that have been allocated land resources for setting up dry port space facility in Naivasha as the country seek to increase dry port services and activities. Previous studies have mainly focused on the impact of dry ports on economic growth, with little attention given to investigating determinants of dry port performance. The studies reviewed do not explicitly examine the interaction between the model variables in this research. Therefore, this research examined dry port performance by addressing the current gap from previous studies.

2.5 Conceptual Framework

Conceptual framework is a network of interlinked concepts that work together to offer a comprehensive understanding of a given phenomenon. According to Seuring & Müller (2008), conceptual framework considers current theories, their contexts and findings for study questions. A conceptual framework enables a researcher to assess their goals for their research and to come up with appropriate study methodology and questions.

Figure 2.1 summarizes the conceptual framework; the independent variables are the determinants of the dry port performance while the dependent variable is the dry port performance. Technology was measured using scanners and RECTS. Infrastructure on

the other hand was measured using the SGR and available parking and inspection bays. Employee attitude, qualification and training were used to measure the capacity of personnel. Lastly, under the independent variables, information collected from the senior managers randomly selected from KPA and clearing & forwarding agents were used to measure the stakeholder's cooperation. The dependent variable, dry port performance in Kenya was measured using the amount of revenue collected, import statistics, and volume of cargo cleared.

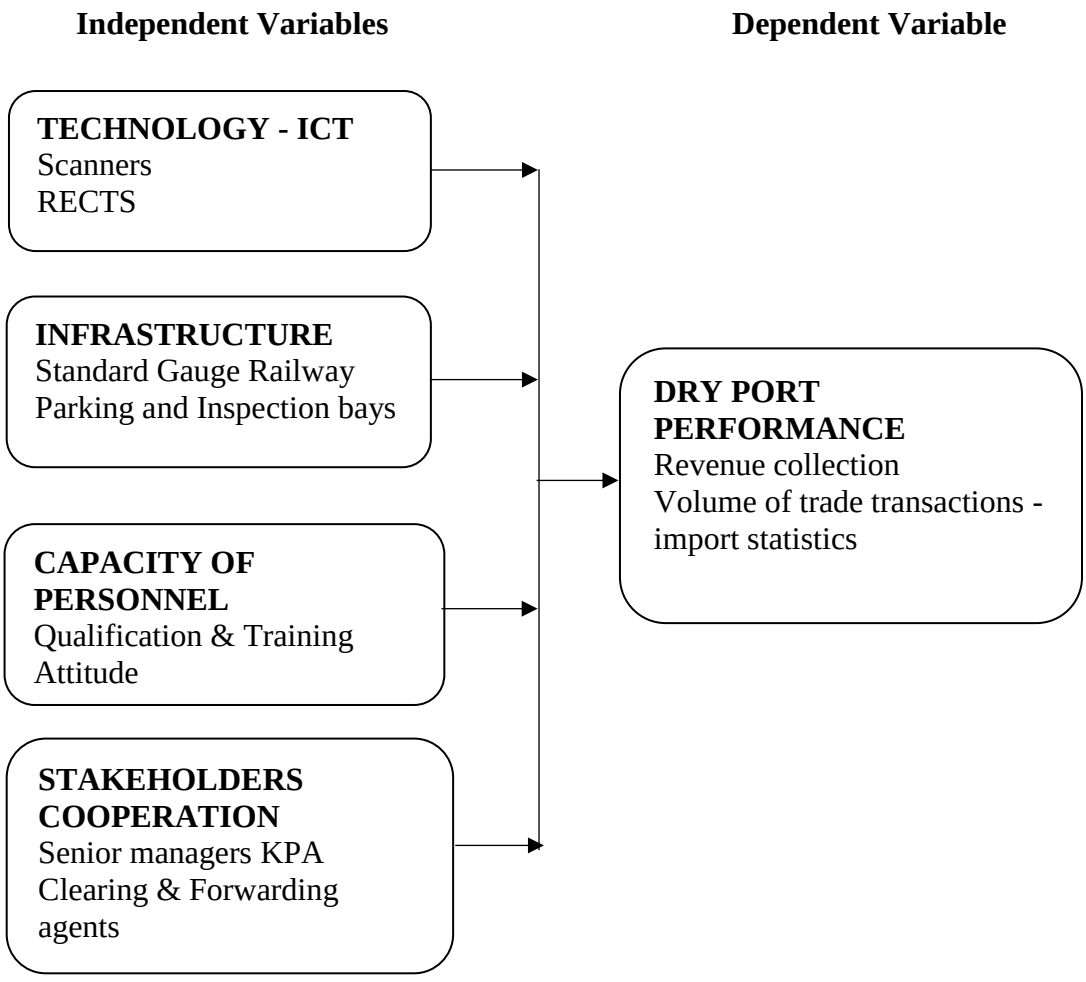

Figure 2.1: Conceptual framework

Source: Author (2020)

2.6 Summary of Literature and Research Gaps

Various scholars have tried to examine the significance of dry ports by applying different research approaches. The literature review observes that most researchers have a keen interest in examining the contribution of dry ports to economic performance of a country. Rahmanto (2016), investigated port performance based on an ordinal scale. The research looked at the effects of government support, stakeholder support, location and transportation cost on reducing port congestion. However, it did not reveal how technology and capacity of personnel play an essential role in determining the performance of the port. The research was particular to the Indonesia economy based on a different set of variables from this research. This research examined port performance in Kenya by incorporating technology and personnel capacity. Similarly, Jeevan et al. (2017), examined the key factors that influence operational performance of the Malaysian dry port. Infrastructure was the common variable under both studies; however, this study will incorporate additional variables to observe how they impact dry port performance in Kenya.

Crainic et al. (2015), focused on freight scheduling and distribution planning optimization with a focus on technology. Other factors that influence port performance were not taken into consideration. This study examined how technology, infrastructure, personnel and stakeholders impact port performance in Kenya. Mirzabeiki et al. (2016), and Fanti et al. (2015), also examined how technology impact dry port performance. In addition to technology, this study examined how infrastructure, capacity of personnel and stakeholder's cooperation impact on dry port performance. Overall, none of the above studies were conducted in Kenya thus the need to examine port performance in the Kenyan context.

In Africa, country specific research has been used to examine port performance in various countries. Bentaleb (2015) examined how effective systems can improve performance in the Moroccan seaport. The research did not investigate the interaction with other variables like stakeholder's cooperation and capacity of personnel in impacting port performance. A similar study in Ghana by Kwateng et al. (2017), was used examine how port congestion can be eased in Ghana. Both studies did not examine port performance in relation to the model variables in this research and they were conducted outside Kenya. Therefore, it was critical to investigate how port performance is impacted in the Kenya context.

In Kenya, notably few studies have been conducted to examine dry port performance. Operational efficiency was identified to be a key concern for the port of Mombasa (Lamarque, 2019). The study recommended an investigation into stakeholder interference in affecting port performance which was investigated in this study.

Ruto and Datche (2015) observed that poor infrastructure, inadequate funding, incompetent personnel, lack of government support and poor management to be key factors ailing Mombasa port performance. The study advocated for stakeholder cooperation and participation for optimal performance. This additional variable was incorporated in this study and its interaction with capacity of personnel, technology and infrastructure examined. Despite these studies being undertaken in Kenya, this study explored additional concepts that impact dry port performance in Kenya not covered by the previous research. Both contextual and conceptual gaps were noted from the works of the previous researches forming a basis for this research.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter highlights on the resources and methods that were used to conduct the research. Therefore, to achieve the objectives of the study, a comprehensive methodology was used to obtain significant results required. It comprises of research design, target population, sampling procedure, collection of data, data analysis, the operationalization and measurement of the study variables and finally ethical consideration.

3.2 Research Design

According to Cooper and Schindler (2006), a research design is a plan or structure which gives a solution to a problem by answering research questions. An explanatory research design was used in this study. This kind of study was used in order to ascertain the characteristics of the variables of interest in a situation by analyzing how one variable affects or is responsible for changes in another variable. Explanatory research helped in understanding the phenomena by discovering and measuring the causal relationships between the variables.

3.3 Target Population

Population is a group of people that have the same features or similar form of characteristics (Mugenda & Mugenda, 2003). The target population for this research proposal was eight hundred and thirty-eight (838) individuals who will be drawn from senior managers of KRA customs and border control department, registered clearing and forwarding agents, and senior managers of KPA. The research was concentrated in ICD Nairobi and Mombasa.

Table 3. 1: Target Population Distribution.

Item	Mombasa	Nairobi	Total
KRA Senior Customs Managers	57	26	83
Clearing & Forwarding Agents	453	274	727
KPA Senior Managers	22	6	28
Grand Total			**838**

Source: (KRA, 2018)

3.4 Sampling Procedure

It is the technique adopted by the research in selecting items for the sample. This may as well define the number of items to be included in the sample. Stratified random sampling was used to stratify the sample of the population into senior managers of KRA customs and border control department, clearing and forwarding agents, and senior managers of KPA. A stratified random sampling was employed to obtain a suitable unit representative of analysis. Stratified random sampling is a variant of random sampling, which allow subgroups to be studied in greater detail (Marshall, 1996). This is because of the heterogeneity of the population and all respondents were all to have equal opportunity of participation.

This study assumed a 95% confidence interval and error level of 0.05. The sample size was calculated by the formula advanced by (Yamane, 1967):

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

Where:

n= sample size

N= target population

e= level of precision

The sample size was therefore calculated as elaborated below.

$$n = \frac{838}{1 + 838(0.05)^2}$$

$$n = 271$$

The calculated sample was proportionately distributed as shown in table 3.2

Table 3. 2: Sample Size

Item	Total Population	Proportion	Sample Size
KRA Senior Customs Managers	83	0.099	27
Clearing & Forwarding Agents	727	0.868	235
KPA Senior Managers	28	0.033	9
Total	**838**		**271**

Source: Research, 2020

3.5 Data Collection

The study used both primary data and secondary data. Data that is obtained from the questionnaire is regarded as the most effective way that researchers or writers can collect qualitative data that can be measured in numbers (Collis & Hussey, 2014). A closed ended structured questionnaire was used to collect primary data. The close-ended questions provided a variety of possible responses for the respondent to choose from and provide uniformity of answers hence easy to code and analyze. Most of the Secondary data for this project was sourced from international established books and journals that present academic research. The statements and the reference of this project are only got from the recognized reports. Secondary data played an important part of

building knowledge to be able to develop a solid background on performance of dry ports in Kenya.

3.5.1 Data Collection Procedure

The study employed questionnaires to collect data from key stakeholders. Before the collection of data, the researcher ensured that the questionnaire was valid and reliable. Thereafter, the researcher sort for a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). Once approval was granted, the researcher sort respondents consent to participate in the research. To improve the response rate, the study put into consideration the research ethical issues. The researcher explained to the respondent the importance of the study and assured them of the confidentiality and anonymity of their identities before administering the questionnaires.

A total of 271 questionnaires were prepared and distributed to: senior managers of KRA customs and border control department; registered clearing and forwarding agents; and senior managers of KPA. Due to the current prevailing corona virus pandemic, to mitigate the issue of non-response, follow-up was done by phone calls and SMS. However, some of the respondents still failed to return the questionnaires. A total of 195 questionnaires were returned and well answered which was 71.96% response rate, while 63 questionnaires were not returned completely, and 13 questionnaires returned incomplete. Thus, the total of 76 questionnaires did not form part of the data used in the analysis of this study.

3.6 Pilot Testing

According to Hassan et al. (2006), it refers to a small test on research protocols, data collection instruments, sample recruitment strategies, and other research techniques in

preparation for a larger study. The technique that was used by the study was simple random sampling where each element of the population had equal probability of being selected for the sample. For survey, small set of respondents, 25% of the intended sample size of 271 respondents, were contacted and interviewed to determine their feedback of the questions asked. The respondents selected for the pilot exercise did not form part of the population under study. The information obtained was then subjected to descriptive and inferential statistical data analysis techniques. Questions not well captured were adjusted accordingly. The pilot test helped determine if the questions are well understood by the respondents and if they offered reliable and valid information for this study.

3.6.1 Data Reliability

Reliability tests the degree to which measures are free from error (Tavakol & Dennick, 2011). For this study, Cronbach's alpha coefficient was computed. Cronbach's alpha, α coefficient has been the subject of considerable methodological and analytical attention (Cortina, 1993). As per the recommendations of Hundleby and Nunnally (1968), the study aimed to achieve reliability alpha of between 0.7 for acceptable and α 1 for excellent to prove the reliability of the research instrument.

3.6.2 Data Validity

Validity is the extent to which the scores from a measure represent the variable they are intended to (Eccleston, 1996). Several ways may be used to estimate the validity of a test including content validity, face validity, construct validity, and criterion-related validity. Creswell (2014) defines content validity as the extent to which the questions on the instrument and the scores from these questions represent all possible questions

about the content. It ensures that the questionnaire includes adequate set of items that tap the concept. This study adopted content validity.

3.7 Data Analysis

Data was analyzed through descriptive and inferential statistics analysis techniques. The relationship between the variables was analyzed using the Statistical Package for the Social Sciences (SPSS) version .21. SPSS software automatically generated descriptive statistics such as means, standard deviation, percentages, frequency and range which was used to describe the respondent's opinions on the determinants of dry port performance in Kenya, a case of the Internal Container Deport, Nairobi. The general summary displayed the descriptive statistics such as mean, percentiles, and standard deviations. In description of the variables, tables and figures were applied.

3.7.1 Analytical Model

The study used a multiple regression model to investigate the relationship between the dependent and independent variables. Multiple regression is a useful means of representing decision outcomes, makes relatively few statistical assumptions and is robust to the statistical assumptions that are made (Hosmer et al., 2015). The multiple linear regression equation was presented as:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon}$$

Where **Y**= Dry port Performance (Dependent Variable)

X_1 = Infrastructure (Independent Variable)

X_2= Capacity of Personnel (Independent Variable)

X_3= Stakeholders Cooperation (Independent Variable)

X_4= Technology (Independent Variable)

β_0 is the constant term (Y-intercept), whilst β_1, β_2, β_3 and β_4 are the slope coefficients for each explanatory variable. Each regression coefficient represents the change in Y relative to a one-unit change in the respective independent variable. ϵ is the model's error term, also known as the residuals.

3.8 Assumptions of Multiple Regression Analysis

The multiple linear regression analysis makes several key assumptions. Prior to conducting the analysis, data was checked to ensure that the assumptions were not violated. These assumptions are normality, linearity, multicollinearity, and heteroscedasticity.

3.8.1 Normality Test

Normality test is used to determine whether a data set resembles the normal distribution (Amata, 2017). A visual representation of the distribution of test results determines whether it conforms to the bell-shaped normal curve. The normality test was done using the Kolmogorov-Smirnov test and the Shapiro-Wilk test. For both tests, the null hypothesis is retained if the probability value was greater than 0.05, implying the data is normally distributed.

3.8.2 Linearity Test

The linearity test is a requirement in the correlation and linear regression analysis. Good research in the regression model there should be a linear relationship between the independent variable and dependent variable. Therefore, linearity implies the degree level to which a change in the dependent variable is related to a change in the independent variables (Hair et al., 2010). The relationship between each of the predictor for the independent variable and dependent variable could be linear. Linearity was

tested using Pearson correlation to check the correlation among the variables of this study.

3.8.3 Multicollinearity

Multicollinearity occurs when the independent variables are correlated. Barnor (2014) stated that when two or more independent variables are linearly dependent on each other, one of them should be included instead of both since it increases standard errors thereby making the results biased. Multicollinearity was be assessed using Variance Inflation Factor and Tolerance values. If the VIF value lies between 1-10, then there is no Multicollinearity whereas if the VIF <1 or > 10, then there is Multicollinearity (Pallant, 2010).

3.8.4 Heteroscedasticity

Heteroscedasticity is as a term used to describe the situation when the variance of the residuals from a model is not constant. Heteroscedasticity is a violation of the multiple regression analysis. Homoscedasticity was examined by visualizing scatter plots and partial regression plots for individual variables (Pallant, 2010). This means the dependent variable scores have the same dispersion/variability around the regression line through them, to mean they have equal spread. Outliers defined as cases that have a standardized residual value of more than 3.3 Or less than -3.3 was checked (Tabachnick & Fidell, 2007). This assumption was checked by visual examination of a plot of the standardized residuals (the errors) by the regression standardized predicted value.

3.9 Operationalization and Measurement of the Study Variables

The table 3.3 gives an outline of the dependent and independent variables and how they were measured and reviewed. Performance of the dry port in Kenya was operationalized

using Information Communication Technology, infrastructure, capacity of personnel and stakeholder's cooperation.

Table 3. 3: Operationalization and Measurement of the Study Variables

Variables	Indicators	Source/Author	Data collection instrument	Measurement scale	Types of Analysis
Independent Variable					
Technology	Scanners	Christensen et al. (2017)	Questionnaire	Ordinal scale – 5-point Likert scale	Multiple Regression Analysis
	RECTS				
Infrastructure	Standard Gauge Railway	Rahmanto (2016)	Questionnaire	Ordinal scale - 5-point Likert scale	Multiple Regression Analysis
	Parking and Inspection bays				
Capacity of Personnel	Qualification and Trainings	Investopedia (2019)	Questionnaire	Ordinal scale - 5-point Likert scale	Multiple Regression Analysis
	Attitude				
Stakeholder cooperation	Senior KPA managers	UNESCAP (2011)	Questionnaire	Ordinal scale - 5-point Likert scale	Multiple Regression Analysis
	Clearing & Forwarding agents				
Dependent Variable					
Dry Port Performance	Revenue collection	Rodrigue et al. (2010)	Questionnaire	Ordinal scale - 5-point Likert scale	Multiple Regression Analysis
	Volume of trade transactions				

Source: Research, 2020

3.10 Ethical Considerations

The research ensured that all respondents were given free will to participate and contribute voluntarily to the study. The research also adhered to appropriate conduct in relation to the rights of the respondents. A verbal consent was sought from the respondents. In addition, the research ensured that necessary research authorities are

consulted before commencement of the study. In addition, all forms of plagiarism were avoided through proper referencing of all sources.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

4.1 Introduction

This chapter presents the response rate, demographics, descriptive statistics, diagnostics tests, inferential analysis, multiple regression analysis, hypothesis testing and discussion of the findings of the study. The findings were presented in two approaches which are; descriptive analysis and inferential analysis.

4.2 Response Rate

A total of 271 questionnaires were distributed to senior managers of KRA customs and border control department, registered clearing and forwarding agents, and senior managers of KPA. However, some of the respondents did not return the questionnaires or returned incomplete questionnaires. A total of 195 questionnaires were returned and well answered which was 71.96% response rate, while 76 questionnaires were not returned or returned incomplete. This is in agreement with Mugenda & Mugenda (2003) that for analysis and reporting, a response rate of 50% is adequate; 60% is good and 70% and over is excellent. This is summarized in table 4.1.

Table 4.1: Response Rate

Response	Frequency	Percentage
Returned	195	71.96%
Returned incomplete	13	4.80%
Unreturned	63	23.24%
Total	**271**	**100%**

Source: Research, 2020

4.3 Demographics

This section presents result on demographic characteristics of the respondents.

4.3.1 Organization

The results shown in the table 4.2 shows that majority of the respondents representing 83.59% were Clearing & Forwarding Agents followed by KRA Senior Customs Managers (11.79%) and KPA Senior Managers (4.62%).

Table 4.2: Organization

	Frequency	Percent	Cumulative Percent
KRA Senior Customs Managers	23	11.79	11.79
Clearing & Forwarding Agents	163	83.59	95.38
KPA Senior Managers	9	4.62	100.00
Total	195	100.00	

Source: Research, 2020

4.3.2 Work Experience

In order to obtain informed responses that were necessary in reinforcing the objectives, the study sought to establish the respondents work experience. The study found that the majority of the respondents (35.4%) indicated that they have worked for their respective organization between 16-20 years followed by (21.5%) 11-15 years, (20.5%) 6-10years, (15.4%) more than 20 years and (7.2%) 1-5years. Therefore, the responses obtained from them were considered informed and adequate for the study as shown in table 4.3

Table 4.3: Wok Experience

	Frequency	Percent	Valid Percent	Cumulative Percent
1-5 years	14	7.2	7.2	7.2
6-10 years	40	20.5	20.5	27.7
11-15 years	42	21.5	21.5	49.2
16-20 years	69	35.4	35.4	84.6
more than 20 years	30	15.4	15.4	100
Total	195	100	100	

Source: Research, 2020

4.3.3 Number of Employees

In order to obtain informed responses that were necessary in reinforcing the objectives, the study sought to establish the number of employees in the organisation. The study found that the majority of the organisations indicated that they had work force of between 51-100 employees (65.1%) followed by 11-50 employees (26.7%) and only 8.2% had a workforce of more than 100 employees. Therefore, the responses obtained from them were considered informed and adequate for the study as shown in table 4.4.

Table 4.4: Number of Employees

	Frequency	Percent	Valid Percent	Cumulative Percent
11-50 employees	52	26.7	26.7	26.7
51-100 employees	127	65.1	65.1	91.8
more than 100 employees	16	8.2	8.2	100
Total	195	100	100	

Source: Research, 2020

4.3.4 Level of Education

The results shown in the table 4.5 shows that majority of the respondents representing 56.9% were diploma holders followed by masters holders (21.0%), undergraduate

holders (15.9%) and finally PhD holders (6.2%). Therefore, the responses obtained from them were considered informed and adequate for the study as shown in table 4.5.

Table 4.5: Education

	Frequency	Percent	Valid Percent	Cumulative Percent
Diploma	111	56.9	56.9	56.9
Undergraduate	31	15.9	15.9	72.8
Masters	41	21	21	93.8
PhD	12	6.2	6.2	100
Total	195	100	100	

Source: Research, 2020

4.4 Descriptive Statistics

It refers to statistics that was used to describe the basic features of the data. They provided simple summaries about the sample and measures used to tell us something about the data.

4.4.1 Information Communication Technology

The first objective of the study was to determine the effect of technology on the performance of dry port at the Internal Container Depot, Nairobi. The respondents were asked to respond to specific statements formulated based on the sub-constructs of the variable. An ordinal scale, five-point Likert's scale was used as the measure where 1 was strongly disagree, 2 disagree, 3 uncertain, 4 agree and 5 strongly agree. The findings, as illustrated in table 4.6 indicate a mean of 3.784 was obtained with a standard deviation of 0.755. This implies that majority of the respondents agreed with the statements on technology with a variation in their responses as shown by a standard deviation of 0.755.

Table 4.6: Descriptive results – Information Communication Technology

	N	Mean	Std. Deviation
The use of single window system on container clearance has curbed congestion problem at ICD	195	4.21	1.088
Modern weighbridge has reduced traffic flow at the ICD		4.59	.597
There are few cases of the system downtime at the ICD		1.41	.763
There is adequate ICT software to promote container clearance at ICD		4.35	.775
There is adequate ICT hardware to promote container clearance at ICD		4.36	.552
		Mean=3.784	**Std = 0.755**

Source: Research, 2020

4.4.2 Infrastructure

The second objective of the study was to evaluate the effect of infrastructure on the performance of dry port at the Internal Container Depot, Nairobi. The respondents were asked to indicate their level of agreement based on the statements of infrastructure. From the results, a mean of 4.304 with the standard deviation of 0.721 was obtained. The findings as shown in table 4.7 portray that majority of the respondents agreed with the statements outlined regarding the effect of infrastructure and the performance of dry port strategy.

Table 4.7: Descriptive results – Infrastructure

	N	Mean	Std. Deviation
The access of roads and other transport means is adequate to promote flow of commodities at ICD.	195	4.57	.600
There is appropriate communication infrastructure to link importers, exporters and other stakeholders at ICD		4.34	.831
Construction of scanning machines has enabled more clearance of goods at ICD		3.75	.858
There is enough parking space for vehicles waiting clearance at ICD		4.36	.552
Construction of modern halls has enhanced clearance of goods at ICD		4.50	.762
		Mean=4.304	**Std = 0.7206**

Source: Research, 2020

4.3.3 Capacity of the Personnel

The third objective of the study was to establish the effect of capacity of the personnel on performance of dry port at the Internal Container Depot, Nairobi. The findings as shown in table 4.8 revealed that majority of the respondents agreed with the statements on capacity of personnel that outline some relationship with the performance of dry port strategy. This is evidenced by a mean of 4.240 with a standard deviation of 0.852.

Table 4.8: Descriptive results – Capacity of Personnel

	N	Mean	Std. Deviation
ICD employees are frequently trained	195	4.45	0.61
Employees at ICD are well motivated through rewarding to ensure they work effectively		3.82	0.848
There are adequate staff members to oversee the operations of the departments at ICD		4.19	1.104
Performance of employees has significantly contributed to THE performance of ICD		4.57	0.6
There is cooperation among employees		4.17	1.098
		Mean=4.240	**Std = 0.852**

Source: Research, 2020

4.4.4 Stakeholder's Cooperation

The fourth objective of the study was to determine the effect of stakeholder's cooperation on the performance of dry port at the Internal Container Depot, Nairobi. The respondents were asked to indicate their level of agreement of disagreement on specific statements based on an ordinal scale, five-point Likert's scale. The findings as revealed on the table 4.9 show that majority of the respondents agreed with the statements that suggest a relationship between stakeholder's cooperation and the performance of dry port. This is evidenced by the mean of 4.088 with a standard deviation of 0.920.

Table 4.9: Descriptive results – Stakeholder Cooperation

	N	Mean	Std. Deviation
The process of documentation is cumbersome at ICD	195	3.81	.975
Introduction and use of single window system on container clearance curbed congestion problem at ICD		4.61	.489
There are ICD learning visits by importers and exporters to improve the information flow.		4.17	1.098
There is support for attendance of stakeholder's meetings at ICD		4.58	.599
KRA has installed software and ICT up to date to help in verification e.g. scanners		3.27	1.441
	Mean =4.088		**Std = 0.920**

Source: Research, 2020

4.4.5 Performance of the dry port

The dependent variable for the study which was the main goal was the performance of dry port at the Internal Container Depot, Nairobi. The findings as shown in table 4.10 indicate that the majority of the respondents generally agree with the statements on the questionnaires regarding the performance of dry port at the ICD, Nairobi. This is evidenced by a mean of 4.160 with a standard deviation of 0.762.

Table 4.10: Descriptive results - Performance of dry port

	N	Mean	Std. Deviation
ICD has eased congestion at the port	195	4.59	0.597
ICD has resulted in the increase of trade volumes		4.58	0.599
ICD has hastened the clearance of cargo.		4.17	1.098
ICD has resulted in increase of revenue		4.58	0.599
ICD has reduced transaction costs		2.88	0.915
		Mean =4.160	**Std = 0.7616**

Source: Research, 2020

4.5 Reliability Results

The results of the Cronbach alpha reliability test for the research instrument is shown in table 4.11:

Table 4.11: Reliability Statistics

Cronbach's Alpha	Number of Items
.840	25

Source: Survey Data (2020)

Form the analysis Cronbach's Alpha was greater than 0.7 (α>.7) for all the variables. This was an indication that the research instrument was reliable.

Table 4.12: Item Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The use of single window system on container clearance has curbed congestion problem at ICD	98.69	77.536	.624	.824
Modern weighbridge has reduced traffic flow at the ICD	98.30	84.707	.510	.832
There are few cases of the system downtime at the ICD	101.49	98.828	-.576	.865
There is adequate ICT software to promote container clearance at ICD	98.54	83.734	.447	.833
There is adequate ICT hardware to promote container clearance at ICD	98.53	85.921	.435	.834
The access of roads and other transport means is adequate to promote flow of commodities at ICD.	98.32	84.498	.527	.831
There is appropriate communication infrastructure to link importers, exporters and other stakeholder at ICD	98.55	82.465	.498	.830
Construction of scanning machines has enabled more clearance of goods at ICD	99.14	86.361	.224	.841
There is enough parking space for vehicles waiting clearance at ICD	98.53	85.921	.435	.834
Construction of modern halls has enhanced clearance of goods at ICD	98.39	85.828	.302	.837
ICD employees are frequently trained	98.44	86.083	.372	.836
Employees at ICD are well motivated through rewarding to ensure they work effectively	99.08	86.546	.216	.841
There are adequate staff members to oversee the operations of the departments at ICD	98.70	77.212	.631	.823
Performance of employees has significantly contributed to THE performance of ICD	98.32	84.498	.527	.831
There is cooperation among employees	98.72	77.286	.631	.823
The process of documentation is cumbersome at ICD	99.09	83.729	.336	.837

Introduction and use of single window system on container clearance has curbed congestion problem at ICD	98.28	88.410	.220	.839
There are ICD learning visits by importers and exporters to improve information flow.	98.72	77.286	.631	.823
There is support for attendance of stake holders meetings at ICD	98.31	84.546	.524	.832
KRA has installed software and ICT up to date to help in verification e.g. scanners	99.62	81.938	.255	.847
ICD has eased congestion at the port	98.30	84.707	.510	.832
ICD has resulted in the increase of trade volumes	98.31	84.546	.524	.832
ICD has hastened the clearance of cargo.	98.72	77.286	.631	.823
ICD has resulted in increase of revenue	98.31	84.546	.524	.832
ICD has reduced transaction costs	100.01	88.608	.071	.847

4.6 Diagnostic tests

The research conducted various diagnostic tests. This section presents the results of the normality test, linearity test, multicollinearity test and heteroscedasticity test.

4.6.1 Normality Test

Statistical procedures are based on the assumption that data follows a normal distribution. The normality tests establish the extent of normality of the data by detecting existence of skewness or kurtosis or both. Shapiro-Wilk and Kolmogorov-Smirnov tests are the two used to indicate normality of data based on the p-values. For the two tests, the null hypothesis is rejected if the p-value < .05 implying the data is not normally distributed whereas null hypothesis is accepted if the p-value > .05

Table 4.13: Normality Test

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Unstandardized Residual	.085	195	.062	.985	195	.291
Standardized Residual	.085	195	.062	.985	195	.291

a. Lilliefors Significance Correction

Source: Research, 2020

It is clear from table 4.13 that the residuals were normally distributed as the p-values .062 and .291 were greater than the threshold point of 0.05 at 95% confidence level. Therefore, the assumption of normality was not violated, and it confirmed the hypothesis that data was collected from a normally distributed population.

4.6.2 Linearity Test

The test for linearity for the four independent variables was conducted to check whether a linear relationship existed between the dependent variables and all the four independent variables. The results are indicated on table 4.14.

Table 4.14: Linearity Test

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	13.877	4	3.469	165.178	.000
	Residual	3.991	190	.021		
	Total	17.867	194			

a. Dependent Variable: Performance of the dry port

b. Predictors: (Constant), Stakeholder cooperation, Infrastructure, Capacity of personnel, Information communication technology

Source: Research, 2020

The ANOVA results in table 4.14 show F-value of 165.178 which is significant at $p<0.05$. This signifies a model is statistically significant and that there is a linear relationship between the dependent and independent variables. Therefore, the assumption of linearity was not violated.

4.6.3 Multicollinearity Test

Multicollinearity refers to a situation in which two or more explanatory variables in a multiple regression model are highly linearly related. It occurs when high correlation exists between the predictor variables leading to unreliable estimates of regression coefficients. This leads to strange results when attempts are made to determine the extent to which individual independent variables contribute to the understanding of dependent variable (Creswell, 2014). To test for multicollinearity the study adopted Variance Inflation Factor (VIF) approach. This study adopted the rule of thumb for VIF value of 10 as the threshold. The VIF values of greater than 10 would indicate presence of multicollinearity.

Table 4.15: Multicollinearity Test

Variable	Tolerance (1/VIF)	VIF
Information Communication Technology	.489	2.045
Infrastructure	.547	1.827
Capacity of personnel	.546	1.832
Stakeholder cooperation	.416	2.407
Mean VIF		**2.02775**

Source: Research, 2020

From the results indicted in the table 4.15, the average Variance Inflation Factor (VIF) of 2.028 was established which is between 1 and 10. The tolerance value was also greater than 0.1 implying that the problem of multicollinearity was eliminated.

4.6.4 Heteroscedasticity Test

Heteroscedasticity occurs when the variance of the error term is not constant. The test was examined by visualizing scatter plot.

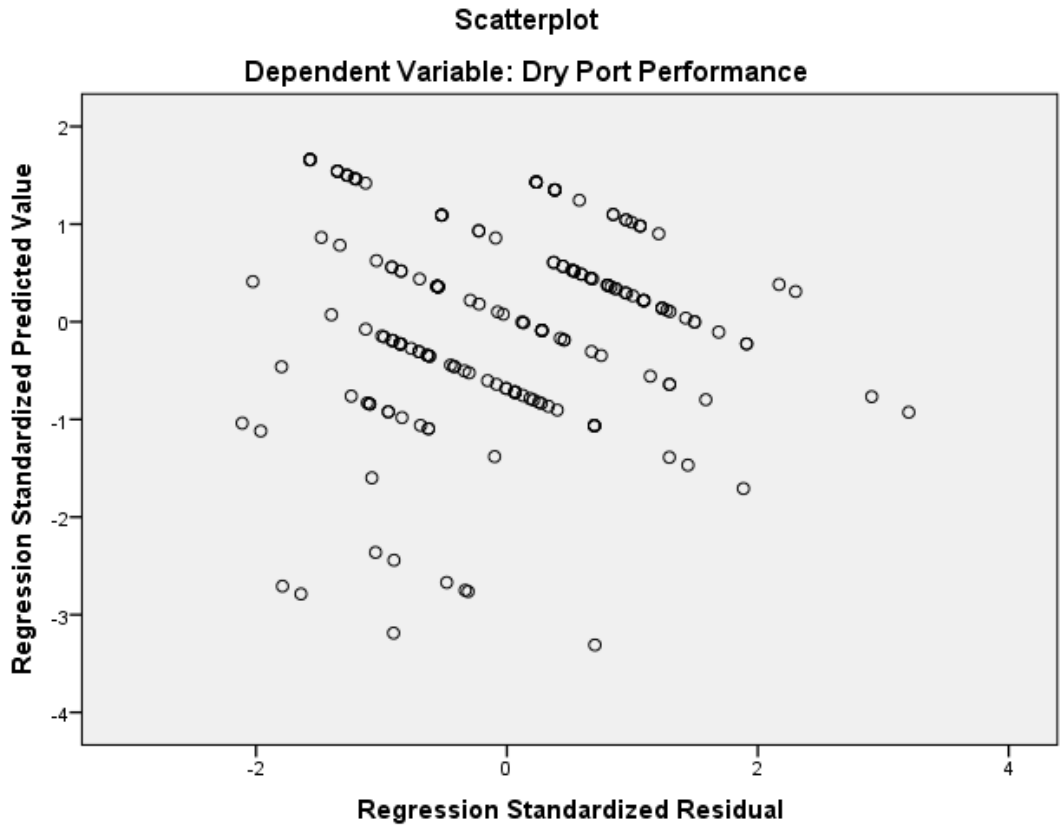

Figure 4.1: Scatter Plot for Heteroscedasticity Test

From the scatter plot above, the dependent variable scores have the same dispersion around the regression line through them, to mean they have equal spread, Outliers, are cases that have a standardized residual value of more than 3.3 Or less than -3.3. Therefore, the assumption of Heteroscedasticity was not violated

4.7 Inferential Analysis

To assess respective strengths and direction of relationships between the independent and dependent variables, Pearson correlation analyses was performed. The variables were computed with the aid of the Statistical Package for Socials Sciences. The study also conducted multiple regression analysis in order to determine the effect of the various independent variables on the dependent variable and hence test the hypotheses of the study.

4.7.1 Correlation Analysis

The Results of the Pearson correlation, as shown in table 4.16 indicate the relationships between the independent variables and the dependent variable. The findings indicated positive and statistically significant correlations between each pair of the independent and the dependent variables. There is a significant positive correlation between information communication technology and the performance of the dry port (r=0.668, p=0.000); a strong positive correlation between infrastructure and performance of the dry port (r=0.830, p=0.000); a significant positive correlation between capacity of personnel and performance of the dry port (r=0.577, p=0.000) and a significant positive correlation between stakeholder cooperation and the performance of the dry port (r=0.727, p=0.000). This implies that any positive changes in information communication technology, infrastructure, capacity of personnel and stakeholder cooperation enhances the performance of the dry port in Kenya.

Table 4. 16: Correlation Analysis

		Performance of the dry port strategy	Information communication technology	Infrastructure	Capacity of personnel	Stakeholder cooperation
Information communication technology	Pearson Correlation	.668**	1			
	Sig. (2-tailed)	.000				
	N	195	195			
Infrastructure	Pearson Correlation	.830**	.584**	1		
	Sig. (2-tailed)	.000	.000			
	N	195	195	195		
Capacity of personnel	Pearson Correlation	.577**	.585**	.463**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	195	195	195	195	
Stakeholder cooperation	Pearson Correlation	.727**	.646**	.632**	.633**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	195	195	195	195	195

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research, 2020

4.8 Multiple Regression Analysis

The study conducted multiple regression analysis to examine whether there is a relationship between the independent and the dependent variables.

4.8.1 Overall multiple regression analysis

Table 4.17: Overall – Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.881	.777	.772	.14492

a. Predictors: (Constant), Stakeholder cooperation, Infrastructure, Capacity of personnel, Information communication technology

b. Dependent Variable: Performance of the dry port

Source: Research, 2020

The correlation coefficient, R was 0.881 implying that there is a strong positive correlation between the explanatory variables and the dependent variable. The results further established that, the coefficient of determination, R squared was 0.777 and adjusted to 0.772. R squared refers to proportion of variance in the dependent variable that is predictable from the independent variable while adjusted R-squared is a modified version of R-squared that has been adjusted for the number of predictors in the model. Therefore, these results from table 4.17 indicate that the independent variables explain 77.2% of all changes in the dependent variables while 22.8% of the changes in dry port performance are explained by other factors.

Table 4.18: Overall – ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.877	4	3.469	165.178	.000
	Residual	3.991	190	.021		
	Total	17.867	194			

a. Dependent Variable: Performance of the dry port
b. Predictors: (Constant), Stakeholder cooperation, Infrastructure, Capacity of personnel, Information communication technology

Source: Research, 2020

The ANOVA results in table 4.18 show the robustness of the model relationship between the independent variable and dependent variable. The F-calculated value of 165.178 was greater than F-critical as depicted by p-value (.000) < 0.05 signifying that the model is statistically significant.

Table 4. 19: Overall – Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	1.222	.117		10.441	.000
	Information communication technology	.107	.037	.141	2.870	.005
	Infrastructure	.300	.025	.565	12.188	.000
	Capacity of personnel	.051	.025	.094	2.028	.044
	Stakeholder cooperation	.149	.036	.220	4.131	.000

a. Dependent Variable: Performance of the dry port

Source: Research, 2020

From the results in table 4.19, the regression results revealed that ICT has significant and positive influence on the performance of the dry port as indicated by $\beta_1 = 0.141$, with p-value (.005) < 0.05. The implication is that when dry port performance is at a constant of 1.222, then a unit change in ICT would lead to an increase in performance of the dry port by 0.141 units holding all other independent variables constant.

Regression results also revealed that infrastructure has a significant and positive influence on performance of the dry port as indicated by $\beta_2 = 0.565$, with p-value (.000) < 0.05. This implied that when dry port performance is at a constant of 1.222, then a unit change in infrastructure would lead to an increase in performance of the dry port by 0.565 units holding all other independent variables constant.

The study further revealed that there existed a significant positive relationship between capacity of personnel and performance of the dry port. This was indicated by $\beta_3 = 0.094$, with p-value (.044) < 0.05. The implication is that when dry port performance is at a constant of 1.222, then a unit change in capacity of personnel would lead to a change

in the performance of the dry port by 0.094 units holding all other independent variables constant.

Last of all, the regression results indicated that there existed a significant relationship between stakeholder's cooperation and performance of the dry port as indicated by $\beta_4 = 0.22$, with p-value (.000) < 0.05. This implied that when dry port performance is at a constant of 1.222, then a unit change in stakeholder's cooperation would lead to a change in performance of the dry port by 0.22 units holding all other independent variables constant.

Therefore, the overall regression equation for this analysis can be presented as:

$$Y = 1.222 + 0.141X_1 + 0.565X_2 + 0.094X_3 + 0.22X_4 + e$$

Where:

Y = performance of the dry port strategy;

$\beta_0 = 1.222$ = intercept term of the regression line.

$\beta_1 = 0.141$ = slope coefficient.

$\beta_2 = 0.565$ = slope coefficient.

$\beta_3 = 0.094$ = slope coefficient.

$\beta_4 = 0.22$ = slope coefficient.

X_1 = Information Communication Technology.

X_2 = Infrastructure.

X_3 = Capacity of personnel.

X_4 = Stakeholder's cooperation

e = error term.

4.9 Hypothesis Testing

To determine the influence of the independent variables on the performance of the dry port, hypothesis testing was carried out. The first null hypothesis, H_{01}, stated that Information Communication Technology has no significant effect on the performance of the dry port. Based on the findings the, p-value was less than 0.05 at 0.05 significance level. Therefore, the study the study accepted the alternative hypothesis based on the p-value and rejected the first null hypothesis H_{01}: Information Communication Technology has no significant effect on the performance of the dry port in Kenya.

The second null hypothesis, H_{02}, stated that infrastructure has no significant effect on the performance of the dry port. Based on the findings, the p-value was less than 0.05 at 0.05 significance level. Therefore, the study the study accepted the alternative hypothesis based on the p-value and rejected the second null hypothesis H_{02}: Infrastructure has no significant effect on the performance of the dry port in Kenya.

The third null hypothesis H_{03}, sated capacity of personnel has no significant effect on the performance of the dry port. Based on the findings, the p-value was less than 0.05 at 0.05 significance level. Therefore, the study accepted the alternative hypothesis based on the p-value and rejected the third null hypothesis H_{03}: Capacity of personnel has no significant effect on the performance of the dry port in Kenya.

The fourth null hypothesis, H_{04}, stated stakeholders' cooperation has no significant effect on the performance of the dry port. Based on the findings, the p-value was less than 0.05 at 0.05 significance level. Therefore, the study the study accepted the alternative hypothesis based on the p-value and rejected the fourth null hypothesis H_{04}: Stakeholders' cooperation has significant effect on the performance of the dry port in Kenya.

Table 4.20: Summary of Hypothesis Testing

Hypothesis	P-value	Conclusion
Ho_1: Information Communication Technology has no significant effect on the performance of the dry port	0.005	Reject Ho_1
H_{02}: Infrastructure has no significant effect on the performance of the dry port.	0.000	Reject Ho_2
Ho_3: Capacity of the personnel has no significant effect on the performance of the dry port.	0.044	Reject Ho_3
Ho4: Stakeholders' cooperation has no significant effect on the performance of the dry port.	0.000	Reject Ho_4

Source: Research, 2020

4.10 Discussion of the Findings

From the above regression model, the study found out Information Communication Technology, infrastructure, capacity of personnel and stakeholders' cooperation enhances the performance of the dry port in Kenya. The four independent variables that were studied explain a substantial 77.2% variation in the performance of the dry port strategy as represented by Adjusted R squared (0.772).

4.10.1 Information Communication Technology on Dry Port Performance

The first objective of the study was to determine the effect of Information Communication Technology on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. The study found that ICT had a positive and significant effect on the performance of dry port. This was supported by the descriptive statistics results of the study with the majority of the respondents having agreed that ICT had affected the performance of the dry port as indicated by the mean score of 3.784. The results of the correlation analysis also indicate that there is a significant positive correlation between ICT and the performance of the dry port ($r = 0.668$, $p = 0.000$). The study established that the beta value for Information Communication Technology was $\beta_1=0.141$, p-value (.005) < 0.05 implying that Information

Communication Technology positively and significantly influenced the performance of the dry port in Kenya. This falls in tandem with the findings of the study by Crainic et al. (2015), as sighted on the literature review of this research project.

4.10.2 Infrastructure on Dry Port Performance

The second objective of the study was to determine the effect of infrastructure on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. The study found that infrastructure had a positive and significant effect on the performance of dry port. This was supported by the descriptive statistics results of the study with the majority of the respondents having agreed that infrastructure had affected the performance of the dry port as indicated by the mean score of 4.304. The results of the correlation analysis also indicate that there is a significant positive correlation between infrastructure and the performance of the dry port ($r = 0.830$, $p=0.000$). Also, from the multiple regression analysis, it was established that the beta value for infrastructure was $\beta_2=0.565$, p-value (.000) < 0.05 implying that infrastructure positively and significantly influenced the performance of the dry port in Kenya. From the empirical literature, the studies by Rahmanto (2016) and Kwateng et al., (2017) had similar findings on the relation of infrastructure as their independent variable to the dependent variable as used on both studies.

4.10.3 Capacity of Personnel on Dry Port Performance

The third objective of the study was to determine the effect of capacity of personnel on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. The study found that capacity of personnel had a positive and significant effect on the performance of dry port. This was supported by the descriptive statistics results of the study with the majority of the respondents having agreed that capacity of personnel had

affected the performance of the dry port as indicated by the mean score of 4.24. The results of the correlation analysis also indicate that there is a significant positive correlation between capacity of personnel and the performance of the dry port (r = 0.577, p = 0.000). Furthermore, the results of the multiple regression analysis in the study also established that there existed a significant positive relationship between capacity of personnel and the performance of the dry port strategy as indicated by β_3=0.094, p-value (.044) < 0.05. This showed that capacity of personnel positively and significantly influenced the performance of the dry port in Kenya. The study done by Ruto and Datche (2015) as reviewed earlier on is in line with the findings of this research project.

4.10.4 Stakeholder's Cooperation on Dry Port Performance

The fourth objective of the study was to determine the effect of stakeholder's cooperation on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. The study found that stakeholder's cooperation had a positive and significant effect on the performance of dry port. This was supported by the descriptive statistics results of the study with the majority of the respondents having agreed that stakeholder's cooperation had affected the performance of the dry port strategy as indicated by the mean score of 4.088. The results of the correlation analysis also indicate that there is a significant positive correlation between stakeholder's cooperation and the performance of the dry port (r = 0.727, p = 0.000). Lastly, the study further established that the beta value for stakeholder's cooperation was β_4= 0.22, p-value (.000) < 0.05 implying that stakeholder's cooperation positively and significantly influenced the performance of the dry port in Kenya. According to Visser et al. (2007) findings, stakeholder's cooperation influenced positively and significantly the dependent variable.

CHAPTER FIVE

FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of key findings made by the study, conclusion drawn from the findings, and recommendations proposed by the research. The conclusions and recommendations are focused on addressing the main objective of the study. This chapter also discusses suggested areas for future research.

5.2 Summary of Findings

This section presents the key findings as considered under each objective in the study.

5.2.1 Information Communication Technology

The first objective of the study was to determine the effect of Information Communication Technology on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. The study found that ICT had a positive and significant effect on the performance of dry port. This was supported by the descriptive statistics results of the study with the majority of the respondents having agreed that ICT had affected the performance of the dry port as indicated by the mean score of 3.784. The results of the correlation analysis also indicate that there is a significant positive correlation between ICT and the performance of the dry port ($r = 0.668$, $p = 0.000$). The results of the multiple regression analysis also supported this finding by revealing that ICT had a significant and positive influence on the performance of the dry port as indicated by $\beta_1=0.141$, p-value (.005) < 0.05. This implied that a unit change in ICT would lead to a change in the performance of the dry port by 0.141 units.

5.2.2 Infrastructure

The second objective of the study was to determine the effect of infrastructure on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. The study found that infrastructure had a positive and significant effect on the performance of dry port. This was supported by the descriptive statistics results of the study with the majority of the respondents having agreed that infrastructure had affected the performance of the dry port as indicated by the mean score of 4.304. The results of the correlation analysis also indicate that there is a significant positive correlation between infrastructure and the performance of the dry port ($r = 0.830$, $p=0.000$). The results of the multiple regression analysis also supported this finding by revealing that infrastructure had a significant and positive influence on the performance of the dry port strategy as indicated by $\beta 2 = 0.565$, p-value (.000) < 0.05. This implied that a unit change in infrastructure would lead to a change in the performance of the dry port by 0.565 units.

5.2.3 Capacity of Personnel

The third objective of the study was to determine the effect of capacity of personnel on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. The study found that capacity of personnel had a positive and significant effect on the performance of dry port. This was supported by the descriptive statistics results of the study with the majority of the respondents having agreed that capacity of personnel had affected the performance of the dry port as indicated by the mean score of 4.24. The results of the correlation analysis also indicate that there is a significant positive correlation between capacity of personnel and the performance of the dry port ($r = 0.577$, $p = 0.000$). The results of the multiple regression analysis also supported this finding by revealing that capacity of personnel had a significant and positive influence

on performance of the dry port as indicated by β3 = 0.094, p-value (.044) < 0.05. This implied that for a unit change in capacity of personnel would lead to a change in the performance of the dry port by 0.094 units.

5.2.4 Stakeholder's Cooperation

The fourth objective of the study was to determine the effect of stakeholder's cooperation on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. The study found that stakeholder's cooperation had a positive and significant effect on the performance of dry port. This was supported by the descriptive statistics results of the study with the majority of the respondents having agreed that stakeholder's cooperation had affected the performance of the dry port strategy as indicated by the mean score of 4.088. The results of the correlation analysis also indicate that there is a significant positive correlation between stakeholder's cooperation and the performance of the dry port (r = 0.727, p = 0.000). The results of the multiple regression analysis also supported this finding by revealing that stakeholder's cooperation had a significant and positive influence on the performance of the dry port as indicated by β4 = 0.22, p-value (.000) < 0.05. This implied that any unit change in stakeholders' cooperation would lead to a change in performance of the dry port by 0.22 units.

5.3 Conclusion

The first objective of the study was to determine the effect of technology on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. According to the findings of the study, it is concluded that information communication technology had a positive and significant effect on the performance of dry port. The

provision of ICT hardware and software and matching with the right skills are critical in enhancing the performance of dry port in Kenya.

The second objective of the study was to evaluate the effect of infrastructure on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. According to the findings of the study, it is concluded that infrastructure had a positive and significant effect on the performance of dry port. The provision of railway lines, parking and inspection bays as well as other infrastructure are critical in enhancing the performance of the dry port.

The third objective of the study was to establish the effect of capacity of the personnel on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. According to the findings of the study, it is concluded that capacity of the personnel had a positive and significant effect on the performance of dry port. Therefore, having qualified and trained personnel who are motivated and adequately stuffed enhances the performance of dry port in Kenya.

Lastly, the fourth objective of the study was to establish the effect of stakeholder's cooperation on the performance of dry port in Kenya; a case of the Internal Container Depot, Nairobi. According to the findings of the study, it is concluded that stakeholder's cooperation had a positive and significant effect on the performance of dry port. The ICD learning visits and support for attendance of stakeholder meetings are critical in enhancing the performance of dry port.

5.4 Recommendation

To reduce on inefficiencies at the dry port, the Government of Kenya through KRA customs and border control department must invest in proper infrastructure and employment of proper and specifically trained customs personnel from accredited

customs training institutions such as Kenya School of Revenue Administration. Also, KRA customs and border control department should develop a policy that enhances infrastructural development within the dry port through the construction of better facilities and foster useful collaborations and linkages with other border agencies involved in the process of customs clearance. These relations must be focused towards ensuring seamless procedures of clearance of goods improving service delivery of the dry port.

5.5 Suggestion for Future Research

The study only focused on the human and non-human determinants of dry port performance in Kenya: a case of the Internal Container Depot, Nairobi. Future studies can be conducted to analyze and understand the political, economic, social, technological, environmental, legal, and ethical factors affecting the performance of a dry port.

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APPENDICES

Appendix I: Questionnaire

This questionnaire is devised to gather information on determinants of dry port performance in Kenya. Your genuine responses are kindly requested.

Thank you for your cooperation and support in realizing this research project.

General Direction:

• Please fill out and return the questionnaire properly

• Any confidential data obtained from you will only be used in aggregated form in any report or presentation concerning this survey and all data will be treated as highly confidential

PART A: DEMOGRAPHIC QUESTIONS

1. Which of the following do you represent? (just tick)

a. K.R.A Senior manager, Customs & Border Control department [ ]
b. Clearing and Forwarding Agents [ ]
c. KPA Senior Manager [ ]

2. How long have you worked in your organization? (just tick)

a. 3-5 years [ ]
b. 6-10 years [ ]
c. 11-15 years [ ]
d. 16-20 years [ ]
e. More than 20 years [ ]

3. Number of employees in your organization? (just tick)

a. Less than 10 [ ]
b. 11-50 [ ]
c. 51-100 [ ]
d. More than 100 [ ]

4. What is your level of education?

a. Diploma [ ]
b. Undergraduate [ ]
c. Masters [ ]
d. PhD [ ]

PART B: DETERMINANTS OF THE PERFORMANCE OF A DRY PORT IN KENYA

Information Communication Technology

Please indicate your level of agreement with the following statements regarding information communication technology

Where: 1= strongly disagree, 2= disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

	Statement	**1**	**2**	**3**	**4**	**5**
1.	The use of single window system on container clearance has curbed congestion problem at ICD					
2.	Modern weighbridge has reduced traffic flow at the ICD					
3.	There are few cases of the system downtime at the ICD					
4.	There is adequate ICT software to promote container clearance at ICD					
5.	There is adequate ICT hardware to promote container clearance at ICD					

Infrastructure

Please indicate your level of agreement with the following statements regarding the infrastructure.

Where: 1= strongly disagree, 2= disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

	Statement	**1**	**2**	**3**	**4**	**5**
1.	The access of roads and other transport means is adequate to promote flow of commodities at ICD.					
2.	There is appropriate communication infrastructure to link importers, exporters and other stakeholder at ICD					
3.	Construction of scanning machines has enabled more clearance of goods at ICD					
4.	There is enough parking space for vehicles waiting clearance at ICD					
5.	Construction of modern halls has enhanced clearance of goods at ICD					

Capacity of Personnel

Please indicate the extent to which you agree or disagree with the following statements on capacity of personnel

Where: 1= strongly disagree, 2= disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

	Statement	**1**	**2**	**3**	**4**	**5**
1.	ICD employees are frequently trained					
2.	Employees at ICD are well motivated through rewarding to ensure they work effectively					
3.	There are adequate staff members to oversee the operations of the departments at ICD					
4.	Performance of employees has significantly contributed to the performance of ICD					
5.	There is cooperation among employees					

Stakeholder's Cooperation

Please indicate the extent to which you agree or disagree with the following statements on capacity of personnel

Where: 1= strongly disagree, 2= disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

	Statement	**1**	**2**	**3**	**4**	**5**
1.	The process of documentation is cumbersome at ICD					
2.	Introduction and use of single window system on container clearance have curbed congestion problem at ICD					
3.	There are ICD learning visits by importers and exporters to improve information flow.					
4.	There is support for attendance of stakeholder's meetings at ICD					
5.	KRA has installed software and ICT up to date to help in verification e.g. scanners					

Dry Port Performance

Kindly indicate your level of agreement with the following statements regarding the dry port performance

Where: 1= strongly disagree, 2= disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

	Parameters	**1**	**2**	**3**	**4**	**5**
1.	ICD has eased congestion at the port					
2.	ICD has resulted in the increase of trade volumes					
3.	ICD has hastened the clearance of cargo.					
4.	ICD has resulted in increase of revenue					
5.	ICD has reduced transaction costs					

Appendix II: List of Organizations

1. Kenya Revenue Authority
2. Kenya Ports Authority

Clearing & Forwarding Agents

3. Mitchell Cotts Freight Kenya Limited
4. Agility Logistics
5. Intraspeed Acpro Kenya Limited
6. Carjet Kenya Limited
7. DHL Global Forwarding (K) Limited
8. General Cargo Services Limited
9. Highlands Forwarders limited
10. Nyagaka Forwarders
11. Reliable Freight Services Limited
12. Waki Clearing & Forwarding Agents Limited
13. Spedag Interfreight Kenya Limited
14. Syller Impress Company Limited
15. Union Logistics Limited
16. Indus Logistics Limited
17. Jemi Freight Limited
18. Skyline Express Services Limited
19. Skylux Logistics Limited
20. Quissan Enterprises Limited
21. Seabridge Forwarders Limited
22. Keynaut Logistics Limited
23. Logwin Air & Ocean (K) Limited

24. Amazon Freight Limited
25. Bollore Africa Logistics
26. Rapid Kate Services Limited
27. Speedex Logistics Limited
28. Adelcus Agencies (K) Limited
29. Al-Emir Limited
30. Blitz Logistics Limited
31. Cargo Nest Kenya Limited
32. Conken Cargo Forwarders Limited
33. Continental Cargo Services (K) Limited
34. Deccan Freight Logistics Limited

Appendix III: KESRA letter

Kenya School of Revenue Administration

KENYA REVENUE AUTHORITY

ISO 9001:2015 CERTIFIED

REF: KESRA/NBI/036

5th October, 2020

TO WHOM IT MAY CONCERN

RE: REQUEST FOR RESEARCH PERMIT:

NAME ; MOKUA BRIAN OKOYO
REG. NO.; MU/KESRA/0088/2016

This is to confirm that the above named is a student at Kenya School of Revenue Administration (KESRA) Nairobi Campus pursuing Masters in Tax & Customs Administration.

The named student is undertaking Research on **"Determinants of Dry Port performance in Kenya."**

The purpose of this letter is to request your good office to assist the above student with the information to enable him work on his project.

Thank you.

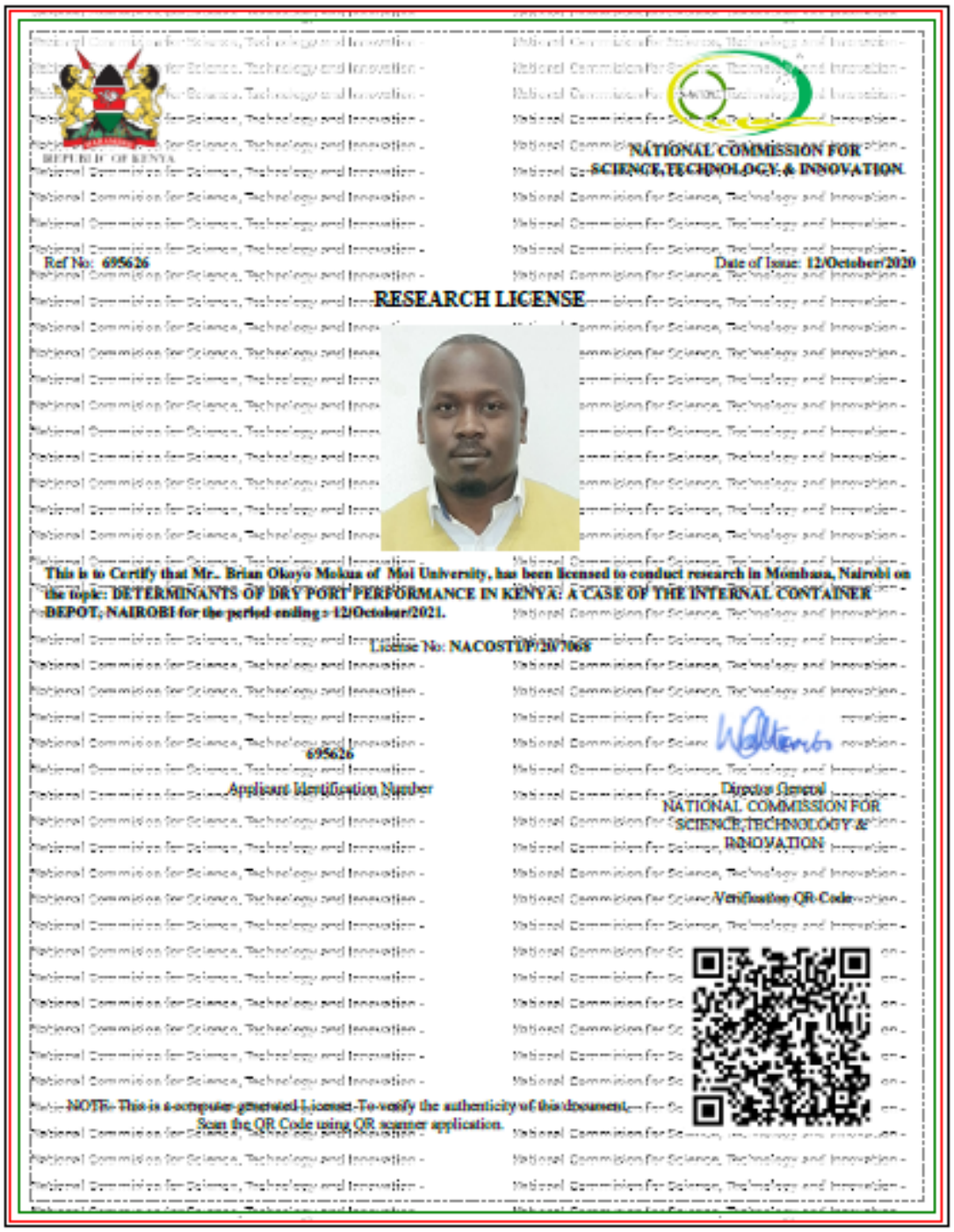
For **Dr. Marion Nekesa PHD,**
Head Academic Research
KESRA

KENYA SCHOOL OF REVENUE ADMINISTRATION (KESRA) 05 OCT 2020 NAIROBI

P. O. Box 48240 – 00100, Nairobi **Email:** kesratraining@kra.go.ke **Tel:** +254715877535/9

Tulipe Ushuru, Tujitegemee!

Appendix IV: Research Permit



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